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OPERATING INSTRUCTIONS

STUMP CUTTER

Predator P 38 M
Predator P 38 R

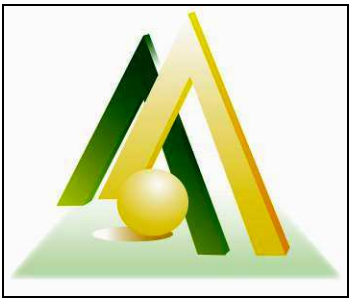
Orig. version: 04. 2013

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND
INVESTMENT IN YOUR FUTURE

Foreword

Thank you very much that you have just purchased our product, the stump cutter P 38 R Predator. Our company has been engaged in production of equipment for stump cutting, wood residue crushing and disposal for many years and has gained considerable experiences in this field. Quality of our small and also powerful machines is proven in 40 countries of Europe and Asia we export to.

Permanent innovations of the Laski manufacturing assortment have been crowned by the most important awards in the company's history, the golden medals Grand Prix, gained for its complete family of products at the international shows Techagro und Silva Regina in Brno:



Grand Prix Techagro 1998
Grand Prix Silva Regina 2002
Grand Prix Silva Regina 2008

This manual brings important instructions for users, i.e. instructions for putting the machine into operation, work safety and operating experiences. You will learn how to carry out maintenance, repairs and servicing and who is authorised for doing checks and other actions on the machine.

Your local dealer will give you this manual with instructions for operation and maintenance while taking this new machine over. Make sure if you understand everything. If not, do not hesitate and contact your dealer and ask him for further explanation. It is very important for you and your work safety to understand all instructions given in this manual.

The firm Laski s.r.o. does not bear any responsibility for any claims resulting from disobedience to the instructions given in this manual.

This operation manual includes also work safety instructions in various parts of its text. If there is any work safety rule or instruction in general description, then this instruction is indicated with the following symbol:

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EC Conformity Declaration

EC Conformity Declaration

issued in compliance with applicable EC Directives

We, as the manufacturer, **LASKI, s. r. o.**
Blišťka 263/16
CZ-798 17 Smržice
Reg.-Nr.: 45479593

declare hereby that our product
- designation: **Stump cutter Predator**
- type: **P 38 M**
- serial number: .....

complies with the given EC Directives:
2006/42/EC - Machinery
2004/108/EC - EMC
2002/88/EC, 97/68/EC

List of technical standards, specifications and harmonised norms used for assessment of its conformity: **EN ISO 12100, EN ISO 13732-1, EN 953+A1, EN ISO 4413, EN ISO 3767-1,3, EN ISO 5349-1, EN ISO 11 201, EN 1175-1,2, EN 55012 ed.2, EN ISO 4254-1, ISO 11 684**

Basic technical parameters:

Parameter	Unit	Value
Length	mm	2440
Width	mm	670 - 970
Height	mm	1380
Cutting head diameter	mm	480
Weight	kg	1042
Engine - type	-	KOHLER COMMAND CH 980
Power output	kW	28,3
Travel speed (attendance while walking)	km/h	0 - 4

Completion of technical documentation: **Ing. Jiří Kvasnička**
Petra Bezruče 205
CZ - 664 43 Želešice

In Smržice, on 19.3.2012

.....
Ing. Jiří Kvasnička

EC Conformity Declaration

issued in compliance with applicable EC Directives

We, as the manufacturer, **LASKI, s. r. o.**
Blíšťka 263/16
CZ-798 17 Smržice
Reg.-Nr.: 45479593

declare hereby that our product - designation: **Stump cutter Predator**
- type: **P 38 R**
- serial number: .....

complies with the given EC Directives:
č. 176/2008 Sb. (2006/42/EC - Machinery)
č. 616/2006 Sb. (2004/108/EC - EMC)
č. 426/2000 Sb. (1999/5/EC – ACT) as amended
č. 365/2005 Sb. (2002/88/EC, 97/68/EC)

List of technical standards, specifications and harmonised norms used for assessment of its conformity: **ČSN EN ISO 12100, ČSN EN ISO 13732-1, ČSN EN 953+A1, ČSN EN ISO 4413, ČSN EN ISO 3767-1,3, ČSN EN ISO 5349-1, ČSN EN ISO 11 201, CSN EN 1175-1,2, ČSN EN 55012 ed.2, ČSN EN ISO 4254-1, ISO 11 684**

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Engine - type	-	KOHLER COMMAND CH 980
Power output	kW	28,3
Travel speed (attendance while walking)	km/h	0 - 4
Remote control	-	SCANRECO RC 400, Švédsko
Transmitter frequency	MHz	433,05 – 434,79
Transmitter output	mW	max. 10

Completion of technical documentation: **Ing. Jiří Kvasnička**
Petra Bezruče 205
CZ - 664 43 Želešice

In Smržice, on 19.3.2012

.....
Ing. Jiří Kvasnička

Product Identification

Our product is identified with its serial number stamped both on the type plate and on the chassis.

Upon take-over of the product we recommend you to fill the required data in the following form concerning the given product and your dealer.

Tab. 1 – General data

Product type	……
Product serial number	……
Engine type	……
Engine serial number	……
Dealer's address	……
Address of authorised service	……
Date of delivery	……
Warranty expiration date	……
Interruption of warranty period	……

The product type plate can be found on the main chassis, down on the machine.
It includes:

- manufacturer's data
- type
- serial number
- weight of machine
- product designation

(CE)

Type plate location

Fig. 4 – Type plate location

Work Safety Instructions

Utilisation

- This product is designed for cutting away a tree stump from above ground level to below ground level with its above-ground part up to +800 mm and its under-ground part up to -380 mm.

- This machine is also rated to climb slopes (perpendicularly to the contour) up to 11°.
- This machine under designation P 38 R is equipped with remote control; its model under designation P38 M is controlled mechanically.

Not Allowed Use

- This machine cannot be used for cutting of dozy stumps which could be released and pulled out by the blades.
- Avoid any cutting if there can be some foreign matters and objects, such as metal, glass cullet, stony debris, ceramics etc. hidden in the stump.
- Avoid driving on very soft or unstable ground. The machine could sink, slide, slew or turn over.
- It is strictly forbidden to start working with removed guards, particularly with a rear guard of the cutting head or rubber guards if missing.
- If the rear guard does not cover the head properly.
- Avoid traversing along steep slopes, since there is always the danger of overturning the machine.
- Always ascend and descend slopes with the cutting head up hill.
- This machine is designed for duty cycles of no more than two hours between breaks.
- It is forbidden to use this machine if operating temperature in the hydraulic system exceeds 65°C.

Generally

- Do not use this machine without prior reading this manual. The user/owner of this machine is obliged to instruct attendants about relevant instructions for its operation in a demonstrable way.
- This manual should be available/accessible for attendants any time.
- This machine is allowed to be operated only by an operator who is over 18 yrs old, physically and mentally capable and demonstrably instructed about its operation.

- Persons under the influence of drugs, alcohol or medication affecting reaction time must never work on or with this machine.
- The stump cutter is allowed to be transported to site either on a trailer or on a low-bed truck. It is not designed to go on public roads.
- While working, wear always personal protective equipment – forestry safety helmet with visor or goggles, protective gloves, steel toe protection boots and working clothes properly buttoned.
- Every operator of this machine is fully responsible for any injury or damage caused to the third persons within the operating reach of the machine.
- While working, the operator should stand at least 3 m away from the cutting head.
- Keep this machine beyond children's and unauthorised persons' reach. Avoid their presence while working.
- Observe the working area. If any person, children or animals approach while cutting (within a 20 metre radius of the machine), then stop working immediately.
- Take the time to familiarise yourself with the machine controls before attempting to operate it and slowly build up to operating the machine at its full capability.
- Before working learn all functions of individual controls and safety elements and carry out functional checks before any use.
- Make sure if necessary operating and ancillary space is free and safe.
- At work in residential zones use the machine in accordance with regulations of the local authorities to avoid disturbing of local inhabitants (noise, flying chips, exhaust gases). Engine exhaust gases contain poisonous carbon monoxide.
- While working keep an eye on chips gathering behind the cutting head. In case of excessive accumulation, stop the engine and wait for running the head out. When the head stops, remove excessive chips.
- This manual describes problems and faults that may occur at work and that could be remedied by an instructed person. In case of other problems and faults do not hesitate and contact the manufacturer. He is always ready to help you.
- Do never any technical changes or any actions that are neither given in this manual nor allowed by the manufacturer. This machine, if not correctly installed or adjusted, may run without problems now but in the future any of important parts could get out of order or do fatal damage.
- For replacement of worn or damaged parts use always original spare parts only.

- The manufacturer does not bear responsibility for any damages or injures to the third persons, or to other equipment and property, resulted from disobedience to instructions given in this manual.
- Do not put any objects or tools on the machine.
- When handing the machine over to another person make sure if all controls, guards, emergency switches and other safety elements are complete, functional and properly installed. They serve for your safety.
- Do not use or attempt to start the stump cutter without the cutter guards, engine covers and access covers securely in place. Failure to do so may result in personal injury or loss of life
- Keep the given intervals for checks of bolted joints.
- Check up condition of rubber tracks regularly.
- Always after work clean up all parts of the machine (brush, cleaning rag).
- Any actions or servicing on the machine are allowed to be done only if the engine is turned off, its ignition key is pulled out and the given machine blocked properly against unwished motion. If the cutting head should remain lifted then block the cutter arm separately against sinking.
- Do not use petrol and similar oil products as a cleaning agent. Protect rubber tracks and other rubber parts against any contact with fuels and other oil products.
- Keep the machine beyond the reach of naked flames.
- Any transport of persons, or of any load, on the machine is not allowed.
- Some parts of the machine may run warm (gearings, hydraulics). Do not touch them when the machine is still running or having been just stopped. Use great care when maintaining the hydraulic system since oil is very hot when the machine has just finished working.
- Do not let the engine running at high speed unreasonably.
- Do not attempt to detect contingent hydraulic oil leakage directly by hand. Use always a piece of cardboard, wooden board etc. – risk of injury by oil under high pressure.
- Carry out regular checks of hydraulic hoses for oil leaks and their actual condition (damage, cracks, wear).
- Do not use the machine in confined or ill-ventilated spaces. Exhaust gases include also toxic carbon monoxide which is colourless, odourless, tasteless and can cause death if inhaled.
- Do not use the machine under conditions of low visibility, especially at foggy weather, when you may overlook persons coming. Operate it only at daylight or with sufficient lighting.

- Ensure that all operators are adequately trained for operating this machine especially with safe working practices. In case of any uncertainty with operation of this machine ask your dealer to show proper operation in practice.
- Every training course for attending personnel should include also practical operation under supervision of an experienced person or your dealer and necessary work safety instructions.
- Do not carry out any repairs that are specified for authorised services only.
- Do not carry out any repair where its solution exceeds your experiences.
- While working, particularly while transporting the machine, respect all the applicable instructions in the concerned manual. At public road transport the driver must keep all local regulations valid for public roads.
- This manual contains also important health and safety information and explains the machine controls. Read and understand this manual before operating.
- While cutting, do not enter the space in direction of ejected or rebounded wooden chips.
- While cutting, the operator should not stand in close proximity to the machine, but beyond the reach of exhaust gases, i.e. in the place as stated for attendance.
- Before transport turn always the cutting head drive off.
- Keep this machine beyond the children's and unauthorised persons' reach. Avoid their presence while working.
- Observe the working area. If any person, children or animals approach while cutting, then stop working immediately.
- Remove the ignition key to avoid accidental starting. Ensure the cutting head has stopped rotating before undertaking any maintenance or adjustments to the machine
- CAUTION!!! Be aware of ejected particles. They have substantial kinetic energy. If the wooden material to be cut contains not allowed parts, such as metal, sand, glass etc., then such objects can reach a longer distance than wooden chips. Before working make sure if the bottom edge of the adjustable guard covers the cutting head properly in order to reduce unwished ejection.
- The operator of this machine is fully responsible for any injury or damage caused to the third persons within the operating reach of the machine.
- At work in residential zones use the machine in accordance with regulations of local authorities to avoid disturbing of local inhabitants (noise, flying chips, exhaust gases).

While working, the operator is obliged:

- to use only such a cutter which is in optimal operating condition, not damaged through transport, storage or from previous operation,
- to check up the working area, respectively soil bearing capacity, before work,

- to avoid working on wet terrain, steep slopes and close to trenches with risks of instability,
- to avoid working with inclination exceeding the permissible limit of 11°,
- to expand the track base before going to any slope,
- to ascend and to descend slopes with the cutting head up hill,
- to expand the track base and to reduce the manoeuvring speed in order to avoid the risk of tipping the machine over and skidding,
- to avoid turning on inclined surfaces as far as possible. When you have to turn on slopes, try to do it on solid and non-slippery sections.
- to check up functions of all controls and safety elements before putting the machine into operation,
- to avoid disturbing other people with noise, exhaust gases or ejected flying particles (at windy weather),
- to protect property, vehicles and people from flying debris and to use sufficient screening accordingly,
- to keep traffic rules and local regulations when going or working on or nearby public roads.
- Do not leave the machine unattended – pull out the ignition key.
- While working, wear always personal protective equipment - protecting shield or goggles, protective gloves, working boots and working clothes properly buttoned.
- Avoid wearing free parts, such as ties, scarves and shawls, belts, jewellery etc. In case of longer hairs use always a proper head piece. Otherwise, such a person is not allowed to operate this machine.
- Keep work safety symbols in proper order.
- Check out the stump to be cut and remove all undesirable objects. If you see such particles in ejected chips stop working immediately.
- In case of any problems and faults at work do not hesitate and stop the machine immediately. Any fault, particularly on rotary parts, may cause fatal and dangerous situations. It may also come to light through strange noise or excessive vibrations.
- Observe the working area. If any person, children or animals approach while cutting (within a 20 metre radius of the machine), then stop working immediately.
- This manual describes problems and faults that may occur at work and that could be remedied by an instructed person. In case of other problems and faults do not hesitate and contact the manufacturer. He is always ready to help you.
- Do never any technical changes or any actions that are neither given in this manual nor allowed by the manufacturer. This machine, if not correctly

installed or adjusted, may run without problems now but in the future any of important parts could get out of order or do fatal damage.

- Pay regular attention to all bolted joints. Keep them properly tightened.
- Do not start the machine in confined or ill-ventilated spaces. Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odourless, colourless and can cause death if inhaled.
- Always ensure that the cutter arm is in its top position and clear of any obstacles before trying to start the machine

Residual Risks

FUEL

Diesel fuel can be injurious to the skin - wash off as soon as possible. If taken internally seek immediate medical attention. Refer to your local fuel supplier for the MSDS sheet.

Store diesel only in approved containers, in well ventilated, unoccupied buildings and away from naked flames. Do not fill the fuel tank while the engine is running.

EXHAUST FUMES

Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odourless, colourless and can cause death if inhaled. Avoid inhaling exhaust fumes and never run the engine in a closed building or confined area with insufficient ventilation.

HOT PARTS

Engine components can get extremely hot from operation. To prevent severe burns, do not touch these areas while the engine is running - or immediately after it is turned off.

Never operate the engine with heat shields or guards removed.

ELECTRICAL SHOCKS

Never touch electrical wires or components while the engine is running - they can be sources of electrical shocks.

ROTATING HEAD

When the drive is turned off, the cutting head could continue to rotate for a short while. Its teeth are sharp and could cause damage or injury even whilst not in motion.

BATTERIES

Batteries contain acid which is corrosive and poisonous. Handle the battery with care - if splashed there is a risk of burns and / or serious damage to eyes. Wash the affected area immediately with lots of clean water and seek medical advice immediately. Read the battery MSDS sheet as supplied.

EXPLOSIVE GASES

Gases, if given off from the battery, are explosive. Keep sparking and flames away.

PERSONAL SAFETY

The following personal protective equipment (P.P.E.) must be worn by the person operating this machine and also all personnel within a 20 metre radius of the machine:

- forestry safety helmet as to EN 397 fitted with a visor as to EN 166
- heavy duty gloves as to EN 388
- full ear protection as to EN 352-3
- close fitting heavy-duty fully protecting clothing
- steel toe protection boots as to EN 345

dust mask if the ground is very dry.

NOISE

Noise levels of LAeq 86,8 dB(A) have been recorded at the working position, i.e. in a distance of 3 m away from the machine in duty as per EN 11201.

DUST

If the ground is very dry, a large amount of airborne dust might occur. In this situation a corresponding respiratory mask should be worn.

HAZARDOUS BRASH

Some species of trees and bushes are poisonous and can irritate the skin or give respiratory problems. Do not work in confined areas and if in doubt wear a respiratory mask in addition to the P.P.E already described. Seek professional advice if you are unsure what you are dealing with.

LIGHTING

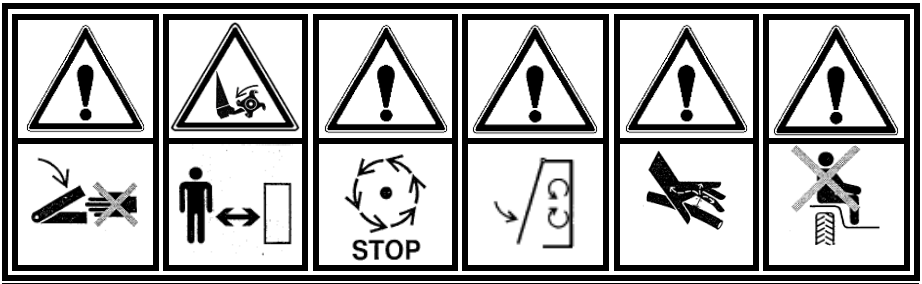
Operate only at daylight or with sufficient lighting.

Work Safety Symbols

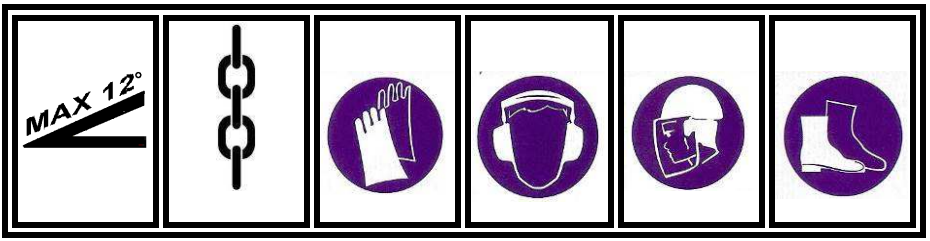
This article introduces work safety symbols (pictographs) used on this machine. Under the given pos. number there is their location on the machine. These work safety symbols warn the operator against risks connected with the machine use. Your respect to the symbol meaning is a precondition for your work safety.

The user is obliged to keep all the work safety symbols legible, clear and undamaged. In case of any damage or illegibility ask your local dealer or an authorised service for a new relevant pictograph.

1	2	3	4	5	6
Read this operating manual before use	Always follow the manual while maintaining, servicing or repairing the machine and take always the switch key out of ignition	Warning! Keep away – ejected objects hazard	Warning! Hot parts of exhaust manifold	Warning! Keep away – the cutter arm swings out while working	Warning! Rotating parts – pull-in hazard

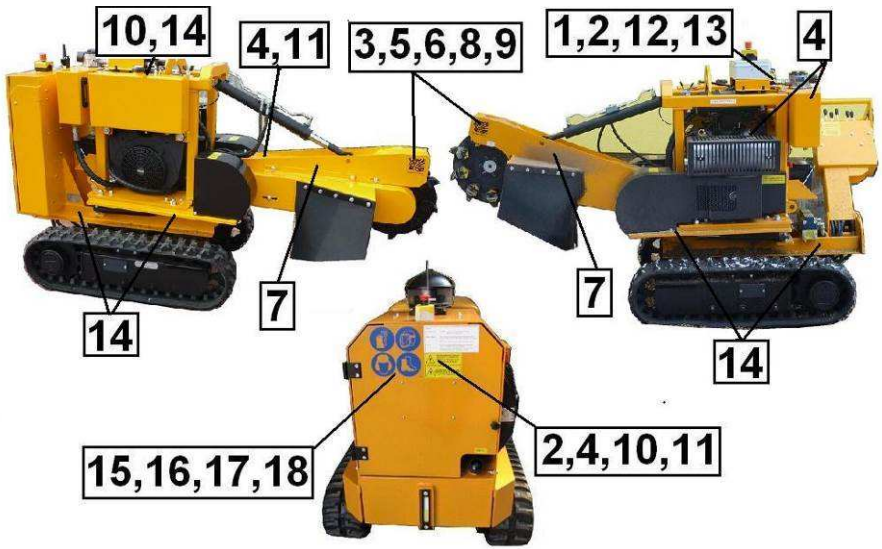


7	8	9	10	11	12
Warning! Keep hands away – squeeze hazard	Warning! Lower extremities injury hazard	Warning! Cutting head runs out	Warning! Close all guards before starting the machine	Warning! Risk of high-pressure liquid leakage	Transport of persons is strictly forbidden



13	14	15	16	17	18
Avoid working with inclination exceeding permissible limit	Lashing points	While working, wear heavy-duty gloves	Wear full ear protection	Wear safety helmet fitted with visor	Wear steel toe protection boots

Work safety symbols on the machine



Work safety symbols on the machine

Technical Description

This machine consists of the following main parts:

- chassis
- engine
- cutter arm
- control box
- hydraulic system

Chassis

This tracked chassis can change its track width. Its travel gear is powered by hydrodrive with continuous regulation. Adjustment of the track base can be done also by means of the hydraulic cylinder. Profiled rubber tracks are stretched on rollers.

Engine

This machine is powered by the engine KOHLER COMMAND CH 980, air-cooled, two-cylinder, power output of 38 HP. The engine is used also for hydraulic drives and a hydrogenerator of the cutting head.

Cutter arm
It is intended for swinging of the cutter arm while working. Its suspension itself provides swinging motion against the chassis. The arm, hinged in the suspension, can move up and down and it is controlled by hydraulic cylinders. It is in fact a hinged bearer with the cutting head attached. The RH and LH cutting blades are fitted on the head perimeter.

Control box
It is in fact a multifunctional remote controller SCANRECO RC 400. This radio control unit is highly sophisticated and offers fine control to operations of the machine. For emergency control of the machine you can use control levers (joysticks) of hydraulic valves installed under the cover at the rear of the machine.

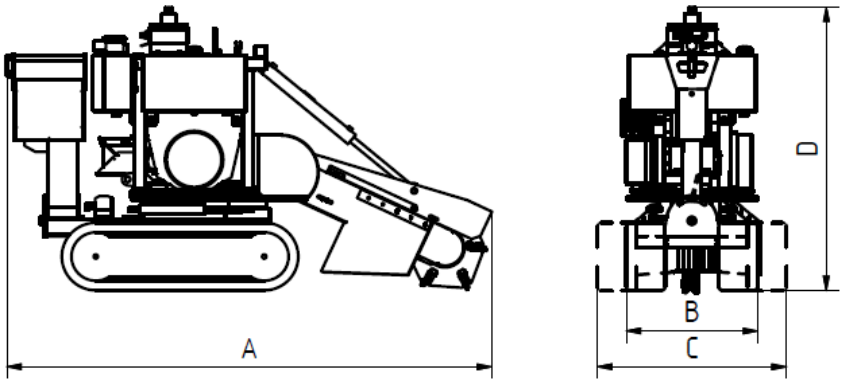
Hydraulic system
It is designed for transmission of the torque from the driving engine to the working elements powered by a hydraulic motor. The entire system includes also an oil cooler with filtration and electromagnetic valves.

Tab. 2 - Technical Parameters

Parameter	Unit	Value	
		P 38 M	P 38 R
Overall length (A)	mm	2440	
Width (B)	mm	670	
Width (C)	mm	970	
Overall height (D)	mm	1380	
Gross weight	kg	1042	
Cutting depth	mm	380	
Cutting height	mm	800	
Swinging range	mm	1140	
Max. permissible inclination	^{o}	11	
Fuel tank capacity	l	17	
Hydraulic oil tank capacity	l	cca.40	
Hydraulic oil *	-	OH HV46, ISO VG46	
Cutting rate	$m.min^{-1}$	42	
Number of blades	ks	18	
Cutting head diameter	mm	480	
Engine - type	-	KOHLER COMMAND CH 980	
Fuel	-	BA 95 N	

Power output	HP/kW	38/28,3
Diameter/bore	mm	90/78,5
Displacement	ccm	999
Lubricating pressure at 100±20°C and idling of 850 rpm	bar	0,6
Engine oil *	-	SAE 15W40
Oil charge	l	2,75
Cooling	-	air-cooled
Starter	-	electric
Battery	Ah/V	Pb, 61 Ah, 12 V

*) Recommendation for winter time: - hydraulic oil ISO VG 32
- engine oil SAE 10W40



Dimensional sketch

Transport

This stump cutter can be transported to site either on a trailer or on a low-bed truck. It is not designed for driving on public roads.

Rubber tracks are designed only for use on soft terrain, not for hard and abrasive surfaces such as sand, stone, minerals, etc. Use of rubber tracks on these surfaces can cause premature wear and deformation, hence reducing useful life of the tracks.

Loading/unloading
Always perform the machine loading and unloading operation with the trailer parked on a solid and level surface.

Ensure the hand brake is on (if fitted) and the trailer wheels are chocked prior to attempting to move the stump cutter onto/from the trailer.

If loading on a gradient, always ensure that the trailer wheels are adequately chocked. Failure to do so may result in the brake de-activating and allowing the trailer to roll. Turn the trailer to an appropriate position and chock both trailer wheels. Do not move the trailer with the stump cutter engine running.

Remember to use a purpose-designed ramp or a loading platform for loading and unloading the stump cutter. The ramp must be strong enough to support the weight of the machine (min. carrying capacity of 2000 kg).

Make sure the slope of the ramp is less than 11°.

Before loading the machine clean thoroughly the ramp and the loading area. Ramps or areas that are dirty with oil, mud or ice are slippery and dangerous.

Avoid steering when going up or down the ramps since this can be extremely dangerous. If it is absolutely necessary to steer, first drive the machine back down to the ground and off the ramps or back onto the vehicle / trailer bed and then change the direction of travel and start back up or down the ramp again.

Expand the track base and reduce the manoeuvring speed in order to avoid the risk of tipping the machine over and skidding.

Never operate any control levers except for the drive control levers when going up or down the ramp. Actuating other levers can cause the machine to become unbalanced and tip over.

Fasten retention chains, straps or cables to the machine chassis. Do not put them over or against hydraulic hoses or other rubber parts. Make sure that they do not cause damage to rubber tracks, hydraulic hoses, elements or cylinders. Fasten each corner of the machine and fasten the front arm to the trailer / vehicle bed with a chain / strap or a suitable anchor.

Product Delivery

- This product is delivered completely mounted and attached to a wooden pallet.
- While handling you may use a lift truck or a crane with min. carrying capacity of 2000 kg (suspension in the given lashing points only). For handling you need min. ceiling height of 2 m.
- The manufacturer delivers this machine shrink-wrapped. The protective foil protects the machine against weather effects but in no case against mechanical damage, fall etc. The protective foil is recyclable; dispose it according to valid local regulations.
- While putting the machine aside (e.g. at reloading) we recommend to place it under a shelter.
- While unloading put the product always on a solid and level surface.
- It is not allowed to put it on a labile base.

- It is not allowed to put any objects or tools on the machine or to pile two machines on each other.

Handling

After delivery unload the machine from the transport pallet as follows:

- Cut the binding band carefully. Be aware, the band is tightened up and after cutting its both ends may 'shoot out'. While cutting the band, use protective gloves and goggles.
- Remove the chocks from tracks.
- Fill the fuel tank, connect the battery and try to start the engine.
- Lift up the cutter arm.
- Put the chocks to the pallet in the required direction and in spacing of the required wheel track.
- Keep free space around the pallet for going down.
- Be aware while the machine leaves the pallet – it may shortly accelerate.

Precautions in Design

This machine is provided with safety guards protecting against any contact with rotating parts (hit and pull-in hazard) and against hot parts (exhaust manifold). The guards are fixed, bolted down and solid; only the guard over the exhaust manifold is perforated.

The cutting head is covered with fixed guards protecting the space above the head and on sides against flying debris.

The hydraulic lock on the cutter arm cylinder is designed for limitation of unwanted sinking in case of a sudden failure or leakage in the hydraulic system.

This stump cutter can be operated by means of a remote control box and the operator can stand off, not in the close proximity to the machine at work.

Control levers (joysticks) are self-returning in their neutral position.

While working, the operator should stand and control movements of the machine through the remote control box.

To turn on the cutting head first open the switch cover and then turn the switch in the ON position. This cover protects the switch against unwished putting the cutting head into motion. When the cover is placed back the switch turns automatically off and the cutting head stops turning.

The emergency stop buttons are installed both on the remote control box and on the machine. CAUTION! The cutting head runs out for about 10 seconds.

Use

Before Putting into Operation

- Do not use this machine without prior reading this manual.
- Check up the engine oil level regularly – top up if necessary.
- Check up the hydraulic oil level.
- Remove any spilled oil or fuel immediately and wipe off all spots.
- Check up proper closing of covers and guards (engine, cutting head, chains). They should be in place and tightened securely.
- Check up tightening of bolted joints on the cutting head and condition of all the blades.
- Before turning the machine on, the cutting head must not be in contact with any obstacle.
- Observe the working area if it is free from persons, children or animals.
- Check up the working area. Avoid working on very soft, wet or unstable ground. The machine could sink, slide, slew or turn over.
- The actual working conditions on site should always allow full control over the machine.

Starting the engine

- Set the choke lever in the position ON. Set the lever of speed regulation to ½ of its stroke.
- Set the ignition key in the position I; turn on the remote control box (P38R).
- Turn the ignition key in the START position. When the engine roars to life, release the key and let the engine run warm at idling.
- Set the choke lever in the position OFF.
- If the engine does not roar to life, for repeated start attempts you must always turn the remote control box on (P38R).

For P38 M: after successful starting take the safety band and fix it on your hand for the attendance while the cutter is running. If the attendant loses stability, the safety band serves as a "dead man switch" and turns off the cutting head drive and the engine.
The switching contact must be inserted in the terminal switch from above!!!

Recommendations for rubber tracks

- Avoid manoeuvring on hard, stony and uneven surfaces such as rock, gravel, etc.
- Avoid keeping the rubber tracks in direct sunlight for more than 3 months.
- Avoid excessive steering manoeuvres on asphalt and concrete surfaces since these cause excess pad wear.
- Avoid driving on asphalt surfaces when their temperature exceeds 60°C since this causes both excess pad wear and damage to the asphalt surface. Avoid any contact of the rubber tracks with abrasive surfaces. Use of rubber tracks on these surfaces can cause premature wear and deformation hence reducing the useful life of the tracks.
- Keep driving over hot objects such as embers etc.
- Manoeuvres with a loose track on an irregular surface can cause the pad to detach and /or damage to the rubber track.

Rubber tracks are designed only for use on soft terrain, not for hard and abrasive surfaces such as sand, stone, minerals, etc. Use of rubber tracks on these surfaces can cause premature wear and deformation hence reducing useful life of the tracks.

- Avoid contact between sharp concrete edges etc. and the rubber track.
- Fuels or synthetic oils must never come in contact with the rubber track. If this does happen then they must immediately be cleaned.
- Avoid using rubber tracks in marine and seaside environments since saline air or salt in general corrode adhesion between rubber and metal inner core.

Instructions for own operation

(for remote control, see the instructions in a separate chapter)

- Do not use or attempt to start the stump cutter without the cutter guards, engine covers and access covers securely in place. Failure to do so may result in personal injury or loss of life.

- Observe all instructions for starting. Make sure if the engine is stably running. If not, turn the engine immediately, detect the cause and first remedy the failure.
- As soon as the engine runs warm, it is possible to start driving. First set the control lever of the cutting head back – the cutting head must be lifted in its top position.
- Set the control lever for motion in the required direction (forwards/backwards). If both control levers are set ahead, the machine moves forwards. If both control levers are set aback, the machine moves backwards. If only the left control lever is set ahead, then the machine turns to the right. If only the right control lever is set ahead, then the machine turns to the left. If only the left control lever is set aback, then the machine turns to the left. If only the right control lever is set ahead, then the machine turns to the right.
- In combination of both control levers you can control motions of the machine.
- Set the cutter in front of the stump, over the front stump edge.
- Before cutting make sure if the stump and the ambient space are free from stones, stony debris, rags, wires, glass cullet, ceramics etc. that may be ejected by the head.
- The appropriate control lever can be used for widening or narrowing the tracks. By pushing the lever forwards you can make the machine track width bigger.

Track widening

Take care when widening or narrowing the tracks. Contingent obstacles e.g. stumps,
walls etc., could cause unnecessary wear to the rubber tracks and its mechanism and
could also cause a track to come off. Also take care that no people or obstacles may be caught between the tracks and the machine or between the tracks and other obstacles.

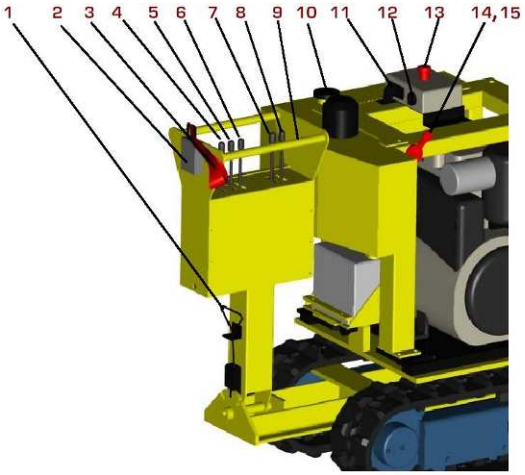
Make sure if the control board is orientated to the attendant and locked in its operating position.

Controls

This stump cutter can be operated by means of controls installed both on the remote control box and on the machine. For emergency control of the machine there are the controls installed at the rear of the cutter.

Legend:

1. Lever for control board locking
2. Safety band holder
3. Safety band clamp
4. Left track control
5. Right track control
6. Cutter arm up / down
7. Variable track width control
8. Forward / back control
9. Control board
10. Fuel tank cap
11. Ignition key
12. Cutting head switch
13. Emergency switch
14. Throttle valve control
15. Choke control



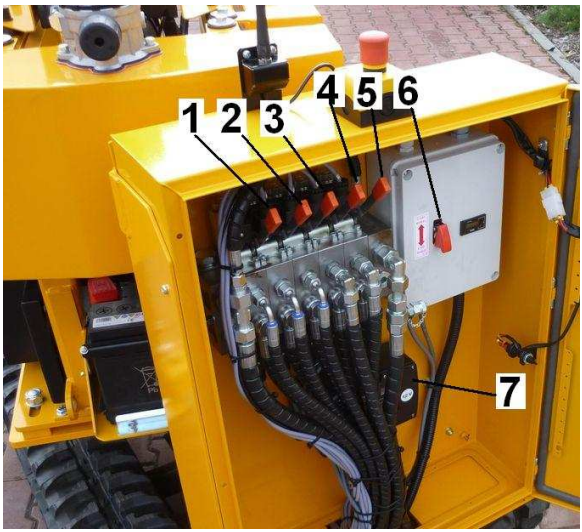
Set the control lever for motion in the required direction (forwards/backwards). If both control levers are set ahead, the machine moves forwards. If both control levers are set aback, the machine moves backwards.

If only the left control lever is set ahead, then the machine turns to the right. If only the right control lever is set ahead, then the machine turns to the left. If only the left control lever is set aback, then the machine turns to the left. If only the right control lever is set ahead, then the machine turns to the right.

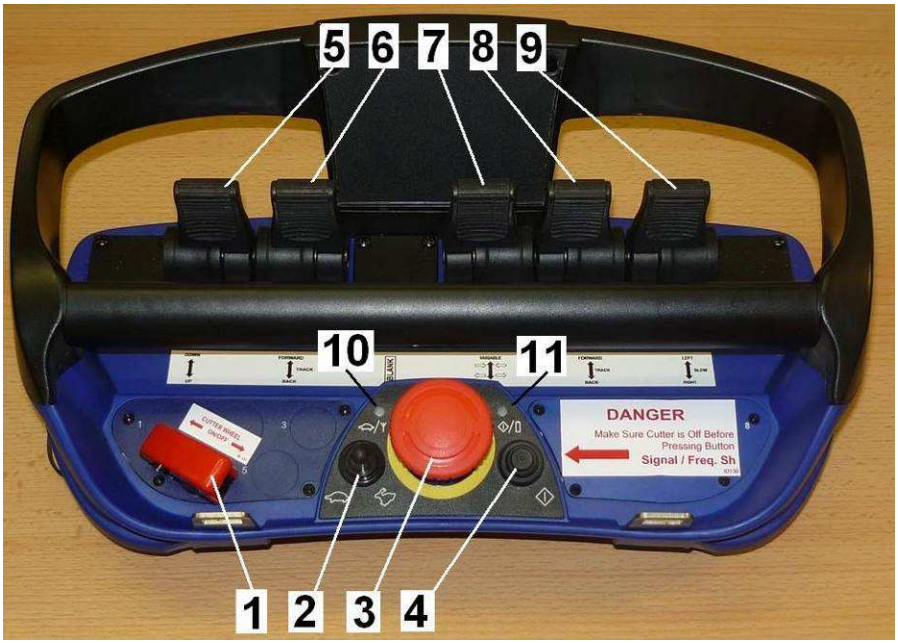
By setting the appropriate control lever you can let the cutting head sink or lift for the first cut. Push the lever forwards and let the cutting head sink. Push the lever backwards and let the cutting head lift.

Emergency controls

1. Cutter arm up / down
2. Cutter arm left / right
3. Variable track width control
4. Left track forward / back
5. Right track forward / back
6. Cutting head switch for manual operation – it must be off before starting
7. Remote control switch



Remote control box



1. Cutting head switch with safety cover
2. Creep speed switch
3. Emergency stop
4. Switch ON/signal/frequency/change
5. Cutter arm up / down
6. Left track forward / back
7. Variable track width control
8. Right track forward / back
9. Cutter arm left / right
10. Green LED
11. Red LED

Noise and Vibrations

Operation of this stump cutter brings following emissions:
Operating noise at max. speed without load, right side: - **L_{Aeq} = 85,6 dB**
Operating noise at max. speed without load, left side: - **L_{Aeq} = 86,8 dB**

Mean sound power at max. speed without load: **L_{WA} = 104,5 dB**
Guaranteed sound power at max. speed without load: **L_{WA} = 105,0 dB**

These noise levels have been recorded at the working position, i.e. 3 m away from the machine being in duty.
All measurements taken in accordance with CSN EN ISO 11201 and CSN ISO 3744; extended combined inaccuracy of measurements U=±0,6 dB.

At work the operator of this machine should wear full ear protection according to noise level.

Use

Before Putting into Operation

- Before the first putting into operation check up the machine for contingent damages and completeness after its transport and storage.
- Exchange all damaged or worn parts. Use always original spare parts. For servicing or spare parts contact your dealer or an authorised service.
- Check up the engine oil level. When the stump cutter is on level ground the oil should be between the MAX and MIN marks on the oil dipstick. Check up the hydraulic oil level – it should be between the MAX and MIN marks on the oil gauge. Check up the fuel tank level – fuel volume should be sufficient for the job to be done.
- Check out tightening of bolted joints, especially of all guards and completeness of other parts.
- For the engine operation use only unleaded petrol BA 95 N.
- Keep this machine beyond children's and unauthorised persons' reach. Avoid their presence while working.
- Check up proper closing of the rear guard. If not closed properly, remote control becomes limited.
- Do not let the cutting head sink on a hard surface – for underlaying use a wooden board.

At the first start there is much more air in the intake manifold and on this account the engine may not roar to life immediately when turning the switch key for the first time. Do not crank the engine for a longer time than 10 sec.

- After short cranking check up if the fuel filter is filled with fuel. At light knocking you can see darker fuel level in the filter. If this level does not reach ¾ of the filter height, try to crank the engine by turning the ignition key shortly.
- Set the choke lever in the position ON. Set the lever of speed regulation to ½ of its stroke.
- Keep an interval between two starts (standstill) 30 sec at least.
- After starting do not increase the engine speed immediately. Allow the engine to run at no more than fast idle speed to warm up the engine and hydraulic oil for about one minute and then you can set it to its max. speed.
- Set the choke lever in the position OFF.
- Do not leave the machine unattended.
- If you heard any strange noise or vibrations or felt a strange smell while cutting, then turn off the machine immediately and contact your dealer or directly the manufacturer.

Handling and Storage

- The stump cutter is allowed to be transported to site either on a trailer or on a low-bed truck. It is not designed to go on public roads.
- As an option you can get a special trailer directly by the machine manufacturer.
- When loading the cutter on a trailer, fasten retention chains, straps or cables to the machine chassis. Do not put them over or against hydraulic hoses. Make sure that they do not cause damage to rubber tracks. Fasten each corner of the machine and fasten the front arm to the trailer / vehicle bed with a chain / strap or a suitable anchor.
- Remember to use a purpose-designed ramp or a loading platform for loading and unloading the stump cutter. The ramp must be strong enough to support the weight of the machine (min. carrying capacity of 1500 kg).
- Do not load the machine by means of ramps and emergency controls if the height of loading area exceeds 750 mm. Otherwise these controls should get beyond the reach of your hands - accident risk.
- Before loading expand the track base to maximum.
- Avoid any handling with inclination exceeding the permissible limit of 11^{o}.
- **While loading and transporting the cutter, never operate any control levers except for the drive control levers when going up or down a ramp. Actuating other levers can cause the machine to become unbalanced and tip over. The switch for cutting head control must be closed by its red cover (see fig. 12).**

Fig. 12 – Cutting head control switch covered

- When going to another working site always ascend and descend slopes very carefully and with the cutting head up hill. Before going on hilly terrain expand the track base to maximum.
- **Store the stump cutter always in dry (sheltered) space to protect it against weather effects.**
- Keep the stored machine beyond unauthorised person's reach. Pull the ignition key out and keep it separately.
- Before storage clean all parts of the machine.
- Remove any spilled oil immediately and wipe off all oily spots.
- Exchange all damaged or worn parts. Use always original spare parts. For servicing or spare parts contact your dealer or an authorised service.
- Do not apply any grease or similar agents on elastic hydraulic hoses.
- Check up hydraulic hoses for wear. Replace them if necessary or every four years at least.
- Protect the rubber tracks against oil products.
- Before putting the machine aside for a longer time change the engine oil and its filter. Clean the air filter.
- Discharge the used oil into a special bin and dispose it always in accordance with applicable laws and local regulations.
- Remove any spilled oil and clean all oily spots properly.
- Always put the machine aside on a flat and solid floor and block it against unwilling motion by means of scotch blocks.
- Do not let the cutting head sink on a hard surface (concrete) – for underlaying use a wooden board.
- Do not put any objects or tools on the machine.
- Store the fuel canisters separately.

Recommendations for chassis with rubber tracks:

- Avoid manoeuvring on hard, stony and uneven surfaces such as rock, gravel, etc.
- Avoid keeping the rubber tracks in direct sunlight for more than 3 months.

- Avoid excessive steering manoeuvres on asphalt and concrete surfaces since these cause excess pad wear.
- Avoid driving on asphalt surfaces when their temperature exceeds 60°C since this causes both excess pad wear and damage to the asphalt surface. Avoid any contact of the rubber tracks with abrasive surfaces. Use of rubber tracks on these surfaces can cause premature wear and deformation hence reducing the useful life of the tracks.
- Manoeuvres with a loose track on an irregular surface can cause the pad to detach and /or damage to the rubber track.

Rubber tracks are designed only for use on soft terrain, not for hard and abrasive surfaces such as sand, stone, minerals, etc. Use of rubber tracks on these surfaces can cause premature wear and deformation hence reducing the useful life of the tracks.

- Avoid contact between sharp concrete edges etc. and the rubber track.
- Fuels or synthetic oils must never come in contact with the rubber track. If this does happen then they must immediately be cleaned.
- Avoid using rubber tracks in marine and seaside environments since saline air or salt in general corrode adhesion between rubber and metal inner core.

Track widening

Take care when widening or narrowing the tracks. Contingent obstacles e.g. stumps, walls etc., could cause unnecessary wear to the rubber tracks and its mechanism and could also cause a track to come off. Also take care that no people or obstacles may be caught between the tracks and the machine or between the tracks and other obstacles.

Checklist before Operation

- Before the first putting into operation check up the machine for contingent damages and completeness after its transport and storage.
- Check out tightening of bolted joints, especially of all guards and completeness of other parts.
- Check out the cutting head for its condition (attachment and wear of blades, bolts, etc.). Check out condition of the blades. Replace them if worn or damaged. CAUTION! The blades are fitted as left and right. Be aware of it while changing them.
- All blades should be replaced always at the same time as a set. Pay special attention to their fixing bolts. Replace them if worn or damaged.
- Check up hydraulic hoses for wear. Replace them if necessary or every four years at least.
- Check up the rubber tracks for wear.
- Check up volume of service fluids available.

- Check out guards, movability of turnable parts respectively functionality of the machine.
- It is strictly forbidden to start the machine with removed guards.
- It is strictly forbidden to do any technical changes on the machine.
- Check out the hydraulic system for condition and contingent leakage.
- Do not use petrol or similar inflammable matters as a cleaning agent.
- If any adjustment is required, do it always at standstill only.
- Observe the working area. If any person, children or animals approach while cutting (within a 20 metre radius of the machine), then stop working immediately.
- The person operating this machine must always wear corresponding PPE, such as
- forestry safety helmet fitted with a visor, full ear protection, steel toe protection boots, heavy duty gloves, close fitting heavy-duty fully protecting clothing.

Starting the Engine

This cutter is equipped with an electric starter installed in the machine switchbox.

Before starting it is necessary to re-connect the battery that should be properly charged.

A partially discharged or flat battery prevents starting and the engine cannot roar to life. The rear hinged cover must be properly closed and locked by means of a safety screw.

The battery contacts must be connected so that the red connector comes to the plus contact (+) and the blue connector comes to the minus contact (-).

Before starting the ignition key is in the position “0”.

Starting:

- Ensure that the red emergency stop buttons on the remote control box (P38R) and on the machine are in the stand-by mode.
- Turn the battery disconnector on and re-connect the battery.
- For cold start set the choke lever in the position ON. Set the lever of speed regulation to ½ of its stroke.
- Turn on the remote control box (P38R).
- Turn the ignition key in the START position.
- If the engine does not roar to life, for repeated start attempts you must always turn the remote control box on (P38R).

Do not crank the engine for a longer time than 10 sec. If the engine does not roar to life, release the key in the position “0”. Keep an interval between two starts (standstill) 60 sec at least.

If the engine turns automatically off just after starting, it may be a symptom of automatic disconnection. Detect the cause and first remedy the failure.

Despite the disconnecting automatics you should keep regular intervals of 8 – 15 hours intended for engine oil level checks.

Putting into Operation

- Do not use the machine under conditions of low visibility, especially at foggy weather, when you may overlook persons coming. Operate it only at daylight or with sufficient lighting.
- Every operator of this machine is fully responsible for any injury or damage caused to the third persons, animals and property within the operating reach of the machine.
- Observe the working area. To ensure the maximum life of the cutter and to keep the cutting blades sharp, any contacts with soil, stones, flint brick and other hard materials around the base of the tree stump or directly in the stump should be kept to an absolute minimum.
- Avoid going with the tracked chassis over contingent obstacles, such as stumps, walls etc. that could cause unnecessary wear to the rubber track and its mechanism and could also cause a track to come off.
- Avoid going or working on slopes with inclination exceeding the permissible limit of 11^{o}.
- Any transport to site or on public roads is allowed only with the engine and cutting head off.
- This cutter is designed for cutting away a tree stump from above ground level to below ground level with its above-ground part up to +800 mm and its under-ground part up to -380 mm.
- Before going and working on hilly terrain expand the track base to maximum.
- After starting do not increase the engine speed immediately. Allow the engine to run at no more than fast idle speed to warm up the engine and hydraulic oil for about one minute and then you can set it to its max. speed.
- Turn on the switch for the electromagnetic clutch and set the cutting head into motion.
- Set the cutter arm onto the stump, start cutting in a swinging way and take individual stump layers continuously off.
- Run slowly up and start cutting with smaller wood chips and go on faster if possible according to actual conditions. The size of cut layers depends on speed and cutting depth.
- Try to keep the same engine speed while cutting. Optimal working conditions could be adapted by response speed control of hydraulics (cutter arm response).

CAUTION! Response speed changes bring impact on cut layer size, not on cutting head speed.

- If you heard any strange noise or vibrations or felt a strange smell while cutting, then turn off the machine immediately and contact your dealer or directly the manufacturer.

No immediate detection and remedy of the cause may be very dangerous for further machine operation and for the attendant.

- If one cut layer is taken off, set the cutter onto the stump in its initial position again and go on cutting as required.
- **To turn on the cutting head, first open the switch cover and then turn the switch in the ON position. While working the cover is opened. It protects the switch against unwished putting the cutting head into motion. When the cover is placed back the switch turns automatically off and the cutting head stops turning. It is strictly forbidden to remove or to block it anyhow.**
- The cutter enables cutting of stumps in max. depth of 380 mm under the ground level.
- If fuel refilling is required then put the machine out of operation and let the engine cool down.
- For filling the tank use always a proper funnel and canisters.
- If any petrol is spilled or overflowed then wipe off the spots and let them fully evaporate before the next start.

Recommendations

The actual used cutting depth depends on the stump quality, i.e. hard or soft wood, dry or wet or dozy stump etc. We recommend making the first cut only for testing the stump quality, i.e. with minimal cutting depth (under 25 mm). Based on the first testing cut you can adopt the next layers accordingly. Maximum cutting depths should be up to 50 mm.

Make sure if the control board is orientated to the attendant and locked in its operating position. All guards should be completed and properly fixed in their places. It is also possible to arrange shielding walls to protect property of the third persons.

While working, the operator must stand at the main control board. Wear always personal protective equipment – forestry safety helmet with visor or goggles, protective gloves, steel toe protection boots and working clothes properly buttoned. At work the operator of this machine should wear full ear protection according to noise level. Should the safety pin be pulled out, the cutting head stops automatically.

Use the control forward/backward levers very carefully while making the first cut. If you feel higher resistance or hear increased noise or vibrations than usually, then move the cutter away, stop the engine and find out the reason.

You can set up speed of the direction change by means of a knob. By turning the knob clockwise the change speed gets reduced, by turning the knob counter-clockwise the change speed gets increased.

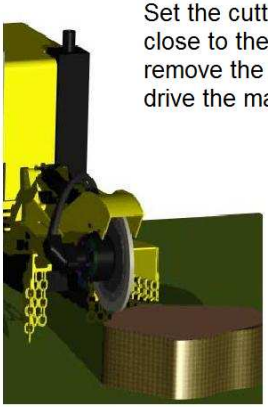
To finish the first testing cut means that the cutting head finished its cross motion and it is necessary to go on moving to the opposite stump edge. After removal of the first layer let

the cutter arm sink by pressing the concerned control lever rather forwards. Now the cutter is ready to make the return cut to the opposite stump edge.

Repeat this procedure layer by layer until you reach the required cutting depth. Lift the cutter arm over the stump. Move the cutter forwards by about 3 cm and cut off the next layer.

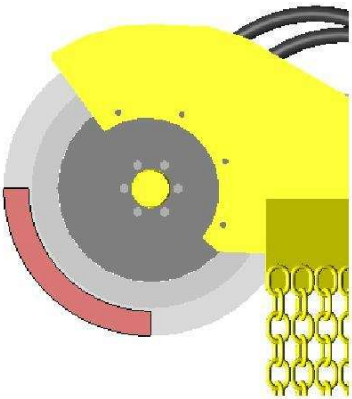
While bringing the cutter back away from the stump, the cutter head must not be engaged in the stump.

Proceed very carefully if you are cutting the layer on the ground level – the cutting head must not come in contact with stones or other obstacles that may be hidden in the chips gathered around. After such a contact stop the machine immediately, pull out the ignition key and remove all stones or obstacles from the cutting space. Only if this space is free from stones and other hard materials you can start the machine again. To stop the cutting head still turning you can turn the cutting head switch counter-clockwise shortly.



Set the cutter in front of the stump, close to the front stump edge, remove the required layer and then drive the machine forward.

For cutting you must use only the bottom part of the cutting head.



Emergency stop

Press the red emergency stop button and pull out the ignition key. For repeated starting first reset the stop button by turning it counter-clockwise.

Blockages

It is possible that foreign matters, such as hard soil, clay, stones or pieces of timber may become trapped between the cutting wheel and its guard either slowing or stopping the head.

This will be accompanied by the engine starting to labour and excessive noise from the hydraulic system. If this happens proceed as follows:

- Turn off the cutting head drive.
- Turn off the engine and pull out the ignition key.
- Make sure the head has really stopped. Try to turn the head back and forth by hand to release the trapped object.
- Remove any other contingent objects trapped between the head or under the guard.
- Thoroughly inspect condition of the blades and tightening of their fixing bolts.
- Finally try to start the machine and carefully go on working.

Remote control (P38R)

Unauthorized tampering with the radio control system automatically invalidates warranty.

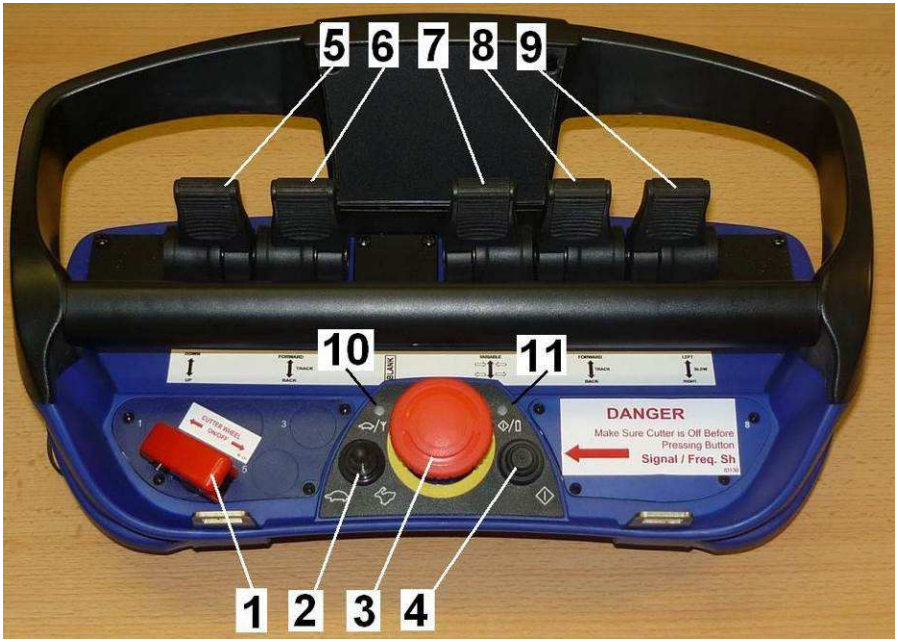
The radio control unit is highly sophisticated and offers fine control to the movements of the machine. Fine tuning of the controls can be made only by a qualified technician or under his instructions.

The control levers give fully proportional operation and are sprung loaded to return to zero position, i.e. "dead-man's-handle". When the control levers are moved from zero position the respective hydraulic function starts to operate slowly and increases in speed as the lever is moved further from zero position and vice versa as the lever is moved back towards zero position.

For safety reasons all control levers must be in their zero/neutral positions for a start-up to be made. If any lever is not in its zero/neutral position during start-up, the control unit will blink and beep the same number of times as the number of the lever to indicate which control lever is faulty. The control unit can be used but the faulty lever will be locked and disengaged. (e.g. if it beeps and blinks five times, it is the 5^{th} lever from the LEFT which is faulty or giving the problem signal).

The micro speed button (2) slows down all the movements. This return sprung switch can be used to reduce the operating speed in five (5) steps from 100% to 60%, 50%, 40%, 30% and 20% speed by limiting the hydraulic steering. The regulation of the function's speed is still made over the entire lever stroke and with retained resolution. With impulses from the spring loaded toggle switch to the left, towards the turtle symbol, speed reduction can be produced from 100% to 60%, 50%, 40%, 30% and 20% steering. Green LED: flashing - speed reduction; not flashing - normal speed.

By pressing the red emergency stop button (3) the remote controller and the engine turn off. For repeated starting first reset the stop button by turning it counter-clockwise and then press the button (4) ON. The red LED indicates that the remote controller is ON again.



1. Cutting head switch with cover
2. Creeping speed switch
3. Emergency stop button
4. Change-over switch ON/signal/frequency
5. Cutter arm up / down
6. Left track forward / back
7. Variable track width control
8. Right track forward / back
9. Motion direction left / right
10. Green LED
11. Red LED

WARNING

The cutting head switch (1) must be in the OFF position always before starting the machine.

The remote controller unit must be in the ON position and their control levers must be harmonized and tuned with all other controls. The remote control levers 5, 6, 7, 8, 9 are fully proportional, see the above-mentioned description.

Instructions of operation

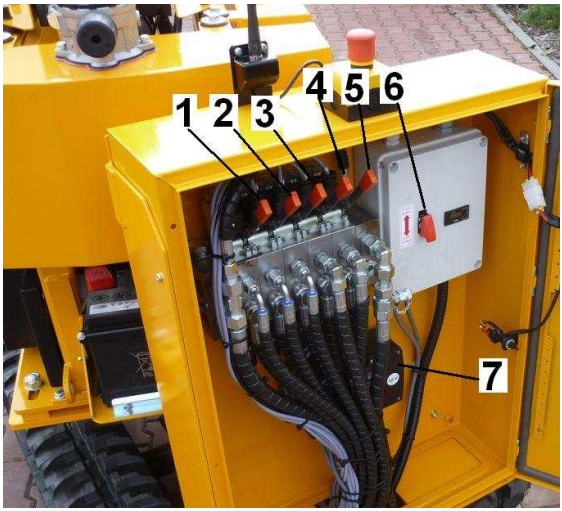
- Put a new (recharged) battery into the remote control box.
- Turn on the machine in the main ignition box.
- Release/reset the emergency stop button on the remote control box.
- Set the cutting head switch (1) in the OFF position.
- Turn on the change-over switch ON/signal/frequency (4) – the red LED lights up.
- Now the machine is ready to start.
- Before working learn all functions of individual controls.
- The control unit have a stop function (the emergency stop button) which will immediately stop all movements, i.e. it turns off both the cutting head and the engine.
- If the machine is beyond reach of the signal, it turns off the engine automatically.
- Should the remote controller not be used, it is necessary to have its emergency stop button pressed down (OFF) – it saves its battery life. It is recommended also for quite short breaks.
- For safety reasons, the engine is turned off automatically, after the unit has been idle for more than approximately five (5) minutes.
- While working, the operator should stand at least 3 m away from the cutting head. If the cutting head could be seen from above (in plan view), then it should be at 12 o'clock and the operator should stand at 10 or 2 o'clock.
- Before starting observe the working area. If any person, children or animals approach (within a 20 metre radius of the machine), then do not start working.
- While working, wear always personal protective equipment as stated in this manual.
- Turn on the cutting head provided it is really safe.
- Observe all safety work instructions as stated in this manual.
- To finish the work, turn off the cutting head by pressing the button (1) and then turn off the engine by the button (3). Finally, press the red emergency stop button on the remote controller unit und pull out the ignition key.
- Put the machine aside or store it always in dry (sheltered) space to protect it against vibrations, dust and weather effects.

Control box for emergency stop on the machine

For access to control, signal receiver and battery charger, just open the hinged door on the electric switchbox on the machine. On the right side there are a switch, a socket and some LEDs. This switch should be in its ON position, i.e. toward the door.
The pin plug (2) is used for connection of a control cable in the case if the remote control fails. It is also used for fine tuning of the related controls.

1. Cutter arm up / down
2. Cutter arm left / right
3. Variable track width control

4. Left track forward / back
5. Right track forward / back
6. Cutting head switch for manual operation – it must be off before starting
7. Remote control switch – it must be always in REMOTE position



We recommend using these manual controls only as the last resort to turn the machine off in case the remote controller and the wired control fail.

Battery Charger and Battery Charging
There is one charger available with this machine. The battery pack is rechargeable and of Nickel Cadmium (NiCd) type.

The normal charging time for an empty uncharged battery, is approximately 3 hours. The battery charger is constructed so that no damage will occur from long continuous charging. The batteries effective operation time is about 8 hours on one charge. When the battery is approaching the time for charging, the control unit beeps three times as a warning and at the same time the LED starts to blink on the control unit. The battery must be used until the LED goes out, after which it can be changed. If the battery capacity is too low, the control unit cannot be activated.

In order to reduce battery loading and for safety reasons, the control unit is turned off automatically, after the unit has been idle for more than approximately five minutes.

Emergency Situations

- If any person or animal approaches the working area while cutting (within a 20 metre radius of the machine), then stop working immediately.
- If you heard any strange noise or vibrations or felt a strange smell while cutting, then turn off the machine immediately and contact your dealer or directly the manufacturer.

- In case of fire or breakdown, stop cutting immediately.
- In case of fire use foam extinguishers only.
- If you cannot damp the fire down yourself, call for a fire brigade.

Routine Maintenance

- Any servicing of the cutter should be carried out by authorised persons only.
- Any servicing or repair is allowed to be done only if the machine was put out of operation.
- Check up the machine for completeness and its general condition.
- After every working shift check up tightening of bolted joints, especially rotating parts and completeness of other parts, such as fixation of blades.
- Check up the V-belts for tightness and wear.
- Keep regular intervals for lubrication of the cutting head bearings.
- Check up condition of the cutting blades regularly.
- Check up the hydraulic hoses for wear. Replace them if necessary or every four years.
- Before any maintenance let the engine cool down.

Vibrations

While in service the stump cutter shows operating vibrations that may loosen the bolted joints. Check out tightness of all bolted joints regularly.

Parts

- For replacement of worn or damaged parts use always original spare parts (Laski Predator) only (particularly engine parts, cutting blades and their fixing bolts).
- The manufacturer bears no responsibility for damages resulted from user's wrong usage of unoriginal spare parts or parts intended for other models. Usage of unoriginal parts means injury of the given warranty terms and immediate warranty expiration.

Work safety

For all works to be done within the frame of routine maintenance refer also to the MSDS sheets from the concerned suppliers.

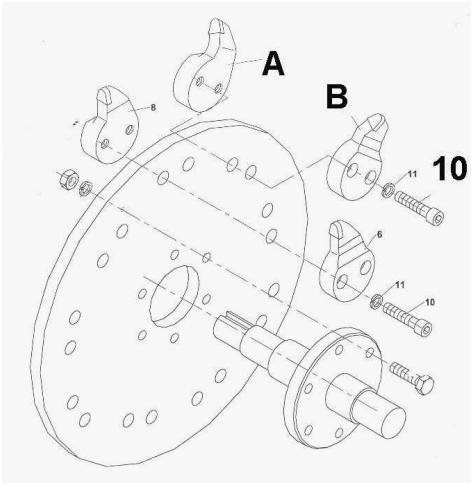
Cleaning

Always after work clean up all parts of the machine. It must be kept free from dust, sediments and other dirt. Check up also the place around the fuel tank cap, oil fillers, grease nipples and battery.

For cleaning use only corresponding brushes and cleaning rags. Use never hot steam, pressure water or flammable liquids.

Maintenance of MultiTip System

- Any servicing of the cutter should be carried out by authorised persons only.
- Check up the machine for completeness and its general condition.
- Check up the V-belts for tightness and wear.
- Keep regular intervals for lubrication of the cutting head bearings.
- Check up the hydraulic hoses for wear. Replace them if necessary or every four years.



Replacement of the blades:

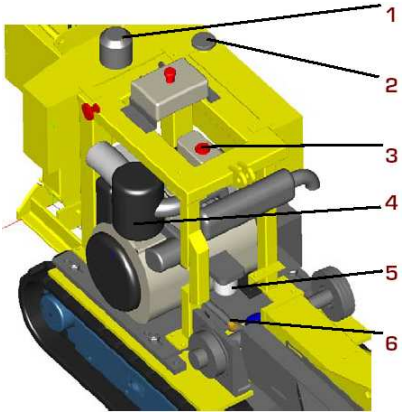
- Loosen the bolts (10).
- Replace the blades by new ones.
- Tighten the new blades slightly.
- Use the torque wrench and tighten the bolts with a torque of 105 Nm.
- For replacement of worn or damaged blades use always the original Laski blades and bolts only (10).
- While replacing, proceed very carefully.

Before replacement the machine must be secured against overturning.

- **Be aware that the cutting blades are in pairs as the RH and LH ones. In addition to that they can be straight or bent. As to their design they are not interchangeable with each other and it is not possible to replace them by another brand marks.**

If the blade assembly cannot be tightened sufficiently into the head, do not use it. Never use this blade system without all the components are in place and properly secured.

Maintenance Intervals



1. Hydraulic oil filler cap / hydraulic filter
2. Fuel tank cap
3. Engine oil filler cap
4. Air filter
5. Fuel filter
6. Engine oil drain plug

Daily checks before starting

- Engine oil / hydraulic oil – top up if necessary.
- Refer also to the concerned MSDS sheet from your oil supplier and instructions in the manual of the engine manufacturer.
- Be sure that there is no debris that may break loose when the cutter is started.
- Contingent engine oil / hydraulic oil leaks.
- Make sure that all retaining bolts on the cutting head are tight.
- Access covers and guards must be securely fitted.
- Check up also the fuel level. To avoid condensation built up in the fuel tank, keep the tank full.
- All guards should be completed and properly fixed in their places.
- Check out tension of the belt between the engine and its clutch.
- Check out the rubber tracks for correct tensioning and contingent damage.
- Check out the cutting head for its condition (attachment and wear of blades, bolts, etc.).
- Check and clean the air filter and remove any debris from within the engine covers. Refer to Engine Manual for cleaning of the entire air cooling system.
- Grease the nipple on the cutting head hub by two strokes of a grease gun.

Checks after first 25 hours

- Carry out all the above mentioned daily checks.
- Check out tightening of all bolted joints, especially of the engine, its bedding, guards and completeness of other parts.
- Check out suspension of the engine, its bedding space and related components.
- Check out tension of the belt between the layshaft and the cutting head.

Checks every 50 hours

- Check out electrolyte level; refer also to the concerned MSDS sheet from your battery supplier.
- Check out the fuel system and its clamps.
- Check out tension of the belt between the layshaft and the cutting head.

Spare parts

For spare parts delivery, contact your dealer or directly the machine manufacturer.

Fuel tank level

- Keep the machine beyond the reach of naked flames while working on the fuel system. Do not smoke while refilling the tank.
- Store the fuel canisters separately, beyond the reach of naked flames or heat sources.
- Remove any spilled oil or fuel immediately and wipe off all spots.
- Avoid any contact of fuel with skin. In this case you must wash the spot immediately. Refer also to the concerned MSDS sheet from your supplier and instructions in the manual of the engine manufacturer.

Refilling

- To avoid condensation built up in the fuel tank, keep the tank full.
- Do not let the fuel tank “dry” empty.
- Avoid any contact of water with fuel, keep cleanness while refilling. Any debris in the fuel system may bring troubles at fuel injection.
- Keep the place around the fuel tank cap clean. Check it up before refilling.
- Close the fuel filler neck immediately after refilling.

Fuel filter change

- Keep the machine beyond the reach of naked flames while working on the fuel system. Do not smoke!
- Release and open the hinged engine hood and the fuel filter cap.
- Replace the old fuel filter element by a new one. Be aware of its proper orientation –the arrow must be orientated in the fuel flow direction.
- Afterwards, the fuel system should be deaerated, refer also to the instructions in the manual of the engine manufacturer.
- Close the engine hood again and lock it.
- Start the engine for trial run.

Maintenance intervals for the fuel filter depend on the fuel purity degree. We recommend replacing the fuel filter element **every 150 hours**.
After reassembly pay special attention to its proper attachment.

Any fuel leakage may bring outbreak of fire.

Engine oil level

See also service plans and maintenance intervals in your Engine Manual.

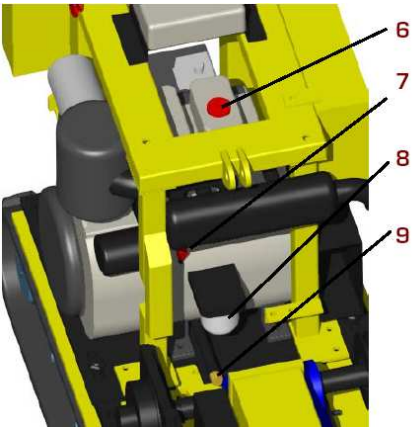
WARNING

- Use the dipstick to check oil level. Do not overfill. The oil should be between MAX and MIN marks on the oil dipstick. Refer to the MSDS sheets from your oil supplier and the Engine Manual.
- Avoid any contact of oil with debris, keep proper cleanness.
- Be aware that oil loses its quality if it is used too long.

Engine overrunning

WARNING

Do not overrun the engine straight from a cold start, i.e. before its oil has had a chance to circulate to every engine part – it may cause engine seizure. When the engine roars to life, first let the engine run warm at idling.

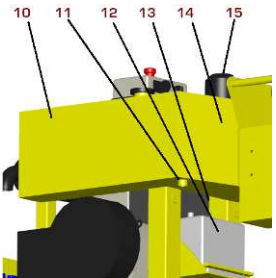


Overfilling the engine with oil can cause serious damage.

Engine oil change

(See maintenance intervals in your Engine Manual)
Change the engine oil only when the stump cutter is turned off, standing on level ground and still warm.

- Undo the oil drain plug (9) on the hose drain adapter.
- Drain oil into a special bin.
- Replace the oil drain plug and tighten it using a new packing ring.
- Refill new oil through oil filler neck (6) and check its level.



- Use the dipstick to check oil level. Do not overfill. The oil should be between MAX and MIN marks on the oil dipstick (7). Refer to the MSDS sheets from your oil supplier and the Engine Manual.

Engine oil filter change

(See maintenance intervals in your Engine Manual)

- When you have drained old oil, loosen the oil filter cap.
- Replace the oil insert by a new one.
- Fill new engine oil with recommended characteristics and viscosity up to the MAX mark on the dipstick.

Hydraulic oil change

There are two hydraulic oil filters on the machine one in the suction line (90 µm) and the other one (25 µm) is installed in the hydraulic oil tank.

The hydraulic oil filters should be changed regularly once a year independently on usage or 10 hrs after any maintenance action done in the hydraulic system.

Hydraulic oil change

Hydraulic tank (14)

- First put a special bin (volume about 40 l) under the oil drain plug (11) for leakage.
- Unscrew the drain plug slowly.
- Clean the ambient space around the filter cap (15) to avoid oil pollution after unscrewing the cap.
- When oil is fully drained, unscrew the cap, remove the oil filter element from its body (15) and replace it by a new one.
- Retighten the drain plug again and fill new hydraulic oil through the oil filler neck under the filter cap (15). Check up the hydraulic oil level – it should be between the MAX and MIN marks on the oil gauge.

Cutting head bearings

There is a grease nipple provided on the outside of the cutting head hub. Grease the nipple on the hub by two strokes of a grease gun.

Blunt cutting blades

Usage of blunt blades brings overloading of the cutting head which may cause also premature wear of its bearings or the bearings fail prematurely.

The cutting head bearings require regular maintenance and they should be also replaced on a regular basis. It is recommended the bearings are changed yearly for their optimum performance.

Should the cutting head in duty show increased rumbling noise or high pitched whine, it is usually the first sign of bearing failure.

Electric installation

In the switchbox, by the emergency stop button, there is a main fuse of the machine electric installation. This fuse protects the voltage supply of 12 V DC of the entire electric system.

Repeated drop-outs of the main fuse is indicated a serious error in the electric installation. In this case contact your local dealer or directly the manufacturer.
To simply replace the fuse without investigating the cause of failure and not carrying out the correct rectification work could be dangerous and detrimental to further safe operation of the stump cutter.

More details

More information, technical details and instructions concerning repairs, servicing and maintenance can be obtained from your local dealer.

Clutch and Brake

Burnishing-in during running-in:
When a field replacement of the P38 clutch occurs, the new clutch should be burnished and ideally run in. If this is not undertaken properly it will incur excessive heat in the first few hours of use and consequently premature failure.

It is standard that the electromagnetic clutches need burnishing in and this is achieved by causing it to slip momentarily several times for short periods without generating too much heat.

This burnishing-in is undertaken as below. This running-in procedure, although not essential, is recommended.

Ensure the clutch belts are at the correct tension before starting each procedure.

1. Start the engine.
2. Set the choke lever (throttle) to LOW speed.
3. Engage the cutting head for approx. 2 seconds.
4. Disengage the cutting head for approx. 2 seconds.
5. Repeat steps 3 and 4 five times (no more).

6. Turn off the engine and leave it for at least 5 minutes to cool.

When the clutch has cooled, repeat the whole procedure twice more. On each repeat, make sure no more than 5 “engage/disengage” cycles are made and that the clutch is left to cool in between. (There are therefore 15 cycles in 3 batches of 5.)

Running-in

To ensure maximum clutch life a short running-in period is recommended when the Predator 38 is used for the first time.

Work as normally for approximately 5 minutes, then disengage the cutting head and leave for it at least 5 minute to cool. Repeat it up to 5 times.

Maintenance

Caution: The properly run-in clutch should transfer maximum torque. The improperly run-in clutch may cause premature wear or damage of its friction surface (clutch facing). Observe all the above mentioned instructions and keep the sufficient intervals between particular cycles.

The gap between the clutch plates should be approximately 0,3 to 0,6 mm. If this increases with wear it is possible that the clutch will not engage. Inspections of the gap are to be carried out through inspection holes on the clutch perimeter. The gap can be adjusted by means of the nuts on the clutch perimeter.

MAKE SURE THE BRAKE WORKS PROPERLY BEFORE USE.

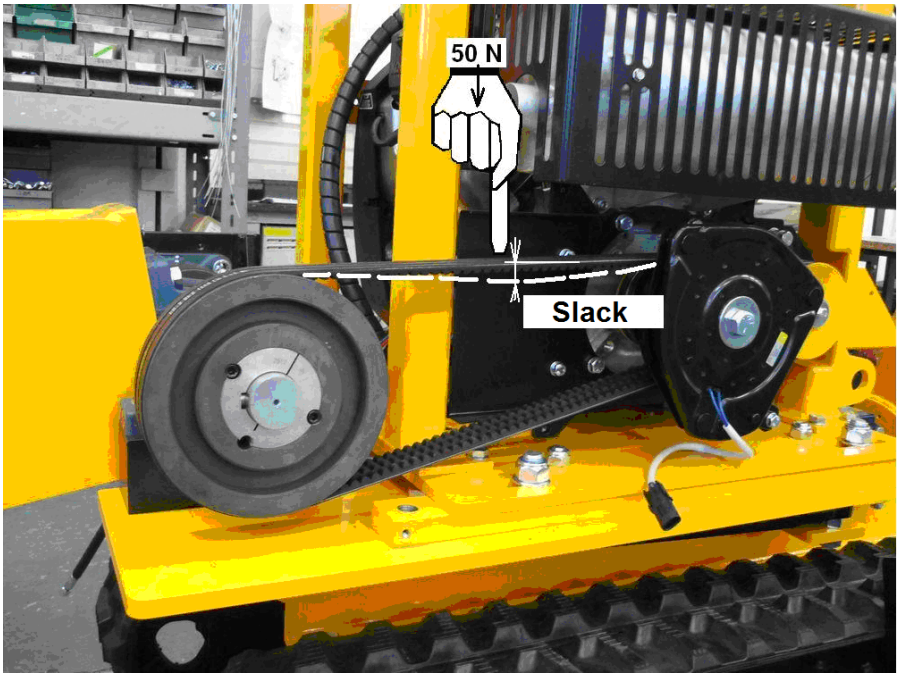
Check and adjust if necessary belt tightness from the layshaft to the cutting head. If necessary, remove the rubber guard, then the cutter arm guard. Loosen the remaining 2 head bolts and loosen the cam locking nut. Turn the cam until the belt is tight and then tighten the locking nut again. Reassemble the guards.

Check and adjust if necessary belt tightness from the engine to the clutch. If necessary, loosen 4 locking nuts and tighten the belts with the jacking screw at the rear of the machine. Then re-tighten the locking nuts.

The cutting head and the layshaft assembly are modular and can be ordered complete as a reconditioned unit if required.

Clean fuel is essential for proper operation and reliability of the machine. Always use the correct in-line fuel filter supplied from your local dealer or the machine manufacturer.

Belt Tension



The belts from the engine to the clutch are the weakest link in the drive train. They are designed to slip momentarily if the cutting head suddenly jams. The engine should stall a second or two later. New belts will stretch within the first few hours so they will require some tightening or they will slip too much.
The belt slack should be kept within the lower-mentioned limits. To check the slack, just touch the belt in the centre and press it with force of 50 N. Permissible values see below.
For belt tension adjustment loosen the engine base frame and set tension by means the tensioning bolt. After adjustment retighten the base frame again.

Excessive slipping will wear the belts and the pulleys out prematurely. Excessive tension reduces belt life essentially.

Belts:	engine-layshaft	50 N	slack	12mm
	layshaft-cutting head	50 N		22 mm
	engine-pump	50 N		7,5 mm

Maintenance of Tracked Undercarriage

Rubber track tension

When the tracked undercarriage is lifted the rubber track must sag 10-15 mm. When this tension decreases it must be re-tightened to prevent the track from coming off.

Do not over tighten it. If you continue to pump grease into the cylinder once the track is already tight, you could compress the cylinder spring and cause excessive damage – the concerned grease nipple is installed under the cover.

Correct inspection and maintenance procedures

- Always perform maintenance on a solid and level surface.
- Never grease or lubricate or perform maintenance on the machine while it is in motion.
- Solidly support the undercarriage if it needs to be lifted up for maintenance.
- Use great care when maintaining the hydraulic system since oil is very hot when the machine has just finished working. Oil circuits are under high pressures even when the machine is not working.
- Keep all components properly installed and in good condition.
- Immediately repair all damage and replace worn or broken parts.
- Remove any build-ups of grease, oil or debris regularly.
- Check up hydraulic hoses for oil leaks and/or damage regularly.
- Use recommended lubricants only. Never mix different brands of lubricants.
- Use only original spare parts.
- Keep clean the undercarriage widening cylinder and track-stretcher grease nipples.
- Intervals for routine maintenance are indicated for normal work conditions. If the tracked undercarriage is used in severe work conditions then maintenance must be performed at shorter intervals accordingly.
- Dispose of lubricants always in an ecologically safe way. Thoughtless disposal of lubricants can damage the environment. Become familiar with local anti-pollution laws and regulations.
- Use suitable containers when draining lubricants. Do not use beverage or food containers that might tempt someone to drink from them. Never pour lubricants on the ground or in a canal, pond or watercourse. While disposing of lubricants, comply always with all applicable environmental protection regulations.

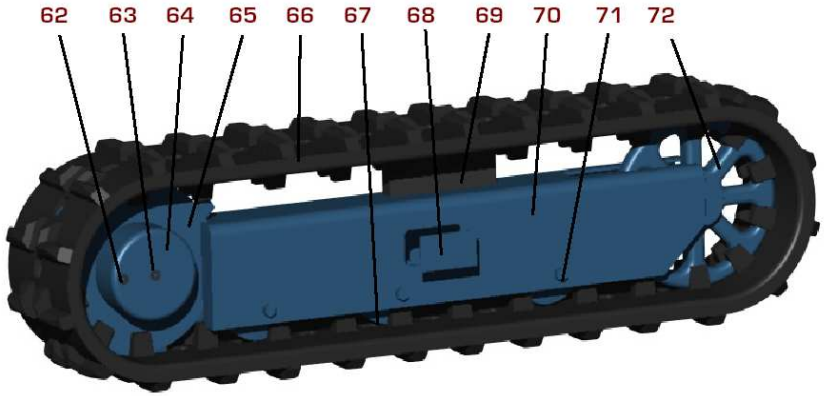
Gear oil

Avoid using oils with different characteristics and brands.

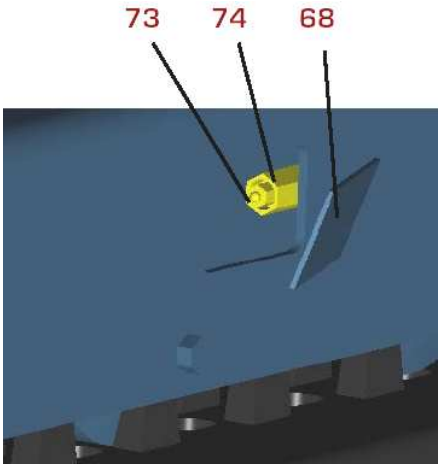
Choice of reduction unit oil type

We recommend, for reduction units, using gear oils with E.P. additives and viscosity class according to ISO VG 150 or SAE 80W/90.

When temperature variation ranges are very high we recommend using synthetic oils with E.P. properties and minimum 165 viscosity index and viscosity class VG.



Legend:
62. Gearbox drain plug
63. Gearbox filler plug
64. Gearbox
65. Drive sprocket
66. Rubber track
67. Roller
68. Cover plate
69. Nylon guide block
70. Side frame
71. Roller bolt
72. Front idler wheel
73. Grease nipple
74. Grease valve



Track loosening / tightening procedures
The grease contained in the hydraulic track is pressurized. Never loosen grease valve (74) for more than one turn. If the valve is loosened too much you risk expelling grease under pressure and possible serious injury to the machine operator. Also never loosen the grease nipple (73).

Remove gravel or mud from between the sprocket and the track.

WARNING

Remove the screws and take off the cover (68) to access the adjustment system.

To loosen the track, turn the valve (74) counter-clockwise but no more than one turn. One turn of the valve (74) is sufficient for loosening the track. If grease does not start to drain out then slowly rotate the track.

Tighten the valve (74) by turning clockwise till tight. Clean all traces of extruded grease.
To tighten the track, connect a grease gun to grease the nipple (73) and pump grease until the track tightens so that there is 10-15 mm of sag. Then stop it.

Front idler locking
It is not normal for the track to remain tight after turning the valve 1 counter-clockwise or for it to remain loose after introducing grease into the grease nipple 2. Never try to remove the tracks or disassemble the track-stretching cylinder since pressure of the grease inside the track is extremely dangerous.

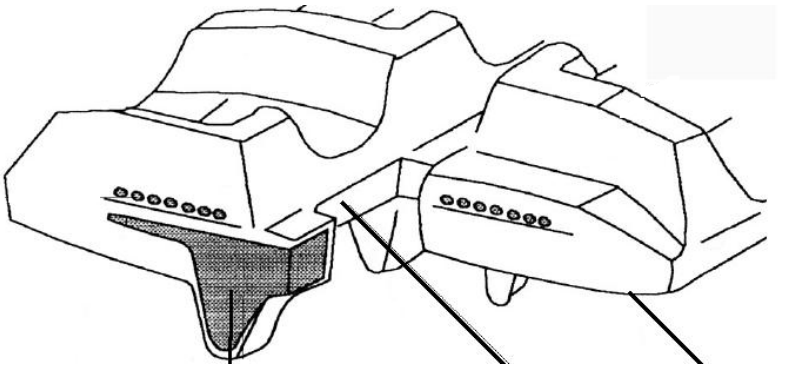
Removing the rubber track

- Stop the machine on a solid and level surface. Jack up side of machine under its main frame and support it in safe condition.
- Remove the cover plate (68) on side of the track frame that gives access to the adjustment system.
- To loosen the track, slowly unscrew the valve (74) counter-clockwise for no more than one turn. One turn of the valve (74) is sufficient for loosening the track.
- If grease does not start to drain out, then slowly rotate the track.
- Insert 3 steel tubes in the space between the rollers and the track. Rotate the driving gear in reverse so that the steel tubes proceed with the track and contact the front idler wheel.
- Exercise force sideways to slide the track and lift it off the front idler wheel.

Installing the rubber track

Make sure that you are always in safe conditions with the machine lifted before
performing this track installation operation.

- Mesh the track links in the sprocket and place the other end of the track on the front idler wheel.
- Rotate the driving gear in reverse slowly and push the track soles into the frame.
- Position the track using a steel tube and turn the driving gear again.
- Make sure the track links mesh correctly with the sprocket and with the front idler wheel.
- Adjust track tension as set out previously. Replace the cover and lower the machine back onto the ground.



The structure of the rubber track is shown above. The steel cables and the metal core are embedded in the rubber. The curved profiles function gives stability on soft terrain. The wheel guides, located on the inside of the track, prevent the track from sliding off the guide rollers.

Breakage of steel cables
Excess track tension can cause steel cables to break in the following conditions:
- when stones or foreign matters accumulate between the track and the undercarriage frame;
- when the track slips off its guide system;
- in case of great friction such as rapid changes in direction.

Breakage of metal core
Excess track tension can cause the metal core to bend or break, just like the steel cables as stated above.

Other causes may include:
- improper contact between track and sprocket;
- rotation of internal rollers;
- operation on sandy terrain.

Maintenance of drive geared motors
Checking the oil level in the reduction unit:
- Stop the hydraulic geared motor with the plugs (62 and 63) aligned horizontally.
- Remove both plugs and check that the oil level is up to their holes. Top up as necessary, filling through one of the holes and using the other to check the oil level.

Replacement of oil in the gearbox
Replace the oil after the first 100 operating hours and then at subsequent 1000-hour intervals.

Proceed as follows to perform the replacement:
- Stop the reduction unit with the plugs (62 and 63) aligned vertically with the plug (62) at the bottom.
- Remove both plugs and drain out all the oil.
- Now position the plugs horizontally and fill the reduction unit through one hole, using the other to check the oil level.

Lubrication

Undercarriage grease points

Perform this maintenance procedure every 100 work hours, using lithium grease with EP2 consistency.

Clean grease nipples before connecting them to the grease gun. Clean all grease being extruded.

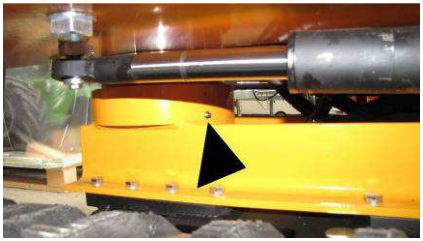
Lubrication should be at more frequent intervals if the tracked undercarriage is used in particularly severe operating conditions.

Grease points for the tracked undercarriage widening cylinder pins can be found when the tracks are extended to maximum. Grease more regularly if working in dusty or wet conditions.

Cutter arm grease points

Cutter arm grease points on drive layshaft – covered.

Undercarriage grease points



Swivel base grease points

The cutter arm grease points are especially hinges that serve for cutting and swinging motions. Perform this maintenance procedure every 100 work hours, using lithium grease with EP2 consistency.

Battery Charger and Battery Charging in Remote Control Box

There is one charger available with this machine for voltages 12 to 30 V DC. The other option is 240 V with an adapter. The battery pack is rechargeable and of Nickel Cadmium (NiCd) type. The normal charging time for an empty uncharged battery, is approximately 3 hours. The battery charger is constructed so that no damage will occur from long continuous charging. The batteries effective operation time is about 8 hours on one charge. When the battery is approaching the time for charging, the control unit beeps three times as a warning and at the same time the LED starts to blink on the control unit. The battery must be used until the LED goes out, after which it can be changed. If the battery capacity is too low, the control unit cannot be activated.

In order to reduce battery loading and for safety reasons, the control unit is turned off automatically, after the unit has been idle for more than approximately five minutes.

Fig 57 – Remote control box battery

Should the battery be fully discharged, it can be replaced by a new one. The battery is accessible under the cover in the bottom of the remote control unit.

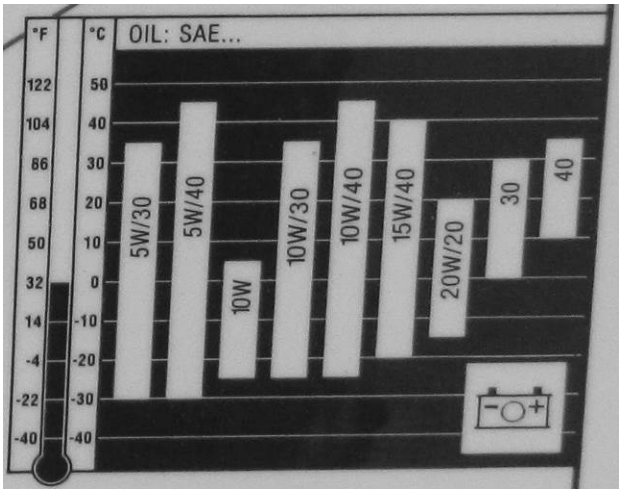
Maintenance Intervals

See tab. 5 – Maintenance

maintenance intervals	maintenance work
Every 8 – 15 hours, respectively daily checks before starting	Engine oil / hydraulic oil – top up if necessary. Air suction part. Cooling air part. Be sure that there is no debris that may break loose when the cutter is started. Contingent engine oil / hydraulic oil leaks. Make sure that all retaining bolts on the cutting head are tight. Access covers and guards must be securely fitted. Check and clean the air filter and remove any debris from within the engine covers and the oil cooler.
Every 50 hours	Check out tightening of all bolted joints. Check out the rubber tracks for correct tensioning and contingent damage. Check out and adjust, if necessary, blower belt tightness. Clean the air pre-filter of the engine.
Every 150 hours	Engine oil change. Fuel filter element change.
Every 250 hours	Cleaning of blower, ribbing and oil cooler. Check out tightening of all bolted joints. Check out the fuel pre-filter for cleanness and replace if necessary. Check out the air filter LED for function. **Do not retighten the cylinder head nuts.** Make sure that all retaining bolts on the cutting head are tight.
Every 300 hours	Oil filter element change. Change the air filter element.
Every 500 hours	Change the fuel pre-filter. Check out and adjust, if necessary, valve clearance.

	Check out all hydraulic elements for condition, function and tightness. Change hydraulic oil and the oil filter element.
Every 1000 hours	Change the gear oil in the reduction units of the tracked undercarriage.

Use of engine oil sorts in dependence on working and ambient conditions



In dependence on ambient conditions we recommend using the winter oil provided the ambient temperatures are deeply under 0°C. Summer oil makes engine starting more difficult in winter time.

Failures and Troubleshooting

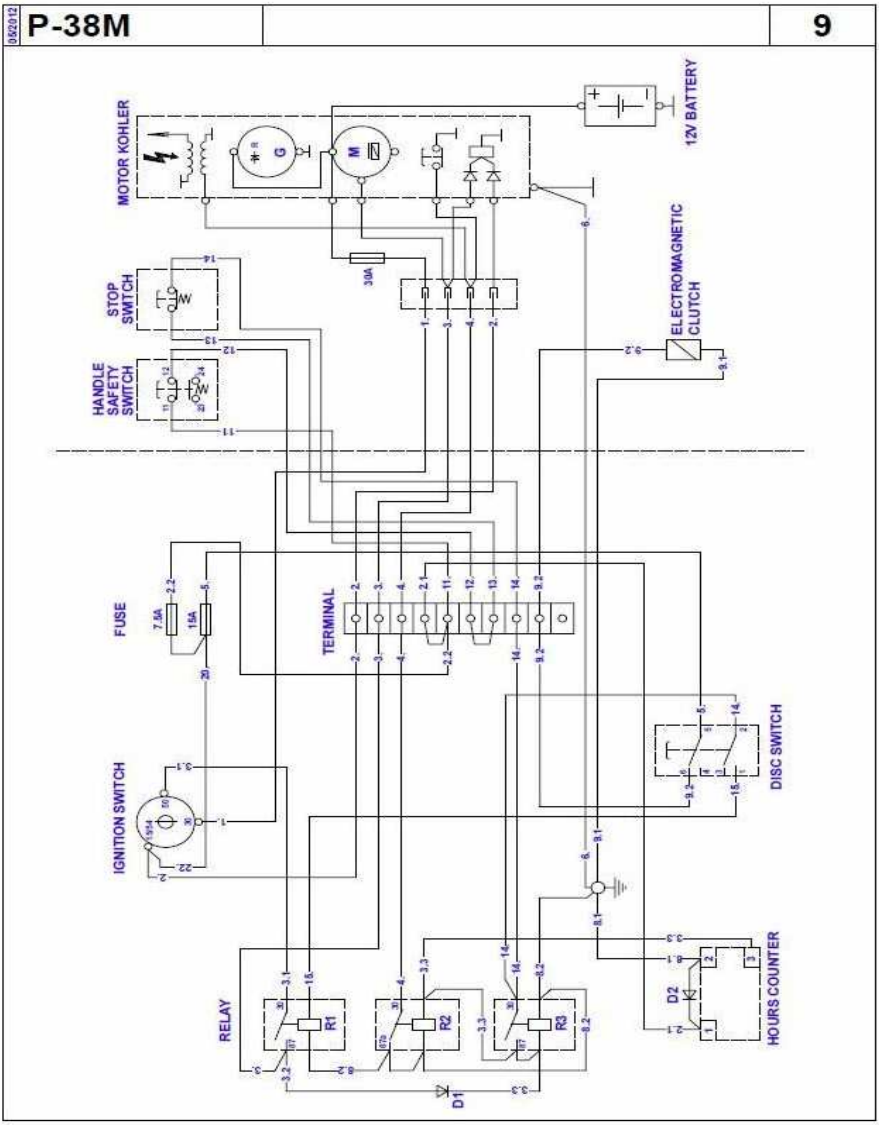
Failure	Cause	Remedy	
Engine does not start but it is possible to crank it	Speed regulator lever in STOP position	Set the lever of speed regulation to 1/2 starting or max. starting speed. The lever should remain fixed there.	
	Choke lever in OFF position	Set it in ON position	
	Low engine oil level	Refill engine oil	
	Flat battery in remote control	Charge or replace it	
	Emergency STOP button activated	Deactivate	
	Remote control OFF	Turn it on	
	Cutting head switch ON	Turn it off before starting	
	Lack of fuel in fuel tank	Refill	
	Insufficient compression stroke: - wrong valve clearance - wear of valves - wear of cylinders and/or piston rings		SERVICE
Problematic starting at low temperatures	Too low speed at starting	Change engine oil	SERVICE
	- solid oil - battery insufficiently charged	- use only recommended oil sorts - recharge battery - resp. contact authorised service	
Starter does not turn on, resp. engine does not crank	No key inserted in safety switch on control grip	Insert key with safety band	SERVICE
	Failure of electric equipment: - loose connection of battery and/or wiring - discharged battery - oxidized contacts - failure of starter - failure of relay or controls	Check electric equipment and particular components	SERVICE
Engine roars to life but does not run after starter disconnection	Speed regulator lever not sufficiently in START position	Set the lever to START	
	Fuel filter fouled	Change	

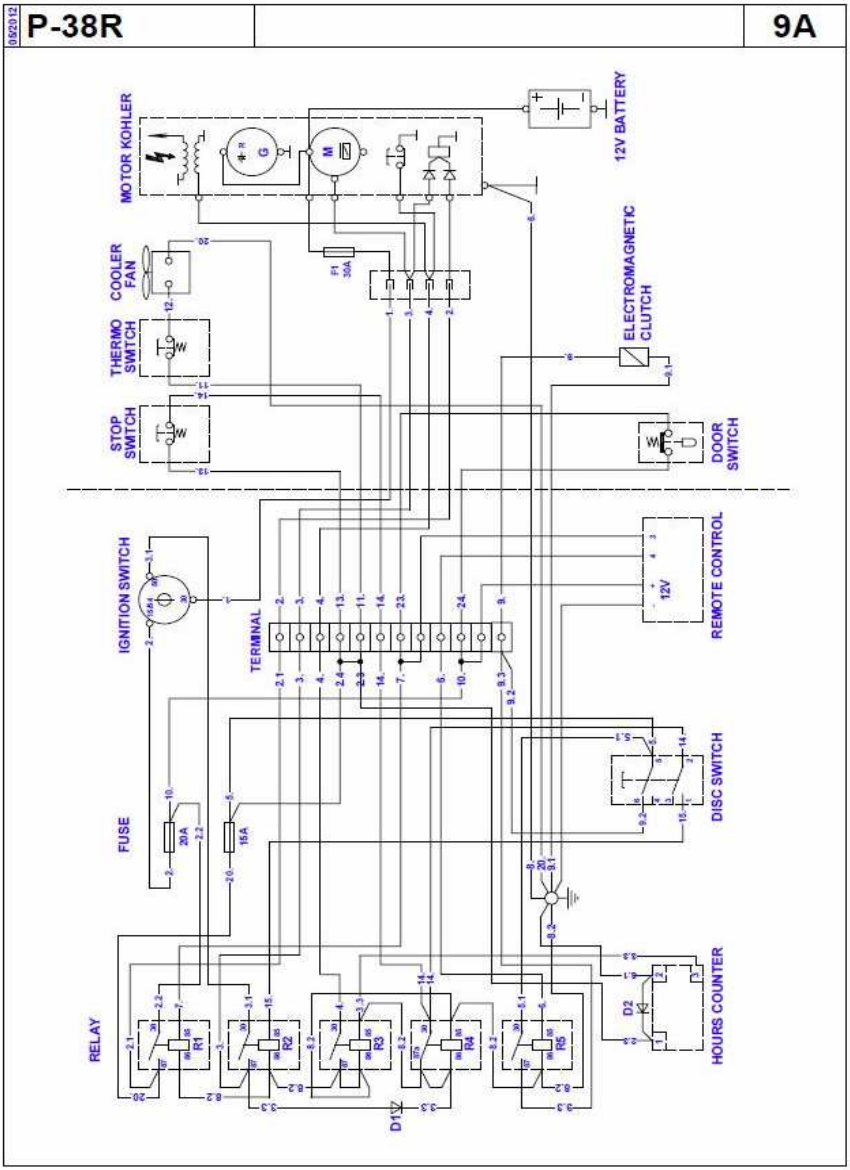
	Fuel supply line broken	Check and remedy - check entire fuel system - check oil level - check filter and clean or replace it as needed - see Engine Manual - change	SERVICE
Engine turns off	Lack of fuel	Refill	
	Fuel pre-filter or fuel filter fouled	Check and replace as needed	
	Low engine oil level	Refill	
	Flat battery in remote control	Change	
	Mechanical failure	Check and remedy	SERVICE
	Failure of electric equipment: - loose connection of battery and/or wiring - failure of alternator - failure of relay or controls	Check electric equipment and particular components	SERVICE
Insufficient engine power	Insufficient fuel supply: - lack of fuel - fuel filter fouled - insufficient fuel tank venting - fuel line leakage - speed regulator lever does not remain in required position - faulty spark plug	 - refill - change filter - check and remedy - check and remedy - unblock - change	
Insufficient engine power, loss of speed, black exhaust fumes	Air filter fouled	Clean filter or replace it as needed	
	Valve clearance not OK	Adjust	
	Failure of in injection nozzle	See Engine Manual	
Cutting head cannot be set in motion	Blown fuse	Replace	
Insufficient cutting quality	- blades blunt - drive belt slack - faulty electromagnetic clutch	- remove blades or regrind - tighten - change	SERVICE

Note: The note "SERVICE" in the "Remedy" column means that this operation should be done by an authorised service only.

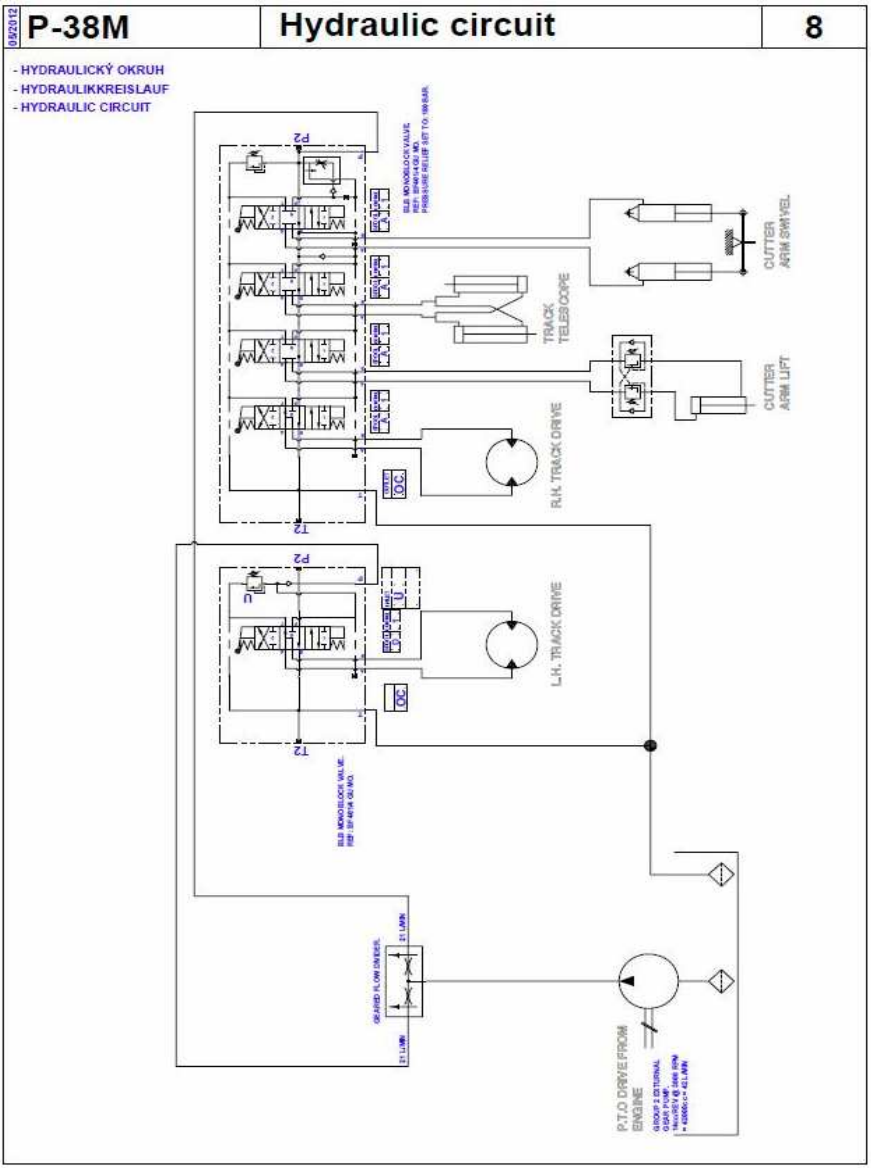
Blades edge regrinding requires high demands for keeping optimal cutting edge shape. While regrinding it is necessary to keep the same weight of particular blades because of balance of their rotating mass. Contact the authorised service.

ELECTRIC CIRCUITRY



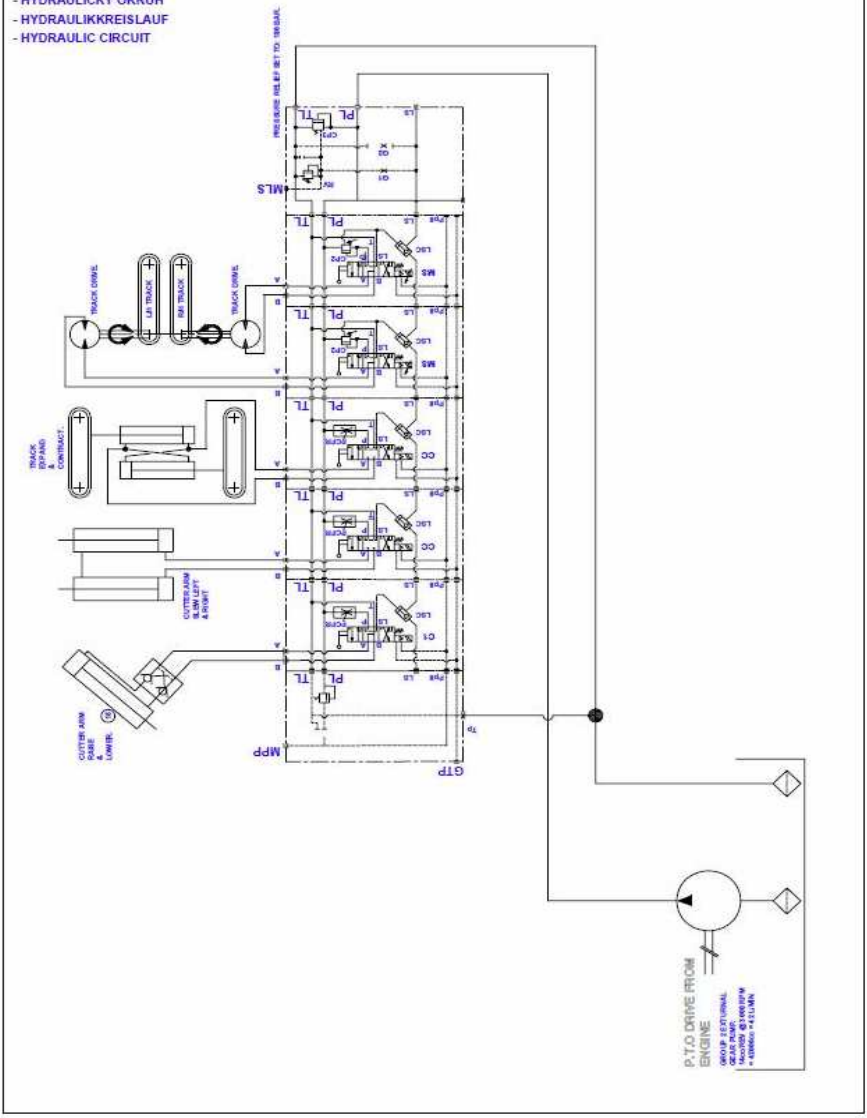

092012
P-38R
9A
MOTOR KOHLER
12V BATTERY
COOLER FAN
THERMO SWITCH
STOP SWITCH
ELECTROMAGNETIC CLUTCH
DOOR SWITCH
IGNITION SWITCH
TERMINAL
REMOTE CONTROL
FUSE
DISC SWITCH
RELAY
HOURS COUNTER

HYDRAULICS


09/2012
P-38M
Hydraulic circuit
8
- HYDRAULICKÝ OKRUH
- HYDRAULIKKREISLAUF
- HYDRAULIC CIRCUIT
CUTTER ARM SWIVEL
TRACK TELESCOPE
CUTTER ARM LIFT
R.H. TRACK DRIVE
L.H. TRACK DRIVE
P.T.O DRIVE FROM ENGINE

09/2012	P-38R	Hydraulic circuit	8A

- HYDRAULICKÝ OKRUH
- HYDRAULIKKREISLAUF
- HYDRAULIC CIRCUIT



Warranty

The manufacturer provides warranty on this product for a period as stated in the enclosed Letter of Indemnity. This warranty period begins upon delivery to the customer.

This warranty covers all failures resulted from faulty assembly, manufacture and materials.

The manufacturer bears no responsibility for damages resulted from user's wrong usage, such as:

- Usage by an unauthorised person.
- Unauthorised changes, repairs and actions on the machine.
- Usage of unoriginal spare parts or parts intended for other models.
- Disobedience to instructions for use.
- Damage of the machine caused by faulty handling, maintenance or overloading.
- This warranty does not cover faults resulted from damages caused by the user.
- This warranty does not cover parts being subject to ordinary wear and tear.
- This warranty does not cover any damage of machine caused by usage of unoriginal
  spare parts.
- This warranty does not cover consequences resulted from weather effects.

Any warranty claims must be submitted in writing with papers concerning acceptance for warranty or post-warranty repair.

Maintenance and Servicing

The following table form (tab. 7) serves for notes of all actions within service life of the machine. Complete the form with description of the given action, changed parts and signature of a competent technician.

Tab. 7 – Maintenance and Servicing

Description of work and changed parts	Technician's signature

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