LASKI SMRŽICE 263
798 17 ČR
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OPERATING INSTRUCTIONS

LEAVES EXHAUSTER
VD 500

Version 03. 2020

Foreword

Thank you very much that you have just purchased our product, the leaves exhauster VD 500 (hereinafter 'exhauster' only).

Our company has been engaged in production of similar equipment for many years and has gained considerable experiences in this field. Quality of our machines is proven in 40 countries of Europe and Asia we export to.

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 explanation. It is very important for you and your work safety to understand all instructions given in this manual.

The firm Laski spol. 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 the text. If there is any work safety rule or instruction in general description, then this instruction is indicated with the following symbol:

EC CONFORMITY DECLARATION

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

declare hereby that our product - designation: **Leaves Exhauster**

- type: **VD 500**
- model: **VD 500P**
- serial number: .....

complies with the given EC Directives:
2006/42/EC
2000/14/EC
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 13857, EN ISO 13732-1, EN ISO 14120, EN 1175-2, EN ISO 11201, EN ISO 3744, EN ISO 19353, EN ISO 3767-1, ISO 11 684**

Popis

Parameter	Unit	Value
Length	mm	2240
Width	mm	1560
Height	mm	2350
Weight	kg	400
Engine - type	-	KOHLER CH 740
Power output	kW	18.0
PTO speed	min-1	3600

Conformity assessment in accordance with Directive No. **2000/14/EC, art. 14, point 2, Appendix V.**

The entity participating in this conformity assessment in accordance with Directive 2000/14/EC: **NB 1017, TÜV SÜD Czech s.r.o., Novodvorská 994/138, 142 21 Praha 4**

Measured sound power level of this equipment: L_{WA} = 114,4 dB
Guaranteed sound power level: L_{WA} = 115,0 dB

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

In Smržice, on 31.7.2016

.....
Ing. Jiří Kvasnička

EC CONFORMITY DECLARATION

issued in compliance with applicable EC Directives

We, as the manufacturer, **LASKI, s.r.o.**
Bliš'ka 263/16
CZ-798 17 Smržice
CRN: 45479593

declare hereby that our product
- designation: **Leaves Exhauster**
- type: **VD 500**
- model: **VD 500P**

serial number:

complies with the given EC Directives:

Directive No. 2014/30/EC - EMC

List of technical standards, specifications and harmonised norms used for assessment of its conformity: **ČSN EN ISO 14982**

Basic technical parameters:

Parameter	Unit	Value
Length	mm	2240
Width	mm	1560
Height operation/transport	mm	2360
Engine - type	-	KOHLER CH 740
Output power	kW/rpm	18,6

In Smržice, on 31.7.2016

Ing. Jiří Kvasnička

Product Identification

Our product is identified with its serial number stamped on the type plate. Pay your attention also to the type plate on the combustion engine.
Upon take-over of the product we recommend you to fill required data in the following form concerning the given product and your dealer.

Type of product: .....

Serial number of product: .....

Engine type: .....

Serial number of engine: .....

Dealer's address: .....

Address of authorised service: .....

Date of delivery: .....

Warranty expiration date: .....

Interruption of warranty period .....

The type plate is located on the machine frame. It includes:

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

VIN code

Utilisation

The leaves exhauster is designed for collecting of leaves or short-cut (mowed) grasses in places where gathered after upkeep and cleaning of parks and green areas.

Not Allowed Use

This exhauster is designed only for collecting of aforesaid materials and not allowed for evacuation of metal particles, woody pieces, wood dust, sand, grit, broken glass, textiles etc.

Work Safety Instructions

Generally

- This machine is allowed to be operated only by an operator who is over 18 yrs old, physically and mentally capable and demonstrably instructed with its operation.
- A towing vehicle driver should have respective driver's license.
- Keep this machine beyond children's and unauthorised person's reach.
- When leaving the machine take always the switch key out of ignition.
- 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.
- Before working learn all functions of individual controls and safety elements and carry out functional checks before any use. Ask your dealer to provide you a necessary training course.
- At work in residential zones use the machine in accordance with applicable regulations of local authorities to avoid disturbing local inhabitants (noise, flying particles).

 **Is strictly off limits** test run of the exhauster puting near the suction hole to parts of the human bodies , stoking limbs to the suction-fan , also to the flow of air.

While working the operator is obliged:

- to use only a such exhauster which is in optimal operating condition, not damaged from previous transport, storage and operation and
- to use only such a transport vehicle which has closed loading space so that collected leaves cannot be blown away.
- It is not allowed to let any person enter the loading space while working.
- While working observe all the given instructions concerning work safety, motion of persons and transport means.

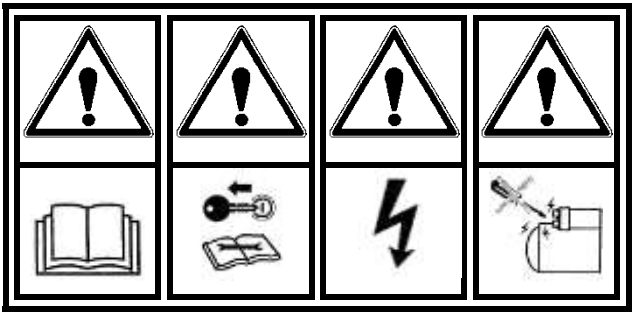
- Before transport put the suction hose in its holders around the machine to avoid its overhanging in side face. Keep the given traffic rules and instructions for vehicle outlines and lights.
- Before transport fix the discharge duct hose against motion.
- Couple the exhauster to a towing vehicle properly and check its proper coupling.
- Plug and check traffic lights of the exhauster.
- Keep the chassis always in good technical condition.
- Do not endanger other people within the reach of the machine.
- Check materials to be sucked and remove all undesirable objects. If you see such particles being rejected, stop working immediately.
- Keep work safety instructions given in manuals of transport means.

- This manual describes problems and faults which could occur at work and which may 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.
- Never do any technical changes or actions which are neither given in this manual nor allowed by the manufacturer. The machine, not correctly installed or adjusted, may run without problems now but in the future it could damage any of important parts.
- Do not put any objects or tools on the machine.
- Do not use the exhauster for transport of persons or things.
- The manufacturer does not bear responsibility for any damages or injures to the third persons or to other equipment resulted from disobedience to instructions given in this manual.
- When handing the machine over to another person make sure if all controls, guards and other safety elements are complete.
- Do not remove guards and other safety elements. They serve for your safety.
- Keep the given intervals for checks of bolted joints.
- Always after work clean all parts of the machine with pressure water.
- Some parts of the machine can be hot while in operation. Avoid any settling of flammable leaves and similar materials on such parts or close to engine intake openings, fuel tank and exhaust manifold. Stop working if such dangerous deposits occur.
- Any servicing can be done only if the machine was put out of operation and its battery was disconnected.
- Avoid any random start - disconnect the plus pole of the battery.

- Fill up the fuel tank before working and only if the machine is turned off. To fill up the fuel tank use always a proper filling funnel with extension.
- Do not fill the fuel tank while the engine is hot or still running.
- Do not use petrol as a cleaning agent.
- Keep open fire away while filling the tank.
- Keep the machine beyond reach of open fire.
- Any transport of persons or any load on the machine is not allowed.
- Some parts of the machine run warm. Do not touch them when the engine is still running or having been just stopped.
- While the engine is running, do not touch its high-voltage cable.
- Do not let the engine running in high speed unreasonably.
- Do not change the engine adjustment, especially its speed regulator.
- Be careful at battery handling.
- Warning! The battery contains sulphuric acid that could cause burns.
- The battery should be always properly fixed in its place.
- Do not start the machine in confined or ill-ventilated spaces.
- Do not use the machine under conditions of low visibility, especially at foggy weather, when you may overlook unwanted persons coming.
- Do not use the machine without prior reading this manual.
- 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.
- It is strictly forbidden to work with a damaged fan wheel (vibrations while running), a damaged suction hose or without sucker.
- Check up bolted joints for tightening after the first 50 km.
- For leavex exhauster without being coupled to a towing vehicle, first set the trailer in a horizontal position (relatively levelled) by means of its jockey wheel and block both travelling wheels by scotch blocks against unwished motion or, in case of a braked trailer, use its parking brake.
- Before transport, after coupling, lift up the jockey wheel under the drawbar at least approximately 20 cm above the ground to avoid any contact with terrain (road).

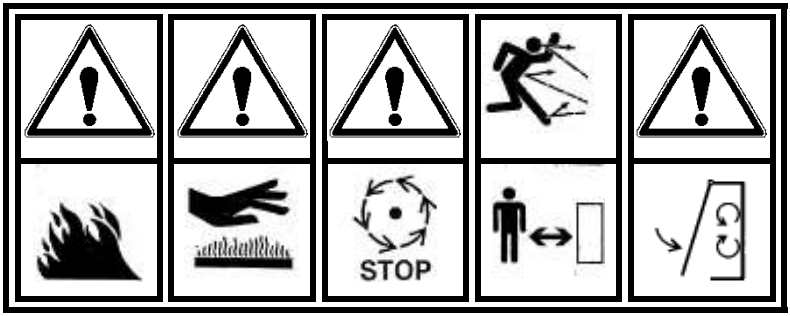
Work Safety Symbols

This article introduces work safety symbols (pictographs) used on this machine. Under the given position 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 meanings 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

Read this operating manual before use.	While maintaining, servicing or repairing always follow the manual and take always the switch key out of ignition.	Warning! Electric voltage	Start the machine with the switch key only. Do not short circuit its contacts.



5	6	7	8	9
Warning! Fuel is flammable! Keep open fire away!	Warning! Hot parts of exhaust manifold.	Warning! Turning wheel is running out.	Warning! Rejected objects hazard. Keep away.	Warning! Close all guards before starting the machine

Transport of Product/Handling

- This product is delivered completely mounted and fitted on its chassis. The exhauster can be towed by towing means which, according to its total weight, even a car can be.
- Any handling the exhauster is supposed at coupling/uncoupling to/from a towing vehicle only.
- It is forbidden to tow the machine to another place by hand (with exception for coupling to a towing vehicle).
- Any exhauster displacement by hand only is not allowed.
- Putting the exhauster aside block it against unwilling motion by means of scotch blocks. On flat surface block one wheel from both sides.

- Uncouple the exhauster always on compact, flat and sufficiently bearing surface only.
- It is not allowed to put any objects or tools on the machine. Never pile exhausters up on each other.

Keep the towing bracket ball or the drawbar eye clean (free of sand etc.); apply a corresponding grease film on their surface. While putting the trailer aside, use the jockey wheel for supporting. Lock it by tightening,

Precautions in Design

This product is equipped with hoods, guards and covers to protect rotary and hot parts against touching. Protective covers and guards are usually fixed or bolted down on framing. The guard over the exhaust manifold is perforated and protects the attendant against contingent burning.

The fan wheel space is protected against access by a hinged cover with a terminal switch.

CAUTION!! If the engine is turned off, the fan wheel runs freely out. Do not open the spiral casing of the fan wheel until it stops.

Controls
The leaves exhauster can be controlled by means of controls installed on the engine console.

Controls on engine

1 - Ignition box
2 - Choke
3 - Speed regulator

Transport Safety on Public Roads

For transport on public roads the trailer should be coupled to transport means equipped with towing brackets approved accordingly. The given towing vehicle should be also approved for this way of transport and equipped with a respective towing bracket intended for permissible weight of an unbraked trailer and for vertical coupling load of 50 kg at least. If the towing vehicle is equipped with a 13-pin receptacle for transport lighting, it is necessary to use an applicable adapter.

- To be ready for transport on public roads the trailer must comply with the concerned instructions in its operating manual and the machine engine must be turned off.
- Maximum transport/travel speed is 80 $km.h^{-1}$.

- Always before coming to a public road it is necessary to remove all mud and accumulated sediments, especially from trailer tires.

Transport Position

First make the machine ready for transport:

- turn the engine off;
- couple the trailer on the towing bracket ball, or
- insert the drawbar in the hitch and lock it with a locking pin;
- connect the brake safety rope to the towing vehicle;
- put the scotch blocks in their holders;
- lift up the jockey wheel under the drawbar;
- set the discharge duct forwards and lock it against turning;
- fold down the end piece and lock it mechanically against moving;
- connect the electric plug to the towing vehicle.

Trailer coupling/uncoupling

For transport this chipper can be coupled to transport means equipped with a respective towing coupler B50-X (with a ball ISO, ø 50 mm) or through a drawbar eye ø 40 mm in the towing vehicle hitch. The given vehicle should be approved for transport on public roads.

- put the scotch blocks under the unbraked trailer wheels.
- While coupling, go always with the towing vehicle to the trailer. Be careful, this approaching could be dangerous, particularly on hilly terrain.
- First of all, set the drawbar in required height by means of its jockey wheel.
- Coupling through a ball coupler:
- Hold the coupler on its grip and put it on the ball in rear of the towing vehicle. After snapping on the ball release the grip and the coupler gets automatically locked. The pointer on the ball coupler Knott must be within the „+“ range. In case of the AL-KO ball coupler you should see the pointer in a green field.
- Try to lift it up by hand to check out if the ball coupler is properly locked.
    - Coupling through a drawbar eye, ∅ 40 mm: :
    - Having approached the towing vehicle to the drawbar and after its height adjustment by means of the jockey wheel put the eye into the hitch. Automatic couplers lock the drawbar inside by a pin automatically.
    - In case of manual couplers put the eye into the hitch and insert its locking pin. After snapping lock the pin by its locking spring or dowel against unwilling uncoupling.
    - Check out proper coupling and locking of the trailer drawbar.

- For a braked variant: connect the brake safety rope to the buffer, frame or towing bracket in rear of the towing vehicle. This rope of the overrun brake system should be led directly to the towing vehicle and freely for all reciprocal movements both of the trailer and the vehicle.
- If the towing vehicle is equipped with a 13-pin receptacle for transport lighting, it is possible to use an applicable adapter for a 7-pin plug. The trailer can be also equipped with a 13-pin plug (option).

While uncoupling the trailer, proceed in reverse order. Do not uncouple the trailer on a hillside as it is very dangerous. Before uncoupling, make sure if the trailer is sufficiently blocked against unwilling motion after uncoupling from the vehicle.

Putting aside and parking

Unbraked trailer

Do not uncouple the trailer on a hillside as it is very dangerous. Before uncoupling, make sure if the trailer is sufficiently blocked against unwilling motion with both wheels properly chocked and then you can uncouple the towing vehicle. Extrude the jockey wheel, let it rest on the ground and lock it in its extruded position mechanically. Should the trailer be uncoupled from a towing vehicle, first unload the towing bracket by lowering of the jockey wheel as needed.
While putting aside or parking the trailer being coupled to the towing vehicle, retract the parking brake on the vehicle and, on hilly terrain, block it against unwilling motion with scotch blocks under both trailer wheels and at least under one wheel of the towing vehicle.

CAUTION! Before removal of the scotch blocks, first find out if the parking brake of the towing vehicle can hold the whole set or the trailer on uneven or rough ground also after this removal.

While putting the trailer aside for a longer brake or storage, for example in winter time, block the trailer against unwilling motion, underlay it so that its wheels are supported without load. In this way you can save tires, bearings and springs considerably.

Trailer loading

While loading on a transport vehicle, the trailer must be properly fixed on the loading surface, lashed and secured against any displacement or overturning. This trailer is not designed for handling by crane, i.e. it has no lashing points.

While loading on a transport vehicle, no persons are allowed to be under the trailer or in its close vicinity – risk of accidents.

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Trailer checks before ride

The driver is obliged to carry out the following checks, in particular:

- wheels fixing
- condition of tires, tire pressure
- condition and functions of lights and reflector glasses
- trailer coupling, condition of towing bracket/hitch, drawbar eye and its locking
- fixing of machine parts on chassis (in their transport position)
- if there are no loose parts or tools laid on the trailer
- if the trailer is set in its transport position, i.e. engine off and concerned parts fixed
- if the jockey wheel is sufficiently lifted up and locked mechanically;
- if the trailer is free from mud and dirt

Machine ready for transport
Set the discharge duct forwards

Put the suction hose in holders and secure it with a clip

Put the hose nozzle in its holder and secure it with a cotter pin

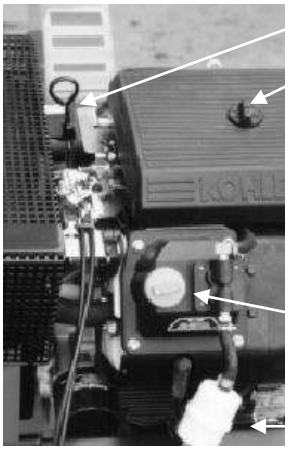
Before starting the battery should be fully charged.
Remove the battery and let have it recharged by an authorised person.
While handling, take care of work safety regulations since the battery contains caustic agent (battery acid). Do not tilt resp. overturn the battery. Do not remove its plugs unreasonably.
Recharge the battery always after a longer operational break exceeding 50 days.
Be aware that any start failed and restarting brings loss of battery voltage. Such a drop of potential might be insufficient for the next start.

Storage

Store the exhauster always in a dry shelter to protect it against weather effects.

- During storage keep the switch key separately.
- Keep the stored machine beyond unauthorised persons reach.
- Before storage clean all parts of the machine. For cleaning use pressure water.
- Clean especially oily spots.
- Exchange all damaged or worn parts. Use always original spare parts. For spare parts contact your dealer or authorised services.
- While putting the trailer aside for a longer brake or storage, we recommend changing the oil filter element together with the engine oil change. The given filter body is on the engine side. Under the filter body there is a drain hole for engine oil discharge.

- Discharge the used oil into a special bin. Dispose used oil and used filters always in accordance with relevant valid laws and local regulations.
- Remove any spilled oil and clean all oily spots.
- Always put the machine aside on a flat and solid floor and block its wheels against unwilling motion by means of scotch blocks.
- Do not put any objects or tools on the machine.
- Store the fuel canisters separately.
- Set the trailer in a horizontal position (relatively levelled) by means of its jockey wheel.
  Lock the jockey wheel mechanically.



Before Putting into Operation

- Before the first putting into operation, check up the machine for contingent damages and completeness after its transport and storage.

Attach the suction hose only at standstill of the engine with the spark plug cable removed and the battery disconnected to avoid any random start-up.

It is strictly forbidden to start the engine if the suction hose is not properly coupled to the metal flange on the suction hole.

Minimum permissible length of the suction hose is 3 m.

It is strictly forbidden to test the suction draw or air flow by extremities.

Keep the suction hose away from your body, other persons or animals.

Check the engine oil level with a dipstick and refill if necessary. The oil level should be between both marks (MIN and MAX).

- Check the suction hose for tightness – any untightness reduces suction performance essentially (wear, damage).
- For putting the suction hose on its adapters use always binding bands.
- In case of any damage on the exhauster contact your dealer or authorised service.
- For replacement use always original spare parts. Parts, such as rotors, should be balanced properly.
- Avoid spillage at filling oil or fuel. Use always a proper filling funnel. If any fuel or oil is spilled or overflowed then wipe off the spots immediately. In case of petrol let it evaporate.
- Check tightening of bolted joints, especially guards, grids and completeness of other parts.
- Check movability of rotary parts.
- Max. capacity of the fuel tank is 16 l. Minimal fuel charge is 5 l.
- The fuel to be used is unleaded petrol NATURAL 95.
- After storage check the battery. Recharge it if necessary.
- Plus and minus poles should be connected just before starting.
- It is strictly forbidden to do any unauthorised technical changes on the machine.

Before Putting into Operation

- Before putting into operation, check up the machine for contingent damages and completeness.
- Check up tightening of bolted joints.
- Check up permissible slack of V-belts.
- It is strictly forbidden to start the machine with its hoods and guards removed.
- Do not start the machine with oily spots.
- Any servicing or adjustment is allowed to be done only if the engine was put out of operation.
- Check up the air filter element regularly, especially while working with dusty leaves. If fouled, change it.
- Before working, check up on-site conditions: leaves to be sucked must be free of any unwished objects, such as stones, metal pieces etc.
- Check up tightening of fixing bolts on the fan spiral casing.
- Direct the hose into the loading area of a transport vehicle and fix it properly.
- Connect the battery (plus pole).

- Any servicing can be done only if the machine was put out of operation and its chassis blocked against unwilling motion. In case of a braked trailer, use its parking brake or chock both travelling wheels. Do not step on the chassis frame!
-

It is strictly forbidden to test the suction draw or air flow by extremities. Keep the suction hose away from your body, other persons or animals.

Putting into Operation

Before start check if the suction hose is free of any materials. Prevent other persons to enter the working area. At work proceed always very carefully.
Avoid collecting of any hard objects that might damage the moving rotor.

- Avoid directing the discharge duct to the area of possible motion of other persons.
- Pay special attention to children if they are within the machine reach.
- Release the suction hose and put it in front of leaves to be sucked.
- Fix the suction hose to the framing.
- Open the choke (cold start).
- Set the speed regulator (throttle valve) to minimum speed.
- Open the fuel cock.
- Start the engine with its ignition key.
- **CAUTION!!!**
- **As soon as the engine roars to life, the vane wheel starts turning and the exhauster starts sucking – risk of ejected particles.**
- **Should the exhauster work in workshops or outdoors, avoid directing the flying leaves/particles in places with motion of persons or animals after starting. Before start-up tilt the end piece to reduce the flying particles range. Be careful while working in workshops – danger of suction of mechanical impurities and debris.**
- **They may have substantial kinetic energy.**
- Having started raise the speed gradually by means of the speed regulator and close the choke.
- If you heard any strange noises or vibrations during initial run turn off the exhauster immediately and contact the authorised service.

- At cold starting, especially in winter time, do not increase the engine speed but first let the engine running in idle speed to warm up.
- **Do not leave the machine unattended.**

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. Keep an interval between two starts (standstill) 30 sec. at least.
Note! If the choke is opened for a longer time after start then you may flood the carburettor and the engine stops. Too much fuel in the firing chamber may increase engine wear. Let the choke opened only for warming the engine up at idling. Do not use the choke while working.

Putting out of Operation

- Having finished working reduce the engine speed by the accelerator lever and wait for real speed decrease (about one minute idling).
- Turn the switch key in the STOP position.

Never forget that the rotor wheel is running out.

Emergency Situations
Turn off the exhauster and stop working in following situations:
- If any person or animal approaches the working range (under 15 m).
- If suction hose breaks.
- If you heard any strange noise or vibrations or felt any strange smell then turn off the machine immediately and contact your dealer or directly the manufacturer.
- In case of fire or breakdown, stop working immediately.
- In case of fire use foam extinguishers only. If you cannot damp the fire down yourself, call for a fire brigade.

Leaves Exhausting
- The exhauster is driven by an engine. Do not start it in confined or ill-ventilated spaces or under conditions of low visibility.
- While exhausting you should let the exhauster coupled to a towing vehicle. Just turn the discharge duct into loading space of the towing vehicle.

Is strictly off limits starting engine with unseeded plastic hose on metal collar of suction hole !
Minimal longht suction hose that can be machine use is 3m!

Is strictly off limits test run of the exhauster puting near the suction hole to parts of the human bodies , stoking limbs to the suction-fan ,
also to the flow of air.

- Set the exhauster so that the suction hose has optimal access to the leaves to be sucked.

Minimal longht suction hose that can be machine use is 3m!

- If any displacement of the exhauster is required then first put the suction hose in the holder and fix it by means of its binding band.
- In case of two attendants (driver and operator) it is necessary to make simple signals clear before working. During operation it is not easy to make any agreements because of operating noise. The driver must always have overview over the site.

- Catch the grip of the suction hose and apply the hose slowly to leaves to be sucked. Proper sucking action requires keeping the continuous air flow taken in the hose together with leaves. Do not make fast and abrupt changes while sucking what is important especially when cleaning wet and heavy leaves, grasses etc.
- While filling the loading space of a towing vehicle let the air escape from the space, i.e. let about 15% of this space free.
- Do not use the choke while working.
- Avoid clogging the suction hose.
- If you heard any strange noise or vibrations then turn off the machine immediately and contact your dealer or directly the manufacturer.
- Should you fill up the fuel tank then use always a proper filling funnel. Do not fill the fuel tank while the engine is hot or still running.

- Avoid spillage while filling fuel. If any fuel is spilled or overflowed then wipe off the spots immediately and let the fuel evaporate.

- **- Do not adjust the discharge duct or its end piece anyhow while the machine is being in operation. Do not put your hand in the air and leaves flow.**
- **Keep the suction hose away from your body, other persons or animals. Pay special attention to small animals such as rodents, dogs, cats etc.**

- **It is strictly forbidden to start the exhauster with the plastic suction hose removed. Keep your extremities away from the suction hole in the metal flange.**

Noise and Vibrations

Operation of this exhauster brings following emissions:
Noise at 6 m distance L_A = 89,3 dB
Noise at 3 m distance L_A = 92,3 dB
Sound power - L_{WA} = 114,4 dB

- All measurements taken in accordance with EN ISO 11201 and EN ISO 3744.

- Extended uncertainty of measurements: U = ±0,6 dB. The given uncertainty means total uncertainty based on standard deviation multiplied by the coefficient k=2 with a confidence interval approximately of 95%.

- These noise levels have been recorded at maximum engine speed of 3600 ±50 rpm.

While working, the persons operating this machine are obliged to use ear protection according to the given noise level.

Residual Risks

HOT PARTS
The engine safety guard can be warmed up to 70°C provided the machine is used on sunny days during the summer season – risk of burns on its surface. To prevent severe burns do not touch the guard while the engine is still running – or immediately after its turning-off. Some engine components can get extremely hot

from operation. To touch these components first wait for 10 min at least to let them cool down.

EXPLOSIVE VAPOURS
Refer to your local fuel supplier for the MSDS sheet. Fuel used for this engine is inflammable material with its class of danger I. If fuel refilling is required then put the machine out of operation and let the engine cool down. While fuel handling, keep it beyond the reach of naked flames and do not smoke!

EJECTION OF OBJECTS
Warning – ejected objects hazard while working. They have substantial kinetic energy. If the leaves being sucked contain unwished parts, such as sand, glass etc., then such objects can reach a longer distance than the sucked leaves. Therefore direct the hose end in order to regulate ejecting. Keep persons and animals away.

UNWISHED MOTION
While putting the trailer aside on a slope, block its wheels against unwilling motion by means of scotch blocks.

ROTATING PARTS – PULL-IN HAZARD
The fan wheel space is protected by a terminal switch. If the engine is turned off, the fan wheel runs freely out. Do not open the spiral casing of the fan wheel until it stops.

Technical Description

This machine consists of following main parts:
- Suction line
- Driving engine
- Suction fan
- Chassis

Suction Line

The elastic and armoured suction hose is fixed on the suction fan hood. On the other side the hose is equipped with a metal nozzle controlled by the attendant holding the grip. For transport the hose should be always put in its holders around the chassis.

Driving Engine

This exhauster is powered by an air-cooled four-stroke single petrol engine KOHLER CH740 built in the rear part of the machine frame. The engine is equipped with an electric starter. One 12 V battery is installed aside the engine with its metal fuel tank. Transmission of power is based on V-belt gearing. The engine is displaceable on its metal base plate.

Suction Fan

The metallic rotor is put in ball bearings. Straight rotor vanes are rigid enough against common impurities usually contained in leaves. The fan case is welded, made of steel plates. Its inlet part is covered by a hinged hood protected by a safety switch so that if this hood remains opened then it is not possible to start the engine. On the outlet part there is the discharge duct rotary in 360°. The duct end is equipped with a hinged adaptor.

Chassis

This leaves exhauster is fitted on a special single-axle trailer, cat. 01. For coupling to a towing vehicle the trailer is equipped with a fixed drawbar and a ball coupler B50-X or with a towing eye ∅40 mm.

The exhauster is powered by an independent combustion engine. The exhausting blowing job is allowed to be done only with the trailer standing.

Necessary coupling device, overrun brake system, axle and brakes are subgroups delivered by f. AL-KO or Knott.

The rear bumper beam complies with applicable EU standards, particularly the Directive No. 70/221/EHS.

The machine driving engine and its fuel tank are installed in the front part of the frame, from behind protected against accidental damage by the machine itself and by a rear bumper beam.

On the trailer mudguards there are white reflector glasses installed; in rear of the trailer there are two combined lamps with side, stop and direction indicator lights, sign plate light, rear triangular red reflector glasses and a fog lamp on the left side. Aside on the mudguards there are orange reflector glasses. All the lamps and glasses are approved for transport on public roads complying with applicable standards (EHK No. 48).

Standardly the trailer is equipped with a 7-pin plug. Should the towing vehicle be equipped with a 13-pin receptacle for transport lighting, it is possible to use an applicable adapter for a 7-pin plug. The trailer can be also equipped with a 13-pin plug (option).

For putting aside the trailer is equipped with an adjustable jockey wheel under the drawbar. Two scotch blocks are put in holders on the front frame part.
Tire pressure, see the plate on the mudguards.
This trailer is not equipped with a spare wheel.

Technical Parameters

Parameter	Unit	Value
Vehicle, type	-	Special trailer, category 01, with leaves exhauster
Type	-	S3
Variant	-	A (unbraked)
Version	-	2H2
Trade mark		VD 500 P
Overall length	mm	2240
Overall width	mm	1560
Overall height	mm	2350
Wheel base	mm	1530
Wheel track	mm	1375
Weight (operating)	kg	400
Weight (max. permissible)	kg	400
Axle load (max. permissible)	kg	750
Max. vertical coupling load	kg	40
Weight of exhauster	kg	326
Chassis		
Type	-	TK911AV2H*0LA7***
Manufacturer	-	LASKI, s.r.o.
Max. travel speed	$km.h^{-1}$	80
Coupling device	-	class B50-X (ball ISO 50 mm) class S (towing eye 40 mm)
Tires	-	155 R13
Tire pressure	kPa	270
Wheel rim	-	4½ J x 13 H2
Electric installation	-	12V, 7-pin plug
Fan wheel		
Rotor - diameter	mm	440
- width	mm	160
- number of vanes	-	6
Rotor speed	min^{-1}	3000
Suction hose		
Diameter	mm	220
Length	m	6
ENGINE		

Type		Kohler CH 740 four-stroke, air-cooled, twin petrol engine
Power output	kW	18,6/3600 min^{-1}
Overhead valves		OHV
Operating revolutions	rpm	3600
Lubrication	-	forced
Oil sort	-	10W-40
Oil charge	l	2,1
Oil filter	-	full-flow
Fuel	-	unleaded petrol, ON 95
Fuel tank capacity	l	16
Ignition system	-	magnetoelectric
Spark plugs	-	Champion RC 12 YC
Spark gap	mm	1,0
Starter	-	electric
Battery	Ah	45 Ah

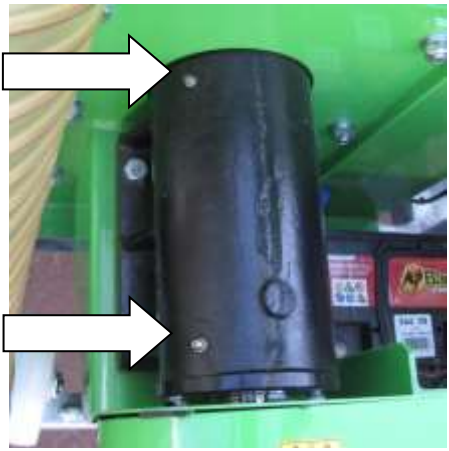
Travel wheel replacement

Any drive with a damaged tire or wheel rim is very dangerous; the tire can blow out and cause a road accident. Should any fault or damaged be detected on the tire or on the rim then do not hesitate to replace a complete wheel. However, this trailer is not equipped with any spare wheel.

- In case of light untightness it is possible to repair the tire by means of a special spray intended for tire service.
- Before wheel replacement block the trailer against unwilling motion by means of its parking brake or scotch blocks.
- The lifting jack should always stand under the place of axle fixing. Otherwise, it could damage the axle.
- All the wheel nuts should be tightened by torque 90 Nm.
- Inflate the tire to pressure of 270 kPa.
- After the first 50 km check out proper tightness of the wheel nuts.

Maintenance

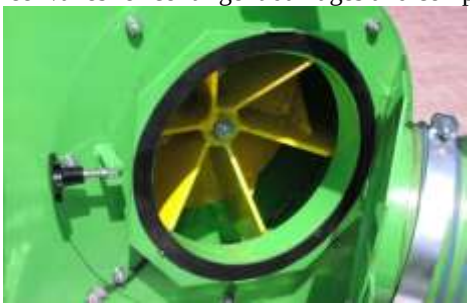
- Any servicing of the exhauster should be carried out by authorised persons and at standstill only.
- Check up the machine for completeness and its general condition.
- Check up V-belts for tightness and wear.
- Keep regular intervals for lubrication of bearings.
- Check up condition of rotor wheel vanes regularly.



Grease points

Fan rotor bedding Discharge duct swivel plate

Check up the fan wheel vanes for contingent damages and completeness



Fan wheel

Trailer maintenance:

Check up the trailer daily for good technical condition (before ride) and remove detected faults. The trailer should be ready for operation only in good technical order.

Keep all the routine maintenance intervals. Should the trailer (chipper) work in dusty and heavy conditions, shorten these intervals accordingly.

Checks on unbraked trailer:

1. After first 500 km:
   - all bolted joints and retighten if necessary
2. Every 5 000 km or every 12 months:
   - all bolted joints and retighten if necessary
   - axle, springs, parts for excessive wear or contingent damages and replace them if necessary
   - wheel bearings are maintenance-free (with permanent grease packing)
   - exchange them only in case of contingent damage
   - ball coupler and towing bracket or towing eye and hitch: apply corresponding grease film on their surface (e.g. as per DIN 51825 KTA 3K4)
   - coupling parts for excessive wear or contingent damages and replace them if necessary
   - tires and wheel rims for wear or contingent damage
   - jockey wheel and its mechanism
   - lights and reflector glasses
   - plug and cables of electric installation - exchange them only in case of contingent damage

- Pay special attention to routine maintenance of the battery. It requires special tools, measuring appliances and skilled attendants. If necessary, ask for help by an authorised service in order to inspect or to recharge the battery, particularly after a longer operational break exceeding 50 days. A longer storage time might also cause a drop of battery potential needed for the next start before new season.

Recharge the battery to full capacity also before longer break or storage, particularly in winter.

Service life of the battery installed in the machine is rather limited. It is usually 3-4 years and after this period the battery should be replaced by a new one.

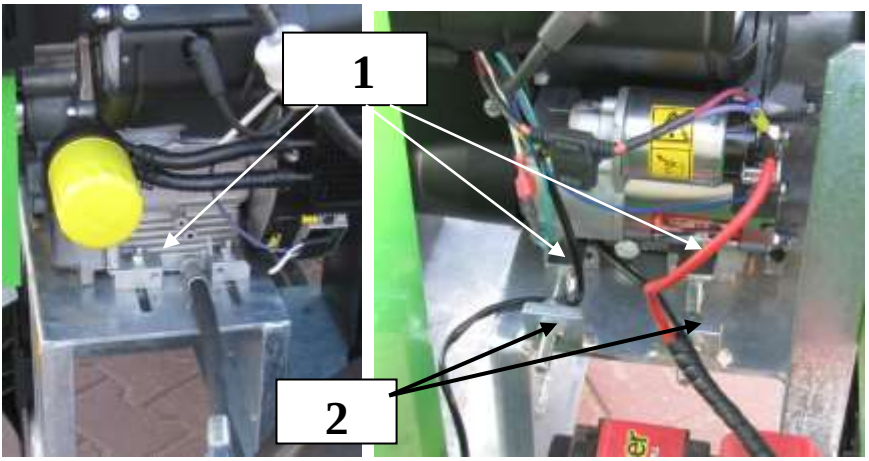
Hot-dip galvanized parts:

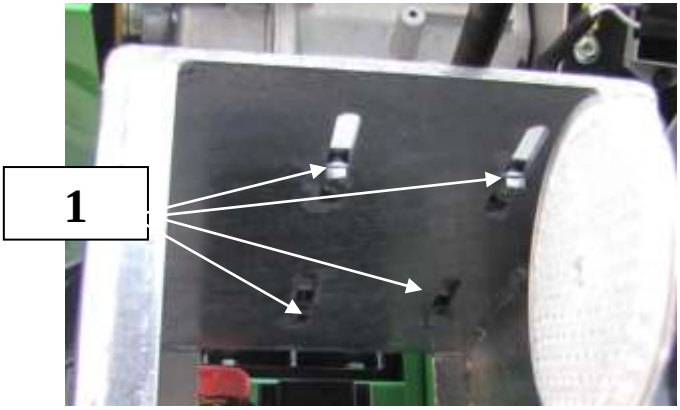
So-called white corrosion may occur on their surface – however, it is only an optical problem.
To eliminate this problem, take the following measures: when putting the trailer aside (or for storage), keep it in sufficiently ventilated space. After work in winter, rinse the hot-dip galvanized parts with clean warm water or by a steam jet.

It is strictly forbidden to carry out any welding works on the axle, overrun mechanism and coupling device – damaged parts must always be replaced.

V-belt tension

It is necessary to pay special attention to the routine maintenance and proper belt tension adjustment because the V-belts on this machine transfer the engine torque to the fan wheel. Belt creeping may bring considerable impact on the fan performance and service life of belts.





Engine bedding

1 – fixing bolts
2 – stretching bolts

For belt tension adjustment remove the side cover fixed here over the belt drive. Check up optimal slack of belts. It should be 15,5 mm just in the middle between both pulleys at down pressure of 50 N. If the recommended slack value is exceeded, tighten the belts by means of necessary replacement of the driving engine in its longitudinal grooves. Loosen the nuts of bolted joints (1) approximately by one turn – loosen the locking nuts alternately. Then move the engine in the required direction.

Before belt tightening turn off the engine and let the belt drive cool down.

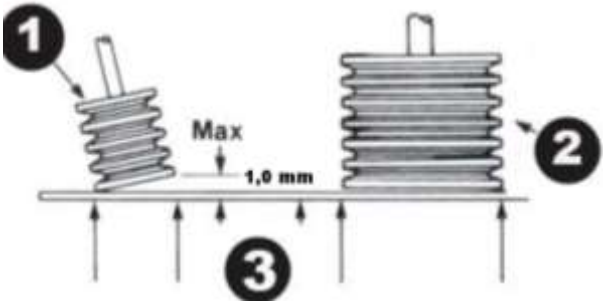
Should the belts be tightened while working, the belt pulleys cooling may take even tens of minutes!

For belt tension adjustment remove the front cover fixed over the belt drive by means of the fixing bolts M8

- For proper belt tension first check up also alignment of pulleys (their faces). Align the pulleys (their faces) by means of a straight-edge rule. Pay your attention to this alignment also after any engine displacement.

At reassembly do not confuse the RH side pulley (engine) with the LH side pulley (fan). Fix each pulley by its fixing bolts with torque of 80 Nm. While tightening the belts proceed as follows:

- **Check up tension of new belts after the first 5 service hours and afterwards always in intervals of 50 hours** Excessive creeping or tension (or improper alignment of pulleys) will wear out the belts and the pulleys prematurely with negative impact on the belt life.



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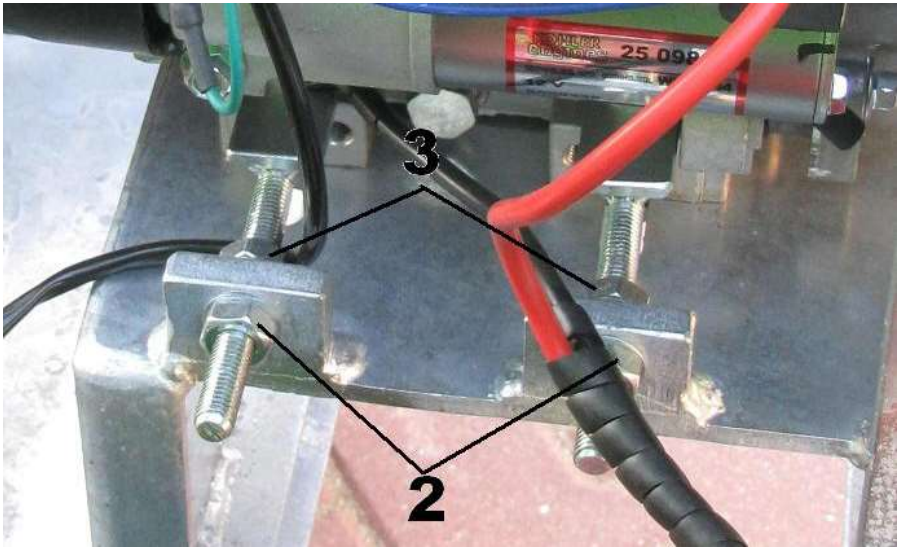
- 1 – driving pulley on engine
- 2 – driven pulley
- 3 – straight-edge rule

- **Align the pulleys** (their faces) by means of a straight-edge rule starting as from the lay-shaft pulley, go on to the engine driving pulley and finally to the fan driven pulley. Max. inclination/deflection allowed on the engine pulley and on the fan pulley should be less than 1 mm.

If this inclination found on the driving pulley and on the driven pulley exceeds this limit value, proceed as follows (on the driving pulley):

- Loosen four fixing bolts on the engine (1 - 4x) by 0,5 – 1 turn to let the engine slide on the frame.

- Loosen the locking nuts (3- 2x) on the stretching bolts (2 - 2x) and move the engine in its slot holes as necessary. Go on displacing the engine to set up optimal belt tension/slack of 15,5 mm at down pressure of 50 N.
- Having reached the recommended belt slack value and proper pulley alignment, retighten the fixing bolts on the engine (1 - 4x) and the locking nuts (3 - 2x).



Maintenance Intervals

Engine Oil Change	The first oil change after first 100 working hours and next changes every 100 hrs. Change the oil always when the engine is turned off and still warm. Discharge the used oil into a bin through the drain plug in the casing bottom. Having discharged the whole volume, screw up the plug and fill new oil of proper viscosity through the filler neck and then screw up the filler plug again. Before checking the oil level wait until the oil on casing walls flows down. In case of any failure in the lubrication system the engine stops automatically.
Oil Filter	Change the oil filter element every 200 working hours.
Air Filter	The air filter with two filter elements provides maximum protection against mechanic impurities and keeps continuous air flow into the fuel system. Remove the filter cap, unscrew

	the locking nut and remove the filter element. Check the air pre-cleaner every 25 working hrs as follows: - Loosen the pre-cleaner carefully from its cap, remove deposits from its element and wash it in warm water with a non-foamy detergent. - Rinse the filter element with the water, press the water out and dry it up. Put the cleaned element into the body, tighten up the nut and fit the cap again. In case of heavy fouling check up the element more frequently. - Check up the paper element every 10 working hours. If fouled change it. CAUTION! - Never oil the element and never clean it with paraffin or similar detergents.
Valves	Design of valves and especially of hydraulic tappets minimises operating noises and removes any further valves adjustment.
Ignition	The electromagnetic ignition requires no adjustment. Spark plugs, power cable and plug socket should be checked every 100 hrs. This check consists in cleaning of electrodes and setting of the spark gap to 0,75 mm. Spark plugs should be changed every 300 hrs.
Cleaning of Engine	Clean the engine according to its actual impurity grade by means of the pressure air. Clean the engine also after every change of oil or air filter element. Check up also the bolts fixing the engine to the chassis. CAUTION! Any repairs of the engine should be done by an authorised Kohler service only.
Electric Installation	Protect all wires against contact with oil products. Keep all elements clean and avoid any damage of wires - short circuit risk. All connections must have clean and proper contact surfaces to avoid intermediate resistance at a wrong contact point. Check the electrolyte level and density in individual cells of the battery. When charging keep all instructions of the battery manufacturer.

Failures and Troubleshooting

Failure	Cause	Remedy

Engine does not start	Discharged battery	Recharge battery	
	Broken lead	Check up wiring	SERVICE
	No plug sparking	Clean/exchange spark plug	
	Fouled fuel filter	Change filter element	
	Lack of fuel	Refill fuel	
	Low engine oil level	Refill oil	

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

Waste Disposal

Any waste materials resulting from the machine operation after its service life should be disposed in accordance with laws and regulations valid in the given country. Protect nature and water resources against used oil and filter elements.

Any parts of the machine should be disposed in accordance with laws and regulations valid in the given country.

Warranty

. The warranty time 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.

Service Report

Type of machine:	Serial number:
Day of inspection: **after six months**	Working hours: **after 100 hours**

Operations done:

- Engine oil - change Yes No
  Sort / viscosity .....
- Oil filter – change Yes No
- Air filter – change Yes No
- Fuel filter – change Yes No
- Solidification point of coolant ..... °C
- Hydraulic oil – change Yes No
  Sort / viscosity .....
- Oil filter element – change Yes No

Stamp of service station; technician's signature

Additional data:

Date:..... Working hours: .....

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Date:..... Working hours: .....

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Next service inspection (whichever occurs first)

Date:..... Working hours:.....

Service Report

Type of machine:	Serial number:
Day of inspection:	Working hours:

Operations done:

- Engine oil - change Yes No
  Sort / viscosity .....
- Oil filter – change Yes No
- Air filter – change Yes No
- Fuel filter – change Yes No
- Solidification point of coolant ..... °C
- Hydraulic oil – change Yes No
  Sort / viscosity .....
- Oil filter element – change Yes No

Stamp of service station; technician's signature

Additional data:

Date:..... Working hours: .....

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Date:..... Working hours: .....

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Next service inspection (whichever occurs first)

Date:..... Working hours:.....

Service Report

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Stamp of service station; technician's signature

Additional data:

Date:..... Working hours: .....

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Next service inspection (whichever occurs first)

Date:..... Working hours:.....