

Elise900

User Manual for Operation and Maintenance

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MANUFACTURER'S ADDRESS AND CONTACT DETAILS



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1. INTRODUCTION

1.1 GENERAL INFORMATION

The skid-steer loader described in these operating instructions meets the requirements of relevant technical standards and safety regulations.

If you want to use the skid-steer loader on public roads, it must meet the requirements of applicable national standards of the country where the skid-steer loader is operated. You must obtain a driving licence from the competent authority.

Our skid-steer loaders are manufactured in accordance with the latest technical knowledge. It is thus sufficient to handle the skid-steer loader safely and to maintain its functionality.

You will find the necessary information for that in these operating instructions. Read this manual carefully and follow the instructions before putting the skid-steer loader into operation. By consequently following the instructions in this manual you will ensure a long service life of the loader and its reliable operation, and you will prevent malfunctions and accidents, many of which are unnecessary.

Make sure that each worker has read and understood these instructions before starting to work with the loader.

Before using the loader, verify that the vehicle operator:

- Ⓚ Is informed about the correct use of the loader and its safe operation;
- Ⓚ Has read and understood the operating instructions for the loader at hand;
- Ⓚ Has read and understood ALL the safety labels on the loader;
- Ⓚ Is actually a person that works in the operating zone;
- Ⓚ Has familiarized themselves with operating the loader controls in a safe and empty area before starting to work with the loader.

Thank you for reading and following the instructions in this manual. If you have any questions or suggestions for improvement or have discovered any errors, please contact an authorized service center.



Danger

When working with the product, you may be exposed to chemicals such as ethylene glycol, which in some countries is considered to cause birth defects or other fertility disorders. Do not swallow this chemical. Wash hands after handling to prevent accidental ingestion.



Danger

When working with the product, you may be exposed to chemicals such as lead and its compounds, which in some countries is considered to cause cancer, birth defects or other fertility disorders. Wash hands thoroughly when handling parts that contain lead.



Danger

Stand at a safe distance. There must be no persons present in this area while the machine is turning. Pushing or squeezing may cause serious injury or death.



Danger

Risk of contusions! The machine may move unexpectedly without warning and cause injury or death of persons. Before leaving the machine, lower the work tool to the ground, lock controls and remove the key.



Danger

High pressure cylinder. Do not remove any parts until overpressure has been released from the system. This will prevent serious or fatal injuries.



Danger

Improper troubleshooting and repair procedures can result in serious injury. The following troubleshooting and repair procedures should only be performed by qualified personnel who are thoroughly familiar with this device.



Explosion Danger

Explosion Danger! Improper connection of connecting cables can lead to an explosion and injury or death of persons.



Warning

Damage to the structure, the machine overturning, modifications, alterations or improper repairs may adversely affect the protective properties of this structure and invalidate its certification. Do not weld anything on or drill any holes into the structure. Consult the manufacturer about the possibilities for modifications to the protective structure so that the certificate is not revoked.

1.2 CE MARKING

The manufacturer uses the CE mark to demonstrate the conformity of the skid-steer loader with the standards and regulations in force at the time of sale. This fact is confirmed by the CE Declaration of Conformity. The CE mark is indicated on the manufacturer’s label.

Unauthorized meddling with the structure of the skid-steer loader or its attachments may cause safety risks. It also invalidates the Declaration of Conformity.

The CE Declaration of Conformity must be kept in a safe place and available to competent authorities.



1.3 MACHINE ACCESSORIES

- (k) Ignition switch key (two pieces)
- (k) Cabin key (two pieces)
- (k) Smartphone
- (k) Car charger for smartphone
- (k) Battery charger
- (k) Distilled water tank
- (k) Basic shovel
- (k) Frame for battery replacement

1.4 AUXILIARY ACCESSORIES

- (k)
- (k)
- (k)
- (k)
- (k)
- (k)
- (k)
- (k)
- (k)
- (k)
- (k)
- (k)
- (k)
- (k)

2. INFORMATION ABOUT DOCUMENTATION

These operating instructions describe all the measures necessary for the safe operation and proper maintenance of the skid-steer loader in all its possible versions at the time of printing. Special versions according to customer requirements are documented in a separate operating and maintenance manual. If in doubt, contact an authorized service center.

For all technical queries, provide with each the identification number (PIN) of the skid-steer loader. Each skid-steer loader comes with several operating manuals. These manuals must be kept in a safe place and available at all times to the driver and the operator’s staff. Their storage location is specified in detail in the "Views" chapter. Should the operating instructions get lost, the operator must immediately obtain a replacement from the manufacturer. The operating instructions are on the spare parts list and can be re-ordered as a spare part. The personnel responsible for operating and maintaining the device must read and understand these operating instructions. The operator is obliged to ensure that all users have received, read and understood these operating and maintenance instructions for the machine.

2.1 DATE OF PUBLICATION AND STATUS OF THIS MANUAL

The date of publication of these operating instructions is indicated on the title page.

KOVACO is constantly working on the further development of skid-steer loaders. These operating instructions are therefore subject to change. No claims can be made based on the information or images provided in this document.

Contact an authorized service center for technical support for your skid-steer loader.

2.2 COPYRIGHT AND TRADEMARK RIGHTS

This manual including its parts may not be reproduced, translated or provided to third parties without the express written consent of the manufacturer.

2.3 EXPLANATION OF THE SYMBOLS AND ABBREVIATIONS USED



Danger

Denotes procedures that must be strictly observed to avoid Dangers to life.



Explosion Danger

Warning of a possible explosion.



Warning

Denotes technical requirements that need to be paid particular attention to.



Warning

Notices concerning the environment.

2.3.1 LIST OF ABBREVIATIONS

This list of abbreviations applies to all types of operating instructions. Not all the abbreviations given here may be used in these operating instructions.

UNIT SYMBOL	NAME OF UNIT	EXPLANATION
°C	degree Celsius	unit of temperature
OH	operating hour	one hour of machine work
°F	degree Fahrenheit	unit of temperature
A	ampere	electric current unit
Ah	ampere hour	electric charge storage capacity unit
dB	decibel	unit of sound intensity
cm	centimetre	unit of length (1 cm = 10 mm)
cm³	cubic centimetres	unit of volume
g	gram	unit of weight
h/d	hours daily	hours driven per day
kg	kilogram	unit of weight (1 kg = 1 000 g)
kg/m³	kilograms per cubic metre	density unit (weight to size ratio)
km/h	kilometres per hour	unit of speed
kN	kilonewton	unit of force (1 kN = 1,000 N)
kW	kilowatt	power supply unit
kWh/h	kilowatt-hours per hour	energy consumption
N	newton	unit of force (1 kN = 10-3 kN)
Nm	newton metre	unit of torque
L/min	litres per minute	unit of consumption
m	metre	unit of length (1 cm = 100 mm)
m/s²	metres per second to the power of two	unit of acceleration
min	minute	unit of time (1 min = 60 s)
rpm	revolutions per minute	unit of revolutions per minute
mm	millimetre	unit of length (1 cm = 10-3 mm)

2.3.2 INFORMATIVE IMAGES

a) Illustrations of functions and procedures (Picture 1)

This document explains the (typically sequential) order in which certain functions or operations are run or performed. To show these sequences, illustrative images of the skid-steer loader are used.



Danger

These illustrative images do not represent the actual design of the documented loader. The sole purpose of the images used is to clarify working procedures.

b) Representation of the display operating unit (Picture 2)



Warning

The representations of operating states and values on the display operating unit are only for referential purposes and differ depending on the particular equipment of the loader at hand. Consequently, the representations showing specific operating states and values may differ. Information not related to the descriptions is not provided.



Picture 1



Picture 2

3. ENVIRONMENTAL IMPACTS

3.1 PACKAGING

For added protection, some parts of the skid-steer loader are wrapped in packaging during transport. This packaging must be completely removed before first use.



Environmental notice

After delivery of the skid-steer loader, the packaging material must be disposed of in an appropriate manner.

3.2 DISPOSAL OF COMPONENTS AND BATTERIES

The skid-steer loader is made of various materials. If any components or batteries need to be replaced or disposed of, they must be:

- Ⓚ Properly disposed of;
- Ⓚ Used elsewhere, or
- Ⓚ Recycled in accordance with regional and national guidelines.



Environmental notice

We recommend cooperating with a waste disposal company for disposal.

When disposing of batteries, be sure to follow the provisions in the battery manufacturer's operating instructions.

4. USE OF THE SKID-STEER LOADER

4.1 PROPER USE

The loader described in these operating instructions is suitable for loading, sweeping and moving rocks of Classes 1 to 4 using the basic shovel, and for pulling rocks, digging narrow grooves and drilling pits in rocks of Classes 1 and 2 according to ČSN 73 3050, using specifically designated attachments. You will find the classification of rocks at the end of the manual. The loader may only be used for its designated purpose as specified and described in these operating instructions.

If the loader is to be used for any purpose other than specified in the operating instructions, the approval of the manufacturer and, if applicable, of competent authorities is required in order to mitigate potential risks.

The maximum weight of lifted load is stated on the rating plate and must not be exceeded.

4.2 CORRECT USE WHEN TOWING

This skid-steer loader is suitable for occasional towing of loads and is equipped for this purpose with towing eyes. The loader must not be used for occasional towing for more than 2% of its daily operating time. Consult the manufacturer when using the skid-steer loader for towing more regularly.

4.3 INAPPROPRIATE USE

The operator or the driver/vehicle operator, as opposed to the manufacturer, is liable for risks arising out of incorrect use of the device.

Use of the machine for purposes other than specified in these operating instructions is prohibited.



Danger

The loader must not be used in places where there is a risk of fire, explosion or corrosion. Loading and stacking loads on inclined surfaces or ramps is prohibited.

4.4 PLACE OF USE

The loader can be used both outdoors and indoors. Use on public roads is permissible.

If you want to use the loader on public roads, it must meet the requirements of national standards of the country where it is operated.

The road must have sufficient carrying capacity (tarmac, concrete).

Driving up or down a slope is permitted providing that the prescribed indications and specifications in these operating instructions are observed.

The loader can be used indoors and outdoors, from northern regions to the tropical zones (temperature range -20 to +40 °C).

4.5 PARKING AT TEMPERATURES BELOW -10 °C



Warning

Batteries may freeze!

If the loader is parked for a long time in an environment with temperatures below -10 °C, the batteries will cool down. The electrolyte may freeze and damage the batteries. In such an event, the loader will not be ready for operation.

If the ambient temperature drops below -10 °C, park the loader in such conditions only for a short time, or only for as long as absolutely necessary, or ensure that the battery is connected to the charger throughout the duration of parking.

4.6 USE OF WORK PLATFORMS



Danger

The use of work platforms is prohibited!

4.7 RESIDUAL RISK

Even with careful operation and compliance with all standards and regulations, risks cannot be completely excluded when using the loader.

The components of the loader and of the entire system meet current safety requirements. Even when the loader is used exclusively for its intended purpose and all instructions are followed, certain residual risks cannot be ruled out.

Such residual risks cannot be completely excluded even outside the narrow risk zone around the loader. Persons in the vicinity of the loader must be extremely vigilant so that they can react immediately in the event of a malfunction, crash, accident etc.



Danger

All persons in the vicinity of the loader must be instructed on the risks arising from its use.

The risks include:

- Ⓚ Leakage of operating fluids due to cracks or ruptures of pipes and tanks;
- Ⓚ Risk of accident when driving over difficult terrain or surfaces such as slopes, smooth or uneven surfaces, or at poor visibility, etc.;
- Ⓚ Falling, tripping, etc. when mounting the loader, especially in wet weather or with leaking working fluids, or on icy surfaces;
- Ⓚ Risk of fire and explosion caused by batteries and electric voltage;
- Ⓚ Human error as a result of non-compliance with safety regulations;
- Ⓚ Unattended damage or wrong and worn parts;
- Ⓚ Insufficient maintenance and inspections;
- Ⓚ Use of wrong consumables;
- Ⓚ Not observing inspection intervals.

The manufacturer is not liable for accidents involving the loader which may occur as a result of the operator's non-compliance with these instructions - whether intentional or due to negligence.



Danger

Danger of injury when the loader overturns!

Use the seat belt!

Even if using an approved restraint system, there is a residual risk of injury should the loader overturn. This risk of injury can be reduced by the combined use of a restraint system and the seat belt. In addition, the seat belt protects against the consequences of rear-end collisions and ramp fall accidents.

4.8 STABILITY

The loader stability tests have been performed in accordance with the latest technical standards; its stability is guaranteed providing that the loader is used correctly and for the intended purpose. However, these standards only provide for static and dynamic centrifugal forces that may manifest in the types of applications that are in accordance with the operating rules and with the intended purpose.

Consequently, loss of stability or the risk of exceeding tolerable distribution of forces due to improper use or operation cannot be completely excluded. Loss of stability can be prevented or minimized in the following ways:

- Ⓚ Always secure the load against slipping, e.g. by tying.
- Ⓚ Always transport precarious loads in suitable containers.
- Ⓚ Always drive slowly when turning.
- Ⓚ Drive with the load lowered.
- Ⓚ Align the load as close to the center of the loader as possible.
- Ⓚ Try to avoid turning when driving transversely on slopes or on sloping surfaces.
- Ⓚ Never drive on slopes or sloping surfaces with the load facing downhill.
- Ⓚ Do not drive on the edges of ramps or on stairs.

4.9 SPECIAL RISKS RELATED TO THE USE OF THE LOADER AND ITS ATTACHMENTS

If the loader is used in another than standard manner, or when the vehicle operator is unsure whether the loader can be used properly and without the risk of accidents, consent of the machine manufacturer and the attachment manufacturer must always be obtained.

5. OVERVIEW OF RISKS AND PREVENTIVE MEASURES



Danger

This table is meant as an aid in determining occupational Dangers and applies to all types of drives. The table may not cover all possible Dangers.

Observe the national regulations of the country in which the loader is used!

DANGER	MEASURE(S)	CHECK NOTE	COMMENTS
Loader equipment does not comply with local regulations	Inspection	○	If in doubt, contact the competent inspectorate or insurance company that takes out employer's liability insurance.
Deficiencies in driver skills and qualifications	Driver training (internal and external)	○	-
Use by unauthorized persons	Access with key for authorized personnel only	○	-
Loader is not in a safe condition	Repeated tests and elimination of deficiencies	○	Decree on Safety and Health Protection in the Operation of Technical Equipment
When recharging the traction battery	See the Decree on Safety and Health Protection in the Operation of Technical Equipment or the Operation and Maintenance Manual	○	Ensure proper ventilation; insulation value within permissible range
When using battery chargers	See the Decree on Safety and Health Protection in the Operation of Technical Equipment	○	-

5.1 RISKS FOR STAFF

In line with the Decree on Safety and Health Protection in the Operation of Technical Equipment and applicable laws on occupational health and safety in the given country of operation, the operator is obliged to determine and assess operating risks and set the necessary measures to ensure occupational health and safety of staff. The operator must therefore draw up an appropriate operating manual and provide it to the driver. An authorized person must be appointed.



Warning

The design and equipment of this loader comply with Directive 2006/42/EC on machinery and are marked with the CE symbol. These elements are not included in the risk assessment. The attachments have their own CE markings and thus are also not included. Nevertheless, the operator must choose a type of loader and its accessories that comply with local operating regulations.

6. SAFETY

6.1 DEFINITIONS OF TERMS

6.1.1 OPERATOR

The operator is a natural person or legal entity that operates the loader, or under whose responsibility the loader is used.

The operator must ensure that the skid-steer loader is used only for the designated purpose and in accordance with the safety regulations set out in these operating instructions.

The operator must ensure that all users have read and understood the safety information.

The operator is responsible for the schedule and correct execution of regular safety inspections. We recommend following national operating specifications.

6.1.2 PROFESSIONAL

A qualified professional is defined as a mechanic or person who meets the following requirements:

- Ⓚ Completed professional qualification for the work, which demonstrably confirms their professional knowledge. Such proof of education is a vocational certificate or similar document.
- Ⓚ Professional practice proving that the professional has gained practical experience with loaders during a confirmed period of their professional practice. Over the period, the person has become acquainted with the full range of indications that require inspections to be carried out, for example on the basis of the results of potential risk assessments or daily checks.

Key is current professional practice in the field of operating loaders and other adequate professional qualifications. A qualified professional must have experience in carrying out the said checks and inspections. Moreover, a qualified professional must monitor current advances in technologies pertinent to the loader and to the risks assessed.

6.1.3 DRIVER/VEHICLE OPERATOR

This skid-steer loader may only be driven by a qualified person who has reached at least 18 years of age, has obtained a driver's licence, has demonstrated experience in driving and handling towards the operator or authorized representative and has received special training in driving the loader. Special knowledge of the respective skid-steer loader is also required.

The requirements for training in accordance with § 3 of the Act on Health and Safety at Work and § 9 of the Decree on Safety in the Workplace are met if the driver has been trained in accordance with the requirements. Follow the applicable regulations in your country.

6.2 BASIC SAFETY RULES

6.2.1 DRIVER OBLIGATIONS

The driver must be instructed in their duties.

Any incorrect use of this machine may cause serious physical harm or even fatal injuries!

Unauthorized persons are prohibited from using this device.

During working hours, the driver is responsible for the loader. The driver must not allow unauthorized persons to use the loader. When the driver leaves the loader, they are obliged to secure it against unauthorized use, e.g. by removing the key.

The driver further is obliged to:

- Ⓚ Read and understand these operating instructions, which must be available to the driver at all times;
- Ⓚ Get acquainted with the safe operation of the loader;
- Ⓚ Wear protective equipment (protective clothing, safety shoes, safety helmet, goggles and gloves) according to the conditions, the environment and the type of load handled;
- Ⓚ Be mentally and psychologically fit to drive the loader safely.



Danger

The ability to drive the loader may be impaired by the intake of drugs, alcohol or medication that affect a person's reactions! Persons under the influence of the above substances must not perform any operations on or with the loader.

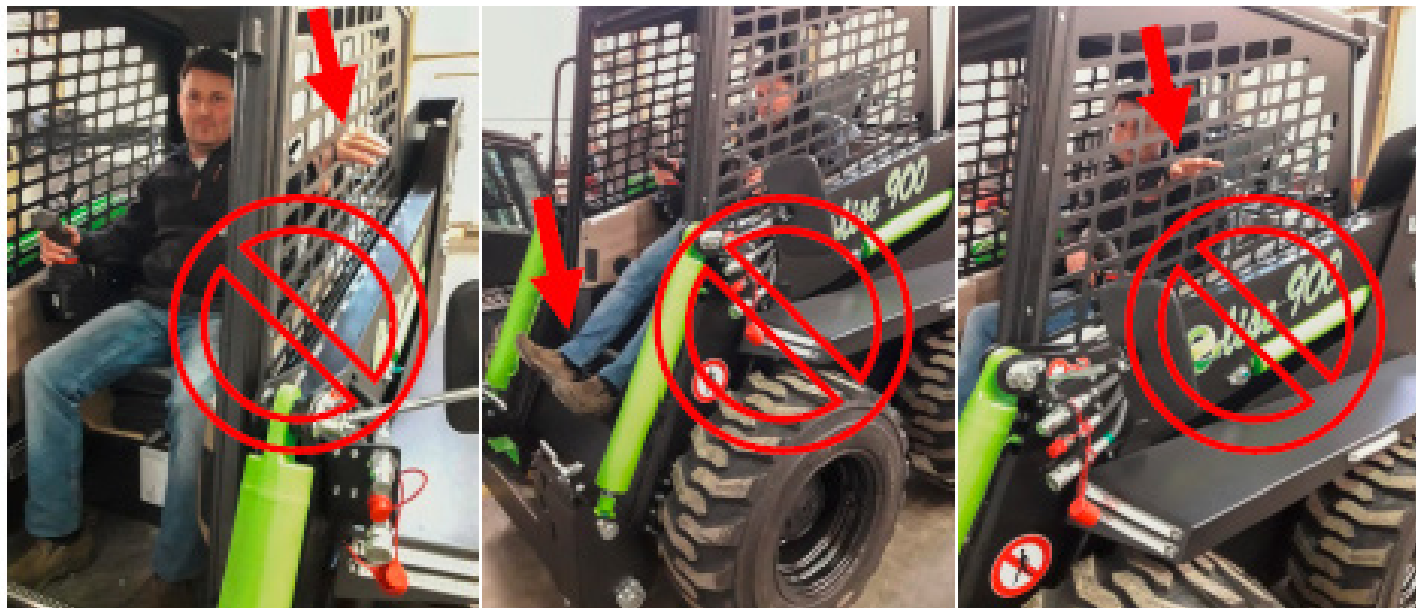
It is forbidden to push limbs through the side grilles and the boarding opening.

There is a risk of limb amputation.

It is forbidden to push objects through the side grilles and the boarding opening.

There is a risk of damage to the machine and a risk of injury.

It is forbidden to use the loader with dismantled or otherwise damaged grilles and windows.



6.3 BASIC SAFETY RULES FOR OPERATION

6.3.1 INSURANCE COVERAGE ON A CONSTRUCTION SITE

In many cases, public transport is not permitted on construction sites.



Warning

In order to ensure that the loader has insurance coverage against claims by third parties in the event of damage caused in areas with limited public transport, the manufacturer recommends that commercial liability insurance be taken out.

6.3.2 ALTERATIONS AND MODIFICATIONS

If you use the loader for works not specified in regulations or in these operating instructions, and the loader must be modified or retrofitted, please note that any alteration of the loader design may affect its stability and performance, which may result in various accidents. Therefore, contact your service center before making any modifications.

Without the manufacturer's consent, it is prohibited to make changes that, among other things, adversely affect the loader stability or load capacity, or its safety functions.

Changes to the loader may only be made with the manufacturer's prior written consent. If necessary, consent of the competent authority must be obtained.

Changes to the brake system, steering, controls, peripheral vision and special equipment (such as attachments) also are subject to the manufacturer's prior written consent.



Warning

When welding on the loader, the batteries and all connections to the electrical control units must be disconnected. More detailed information on these topics can be obtained from an authorized service center.



Warning

Additional openings in the battery cover present a risk of explosion! Volatile gases may be released, which can explode and cause harm, including fatal injuries. Sealing the openings with plugs does not provide an additional barrier to gas leakage.

Do not drill any holes into the battery cover!

Otherwise the structural stability will be compromised of the battery cover, which then may break. It can hit the driver's seat, which poses a risk of accident due to uncontrolled movements of the controls while driving.

Should the manufacturer be wound up and its company is not taken over by a new owner (legal entity), the operator can make modifications to the loader.

In doing so however, the operator must observe the following rules:

- Ⓚ Production documents, test reports and assembly instructions related to the modification must be retained and be available at all times;
- Ⓚ Check that the modifications have not affected the validity of the rating plate, information labels, warning labels or the operating instructions and, if necessary, modify these;
- Ⓚ Modifications can only be designed, approved and implemented by a design office that specializes in designing loaders in accordance with the standards and directives in force at the time of the modifications.



Warning

Never allow a ride with a passenger. Never use the work tool as a platform for another person. A failure to observe the vehicle-related instructions or warnings may result in injury or death of persons.



Warning

Hot liquid can cause severe burns. Protect yourself with suitable protective clothing.



Warning

Improper clamping of the work tool can cause injury or death of persons. Do not start working with the machine until making sure that the mechanism pins are fully inserted. Follow the operating procedures in this Manual.



Warning

Do not enter under the cabin unless the cabin is empty and the support strut installed. A failure to observe the vehicle-related instructions or warnings may result in injury or death of persons.



Warning

This machine is equipped with a communication device. Where electric detonators are used, this communication device should be switched off at a distance of 12 m (40') from the blasting point for satellite systems, and at a distance of 3 m (10') from the blasting point for mobile systems, or at a distance required by applicable legal requirements. A failure to observe this provision may result in interfering with explosive blasting operations, which can result in serious injury or death.

6.3.3 CHANGES TO THE DRIVER’S PROTECTIVE ROOF AND ROOF LOAD



Warning

If the driver’s protective roof fails when load falls off or the loader overturns, it may have fatal consequences for the vehicle operator. Potential Danger to life!

- Ⓚ Do not weld on the driver’s protective roof!
- Ⓚ Do not drill on the driver’s protective roof!

When welding or drilling on the driver’s protective roof, the material and structural properties of the driver’s protective roof will change. Excessive forces involved when load falls off or the loader overturns may cause the driver’s protective roof thus modified to deform and so compromise the driver’s safety.



Warning

Heavy roof loads damage the driver’s protective roof.

To ensure continued stability of the driver’s protective roof, any load on the roof can only be installed after the structural design has been tested and subject to the manufacturer’s consent.

6.3.4 USE OF NON-ORIGINAL PARTS

Genuine parts, attachments and accessories are specially designed for this loader. We would like to draw your attention specifically to the fact that non-original parts, attachments and accessories from other suppliers have not been tested and approved by KOVACO!



Warning

Installation and use of such products may negatively affect the design characteristics of the loader and thus also compromise passive driving safety.

Before installing such components, we recommend obtaining the consent of the manufacturer and, if applicable, of the competent inspection authorities. The manufacturer accepts no liability for damage caused by using non-original parts and accessories that have not been approved.

6.3.5 LOADER DEFECTS AND DAMAGE, INCORRECT USE OF SAFETY DEVICES

Damage and other faults of the loader or its attachment must be immediately reported to the operator so that the fault can be rectified by the same.

Loaders and attachments that are not safe or functional must not be used until properly repaired.

Do not remove, disable or turn off safety devices or switches!

Predefined settings may only be changed with the manufacturer’s consent.

Works on the electronic system (such as connecting radio, additional headlights etc.) are only permitted with the manufacturer’s written consent. All interventions in the electrical system must be properly documented!

6.3.6 RISK TO STABILITY

To ensure stability, the following rules must be observed:

- Ⓚ Only use tyres with the same and permitted level of wear on the same axle.
- Ⓚ Use only wheels and tyres of the same type on the same axle, for instance superelastic tyres only.
- Ⓚ Only use wheels and tyres approved by the manufacturer.
- Ⓚ Use only high quality products.

Wheels and tyres approved by the manufacturer can be found in the spare parts list. If you want to use other wheels or tyres, you must first obtain the manufacturer’s consent!

When changing wheels or tyres, always make sure that the loader never tilts to one side as a result (that is, always replace all wheels at the same time). Modifications can only be made subject to consultation with the manufacturer. When changing the type of tyres used on a single axle, for example from superelastic to pneumatic tyres, the load diagram must also be changed accordingly.

More detailed information on these topics can be obtained from an authorized service center.



Warning

The loader may overturn; there is a risk of accident.

A failure to follow these instructions and information may result in compromised stability.

6.3.7 MEDICAL DEVICES

Only use devices that are sufficiently protected against electromagnetic interference. Medical devices such as pacemakers or hearing aids may not function properly during the loader operation.

Check with your doctor or medical device manufacturer to make sure that it is sufficiently protected against electromagnetic interference.



Warning

Electromagnetic interference with medical devices may occur.

6.4 INSULATION TEST

The insulation of the loader must provide sufficient insulation resistance. Consequently as part of the tests under the FEM standard, the insulation resistance must be checked at least once a year in accordance with ČSN EN 1175, DIN 43539, VDE 0117 and VDE 0510. The results of the insulation tests must meet at least the test values given in the following two tables.

Contact an authorized service center if you want to carry out insulation tests!



Warning

The electrical system of the loader and the traction battery must be checked separately!

Test values for the traction battery and the complete loader:

COMPONENT	RECOMMENDED TEST VOLTAGE	MEASUREMENT		RATED VOLTAGE U _{BAT}	TEST VALUES
Battery	50 V DC	Batt. + Batt. -	Battery compartment	24 V	> 1 200
	100 V DC			48 V	> 2 400
	100 V DC			80 V	> 4 000
RATED VOLTAGE	TEST VOLTAGE		TEST VALUES FOR NEW LOADERS	MINIMUM VALUES OVER SERVICE LIFE	
24 V	50 V DC		At least 50 k	> 24k	
48 V	100 V DC		At least 100 k	> 48k	
80 V	100 V DC		At least 200 k	> 80k	

6.5 SAFETY INSTRUCTIONS FOR HANDLING CONSUMABLES

6.5.1 ALLOWABLE CONSUMABLES

Non-compliance with the safety regulations applicable to consumables may result in injury, death or damage to the environment!

Observe the safety regulations when handling such materials.

Allowable materials necessary for operation are listed in the maintenance data table.

6.5.2 OILS



Warning

Make sure that oils do not come into contact with hot machine parts! Oils are flammable.

Smoking and access with fire or open flame is prohibited!

Observe the legal regulations of the country of operation!



Danger

Avoid contact with and ingestion of oil! Oils are toxic.

- Ⓚ When gases or vapours have been inhaled, get to fresh air immediately.
- Ⓚ If eyes are affected, rinse with plenty of water (for at least 10 minutes, then seek an ophthalmologist!
- Ⓚ If swallowed, do not induce vomiting and seek medical attention immediately.
- Ⓚ Prolonged intensive skin contact may cause skin dryness and irritation.
- Ⓚ Wear protective gloves.
- Ⓚ If the substance comes into contact with skin, wash the skin with soap and water, and then apply skin care products.
- Ⓚ Replace contaminated clothing and shoes immediately.



Warning

There is a risk of slipping on spilled oil, in particular in combination with water!



Warning

Spilled oil must be removed immediately using oil absorbents disposed of in accordance with regulations.



Warning

Oil is a water pollutant!

- Ⓚ Always store oils in containers that comply with pertinent legal regulations.
- Ⓚ Avoid spilling oil.
- Ⓚ Spilled oil must be removed immediately with oil absorbents and disposed of in accordance with regulations.
- Ⓚ Dispose of used oil compliant with applicable directives.

6.5.3 HYDRAULIC FLUID



Warning

These fluids are exposed to high pressures in the loader operation and pose a potential health Danger.

- Ⓚ Observe the legal regulations of the country of operation when handling liquids.
- Ⓚ Make sure that these liquids do not get into contact with hot parts of the machine and the environment.
- Ⓚ Avoid contact of these liquids with skin.
- Ⓚ Do not inhale spray liquid.

Leakage of compressed fluids escaping under high pressure from the hydraulic system is extremely dangerous. In the event of such an injury, seek medical attention immediately!

To prevent injuries, use appropriate personal protective equipment (such as protective gloves, goggles, skin protection and skin care products)!



Warning

Hydraulic fluid is a water pollutant, so the following instructions must be observed:

- Ⓚ Always store hydraulic fluid in containers that comply with national regulations of the country concerned.
- Ⓚ Avoid spilling the fluid.
- Ⓚ Spilled hydraulic fluid must be removed immediately using absorbents that soak up oil and disposed of in accordance with regulations.
- Ⓚ Dispose of used hydraulic fluid compliant with regulations.

6.5.4 BATTERY ACID



Warning

Battery acid contains diluted sulphuric acid. This acid is toxic and corrosive. Never touch or swallow the battery acid! In case of injury, seek medical attention immediately.

When handling battery acid, use appropriate protective equipment (rubber gloves, apron, goggles)!

Never wear watches or jewellery when handling battery acid!

Avoid contact of the acid with clothing, eyes and skin. In case of contact, immediately flush affected area with plenty of clean water.

In case of injury, seek medical attention immediately.

Rinse spilled battery acid immediately with plenty of water.



Warning

Dispose of used battery acid in accordance with applicable regulations.

6.5.5 DISPOSAL OF CONSUMABLES



Warning

Materials that accumulate during repairs, maintenance and cleaning must be properly collected and disposed of in accordance with national regulations of the country in which the loader is used. Such works may only be carried out in designated areas. Any negative impacts on the environment must be minimized to the extent possible.

- Ⓚ All spilled fluids, such as hydraulic or transmission oil, must be immediately contained using an absorbent that binds oils.
- Ⓚ Neutralize spilled battery acid immediately.
- Ⓚ Always follow the national regulations governing the disposal of used oil.

6.6 EMISSIONS

6.6.1 BATTERY



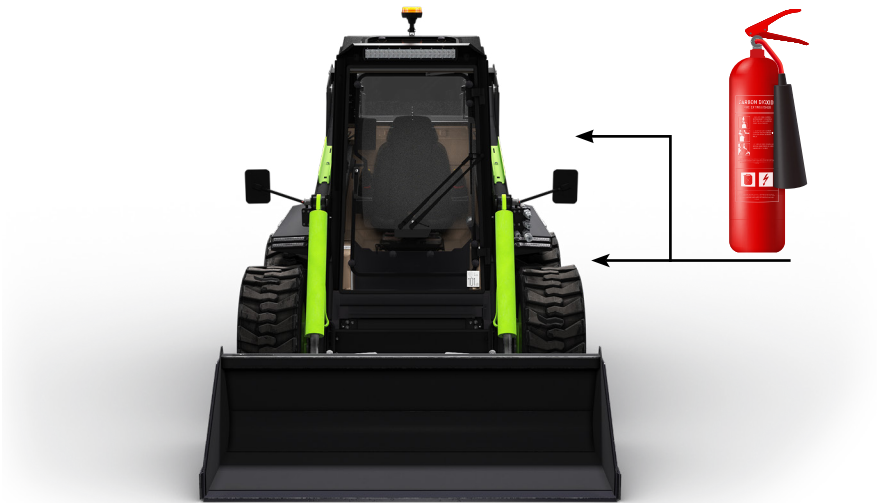
Explosion Danger

When charging, the battery releases a mixture of oxygen and hydrogen (oxygen-hydrogen mixture). This gas mixture is volatile and must not ignite!

- Ⓚ Always ensure that completely or partially enclosed workplaces are well ventilated.
- Ⓚ Keep a safe distance from open flames and flying sparks.
- Ⓚ Do not smoke near the machine and the battery.
- Ⓚ Observe the safety regulations when handling the battery.

6.7 FIRE SAFETY

The loader has several components that heat up significantly under normal operating conditions - such as the electric motor. If the electrical system is damaged or poorly maintained, it can produce electricity arcs or sparks.



Picture 3: Possible place for storing a fire extinguisher

The manufacturer recommends equipping the loader with a suitable fire extinguisher to be at hand during operation in accordance with the relevant national regulations. Its possible storage location is shown in Picture 3.

Flammable waste (such as dry leaves, straw) must be disposed of regularly. If such waste accumulates, it will increase the risk of fire. The loader must be cleaned as needed to prevent such buildup.

Do not use the loader where electric arcs, sparks or hot parts may come into contact with flammable substances or explosive atmospheres.

Inspect all electrical wires and connections for damage. Keep the battery terminals clean and screwed tight. Repair or replace any damaged component.

Inspect fuel and hydraulic pipes, hoses and terminals for damage or leaks. Never use open flame or exposed skin to check for fluid leaks. Tighten or replace any leaking components. Always clean liquid stains. For cleaning the components, do not use petrol or diesel. Use commercial non-flammable solvents.

Do not use the loader in an explosive atmosphere.

Do not connect the battery improperly. It needs to be connected by a professional.

Keep batteries clean, and lubricate pole terminals with grease.

When welding, disconnect the batteries, provide ventilation and have a fire extinguisher at the ready near the loader.

6.8 SAFETY RULES WHEN WORKING

- Ⓚ Before commencing work, the driver/vehicle operator is obliged to perform daily maintenance.
- Ⓚ Crushing and loading other types of rocks than specified in the operating instructions is prohibited!
- Ⓚ It is allowed to work with the machine on slopes with a transverse and longitudinal inclination of up to 10 degrees without restrictions.
- Ⓚ If necessary to work at night or in otherwise reduced visibility, the workplace must be lit by local light sources. The work lights of the loader alone are not sufficient for working at reduced visibility.
- Ⓚ When working while on public roads, the loader must not endanger the safety of other road users, the workplace must be marked with warning signs and the machine must have the warning beacon on.
- Ⓚ Due to the possibility of overloading the loader, it is necessary to adjust the driving speed and working movements with loaded bucket to the effective load. Overloading the machine will characteristically manifest when lifting the work device by relieving the rear wheels.



Warning

The maximum load capacity of the machine (900 kg) can only be used on a paved and level surface.



Warning

A failure to observe the maximum load can result in injury to persons or damage to property.
Before carrying out any operation, check the maximum load of the work tool concerned.

6.9 SAFETY RULES FOR MAINTENANCE

- Ⓚ The operating personnel has to perform maintenance and lubrication at intervals according to the operation hours worked in accordance with the machine operating and maintenance instructions. Each maintenance and lubrication must be recorded in the machine warranty book issued by the operator in accordance with national regulations of the country concerned.
- Ⓚ Always use for maintenance and in any repairs of the loader the tools and equipment designed for the type of task at hand.
- Ⓚ Cotter pins, bolts and nuts must not be used again after disassembly, but have to be replaced with new ones.
- Ⓚ The hydraulic circuit is protected by relief valves. Only a trained person and in the warranty period, only the warranty service may readjust the relief valves.
- Ⓚ While the boom is raised and not secured, any maintenance of the hydraulic system and any maintenance works under it are prohibited. During maintenance and repairs, it is necessary to secure a raised boom in its position with the safety strut that is part of it.
- Ⓚ Any interventions during maintenance of the hydraulic transmission may only be carried out with the engine stopped, when there is zero pressure in pipes and hoses.
- Ⓚ After mounting an attachment, its operation needs to be checked without load.
- Ⓚ It is not allowed to use any lubricants other than those specified in these maintenance instructions. Mixing individual lubricants is prohibited.
- Ⓚ Contact an authorized service center to have more complex repairs carried out by them.



Danger

There is a risk of falling when working on high parts of the loader.

6.10 SECURITY RULES FOR TRAVEL ON PUBLIC ROADS

- Ⓚ Using public roads (outside Class I and II roads) only is permitted for moving between workplaces, or to reach a nearby workplace via the shortest route outside rush hours.
- Ⓚ When driving, the boom must be fully lowered to the lowest position, with the bucket tilted towards the boom to the maximum extent possible, and with the bucket cutting edge covered with a protective cap.

6.11 LOADING, CLAMPING WHEN LOADING

For moving the loader with a crane, use a lifting device with a load capacity of at least 3.5 tons. A hemp rope or a textile belt with a load capacity of at least 3.5 tons can be used. The attachment points are located in the front on the boom arms and in the rear on the inside of the frame cross member, and are marked with the "HOOK" symbol.



Picture 4: Loading



Warning

When loading, the boom must be locked in the lower position!

6.12 IT IS PROHIBITED:

- Ⓚ To use the loader without training and without following the operating instructions;
- Ⓚ To use the loader without the seat belt fastened;
- Ⓚ To leave the loader with the engine running or the boom raised; when parking, the boom must be lowered all the way down and the bucket resting on ground;
- Ⓚ To exceed the loader’s carrying capacity;
- Ⓚ To let persons into the loader’s work zone and to transport persons with the loader;
- Ⓚ To use the loader for any work other than specified in the operating instructions;
- Ⓚ To make any alterations to the cabin design, which has passed the FOPS and ROPS safety test;
- Ⓚ To otherwise modify attachments and use any devices other than those specified by the manufacturer for the approved loader version;
- Ⓚ To turn with and drive the loader with the boom raised and the bucket filled.



Danger

Before starting up the machine, its operating personnel must be instructed in its use!

Untrained operating personnel may cause injury or death of persons.

7. TECHNICAL DESCRIPTION

The universal front loader Elise 900 is suitable for loading, sweeping and moving rocks of Classes 1 to 4 using the basic shovel, and for pulling rocks, digging narrow grooves and drilling pits in rocks of Classes 1 and 2 according to ČSN 733050, using specifically designated attachments. An extract from the ČSN 733050 standard can be found on page 73 of these operating instructions.

The loader is driven by electric units. The transmission mechanism consists of four separate gearboxes and four separately suspended wheels.

The loader control and control of the work device is channelled into two control levers, which control all the operating functions.

The loader turning is facilitated by different revolution speeds of the individual pairs of wheels. The machine cabin is a safety design. The basic shovel is toothless. In addition to the basic shovel, other attachments can be mounted on the machine as well using quick clamps.

The following sections of these operating and maintenance instructions provide instructions for controlling, using and maintaining the loader. We ask that you familiarize yourself with their contents before starting any work.

In the basic version, the loader can work in the WT climate zone according to ČSN 038900, with the range of working temperatures adjusted to -15 to + 35 °C according to ČSN ISO 7131 (Earth-moving machines - Loaders). For working in other climate zones, the loader must be modified subject to arrangement between the supplier and the customer.

7.1 LAYOUT OF AGGREGATES (Picture 5)

The frame (1) of the loader carries the aggregates, which are concentrated in larger assembly units. Batteries and chargers (2) are located in the rear part of the frame. The hydraulic tank (3) and the hydraulic distributor (4) also are placed at the rear of the frame. The electric motors (5) driving the vehicle are located in the front part of the frame. Finally there is the tilting safety cabin (6), in which all the controls, monitoring devices and the operator’s seat are located.

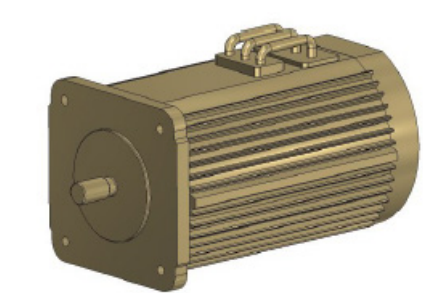
The work device (7) on which the work tool (8) is mounted is attached to the rear part of the frame. The wheels (9) are mounted on gearboxes (10), which are bolted to the sides of the frame. The independent heating system is built into the lower part of the cabin frame (11).



Picture 5

7.2 ELECTRIC MOTOR (Picture 6)

The loader is driven by two three-phase electric motors with a total output of 20 kW (Picture 6).



Picture 6

7.3 HYDRAULIC SYSTEM

The loader’s hydraulic system is used to control the work device. The system consists of an electric motor, hydraulic pump and distributor.

The entire hydraulic system is protected by relief valves. Pressure adjustment on the relief valves during the warranty period may only be performed by a service technician, and after the warranty period by a trained worker. For attachments, connections with quick couplings are routed via the boom to its front part.

7.4 BRAKE SYSTEM

The service and parking brakes activate via controls (by setting these to the neutral position).

7.5 WORK DEVICE

The work device consists of a boom, euro clamp and hydraulic cylinders.

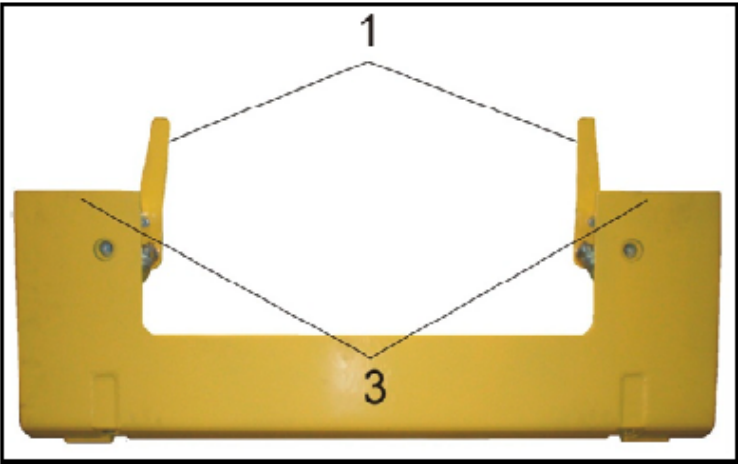
It is pivotally attached via pins to the rear of the frame. The basic work tool is mounted on the front part of the boom using the euro clamp. The boom is raised and lowered by a pair of hydraulic cylinders.

Another pair of hydraulic cylinders ensures the picking up and dumping of soil from the work tool (bucket).

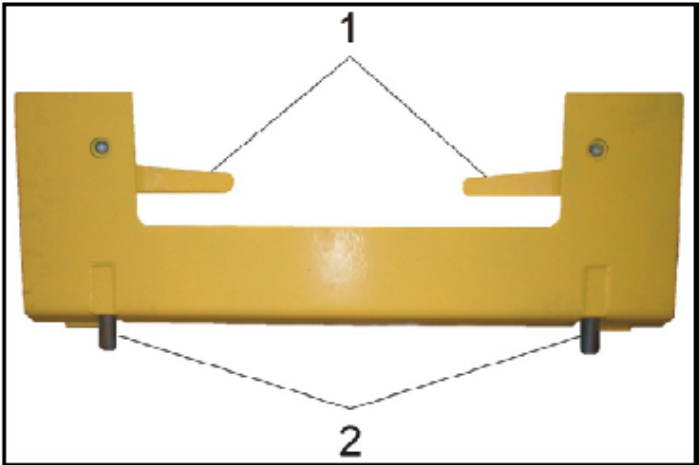
7.6 CLAMPING ON ATTACHMENT

7.6.1 "EURO" QUICK CLAMP

- 1. Before clamping, the clamping surfaces on the attachment and on the quick clamp must be cleaned of any dirt.
- 2. The attachment to be clamped on must be placed with the bottom and the cutting edge on the ground so that the cutting edge faces away from the machine.
- 3. After flipping the levers (position 1 in Picture 7: released quick clamp) into vertical position, insert the quick clamp by its pins (2).
- 4. By handling the loader and the quick clamp, fit the clamping edges (3) of the quick coupler into the beds on the attachment.
- 5. Adjust the attachment by tilting the quick clamp so that the holes on the work tool are opposite the pins (2) on the quick clamp.
- 6. Secure the attachment by sliding the pins (2) into the holes on the work tool, and flip the levers (1) back to the original (horizontal) position (Picture 8: quick clamp in secured position).



Picture 7



Picture 8



Danger

Improper clamping of the work tool can cause injury or death of persons. When the work tool touches the ground, it may shift away from the clamp. Make sure that the work tool does not touch the ground until the clamping pins are fully inserted.



Danger

By releasing the clamping pins of the mechanism, the mechanic (vehicle operator) loses control over the work tool. Disconnecting the work tool when in an unstable position or when carrying a load can result in a serious or fatal injury. Place the work tool in a safe position before releasing the clamping pins.

7.7 ELECTRICAL INSTALLATIONS

The electric drive of the loader is provided with a voltage of 96 V; all other appliances are in the 12 V version. The power source are batteries located in the rear part of the frame. The appliances are protected by fuses. To control the appliances and for monitoring operating data, the Kovaco mobile application is used, which is installed on a mobile phone or tablet. The place for the mobile phone is on the right window, where it is fixed by a magnetic holder.



Warning

The magnetic field radiating from the magnetic holder can damage mechanical watches.



Warning

In the event of a malfunction of any aspect of the electrical equipment, we recommend that you first check the fuse for the relevant circuit.

7.8 CABIN

The cabin is structurally conceived as a safety design, and complies with the FOPS and ROPS tests. The cabin attachment is designed so that it can be tilted, giving you access to the loader units for repairs. The cabin is entered through the front door. The seat is standalone, adjustable and equipped with a two-point safety belt and an electrical switch. If the seat is not loaded, the machine controls remain switched off. The front windscreen is cleaned with a washer and electric wiper.



Picture 9: Boom lock 1 – safety strut



Warning

Tilting the cabin: To tilt the cabin, the safety locks in the rear cabin consoles must be unlocked.

8. VIEWS

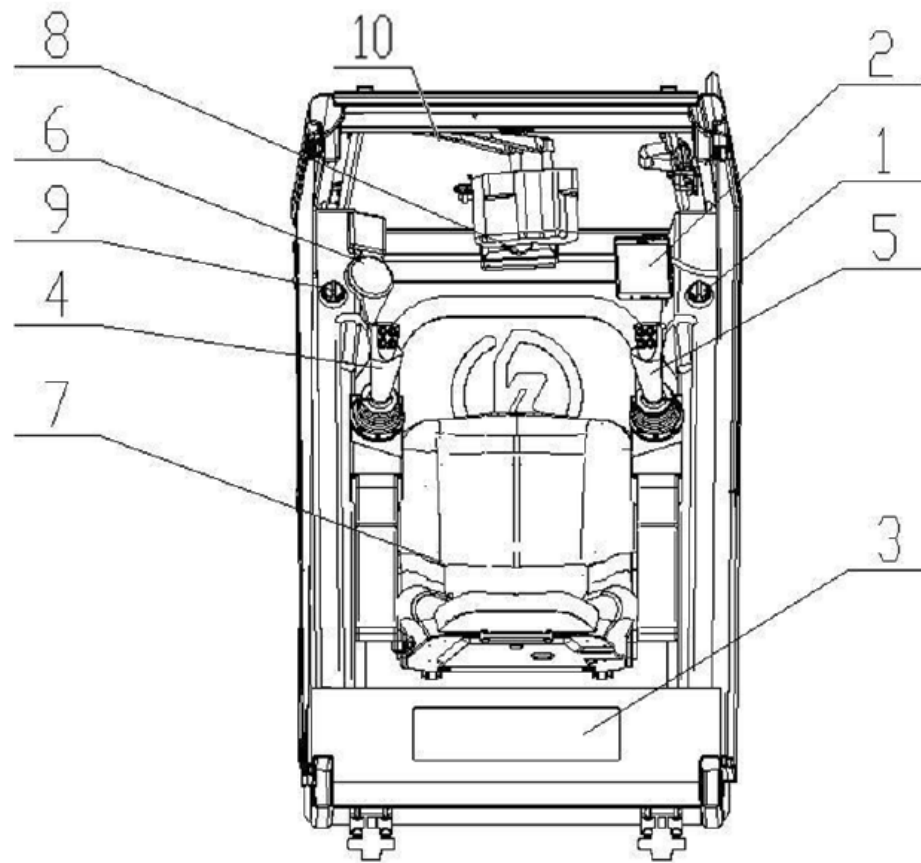
8.1 OUTSIDE VIEW OF THE LOADER (Picture 10)



Picture 10

- ① Cabin
- ② Door
- ③ Boom
- ④ Frame
- ⑤ Basic shovel
- ⑥ Transmission
- ⑦ Wheel
- ⑧ Hydraulic tank
- ⑨ Tilting cylinder
- ⑩ Lifting cylinder
- ⑪ Quick clamp
- ⑫ Reversing camera

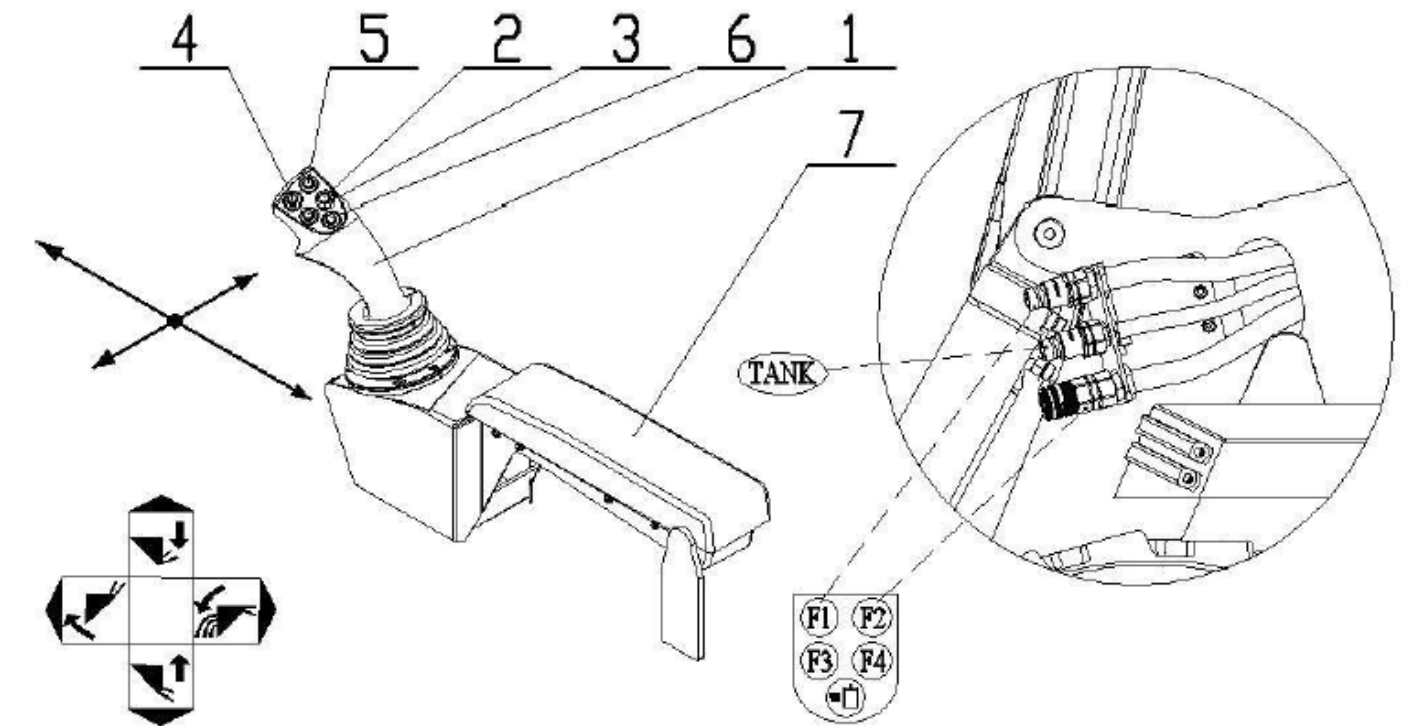
8.2 LAYOUT OF THE DRIVER'S CABIN



Picture 11

- ① Ignition switch
- ② Smartphone
- ③ Storage tray
- ④ Left control lever
- ⑤ Right control lever
- ⑥ Bottle holder
- ⑦ Seat
- ⑧ Front windscreen washer reservoir
- ⑨ Heating controller
- ⑩ Reversing camera monitor (on the front windscreen)

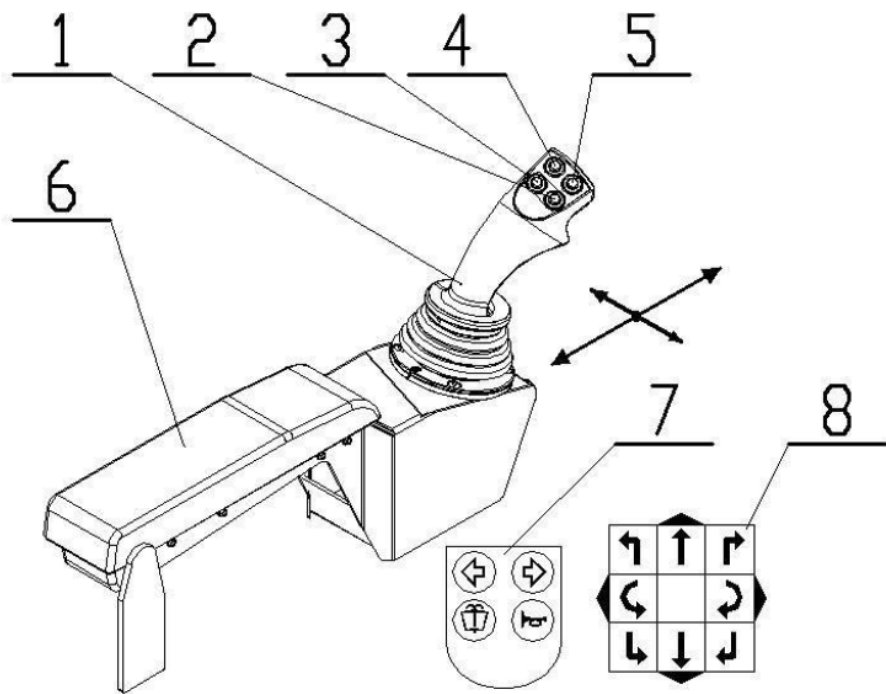
8.3 VIEW OF RIGHT CONTROL LEVER



Picture 12

- ① Right control lever handle
- ② Reserve button
- ③ Full oil flow lock button
- ④ Attachment button f2
- ⑤ Attachment button f1
- ⑥ Reserve button
- ⑦ Armrest

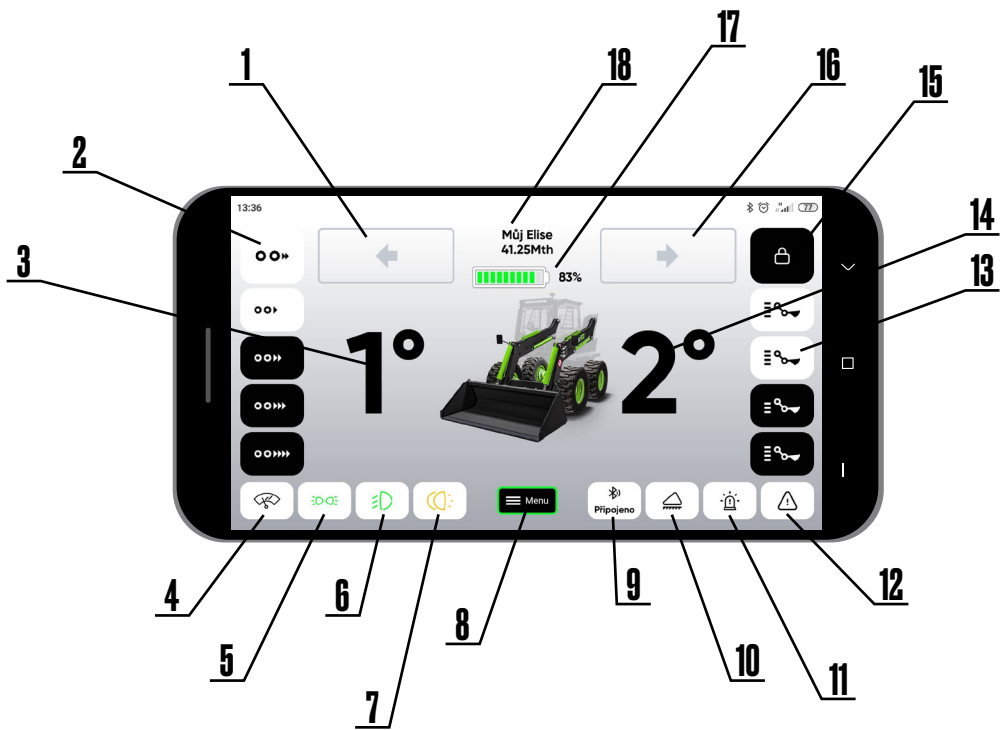
8.4 VIEW OF LEFT CONTROL LEVER



Picture 13

- ① Left control lever handle
- ② Audio indicator button
- ③ Front windscreen washer button
- ④ Left turn indicator button
- ⑤ Right turn indicator button
- ⑥ Armrest
- ⑦ Pictogram with layout of button functions
- ⑧ Pictogram with control indications

8.5 OVERVIEW OF CONTROLS OF THE KOVACO APPLICATION - IN CABIN MODE

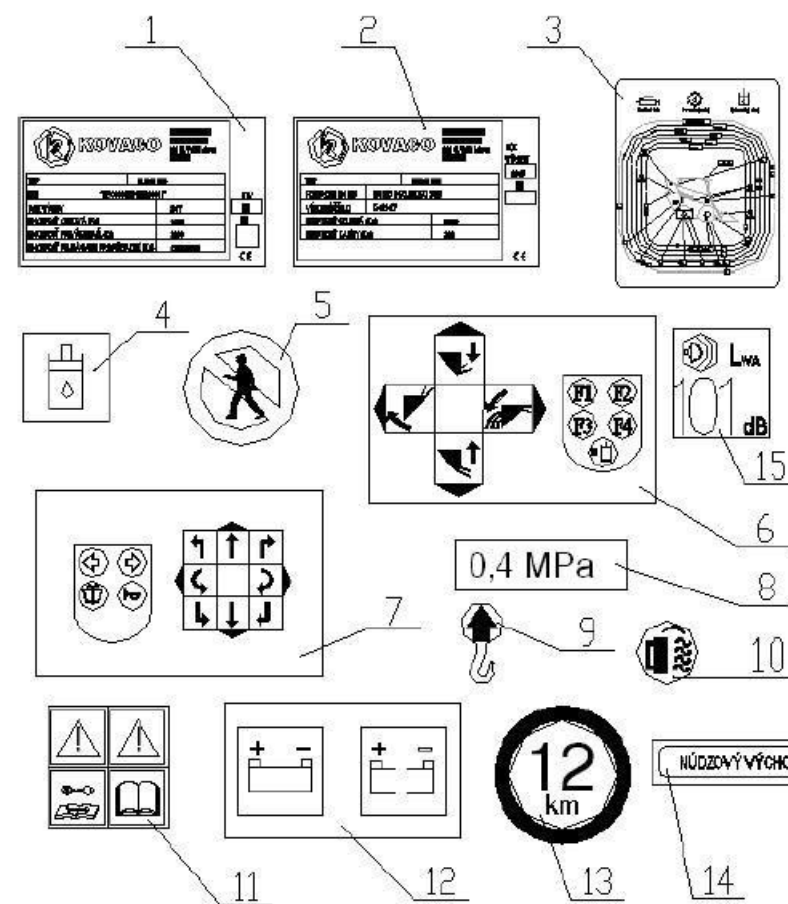


Picture 14

- ① Left turn indicator
- ② Hydraulic speed selection
- ③ Selected hydraulic speed level
- ④ Active wiper indicator
- ⑤ Active work lights indicator
- ⑥ Active road lights indicator
- ⑦ Active motorway lights indicator
- ⑧ Menu to return to landing page
- ⑨ Indicator of device connected to the application
- ⑩ Active bucket balancing
- ⑪ Active beacon indicator
- ⑫ Active warning triangle indicator
- ⑬ Travel speed selection
- ⑭ Selected travel speed level
- ⑮ Travel speed selection -locked
- ⑯ Right turn indicator
- ⑰ Battery status indicator
- ⑱ Name/designation of machine

The individual indicators are active when their respective field is white. An inactive indicator is marked with a black box. When the device is disconnected from the application (loss of signal for Bluetooth reception), the connection field is marked in black and the Menu field has a red border.

8.6 IDENTIFICATION POINTS



Picture 15

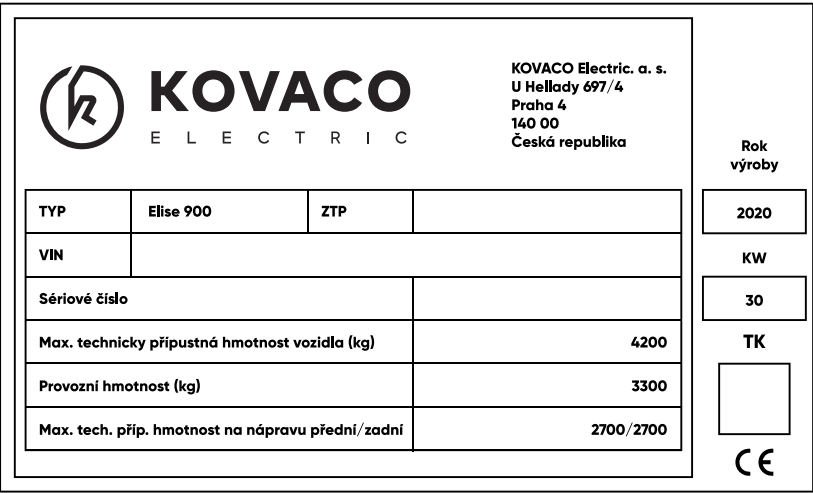
- 1 Chassis manufacturer's label
- 2 Cabin manufacturer's label
- 3 Lubrication schedule and maintenance
- 4 Hydraulic tank
- 5 No entry warning sign
- 6 Information on controls
- 7 Information on controls
- 8 Tyre inflation pressure
- 9 Attachment point for lifting device
- 10 Cabin heating controls
- 11 Warning: read the operating instructions
- 12 Battery disconnection point
- 13 Maximum speed indication
- 14 Emergency exit sign
- 15 Maximum noise

8.7 MANUFACTURER'S LABEL

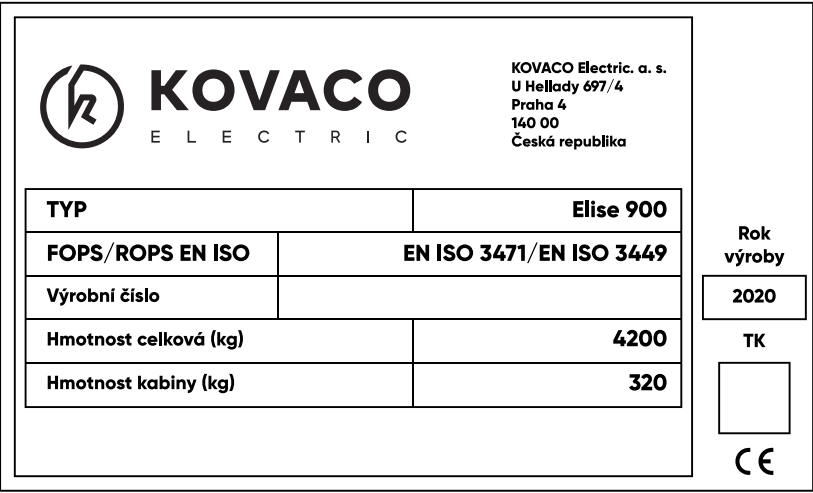
The loader is identifiable by information on the manufacturer's labels (Pictures 16, 17 and 18):



Picture 16 - Battery manufacturer's label



Picture 17 - Factory label



Picture 18 - Cabin manufacturer's label

9. COMMISSIONING

9.1 CONNECTING THE BATTERY PLUG



Warning

Do not connect the battery plug while the ignition switch is on.

There is a risk of damage to components!

If you connect the battery plug while the ignition switch is on (energized), an electric arc will form. This may cause corrosion of the contacts, which will significantly shorten their life.

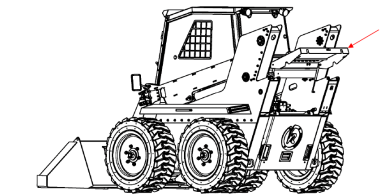


Danger

If cables are damaged, there is a risk of short circuit. The battery cable must not be pinched when closing the cover.

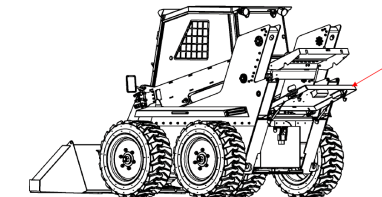
In the event of a loader accident, make sure to disengage the battery connectors.

1. Open the top cover of the hydraulic system (Picture 19):



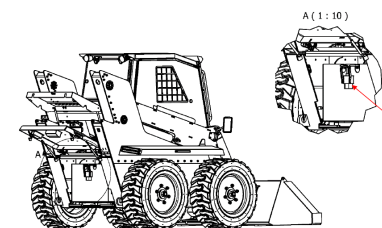
Picture 19

2. Open the bottom battery cover (Picture 20):



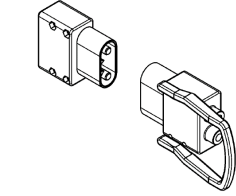
Picture 20

3. Hold the connector on the battery (Picture 21):



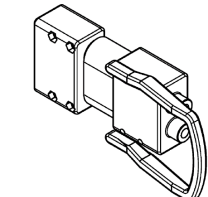
Picture 21

4. Rotate the connector to the correct position (Picture 22):



Picture 22

5. Insert the connector fully (Picture 23):



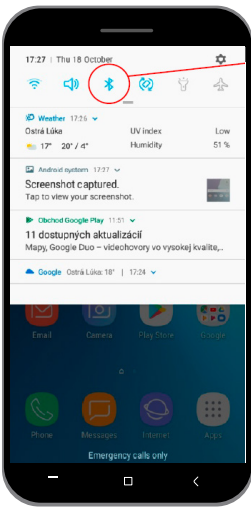
Picture 23

9.2 INTERCONNECTING THE MACHINE WITH THE BLUETOOTH PHONE

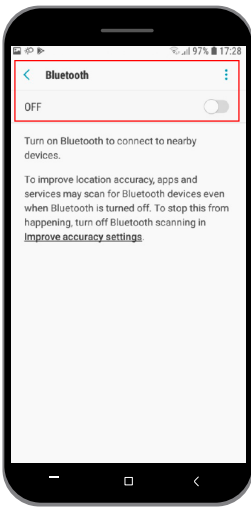
- When the phone is switched on, its home screen displays (Picture 24).
- Drag down from the top of the screen to see the phone settings, such as the Bluetooth icon (Picture 25).
- Press and hold the Bluetooth icon for about 2 seconds until the Bluetooth menu appears on the display. If Bluetooth is turned off, a screen will appear where you need to turn Bluetooth on (Picture 26).
- Bluetooth is activated by dragging the button to the right (Picture 27):
- When turned on, a screen will appear with information on available devices within Bluetooth range (Picture 28):
- Wait until the HC-05 device appears on the display (Picture 29):
- After the HC-05 device has been displayed, connect it to Bluetooth by pressing the HC-05 title.
- Then enter PIN on the keyboard that appears (Picture 30). The PIN is: 1234.
- After entering the correct PIN code, the phone connects to the Elise 900 loader and the display shows the paired device (Picture 31):
- After pairing the phone with the machine and turning on the Kovaco application, you can start fully using the machine.



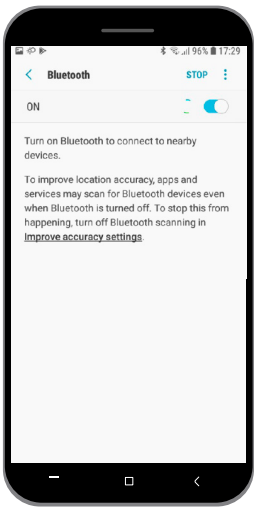
Picture 24



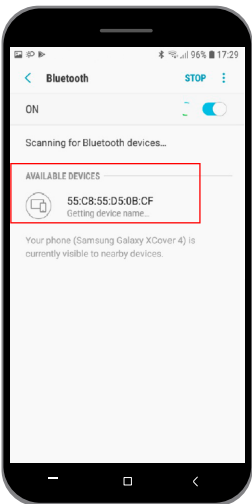
Picture 25



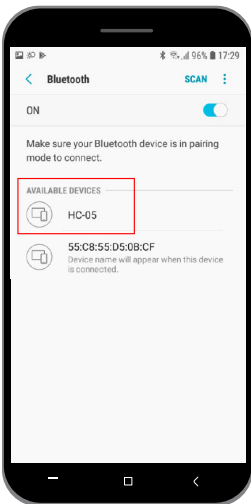
Picture 26



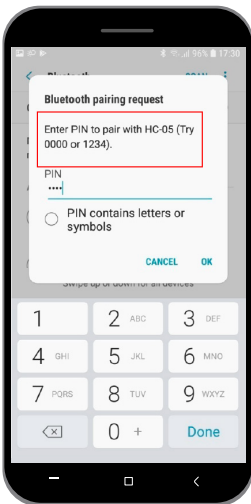
Picture 27



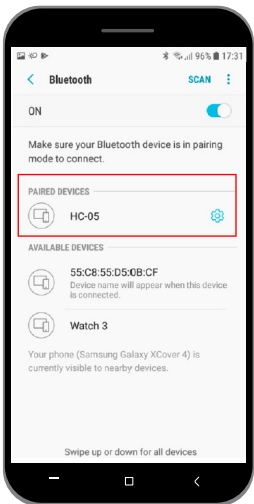
Picture 28



Picture 29



Picture 30



Picture 31

9.3 CHECKS AND ACTIONS BEFORE COMMISSIONING

Damage to the loader or attachment (optional equipment) can lead to unpredictable and dangerous situations. If you notice any damage or other fault of the loader or attachment during the following checks, the loader must not be used until all the defects have been removed.

- Ⓚ Do not remove, disable or turn off safety devices or switches.
- Ⓚ Do not change predefined setpoints.
- Ⓚ Do not use the loader until it has been properly repaired.

Before putting the loader into operation, make sure that its safe operation is guaranteed:

- Ⓚ The boom and bucket arms must not be visibly damaged.
- Ⓚ The locking device of the attachment must not be damaged or deformed.
- Ⓚ Any other accessories as well must not show any visible damage (such as bends, cracks, significant wear).
- Ⓚ The pins must be properly lubricated and inspected.
- Ⓚ The space under the loader must be checked for leaks of working fluids.
- Ⓚ The protective grilles (optional equipment) and the driver’s protective roof must not be damaged and must be roperly fastened.
- Ⓚ The attachment (optional equipment) must be correctly fastened and must operate in accordance with the operat-ing instructions.
- Ⓚ All information labels must be affixed in place and legible. Damaged or missing labels must be replaced according to indications in the chapter "Identification Points".
- Ⓚ All warning devices (such as the warning horn) must be in perfect condition and fully functional.
- Ⓚ Make sure to check for damage and leaks in visible parts of the hydraulic system and the hydraulic oil tank. Damaged hoses must be replaced.
- Ⓚ The batteries must be located securely in the battery compartment.
- Ⓚ The battery plug must be inspected for damage (e.g. cracks, fissures or housing deformation, bending or damage to contacts). If necessary, the battery plug must be replaced in an authorized service center.
- Ⓚ The battery cover must be securely closed.
- Ⓚ The battery lock must not be damaged or deformed.
- Ⓚ The base frame of the battery, the battery compartment and the battery cover must not be damaged or deformed.
- Ⓚ The service covers must be closed and the cabin safety locks secured.
- Ⓚ The cabin steps must be clean and ice-free.
- Ⓚ The cabin locks and their locking pins must be secured before using the machine.
- Ⓚ All glass surfaces (such as the front windscreen) must be clean and ice-free.
- Ⓚ Depending on the tyres, the loader can be equipped with an antistatic belt. The antistatic belt must not be damaged. Further it must be clean and long enough to touch the ground.
- Ⓚ Damage to or other defects of the loader including attachment (special equipment) must be reported immediately to the operator do that the fault can be rectified by the same.

10. OPERATION

10.1 OPTIMUM OPERATING CONDITIONS TO CONSERVE THE BATTERY CAPACITY

10.1.1 BATTERY CAPACITY INDICATOR: THE DISPLAY BACKLIGHT

When working with the Elise 900 loader, it is very important to monitor the machine load or the power intake from the loader battery. For this, the power intake indicator is used in the Kovaco application on the phone.

10.1.2 RECOMMENDED SPEEDS

When working with the loader with the basic shovel, we recommend setting the machine’s travel speed to 2 and hydraulic speed to 3. For fine handling of heavy objects when loading or unloading, the recommended settings are travel speed 1 and hydraulic speed 1. Travel speed 1 and hydraulic speed 1 also are recommended for connecting attachments. For other types of work with the loader, the settings must be done and adjusted according to the type of task at hand. As a rule when working with the loader, the lower the speed, the more substantial savings on battery capacity.

10.1.3 DRIVING STYLE

The battery capacity is significantly affected also by the actual driving style. As far as the situation allows it, it is recom-mended to turn with the machine in a style around the entire radius, that is, with the wheels on one side of the loader not moving, or moving at low speed, and rotating on the other side of the machine. In this way, the loader turns economically. It is uneconomical to turn around the axis, which is with the wheels on each side moving in the opposite direction from the other side. This will result in a sharp drop in battery capacity.

10.1.4 SURFACE

The surface on which the loader operates also greatly affects the battery capacity. The loader has rough-terrain tyres mounted as a factory standard, specifically tyres with a sparse and high tread pattern. However, this tyre is not suitable for tarmac or concrete as it is soft, has great rolling resistance and it slips.

Where the machine is expected to operate mostly on paved surfaces such as tarmac or concrete, it is recommended to equip the loader with tyres for paved surfaces to avoid heavy draw on the battery and severe tyre wear.

10.1.5 TURNING OFF BUCKET LEVELLING

Moderate savings on battery capacity can also be obtained by disabling bucket levelling. This function mainly is used for working at more elevated heights. This means working above the vehicle operator’s cabin, where visibility of the work device is impaired. The higher draw on the battery is due to the fact that the hydraulic pump has to run at a higher output in order to be able to supply oil to two sections of the distributor simultaneously. Therefore, when levelling is on, the boom speed also is slightly lower.

10.1.6 HEATING AND AIR-CONDITIONING

The use of heating and air-conditioning also has a significant effect on the battery capacity. For loaders with an internal com-bustion engine, the use of air-conditioning results in an increase in the machine power consumption by up to 10%. Similarly, it also reduces the battery capacity of the electric machine.



Warning

Risk of damage to components!

A deformed or damaged battery plug may cause overheating and subsequent damage.



Danger of explosion if hydrogen accumulates inside the cabin

Hydrogen from the battery compartment may enter the cabin through unsealed openings in the cabin.

Accumulated hydrogen may cause an explosion.

There must be no unsealed openings in the cabin. Sealing the openings with plugs does not provide an additional barrier to gas leakage.

Have unused openings in the cabin sealed by an authorized service center.



Danger

Distractions while working with the machine may result in loss of control over the machine. Exercise extreme Warning when using any devices while working with the machine. Distractions while working with the machine may result in injury or death of persons.



Danger

A machine fire may cause injury or death of persons. Exposed battery cables that come into contact with a grounded connection may cause a fire. Replace cables and similar components that show signs of wear or damage. Contact the manufacturer.

10.2 BASIC INSTRUCTIONS FOR CORRECT USE OF THE CHARGING EQUIPMENT

1. Before connecting the battery to the charger, check the integrity of contacts, connecting cables, connectors and auxiliary systems.
2. Connect the battery to the charger observing correct polarity.
3. The batteries may only be connected to designated chargers approved for the type concerned.
4. Observe the full charging time, i.e., until the full charge indication on the charger.
5. Charging starts automatically once the connectors are interconnected.
6. Disengage the connectors in the off state (when not energized)- press the STOP button.
7. Replenish distilled water in the battery each time it is charged. In case of water losses and leakage when replenishing, report this to service.
8. Carefully read the instructions for using the assigned equipment.
9. Report any damage to or malfunction of the charging equipment to your supervisor and service.

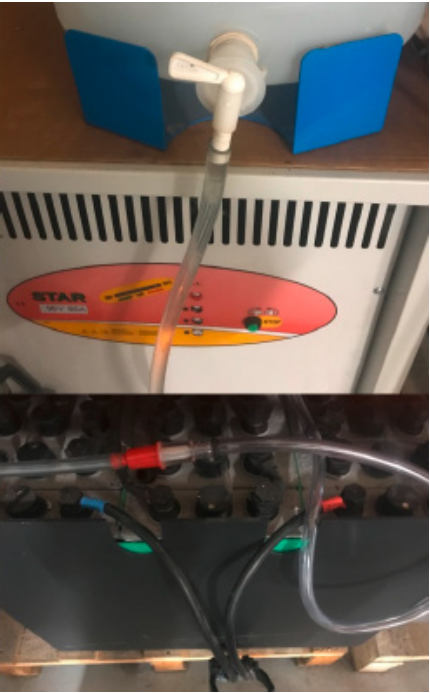
OPERATION

- ⌚ After connecting the battery to the mains, the control unit performs a light test of all the indicators. The green light means BATTERY CONNECTED, remains lit up (continuously).
- ⌚ Once connected, the AUTOSTART function launches. The charger starts charging automatically 5 seconds after connecting to the battery. AUTOSTART is indicated by flashing green light. END OF CHARGING is indicated by red light. Once charging is complete, the charger switches to battery saving mode, which is indicated by yellow light.
- ⌚ If the AUTOSTART function does not work, press the green button to start the charging process. The green light will be flashing during the entire charging process. If you want to stop charging, press the green button again.
- ⌚ After the initial charging, the yellow FINAL CHARGING light will illuminate. The electric timer starts counting down the last 3 hours of final charging.
- ⌚ When the last charging stage is completed, the charger switches off automatically and the green indicator light indicates END OF CHARGING.
- ⌚ An hour later, the BATTERY FORMATTING procedure is run (green light will be flashing).
- ⌚ A red light means ERROR. If the red light comes on, contact service.



Picture 31

Charging station and container with distilled water.



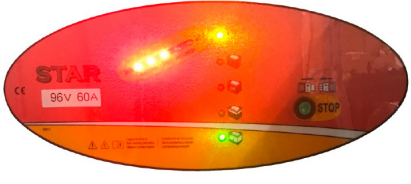
Picture 32

After recharging the battery, top up distilled water.



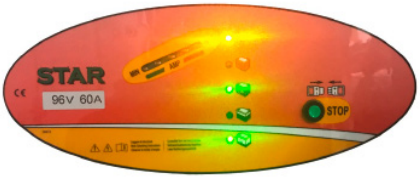
Picture 33

The charging station is ready for use.



Picture 34

Battery charging in progress.



Picture 35

The battery is fully charged.

LED SIGNALS

SIGNAL	LD5 GREEN	LD4 YELLOW	LD3 GREEN	LD2 RED	LD1 YELLOW
Energy from the grid only	OFF	OFF	OFF	OFF	ON
Energy from the battery only	OFF	OFF	OFF	OFF	OFF
Battery and mains power	OFF	OFF	OFF	OFF	-
Automatic start	OFF	OFF	FL	FL	FL
Initial charging	FL	OFF	OFF	OFF	-
Final charging	FL	ON	OFF	OFF	-
End of charging	ON	ON / OFF	ON	OFF	-
Formatting	FL	ON	ON	OFF	FL
Grid failure	NOT ASSIGNED				
Battery disconnected during the charging process	OFF	FL	OFF	OFF	OFF

OFF = LED OFF
ON = LED ON
FL = SLOW FLASHING LED (T = 1 SECOND)
- = LED WITH ANY STATUS



Danger

The charger must be located in a covered area sheltered from rain, snow and weather.

10.3 ADDING FLUID TO THE WASHER SYSTEM

The front windscreen washer tank is located on the door below the wiper motor. The sight glass is used to check the fluid level.

- Open the windscreen washer tank filler cap.
- Top up the windscreen washer tank with the washer fluid and antifreeze.
- Close the cap.
- Start the washer system until fluid begins to spray from the nozzles.



Warning

Individual components can be damaged by frost!

Frozen water increases its volume. If there is no antifreeze in the washer system, the system may be damaged by freezing in very cold conditions.

Always use in the washer system liquid with antifreeze admixture.

10.4 CHECKING THE CONDITION OF WHEELS AND TYRES



Danger

Beware of accidents! Uneven wear or incorrect air pressure reduces the loader stability, increases braking distance and also poses a risk of tipping over. Replace worn or damaged tyres immediately.

If you want to use the loader with a different type of tyres from those approved by the loader manufacturer, or with tyres from another manufacturer, you must first obtain consent from the loader manufacturer.



Warning

If pneumatic or all-rubber tyres are used, the wheel rim parts must never be changed and wheel rim parts from different manufacturers must not be used at the same time. Only tyre types approved by the manufacturer may be used.

Check tyres for wear and damage!

The tyres must not be damaged or worn.

Check air pressure! The pressure values indicated on the labels must be observed.

10.5 ENTERING AND EXITING THE LOADER



Danger

When getting into and out of the loader, there is a risk of injury due to slipping, hitting parts of the loader or getting stuck!

If the surface of the footwell is very dirty or greasy from oil, there is a risk of slipping. When getting out of the loader, there is a risk of hitting the head on the roof pillar or getting caught by clothing.

- ⌚ Make sure that the surface of the footwell is not slippery.
- ⌚ Do not jump into or out of the loader.
- ⌚ Make sure you always hold on firmly to the loader.
- ⌚ Do not wear jewellery at work.
- ⌚ Do not wear loose work clothing.



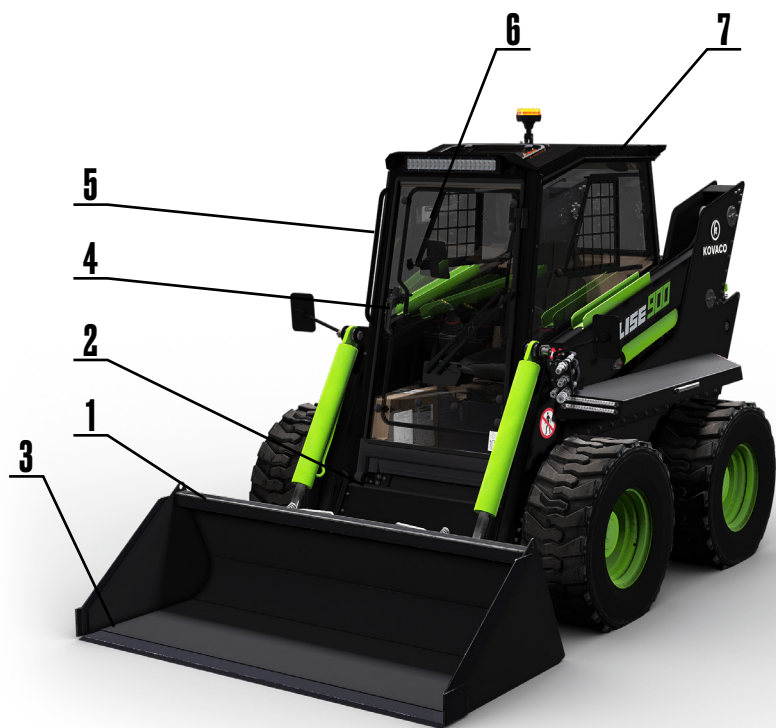
Danger

There is a risk of injury if jumping out of the loader! If your clothing or jewellery (such as watches, rings, etc.) gets caught in any part of the loader while jumping out of the vehicle, you may suffer a serious injury. It is forbidden to jump out of the loader!



Warning

When getting into and out of the loader, only use equipment designated for this purpose. Improper use can damage the machine components! Loader components such as the driver's seat, control levers, etc., are not intended as aids in getting into and out of the loader and may be damaged by improper use.



Picture 36

- ① Tread on the bucket
- ② Tread on the arm
- ③ Bucket
- ④ Door handle
- ⑤ Handrail on the cabin
- ⑥ Door
- ⑦ ROPS safety roof

Use the cabin handrail (5) as support when getting into and out of the loader. The door frame (6) can also be used as an aid.

Always enter the loader in the front direction (Picture 36):

1. Grasp the handrail (5) with your left hand and hold.
2. Grasp the handle (4) with your right hand and open the door towards you.
3. Place the left foot on the bucket tread (1).
4. Place the right foot on the arm tread (2).
5. Grip the handrail (5) with your right hand, and at the same time hold the handrail (5) for support with your left hand.
6. Get into the loader and seat yourself in the driver's seat. Exit the loader in the reverse order of steps.



Danger

When using another type of work device (3), adjust entering the loader accordingly.

10.6 ADJUSTING THE DRIVER'S SEAT GRANT ST PLUS

- Ⓚ Do not adjust the driver's seat or backrest while driving.
- Ⓚ Adjust the driver's seat and seat back so that you can operate all the controls safely.
- Ⓚ Check that the driver's seat and seat back are securely adjusted.
- Ⓚ Make sure there are no objects in the area of the driver's seat so as to prevent injuries.



Warning

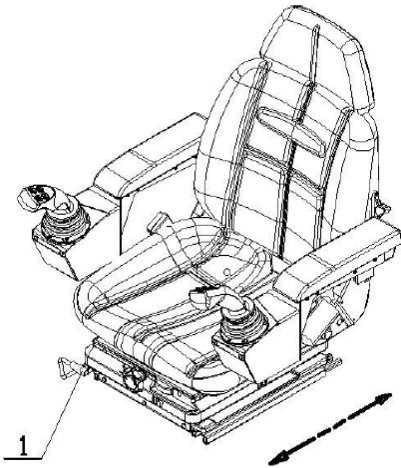
There is a risk of an accident if the driver's seat or the seat back suddenly moves, as the driver could start making uncontrolled movements. Such movements can cause unintentional activation of steering or controls and subsequent uncontrolled movement of the loader or its load.



Picture 37

In order for the seat upholstery to optimally dampen shocks and vibrations, the driver's seat suspension needs to be adjusted to the weight of your body. It will have a positive effect on your back and help protect your health.

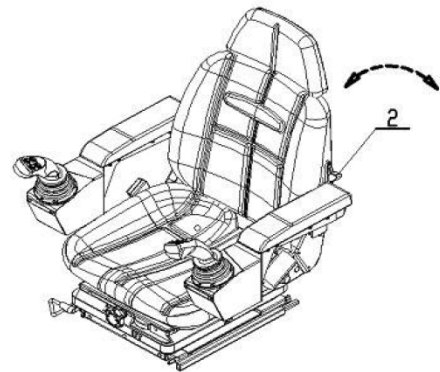
The seat suspension is adjusted with lever 3 (Picture 37).



Picture 38

10.6.1 SHIFTING THE DRIVER'S SEAT

1. Lift and hold lever (1).
2. Push the driver's seat into the desired position.
3. Release the lever.
4. Check that the driver's seat is securely adjusted.

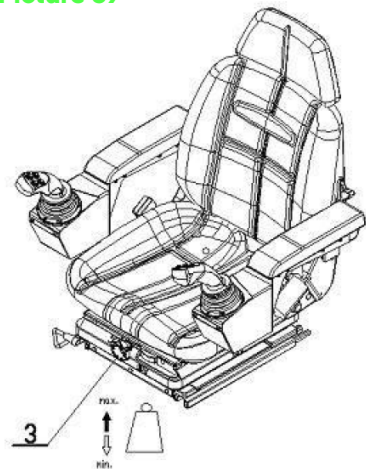


Picture 39

10.6.2 ADJUSTING THE SEAT BACK

1. Lift and hold lever (2).
2. Adjust the seat back to the desired position.
3. Release the lever.
4. Check that the seat back is securely adjusted.

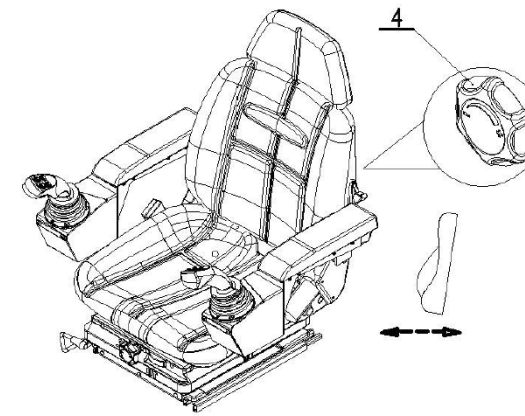
Do not push on the seat back when adjusting it!



Picture 40

10.6.3 ADJUSTING SEAT SUSPENSION

The driver's seat can be adjusted to suit the weight of a particular driver. The best seat suspension setting is achieved by adjusting while the driver is sitting on the seat.

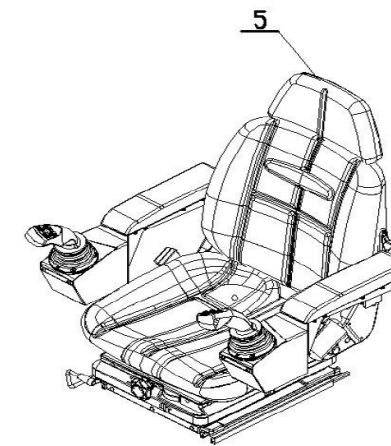


Picture 41

10.6.4 ADJUSTING THE LUMBAR SUPPORT

The lumbar support can be adjusted to suit the shape of the specific driver's spine. When adjusting the lumbar support, you move the convex support cushion to the top or bottom of the backrest.

1. Turn the rotary controller (4) up or down until you get the lumbar support into the desired position.

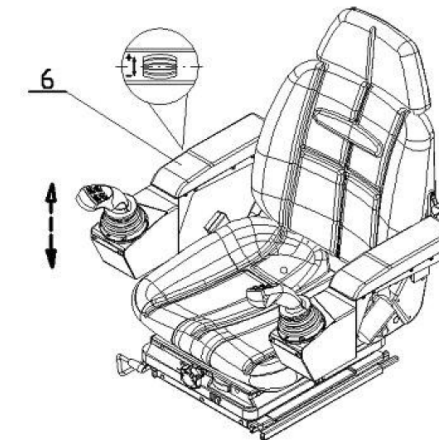


Picture 42

10.6.5 ADJUSTING THE SEAT HEADREST

1. The seat headrest (5) is adjusted by pulling or pushing into the desired position.

If you want to remove the headrest, pull it upwards all the way beyond the last groove.



Picture 43

10.6.6 ADJUSTING THE ARMREST HEIGHT

1. Turning the controller (6) counterclockwise lowers the armrest.
2. Turning the controller (6) clockwise raises the armrest.

10.7 SAFETY RAMP

Correct use of the safety ramp:



Picture 44

The safety ramp is tilted open in the basic position.



Picture 45

Safety ramp in closed position.



Picture 46

Always fasten the seat belt before closing the safety ramp.



Picture 47

The armrests must be at the same height for the correct position and securing of the safety ramp.



Picture 48

Before closing the safety ramp, make sure that the driver is sitting upright to prevent injuries to their face or head.

Note: The same applies when opening the safety ramp.



Picture 50

For closing the safety ramp correctly, make sure that the driver's legs are positioned evenly side by side and do not touch the armrests.



Picture 51

Incorrect position of legs.



Picture 52

Safety lock in the ball shape in secured position.
After lowering the safety ramp, make sure that the ramp is secured.

To unlock, push the ball to the right while lifting the ramp.



Picture 49

Incorrect position of the vehicle operator.

10.8 SWITCHING ON THE IGNITION AND PUTTING THE LOADER INTO OPERATION



Warning

Before switching on the ignition, all the pre-commissioning checks and actions must be carried out with no fault as a result.

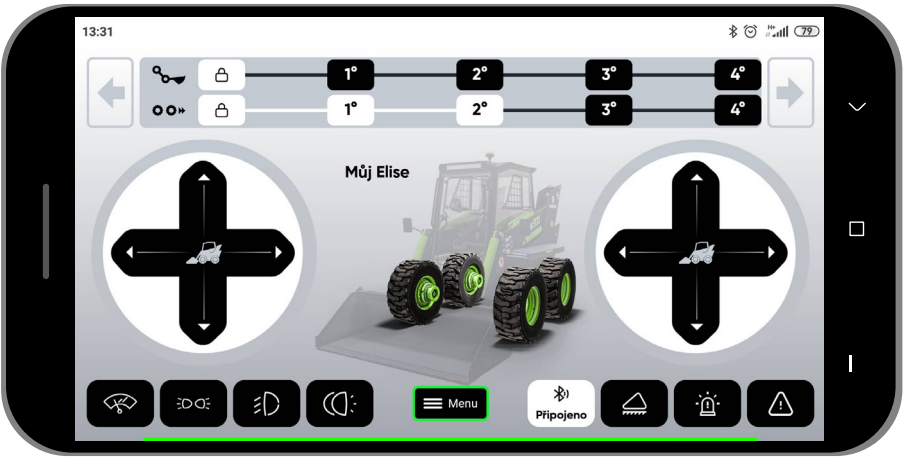
If you find a fault, do not use the loader and contact an authorized service center.

Before putting the loader into operation and during operation, make sure that the door is closed. Otherwise there is a risk of damage to the loader and its parts and the risk of injury.



Danger

Before inserting the ignition key into the ignition switch, close the door, fasten the seat belt and secure yourself with the safety ramp. Place the mobile phone into the holder on the right window. Check that the battery is fully charged and connected to the machine's electrical system.



Picture 53

1. Insert the ignition key into the ignition switch and turn it to position "I".
2. Start the Kovaco application and log into the application (more in the Kovaco Application Manual).
3. The screen displays information and connected devices. This includes information on the current battery status.
4. Use the touch key to select the desired travel speed. The speed can be chosen on a range from 1 to 4. The selected gear remains illuminated.
5. Depending on needs and the type of work at hand, bucket levelling can be turned on or off with the touch button. Bucket levelling on is signalled by illumination.

10.9 CHANGING THE FLOW RATE OF HYDRAULIC OIL

If the loader has an attachment connected that needs a hydraulic connection, you can change the hydraulic oil flow rate on a range from 20 to 65 l. The change can be made by a combination of touch buttons (17) and (5) as follows: press the touch button (17) - the touch button starts flashing until selection is made with button (5). The selected request is indicated by a blue mark (6). The hydraulic oil flow rate is divided equivalently to the vehicle travel speed into 4 levels, which are: Level 1 = 20 l, level 2 = 30 l, level 3 = 45 l, and level 4 = 65 l.

10.10 WORK LIGHTS

- Ⓚ The work lights are located on the top of the cabin in the front and rear, with auxiliary side lights on the fenders.
- Ⓚ If a malfunction occurs of the lights, do not use the loader and contact an authorized service center.
- Ⓚ The work lights are switched on with button (15) as follows: by pressing the button the lights are switched on, the second time the same button is pressed the lights are switched off. Switching on the lights illuminates the button.



Warning

It is forbidden to operate the loader at reduced visibility!

For such conditions, the loader is equipped with work lights that must be switched on when visibility is reduced. This will prevent possible collisions and collision-induced damage.

10.11 ROAD LIGHTS



Warning

It is forbidden to drive the loader on public roads at reduced visibility with the work lights on! Other drivers using the public road may be dazzled by the lights. The work lights must be switched off. For driving on public roads, the loader is equipped with road lights, which must be turned on when using public roads. This will prevent possible collisions and collision-induced damage.

- Ⓚ The road lights are located on the loader fenders and meet pertinent certifications for use when driving on public roads. It is forbidden to replace these lights with any lights other than approved by the manufacturer for this type of loader.
- Ⓚ If a malfunction occurs of the lights, do not use the loader and contact an authorized service center.
- Ⓚ The road lights are switched on with the button with the respective icon in the lower left corner of the Kovaco application as follows: pressing the button turns on the road lights, by pressing the button the second time the road lights are switched off. Switching on the lights illuminates the button.

10.12 BEACON



Warning

It is forbidden to operate and drive the vehicle without the light beacon on!

The loader is equipped with a light beacon. The light beacon must be turned on while driving or working. This will prevent possible collisions and collision-induced damage.

- Ⓚ The light beacon is located on the top of the cabin.
- Ⓚ If a malfunction occurs of the light beacon, do not use the loader and contact an authorized service center.
- Ⓚ The light beacon is switched on with the button with the respective icon in the lower left corner of the Kovaco application as follows: pressing the button turns on the beacon, by pressing the button the second time the beacon turns off. Switching on the light beacon illuminates the button.

10.13 DEACTIVATING THE BOOM AND BUCKET CONTROLS



Warning

To prevent unwanted movement of the boom or bucket while driving on public roads, these movements must be disabled. This will prevent possible damage to health or property.

- Ⓚ To deactivate the boom or bucket, press the button. The deactivation is signalled by the button lighting up. Press again to reactivate boom and bucket control.

10.14 FRONT WINDSCREEN CLEANING



Warning

It is forbidden to work and drive with a dirty front windscreen! By keeping it clean you will prevent possible damage to health or property.

The loader is equipped with an electric wiper system. The wiper system is switched on with the button with the respective icon in the lower left corner of the Kovaco application.

11. LOADER CONTROL - TRAVEL

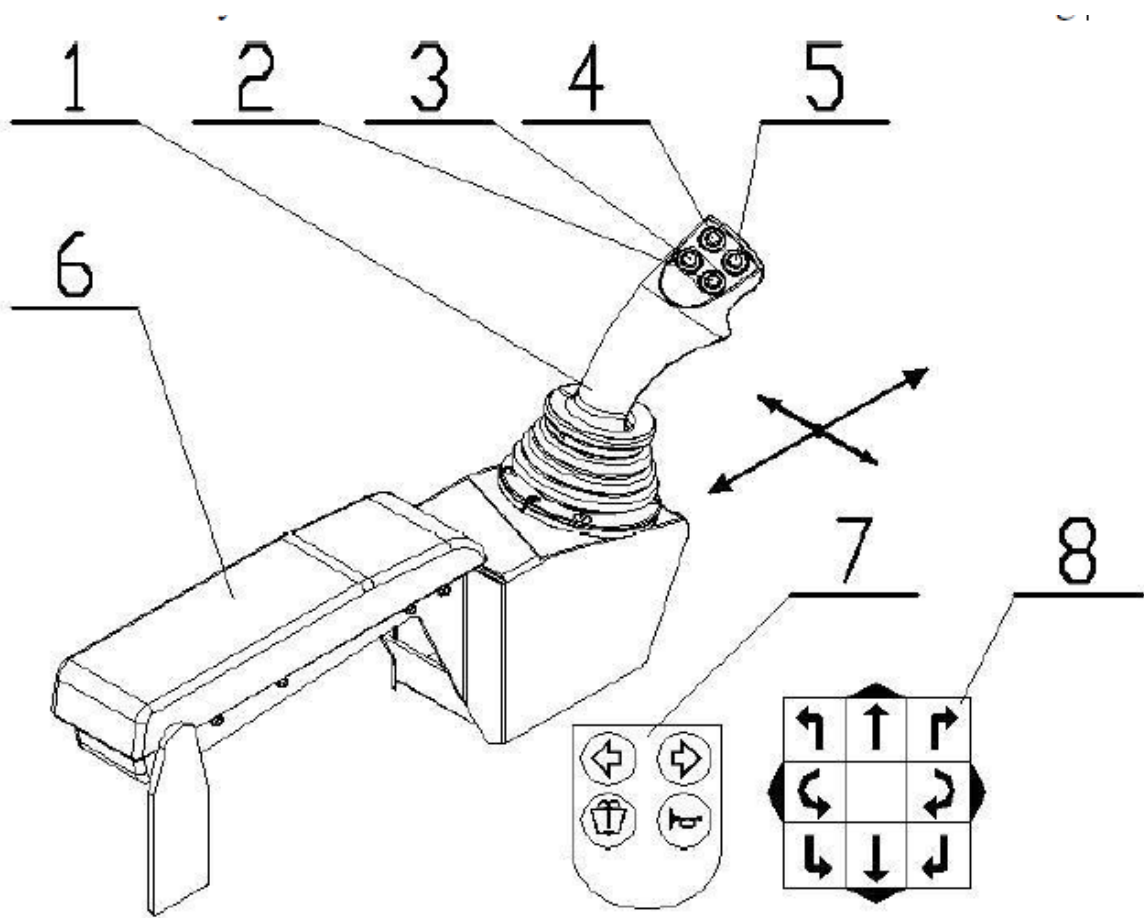


Danger

Risk of serious or fatal injuries when operating the loader!

- Ⓚ Tighten the seat belt well.
- Ⓚ The safety ramp must be lowered.
- Ⓚ Keep your feet on the footrests and your hands on the control levers.
- Ⓚ Make sure there is no other person or living creature in the travel area.
- Ⓚ The windows must be clean for a good view.
- Ⓚ Adjust the rear-vision mirrors correctly for a good view to the rear.

Steer the vehicle with the left control lever (1). This lever is located on the armrest (6). Move the control lever smoothly. This will avoid sudden jolts and jerky movements while accelerating or braking.



Picture 54

Driving forward - push the control lever (1) forward.

Driving backwards - push the control lever (1) backwards.

Turn forward left - push the control lever (1) forward and left.

Turn forward right - push the control lever (1) forward and right.

Turn backwards left - pull the control lever (1) backwards and right.

Turn backwards right - pull the control lever (1) backwards and left.

Fast turn forward and left - push the control lever (1) left.

Fast turn forward and right - push the control lever (1) right.

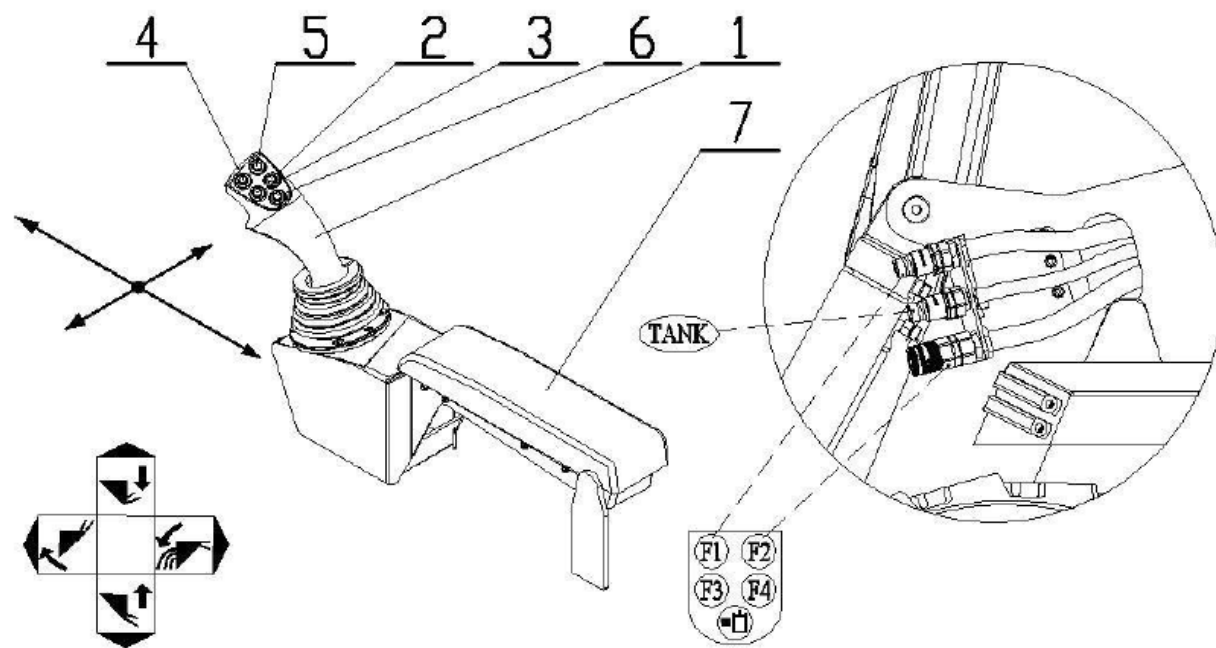
12. LOADER CONTROL WITH THE WORK ADD-ON (BOOM WITH BUCKET)



Danger

Risk of serious or fatal injuries when operating the loader!

- Ⓚ Tighten the seat belt well.
- Ⓚ The safety ramp must be lowered.
- Ⓚ Keep your feet on the footrests and your hands on the control levers.
- Ⓚ Make sure there is no other person or living creature in the travel area.
- Ⓚ The windows must be clean for a good view.
- Ⓚ Adjust the rear-vision mirrors correctly for a good view to the rear.



Picture 55

Lowering the boom - push the control lever (1) forward.

Raising the boom - pull the control lever (1) backwards.

Tilting the bucket shut - push the control lever (1) left.

Tilting the bucket open - push the control lever (1) right.

Lowering the boom while at the same time tilting the bucket shut - push the control lever (1) forward and left.

Lowering the boom while at the same time tilting the bucket open - push the control lever (1) forward and right.

Raising the boom while at the same time tilting the bucket open - pull the control lever (1) backwards and right.

Raising the boom while at the same time tilting the bucket shut - pull the control lever (1) backwards and left.

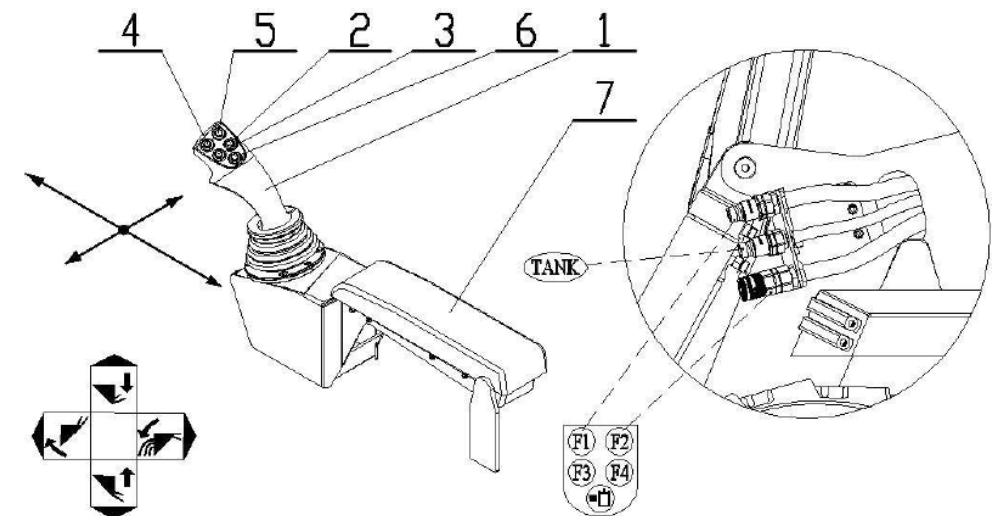
13. LOADER CONTROL WITH AUXILIARY HYDRAULIC DEVICE



Danger

Risk of serious or fatal injuries when operating the loader and its attachments!

- Ⓚ Tighten the seat belt well.
- Ⓚ The safety ramp must be lowered.
- Ⓚ Keep your feet on the footrests and your hands on the control levers.
- Ⓚ Make sure there is no other person or living creature in the travel area.
- Ⓚ The windows must be clean for a good view.
- Ⓚ Adjust the rear-vision mirrors correctly for a good view to the rear.



Picture 56

Some attachments require in order to function a connection to a hydraulic power and flow source. The connection to the loader is through quick couplings, which are located on the left arm of the boom. These are marked as F1, F2, TANK.

Before connecting an attachment, check the technical condition and technical specifications.

Always wear protective gloves and goggles when connecting and disconnecting, as the hydraulic oil and quick couplings may be as hot as 90 °C - risk of burns.

Do not connect damaged or technically incompatible attachments as they may cause serious damage to the loader and other property, or pose a Danger to life.

Clean the quick couplings after use and put on the protective covers.

An attachment is operated with buttons (4) and (5) on the left control lever (1). The hydraulic flow lock is activated by button (3) on the left control lever (1). When the hydraulic flow lock is activated, the indicator (17) in the control application lights up in yellow. You can change the hydraulic flow volume (between 20 and 65 l) in the application by a combination of touch buttons (17) and (5) as follows: press the touch button (17). The touch key starts flashing until a selection is made with button (5). The selected request (6) remains lit in blue. The hydraulic oil flow rate is divided equivalently to the vehicle travel speed into 4 levels, which are: Level 1 = 20 l, level 2 = 30 l, level 3 = 45 l, and level 4 = 65 l.



Warning

When working with an attachment fitted, follow the operating instructions supplied with each attachment!

14. LIST OF OPTIONAL ATTACHMENTS

The ELISE 900 loader can operate with the following tools and attachments:

- Ⓚ Basic shovel
- Ⓚ Bulk bucket
- Ⓚ Grate bucket
- Ⓚ Swing blade
- Ⓚ V-shaped snow-plough blade
- Ⓚ Rotary snow plough
- Ⓚ Winter sander
- Ⓚ Pallet forks
- Ⓚ Forks with holder
- Ⓚ Log forks
- Ⓚ Bale carrier
- Ⓚ Mobile undercut
- Ⓚ Sweeping device
- Ⓚ Angle broom
- Ⓚ Drilling device
- Ⓚ Combined bucket 4 in 1
- Ⓚ Mixing bucket
- Ⓚ Bucket with holder
- Ⓚ Wood splitter
- Ⓚ Tree pruner
- Ⓚ Mower/brushcutter

A complete list of attachments is available on the manufacturer’s website.

15. CLASSIFICATION OF ROCKS

Rocks are classified into 7 classes according to the difficulty of separating and removing them. These classes are called minability classes (this is an excerpt from the standard, the exact wording is given in ČSN 733050).

15.1.1 CLASS

- a) Cohesive with soft consistency (topsoil, loam, loamy sand, etc.);
- b) Non-cohesive, loose with grain size up to 20 mm;
- Ⓚ With grain size over 20 mm in up to 10% of volume of the rock to be separated (sand, medium gravel, gravel with stone).

15.2.2 CLASS

- a) Cohesive with hard consistency (topsoil, loam, loamy sand, peat);
- b) Non-cohesive, moderately compacted with grain size up to 20 mm;
- Ⓚ With grain size from 20 to 50 mm in more than 10% of volume of the rock to be separated;
- Ⓚ With grain size above 50 mm in up to 10% of volume of the rock to be separated (sand gravel, coarse gravel, or gravel with stone);
- c) Construction waste and landfill materials similar in nature to Class 2 rocks.

15.3.3 CLASS

- a) Cohesive with soft to firm consistency;
- b) Non-cohesive, compacted with grain size up to 50 mm;
- Ⓚ With grain size from 50 to 100 mm in more than 10% of volume of the rock to be separated;
- Ⓚ With grain size over 100 mm in up to 10% of volume of the rock to be separated (coarse gravel, or gravel with stone).
- c) Non-cohesive, classified in Classes 2 and 3, held together by a cohesive material, as far as their grains remain in lumps after separation;
- d) Weathered with very weakened structural bonds, qualifying as clay-sand soils (hydrothermally decomposed rocks, eluvial deposits);
- e) Construction waste and landfill materials similar in nature to Class 3 rocks.

15.4.4 CLASS

- a) Cohesive with firm and hard consistency (clay, sandy clay, sandy loam, dust loam);
- b) Non-cohesive with grain size from 100 to 250 mm in more than 10% up to 50% of volume of the rock to be separated, with grain size above 250 mm in up to 10% of volume of the rock to be separated (coarse gravel, gravel with boulders);
- c) Non-cohesive, classified in Classes 2 and 3, held together by a cohesive material, as far as their grains remain in lumps after separation;
- d) Solid, slightly weathered and weathered (weathered claystones, marlstones, tuffs, turiffs, slates, etc.), weathered slates, sandstones, soft limestones, etc.;
- e) Solid, weathered, severely cracked. The rock is disturbed along the cracks and its disintegration spreads into neighbouring areas. The grain size corresponds to non-cohesive Class 4 rocks (highly cracked granites, gneisses and limestones);
- f) Slurry and liquid in consistency (muddy alluvium, liquid sand, decomposed peat).

15.5.5 CLASS

- a) Non-cohesive with grain size from 100 to 250 mm in more than 50% of volume of the rock to be separated, with grain size above 250 mm up to 0,1 m3 individually in more than 10% up to 50% of volume of the rock to be separated (coarse gravel with stone/boulders);
- b) Non-cohesive, classified in Class 4, held together by a cohesive material with Class 4 properties, as far as their grains remain in lumps after separation (coarse gravel with clay-loam bonding material);
- c) Solid, healthy, in layers up to 150 mm thick (conglomerate with clay bonding material, slate, travertine, sandy marlstone, etc.);
- d) Solid, igneous, sedimentary, weathered and cracked with areas of divisibility of less than 150 mm (weathered granite, gneiss, andesite, sandstone, quartz);
- e) Landfill materials similar in nature to Class 5 rocks;
- f) Frozen soils.

15.6.6 CLASS

- a) Non-cohesive with boulders from 250 mm up to 0,1 m3 individually in more than 50% of volume of the rock to be separated, with boulders above 0,1 m3 individually in up to 50% of volume of the rock to be separated;
- b) Solid, igneous and metamorphic rocks, healthy with areas of divisibility up to 1.0 m in bench block separation. Crack distances less than 250 mm (granite, gneiss, andesite, basalt, slate, phyllite);
- c) Firmly sedimented, healthy with a distance of divisible surfaces up to 1.0 m. Other crack distances of up to 250 mm - coarsely bench-shaped (coarsely fragmentary to boulder conglomerates and agglomerates with calcareous and marly bonding material, limestones, dolomite, etc.).

15.7.7 CLASS

- a) Non-cohesive with grain size over 0.1 m3 individually in more than 50% of volume of the rock to be separated;
- b) Solid, healthy, massive, or with irregular spherical, columnar detachment with individual wedges, with areas of divisibility greater than 250 mm (quartz, silica granite, gneiss, basalt, andesite, veined quartz, cherty limestones, diorites).

Abbreviated characteristics of the mining classes according to the ways in which rocks can be separated:

- Class 1 - loose rocks that can be picked up with a shovel/with loader;
- Class 2 - excavable rocks, separable with a spade/with loader;
- Class 3 - diggable rocks, separable with a pickaxe/with excavator;
- Class 4 - crumbly solid rocks, separable with a wedge/with excavator;
- Class 5 - solid rocks that are easily broken up and separable with a ripper/heavy excavator (over 40 tons) or with explosives;
- Class 6 - solid rocks that are difficult to break up with a heavy ripper or with explosives;
- Class 7 - solid rocks that are very difficult to break up, separable with explosives.

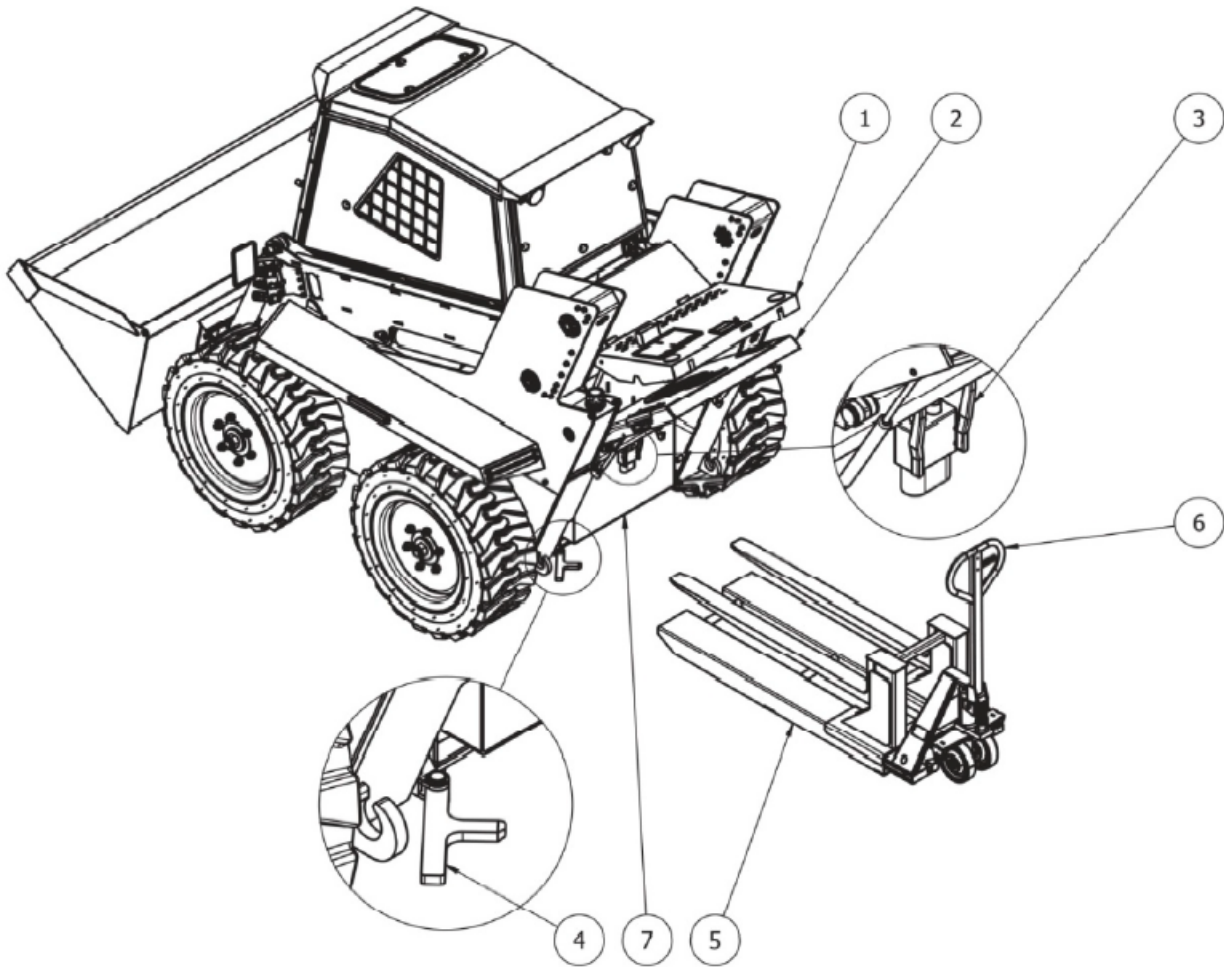
16. REMOVING / INSERTING THE BATTERY

16.1 REMOVING THE BATTERY FROM THE MACHINE

- 1 Open the machine top cover (position 1).
- 2 Open the machine bottom cover (position 2).
- 3 Disengage the battery connector (position 3).
- 4 Unlock the battery levers (position 4).
- 5 Slide the frame for battery replacement (position 5) onto the pallet truck (position 6) and fix it with chain.
- 6 Slide the pallet truck with the frame under the machine battery (position 7) and carefully pull out the battery.
- 7 Connect the battery to a charger that is in its designated place.

16.2 INSERTING THE BATTERY INTO THE MACHINE

- 1 Using a pallet truck (position 6) and the frame for battery replacement (position 5), carefully insert the battery into the machine.
- 2 Lock the battery levers (position 4).
- 3 Attach the battery connector (position 3).
- 4 Close the machine bottom cover (position 2).
- 5 Close the machine top cover (position 1).



Picture 61



Danger

The battery may only be replaced by trained personnel. Replace on a paved and flat surface with a maximum inclination of 1 ° (tarmac, concrete).



Picture 62

Correct grip of the machine bottom cover when handling.

Picture 63

Incorrect grip of the machine bottom cover when handling.



Warning

Improper handling of the bottom cover can result in amputation of limbs!



Warning

If the machine top and bottom do not hold properly in their place by themselves, service is needed, or the fault to be reported to service center!



Warning

Do not secure the covers with any object!

17. PREVENTIVE MAINTENANCE

Maintenance is important and is the best protection against premature wear of the unit assemblies. Perform the prescribed works to prevent possible malfunctions. In regular checks and inspections, it is possible to detect wear and malfunction, and failures can be prevented by cleaning and lubricating, or tightening loose connections, removing leaks, etc.

Maintenance includes the following works:

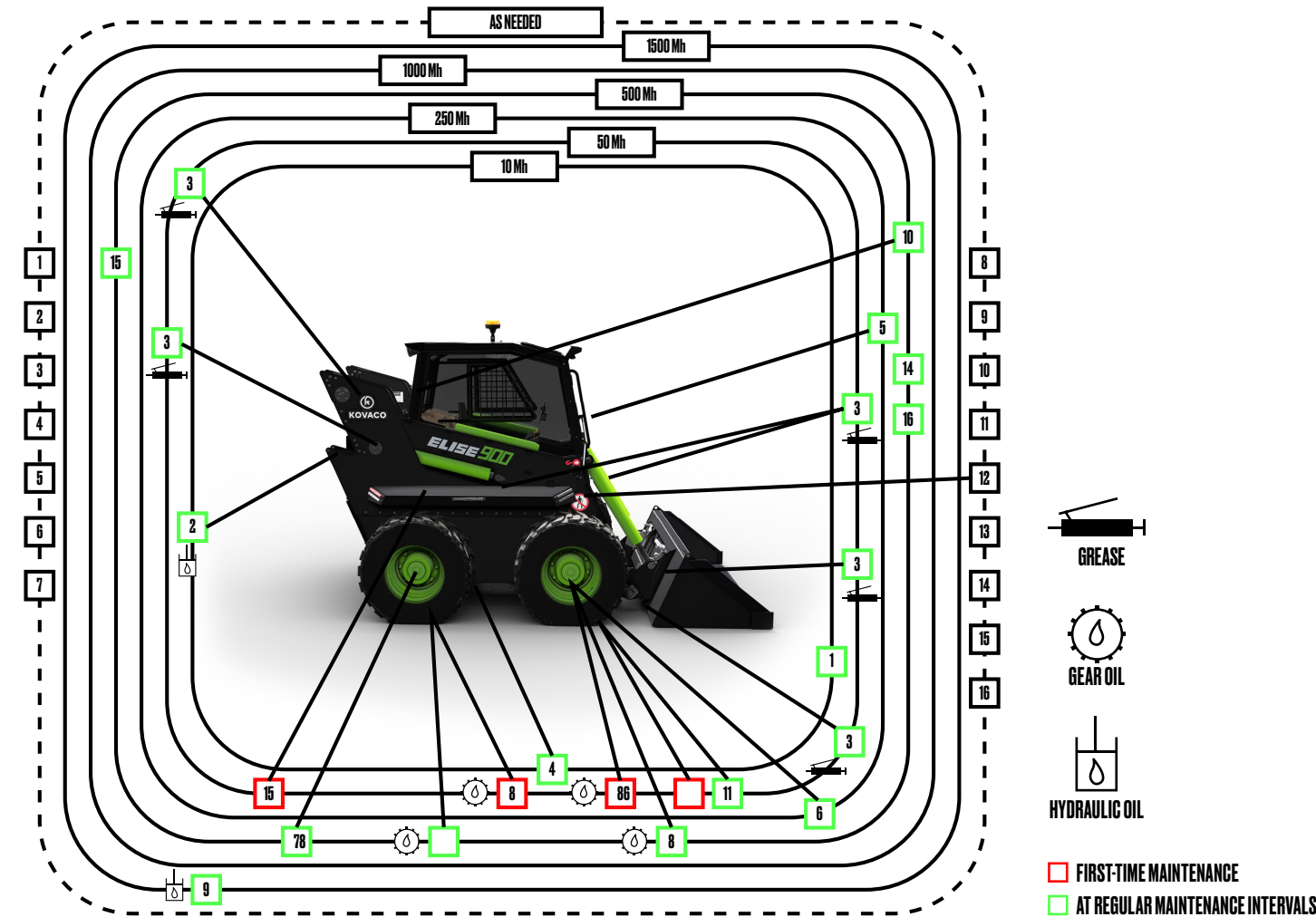
- ④ Cleaning and care, recharging the battery, topping up lubricating greases, changing oils, checking all units, adjusting clearances, checking mechanical joints and their tightening, etc.

For a better overview, we have included all maintenance works in tables according to the number of operating hours worked. Read the number of operating hours on the control panel located in the cabin. Keep a record of the maintenance works carried out in the machine's warranty book. Maintenance is divided according to the inspection and maintenance schedule.

The following common rules apply to all disassembly and assembly procedures:

- ④ Use the most suitable tools that do not damage the nuts or bolt heads.
- ④ Components that move relative to each other when assembled are not mounted dry. They need to be lubricated with a designated lubricant for the respective component in service.
- ④ When assembling preserved components, the preservative grease must be removed and replaced with operating lubricant.
- ④ Replace defective components only with original parts!

17.1 INSPECTION AND MAINTENANCE SCHEDULE



Picture 64

POSITION	INSPECTION AND MAINTENANCE WORKS		FIRST TIME AFTER OH	MAINTENANCE INTERVALS AFTER OH						AS NEEDED
				10	50	250	500	1000	1500	
1	General inspection of the machine	- Leaks - Hoses, aggregates - Work devices - Firm attachment of parts - Tyres - Instruments and lighting - Warning and control lights	10 •	•						
2	Hydraulics	Check the oil level - top up		•						
3	Work devices	Lubricate pins			•					
4	Battery	Check the electrolyte level - top up with distilled water		•						
5	Loader	Lubricate hinges, locks, etc. with an oiler				•				
6	Wheels	Check and tighten nuts	50 •			•				
7	Parking brake	Functionality check						•		
8	Transmission gears	Oil change and drive belt checks	50 •				•			•
9	Hydraulics	Oil change (annually)	1500 •						•	
10	Electrical installations	Check	500 •				•			
11	Tyres	Check pressure, inflate as needed	50 •		•					
12	Window washer	Top up water/antifreeze fluid								
13	Loader	Remove leaks								
14	Loader and motor	Check and tighten screw connections	500 •				•			
15	Hydraulics	Replace the hydraulic oil filter	50 •				•			
16	Work devices	Check the condition of the boom and quick clamp (welds, deformations)	500 •				•			



Warning

Explanation of the symbols used in the table:

- "SERVICE": inspection and maintenance works that are to be performed by a professional
- Inspection and maintenance works to be performed by the customer on their own



Danger

Do not enter under the cabin unless the cabin is empty and the support strut installed. A failure to observe the vehicle-related instructions or warnings may result in injury or death of persons.

Tilt the cabin when the door is open. When raising the cabin, the door must be closed and locked. Otherwise the door could loosen from its hinges and cause serious or fatal injury.

17.2 CORRELATION TABLES FOR OILS AND LUBRICATING GREASES

17.2.1 HYDRAULIC TANK

SLOVNAFT	- HV 46, HV 32, HV 68
SHELL	- TELLUS 32
MOBIL	- DTE 25, DTE 15M, SHC 525
BP	- ENERGOL HLP 32
CASTROL	- Castrol TQ
ESSO	- Esso ATF 55 type A, Esso Nuto H 46, Esso Unavis N 46
RUSSIA	- Hydraulic oil AMG-30 (-14 to +80 °C), AMG-10 (below -12 °C)
GERMANY	- Hydraulic oil WA 24 HLP 36

17.2.2 TRANSMISSION GEARS

ENI BLASIA 150
PARAMO CLP 150

17.2.3 ALL GREASE-LUBRICATED POINTS

SLOVNAFT	- Lubricating grease A 00
SHELL	- Mitilus Grease A, Retinax A
MOBIL	- Mobilgrease MP, Mobilgrease special
BP	- Energrease GP-36
CASTROL	- Imprevia GSL
RUSSIA	- Lubricating grease US-1
GERMANY	- Lubricating grease SWC 423

17.3 DESCRIPTION OF MAINTENANCE ACTIVITIES

17.3.1 OIL CHANGE IN THE HYDRAULIC SYSTEM

Drain the oil by unscrewing the plug on the bottom edge of the hydraulic tank.

When changing the oil, observe maximum cleanliness. Fill the new oil through a filter with an efficiency of 10 µm. The correct oil level is indicated by the position of the oil mark on the tank. Move the work device a little so that the oil fills the entire system. Refill the tank again with oil to half the height of the oil mark.

To extend the service life of the loader units, take a sample of the hydraulic oil in the amount of 0.5 litres every 500 OH. Take the sample into a clean glass container when the oil is heated to approx. 50 °C. If the removed oil is thickened and dirty compared to new oil, it must be changed or the change intervals shortened. Use only oil specified in the machine’s operating and maintenance instructions! When changing hydraulic oil, always replace the hydraulic oil filter as well.

17.3.2 MAINTENANCE OF HYDRAULIC CYLINDERS

Make sure that in operation, the bearings of the cylinder attachment lugs are sufficiently lubricated and the wiper ring on the cylinder cap wipes dirt from the piston rod over the entire stroke range. In the event of a leak, it must be replaced to prevent damage to the sleeve and subsequent oil leakage around the piston rod.

17.3.3 CHECKING AND INFLATING TYRES

In operation, regularly monitor the condition (wear, air pressure) of tyres. Replace a damaged tyre in time. When inflating, proceed carefully, observe the prescribed pressure value, and use only a calibrated manometer to check the pressure.

17.3.4 CHECKING AND TIGHTENING NUTS

Check tightening of the wheel nuts according to the machine inspection and maintenance schedule. The tightening torque is 260 Nm.

17.3.5 CHANGING OIL IN GEARBOXES

1. Turn on the machine and make a trip to warm up the oil. After a short drive, the oil temperature will rise. Take a few round trips or take a short trip out of town. Once the oil is warmed up enough, it will be less viscous and much easier to drain.
2. Make sure the machine is on a level and paved surface. Raise the machine with the jack so that the wheels are above the ground, and remove the wheels.
3. Locate the drain plug found in the gearbox bottom.
4. Remove the drain plug and allow oil to drain into the prepared container. 3-4 minutes should be enough to completely drain the used oil. Repeat the procedure for the other gearboxes as well.
5. Check that the drain plug is not damaged and screw it back on securely. Be careful not to tighten it too excessively.
6. Now you can refill with new oil. Release the filler cap found on the top of the gearbox and fill with oil using a funnel. To reach the required level, 1.8 litres of oil are required. Tighten the cap correctly and firmly. Repeat the procedure for the other gearboxes as well.
7. Mount the wheels. Before lowering the jacks, check that there are no stains of leaked oil under the machine. Carefully lower the machine to the ground.
8. Finally, dispose of the used oil properly. Use any container that can be closed tight and take the used oil to a designated place, collection point or landfill.

17.3.6 MAINTENANCE OF THE LOADER'S ELECTRICAL EQUIPMENT



Warning

For the proper functioning of the entire electrical equipment, properly charged and maintained batteries are the most important factor.

Maintain the correct electrolyte level by topping up with distilled water each time you charge.



Warning

At the end of work or a drive, and always when the loader will not be used for a longer period of time, disconnect the battery by disengaging the battery connector. The batteries also must be disconnected during repairs or when replacing parts of the electrical equipment. This will prevent a short circuit in the power line during the installation works. Battery maintenance includes cleaning the terminals, topping up with distilled water, and recharging. At lower air temperatures, keep the batteries sufficiently charged, as otherwise they are not frost-resistant and may freeze.

If you do not use the battery for a longer period of time, you must recharge and carry out maintenance for it after 4 to 6 weeks. Clean the battery terminals of deposits with hot water and lubricate them lightly with grease. The service life of batteries lasts longer the more often they operate, i.e. are alternately charged and discharged.

18. TECHNICAL SPECIFICATIONS OF THE MACHINE

TRANSMISSION AND DISTRIBUTION SYSTEMS		WEIGHT DATA	
End gears		Machine operating weight	3300 kg
WHEELS		Total machine weight	4200 kg
Type	firmly attached to the gearboxes, springless	Machine transport weight	3200 kg
TYRES		ELECTRICAL INSTALLATIONS	
Standard factory equipment of the machine	12 – 16.5	Electrical equipment voltage	96/12 V
Disks	9.75 x 16.5	Ground pole	negative (-)
Tyre pressure	400 kPa (front and rear)	Battery	48 units 2V/240A
STEERING		Lighting	road lights, turn indicators, tail lights, work lights, cabin lighting, warning beacon
Electronic via CANBUS data bus		Heating and ventilation	Electric heating (independent)
WORK DEVICE HYDRAULICS		OPERATING PARAMETERS	
Pump	SAUER DANFOS	Theoretical work cycle	10 seconds
Operating pressure	18 ± 0.5 MPa	Break-up force	13 kN
Distributor	PVG 16	Lifting force	18 kN
Oil type	HV - 46 / HV - 32 / HV – 6	Rated load capacity	900 kg
Oil filter	replaceable	VOLUMES AND TYPES OF OPERATING FLUIDS	
DRIVING CHARACTERISTICS		Side gears	4 x 1.5 litres of oil EP ISO VG 150
Constant forward speed	12 km/h	Oil tank	40 litres of oil HV 46 / HV 32 / HV 68
Traction force	32kN		
Turning radius front	2000 mm		
Contour turning radius rear	1500 mm		
Works on slopes with reduced stability at a maximum inclination of	12°		
Parking brake effective up to a maximum inclination of	30°		
Wading ability	400 mm		
Climbing ability	25% (15°)		

19. DIMENSIONAL DRAWING OF THE MACHINE



Picture 65

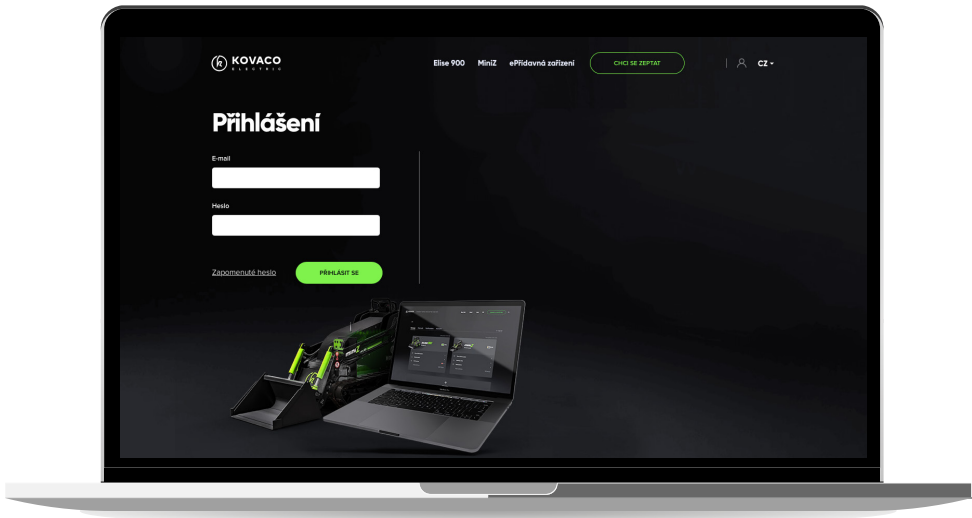
20. USER ACCOUNT

The Kovaco user account is used to manage Kovaco machines and their attachments. The account also includes administration of users and of individual authorizations to handle the machinery.

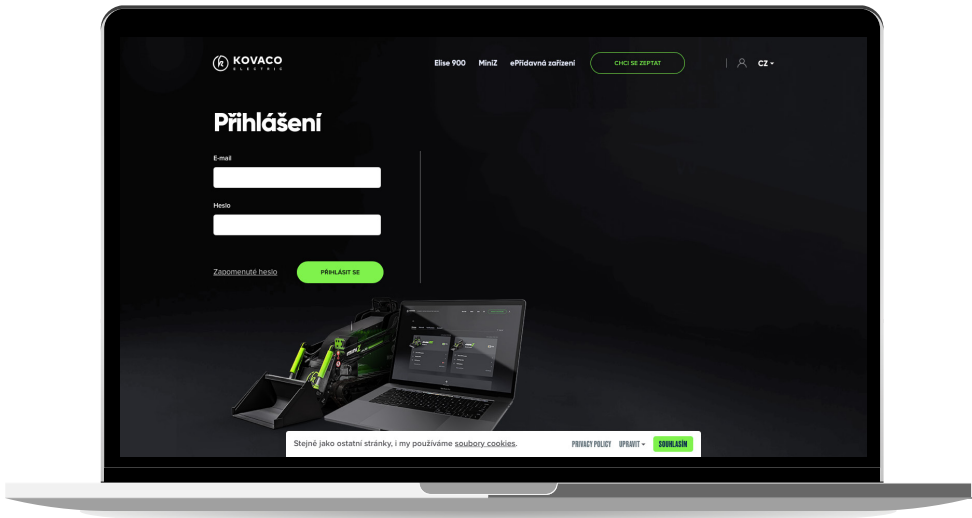
You can log in to the account via the link <https://www.kovacoelectric.com/cs/klient>

On the login page (Picture 12), enter the login details you chose when registering your machine. These are the same login details as for the Kovaco application.

If you do not know your login details, please contact your dealer. For a forgotten password, use the **Forgotten Password** option.



Picture 12 - Kovaco user account login page



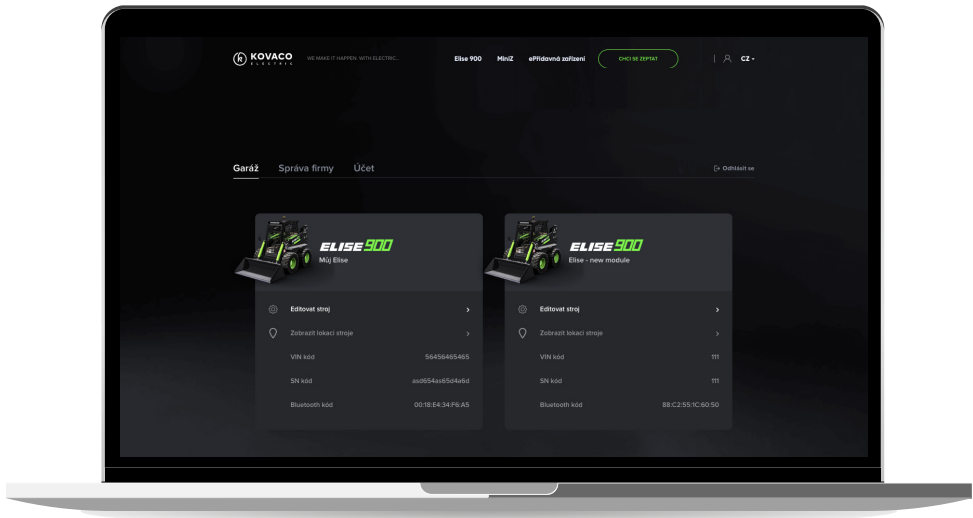
Picture 12 - Kovaco user account login page with the Cookie bar

GARAGE SECTION

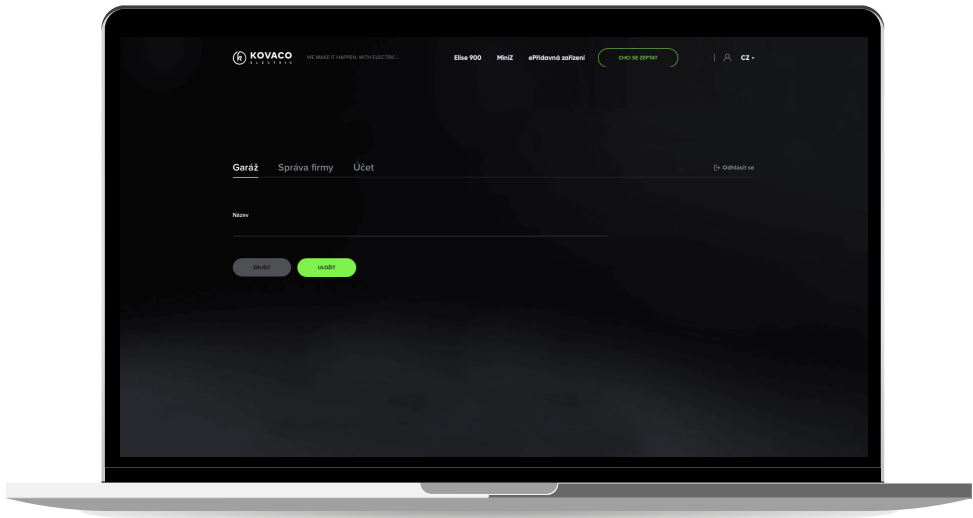
In the Garage you can see all your machines (Picture 13) and you can manage them. Click **Edit Machine** to change the name (designation) of the machine for better orientation between your machines (Picture 14).

Use the **Show Machine Location** option to find out where your machine is currently located.

For each machine, technical information is also displayed - VIN code, SN code and Bluetooth code.



Picture 13 - Garage section



Picture 14 - Editing the machine name

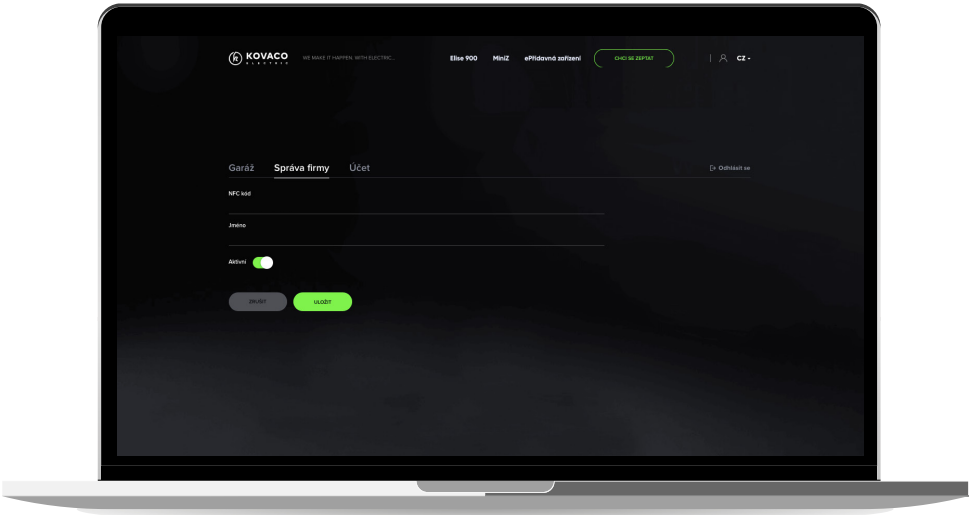
COMPANY ADMINISTRATION SECTION (Picture 15)

This section allows you to set up your company profile (Picture 16) and manage NFC chips, which are used to activate the machine in the application so that the driver can operate it. Several NFC chips may be available to operate a single machine.

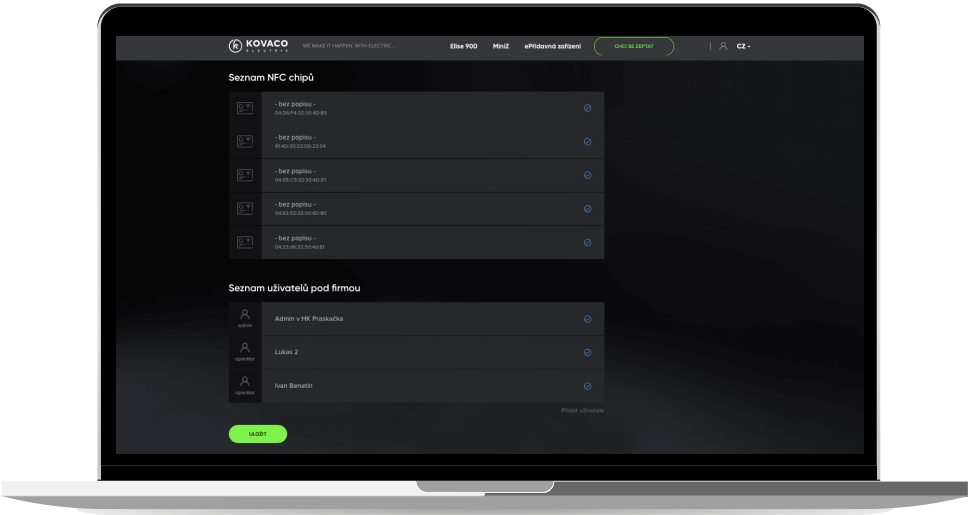
For each machine, you can see which chips are assigned to it (Picture 16), and their names can be changed for better orientation.

Further in the Company Administration section, you can also view a list of users (Picture 17) and their contact details.

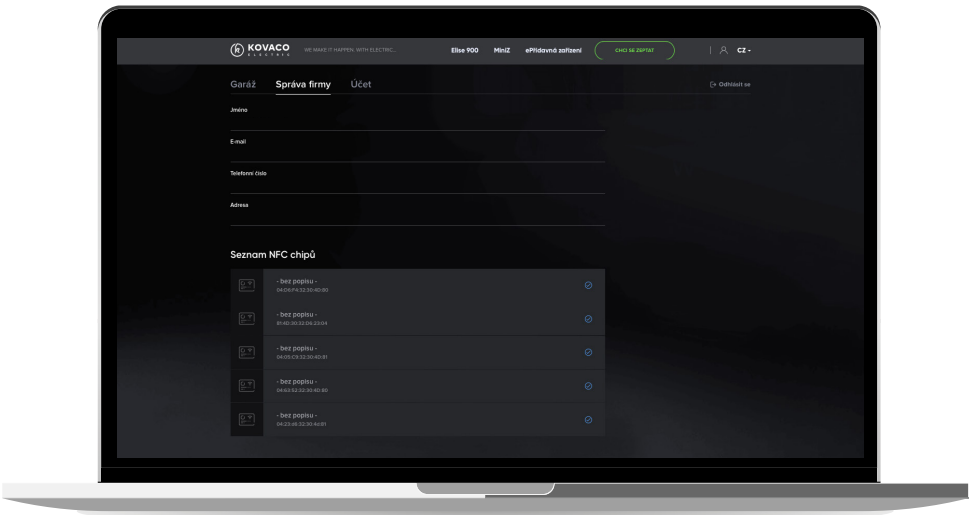
Here you assign to users machines (Picture 18) they are meant to operate and assign chips to be available to the users to operate the machines. Each user has an assigned role and has authorizations for adjusting/editing data in the user account set accordingly.



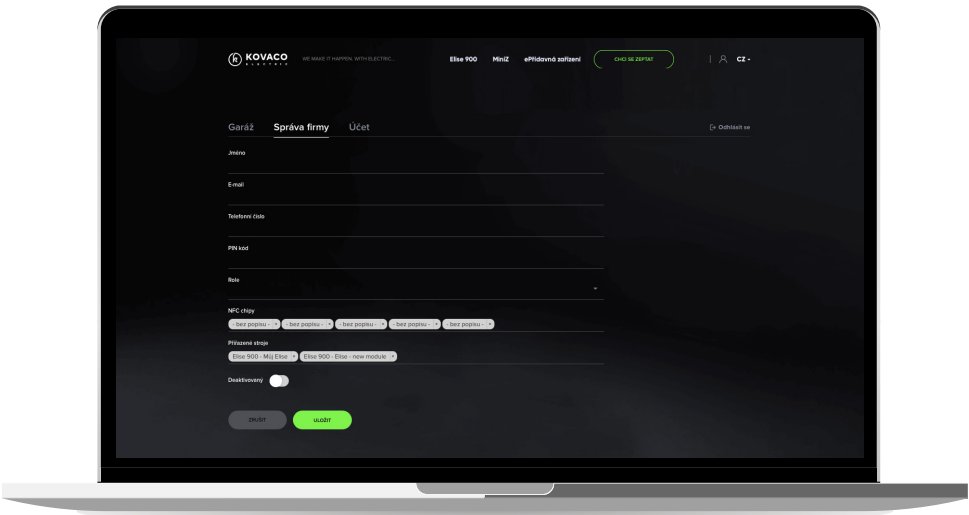
Picture 15 – Company administration



Picture 17 – List of users



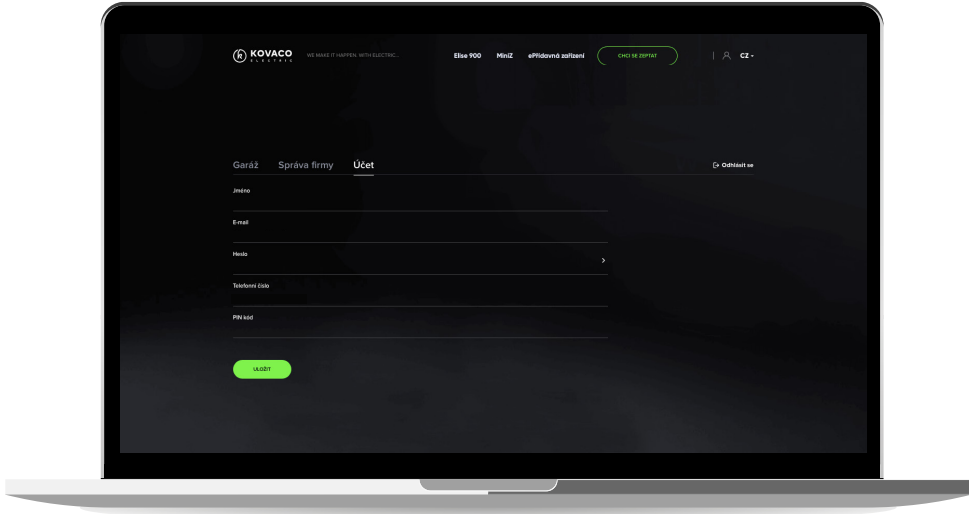
Picture 16 – Editing company administration



Picture 18 – Editing user

ACCOUNT SECTION

In the Account section, you set your user data. This section allows you to change the login details for accessing the user account.



Picture 19 - The Account section

Elise900

Manual for the Kovaco Application

DOWNLOADING THE APPLICATION

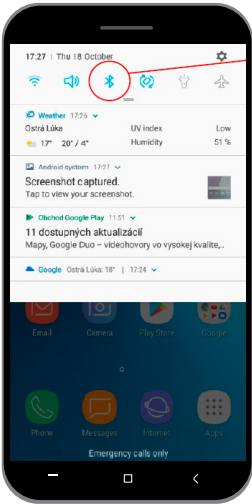
The Kovaco application is already available on the supplied mobile device. If you use a device other than the one supplied to control the machine, download the Kovaco application from the Google Play store following the download instructions on your mobile device.

Once the application is downloaded, its icon will appear on the phone screen (Picture 1).

Before actually launching the application, make sure that the mobile device has Bluetooth signal reception turned on. Bluetooth can be turned on in the mobile device settings or by sliding out the top panel by swiping the screen down on your mobile phone (Picture 2).



Picture 1



Picture 2



Warning
Without the Bluetooth signal receiver turned on, the application cannot be used to control the machine.

Now launch the Kovaco application and log in to your user account. The login details (username and password) are the data you have chosen and which were provided when assigning the device to your account, and which were set up via a confirmation e-mail sent by the manufacturer.

LOGGING INTO THE APPLICATION

In case you forgot your login details or you are unable to log into the application, contact the manufacturer. For a forgotten password, select the "Forgot your password?" option (Picture 3).

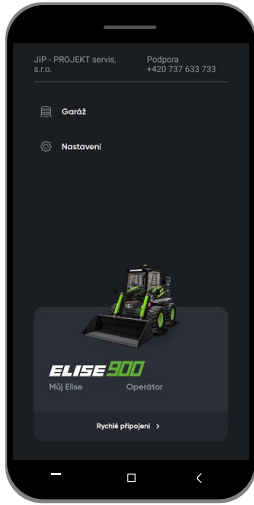
After logging into the application, the landing page will display (Picture 4). Here you can quickly connect to the selected machine and start using the machine according to the instructions provided in this manual.

GARAGE

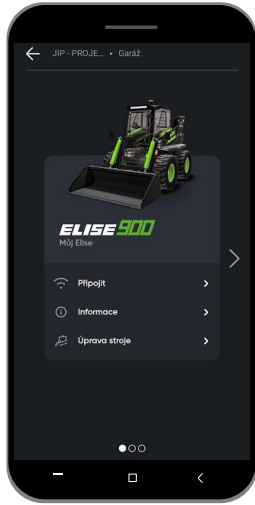
The landing page contains the Garage section. The Garage section allows you to select the machine you want to control via the application (in case you own more machines). You will also find all the information about the purchased machines here, and you can change their names for better orientation (Picture 5).



Picture 3



Picture 4



Picture 5

SETTINGS

Part of the landing page is the Settings section. In the settings you can:

- Select a dark or light application mode (Pictures 6 and 7), or automatic switching between these modes depending on ambient lighting (Picture 8);
- Select the machine control method for the Remote Mode (Picture 9);
- Choose the application language (English, Slovak, Czech) (Picture 9);
- Modify and edit user settings (Picture 9).

CONTROL MODE

In the Settings section, you can also set the control mode.

The application allows two ways to control the machine: In Cabin Mode and Remote Mode.

The In Cabin Mode is an application mode where the driver/vehicle operator controls the machine by steering it from inside the cabin. The application serves the driver/vehicle operator similarly to the dashboard in a car. Via the application, the driver can adjust the travel speed and hydraulic speed, switch on lights, wipers, the beacon, warning signs and turn indicators.

The Remote Mode allows remote control of the machine up to a distance of about 5 metres from the machine.

The user can choose whether they want to control travel of the machine via a single control lever and to control the bucket (or other attachment) with the other control lever, i.e., the separate control mode, or whether they want to control travel and the bucket via both the control levers, i.e., the combined mode.

For professional remote control, a radio controller is used that allows you to control the machine up to a distance of 15 metres from the machine.

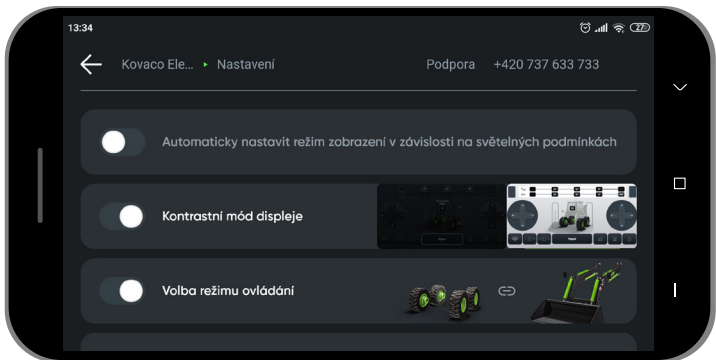
The application also serves as a security system against machine theft. The machine operation is tied to the specific user and mobile device. User authentication in the application is done via an NFC chip or PIN.



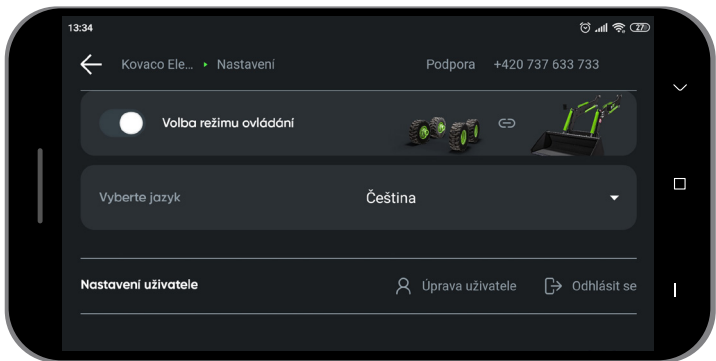
Picture 6 - Dark application mode



Picture 7 - Light application mode

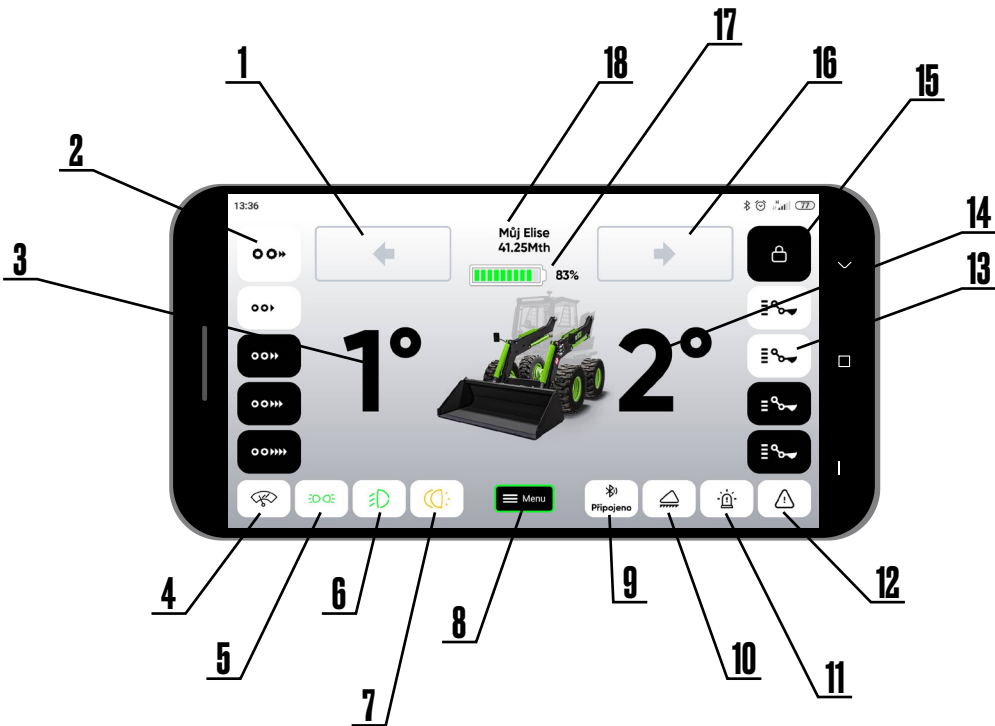


Picture 8 - View of the application setting options



Picture 9- View of the application setting options

IN CABIN MODE - DESCRIPTION OF INDIVIDUAL CONTROL AND INDICATORS

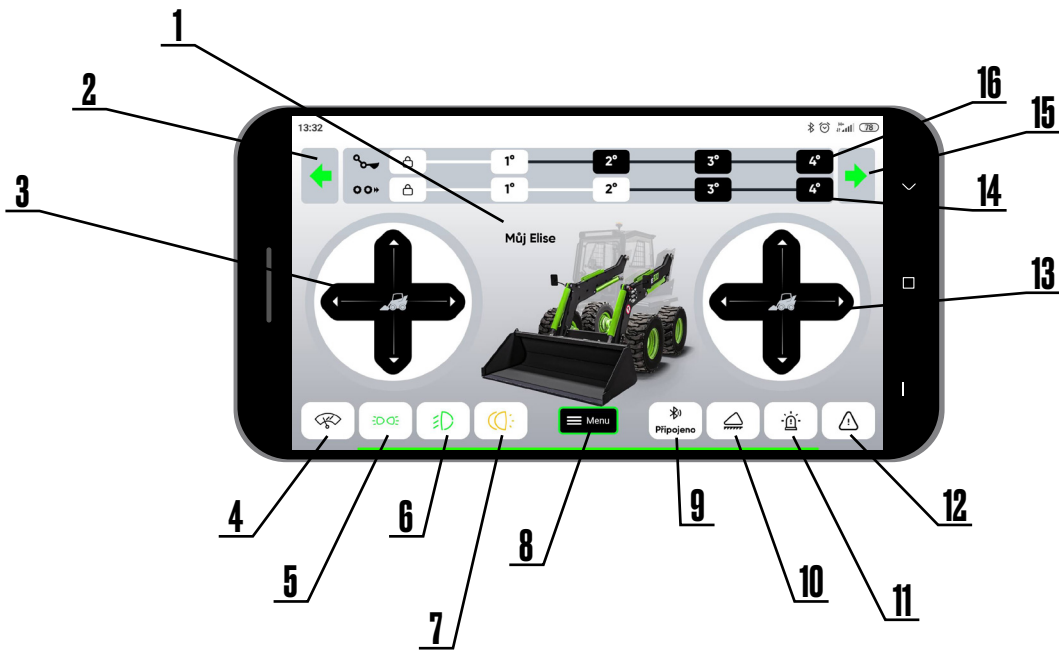


Picture 10

- ① Left turn indicator
- ② Hydraulic speed selection
- ③ Selected hydraulic speed level
- ④ Active wiper indicator
- ⑤ Active work lights indicator
- ⑥ Active road lights indicator
- ⑦ Active motorway lights indicator
- ⑧ Menu to return to landing page
- ⑨ Indicator of device connected to the application
- ⑩ Active bucket balancing
- ⑪ Active beacon indicator
- ⑫ Active warning triangle indicator
- ⑬ Travel speed selection
- ⑭ Selected travel speed level
- ⑮ Travel speed selection -locked
- ⑯ Right turn indicator
- ⑰ Battery status indicator
- ⑱ Name/designation of machine

The individual indicators are active when their field is white (lit on). An inactive indicator is marked with a black box, or is not bordered. When the device is disconnected from the application (loss of signal for Bluetooth reception), the connection field is marked in black, or is not bordered, and the Menu field has a red border.

REMOTE MODE - DESCRIPTION OF INDIVIDUAL CONTROLS AND INDICATORS



Picture 11

- ① Name/designation of machine
- ② Left turn indicator
- ③ Hydraulics control
- ④ Active wiper indicator
- ⑤ Active work lights indicator
- ⑥ Active road lights indicator
- ⑦ Active motorway lights indicator
- ⑧ Menu to return to landing page
- ⑨ Indicator of device connected to the application
- ⑩ Active bucket balancing
- ⑪ Active beacon indicator
- ⑫ Active warning triangle indicator
- ⑬ Travel control
- ⑭ Travel speed selection
- ⑮ Right turn indicator
- ⑯ Hydraulic speed selection

The individual indicators are active when their field is white (lit on). An inactive indicator is marked with a black box, or is not bordered. When the device is disconnected from the application (loss of signal for Bluetooth reception), the connection field is marked in black, or is not bordered, and the Menu field has a red border.



Warning

When controlling the machine remotely via Remote Mode, make sure to pay attention to the proper handling of the application.

When using the application, the application may malfunction (image freezing, application or system crash, etc.).

If the machine becomes uncontrollable and the vehicle operator is not able to control the machine via the application, then the mobile device must be moved as far away from the machine as possible so that the connection between the machine and the application is severed.



Warning

The manufacturer is not liable for misuse of the application in case of its use by an unauthorized person.

The operator is obliged to provide training for drivers/vehicle operators in working with the application. The manufacturer is not liable for incorrect use of the application in case of insufficient training of the operator's personnel.

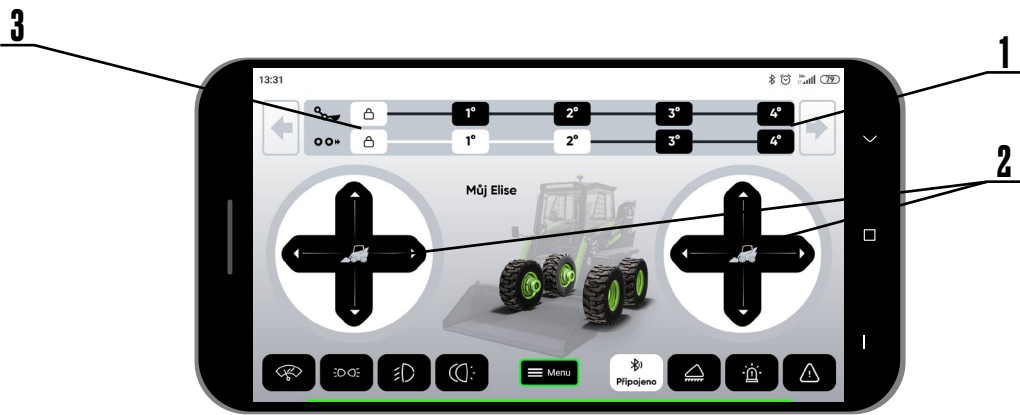


Danger

Before activating the remote control, make absolutely sure that there are no people or objects around the machine that could be injured or damaged. The minimum distance from living creatures for operating the machine when using remote controls is 5 m.

Before switching on/using the remote control and when the remote control is already on, you must be aware at all times that the surface of the mobile phone must be clean and dry and it must be protected from rain, snow and moisture condensation. In rain, raindrops can cause uncontrolled movements of the loader. Should this happen when using the remote control, you must turn off the application on your phone at once.

REMOTE MODE - COMBINED CONTROL MODE

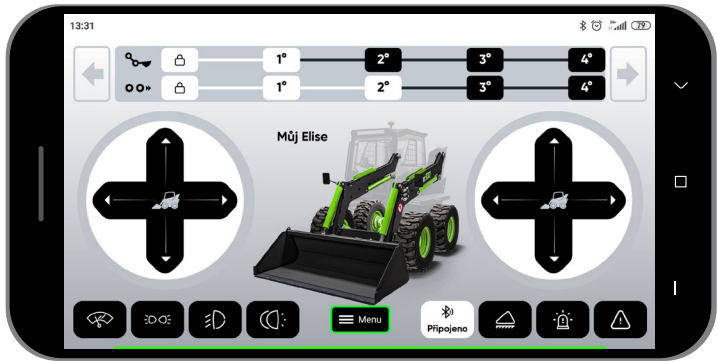


Picture 12 - Combined control mode with locked hydraulics control and with travel-only control option

- ① Selection of travel speed and hydraulic speed. The vehicle operator can choose at what speed the machine will move and at what speed the bucket or other attachment will react to steering input. Different speeds may be selected for hydraulics and for travel respectively. The desired speed is activated by clicking on it. The selected speed is indicated by a white field.
- ② Button that replaces the control lever inside the machine. It is used to control both travel and hydraulics of the machine. The machine moves or turns as pulled with your fingers across the screen:
 - ⌚ For moving the machine forward, the movement is guided by pulling upwards on both control fields.
 - ⌚ For moving the machine backwards, the movement is guided by pulling downwards on both control fields.
 - ⌚ For turning the machine to the right or left, the movement is guided upwards on one control field and downwards on the other.
 - ⌚ Pulling to the right on the right control field raises the boom.
 - ⌚ Pulling to the left on the right control field lowers the boom.
 - ⌚ Pulling to the right on the left control field tilts the boom upwards.
 - ⌚ Pulling to the left on the left control field tilts the boom downwards.
 - ⌚ To tilt the bucket (or other attachment), it is necessary to pull to the left on both control fields.
- ③ Locking the travel and hydraulic controls.

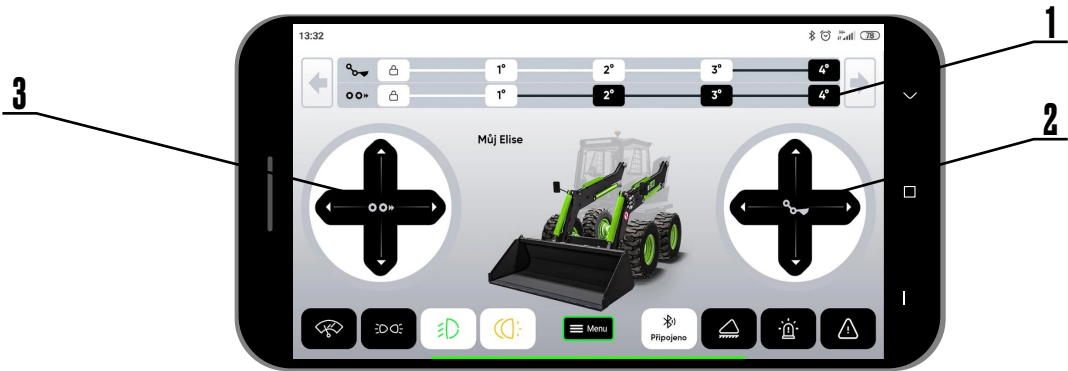


Picture 13 - Combined control mode with locked travel control and with hydraulics-only control option



Picture 14 - Combined control mode with both travel control and hydraulics control enabled and with both controllable

REMOTE MODE - SEPARATE CONTROL MODE



Picture 15 - Separate control mode with both travel control and hydraulics control enabled and with both controllable

- ① Selection of travel speed and hydraulic speed. The vehicle operator can choose at what speed the machine will move and at what speed the bucket or other attachment will react to steering input. Different speeds may be selected for hydraulics and for travel respectively.
- ② Button that replaces the control lever inside the machine. Used to control travel. The machine moves or turns as pulled with your finger across the screen:
 - Ⓚ When you pull your finger up, the machine moves forward.
 - Ⓚ When you pull your finger down, the machine moves backwards.
 - Ⓚ When you pull your finger to the right, the machine turns right.
 - Ⓚ When you pull your finger to the left, the machine turns left.
- ③ Button that replaces the control lever inside the machine. It is used to control the hydraulics of the machine. The bucket (or other attachment) is raised and tilted by moving your finger across the screen:
 - Ⓚ When pulling upwards, the hydraulic device rises.
 - Ⓚ When pulling downwards, the hydraulic device is lowered.
 - Ⓚ When moving to the right, the device tilts downwards.
 - Ⓚ When moving to the left, the device tilts upwards.

NOTES

NOTES



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