LEGUAN®

135

Operators Manual
2015-

Edited:
10.01.2019

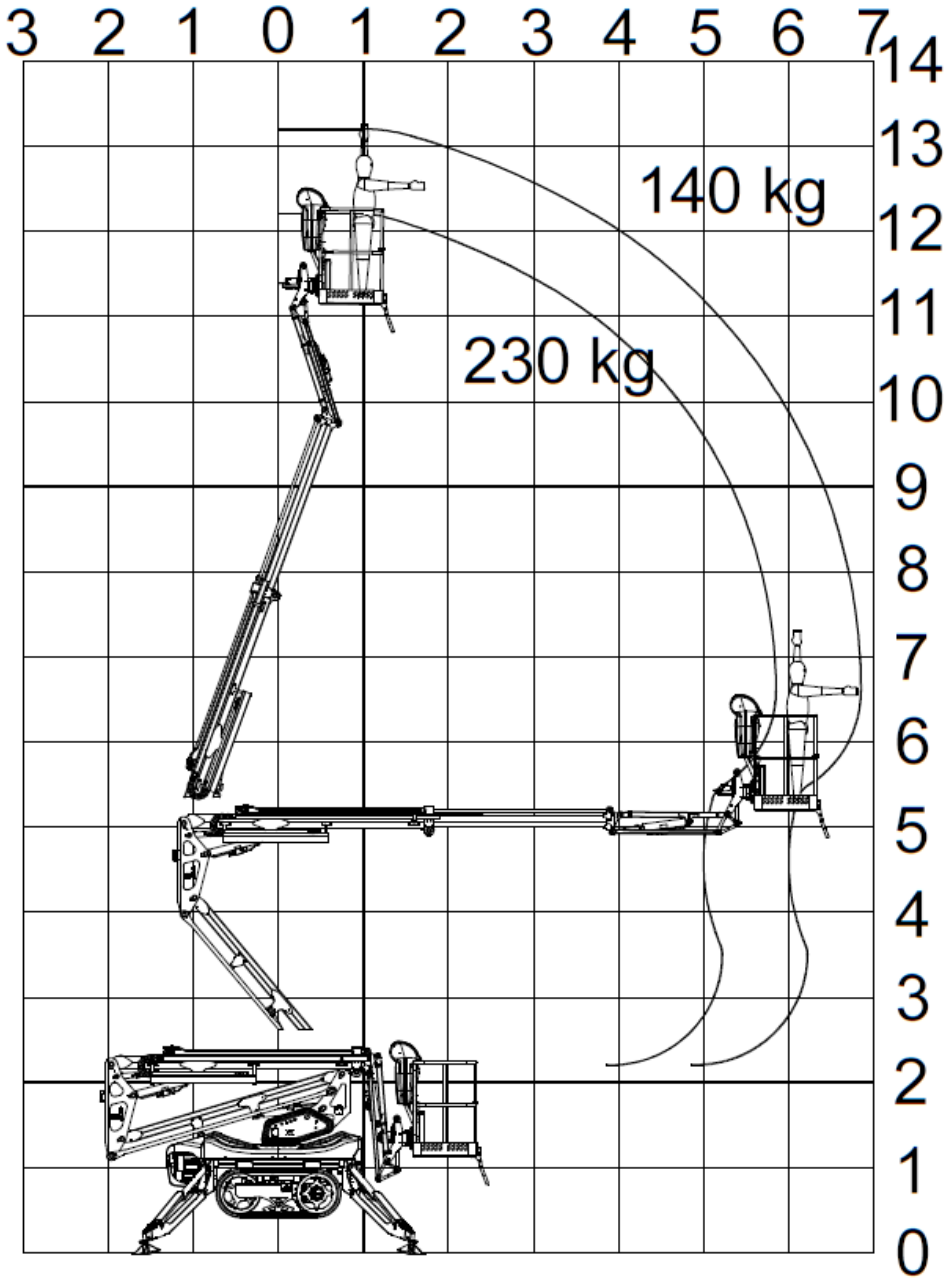


TABLE OF CONTENTS

Attachments:

Hydraulic schematic
Electric schematic
Parameter list and application specific error code list
Error code list of IFM safety logic
Error code list of Scanreco
Safety functions evaluation chart
Honda iGX390 Owner’s manual

1. INTRODUCTION AND WARRANTY CONDITIONS

1.1. Introduction

LEGUAN LIFTS wants to thank you for purchasing this Leguan access platform. It is the result of Leguan's long experience in design and manufacturing of access equipment.
We ask you that you read and understand the contents of this manual completely before operating the access platform. This will improve your operating and maintenance efficiency, help avoid breakdowns and damage and extend your machine's life.

Pay special attention to this symbol. It indicates important safety factors that require special attention. Every operator must read and understand this manual before starting operation, and the instructions in this manual must be followed. If you are lending the access platform out to somebody, make sure that he or she familiarizes himself or herself with and understands these instructions. If there is anything unclear with the operation please contact your Leguan dealer.

If spare parts are needed, use only original LEGUAN parts. They will provide your machine with the maximum life expectancy and ensure optimum safety.

The manufacturer does not warrant any damages which are the result of using the access platform.

It is not possible to give explicit operating instructions to all operating conditions of the machine. Therefore the manufacturer is not responsible for any damage caused by eventual faults in this Operators Manual.

The lifespan of the crawler track system of an access platform on rubber tracks is heavily dependent on the working environment and the way of working. If the access platform is being used in terrains with stones or gravel, on demolition sites where there is concrete, or in an environment with scrap metal, the lifespan of the track system can be significantly reduced. Because of this, damages on the tracks, track rollers or crawler track chassis, caused by operation in such environments, are not covered by warranty.

The operator has a good possibility to increase the lifespan of the crawler track system by following the operating and maintenance instructions of the track system.

1.2. Warranty conditions

This product is warranted for a period of twenty-four (24) months, with unlimited operating hours.

Warranty covers manufacturing and material defects. All warranty obligations end when the warranty period ends. Warranty repair that has been started will be completed regardless of the ending date of warranty period.

A condition for the warranty is that both the buyer and the seller have accepted the delivery. If the buyer is not present when the delivery takes place and doesn't make a complaint within 14 days of delivery of this access platform, it is considered that the sale is closed and the warranty period has started.

Warranty is limited to the repair of a faulty access platform without cost at an authorized Leguan service workshop. Warranty period for parts that are changed in connection with the repair will end when the warranty period for the access platform ends. Parts that have been changed in the warranty repair will remain Leguan Lifts' property without compensation.

Warranty does not cover:

- damages caused by wrong or negligent use of this product, or mischief
- any repairs or modifications to the product, performed without the prior authorization of the manufacturer
- damages caused by not following service and maintenance instructions
- breakdowns, unless caused by manufacturing fault
- adjustments, repairs and spare parts replacements caused by normal wear
- damages caused by excessive loads on the access platform, sudden unexpected incident, natural disaster
- damages caused by external mechanical or chemical reasons (paint damages, especially caused by stone chips, air and environmental pollution and strong cleaning agents)
- any repairs, modifications or reassemblies performed without the prior authorization of the manufacturer or importer
- eventual visible patterns or unevenness of painted surfaces
- warranty claims that haven't been sent to the manufacturer within 14 days from the date the buyer has noticed the defect. In all conditions the buyer shall act so that his action doesn't make the eventual defect(s) worse.

The manufacturer does not accept any responsibility for consequential losses resulting from the use of this access platform.

In the event a fault occurs which is attributable to manufacturing or assembly defect, contact the dealer without delay.

ALKUPERÄINEN EY-VAATIMUSTENMUKAISUUSVAKUUTUS
ORIGINAL EC DECLARATION OF CONFORMITY FOR MACHINERY

TÄTEN VAKUUTAMME, ETTÄ
HEREWITH DECLARES THAT

HENKILÖNOSTIN AERIAL PLATFORM	***LEGUAN***	NIMELLISKUORMA NOMINAL LOAD	***230 KG***
MALLI MODEL	***L135***	NOSTOKORKEUS PLATFORM HEIGHT	***11,2 M***
SARJANUMERO SERIAL NR		VALMISTUSVUOSI YEAR OF CONSTRUCTION	

ON KONEDIREKTIIVIN 2006/42/EY ASIAAN KUUULUVIEN SÄÄNNÖSTEN MUKAINEN IS IN ACCORDANCE WITH THE REGULATIONS LAID OUT IN THE MACHINERY DIRECTIVE: 2006/42 / EC

KONE TÄYTTÄÄ LISÄKSI MUIDEN EY-DIREKTIIVIN VAATIMUKSET: 2004/108/EY
THE MACHINE ALSO FULFILLS THE REQUIREMENTS LAID OUT IN THE DIRECTIVES 2004/108/EY

SEURAAVIA EUROOPPALAISIA YHDENMUKAISIA STANDARDEJA ON SOVELLETTU SUUNNITTELUSSA: EN280:2013
FOLLOWING EUROPEAN HARMONIZED STANDARDS ARE USED WHEN THE MACHINERY WAS DESIGNED: EN280:2013

Teknisen tiedoston on valtuutettu kokoamaan:
Storage address of original documents:
Finland

LEGUAN LIFTS OY
Ylötie 10, FI-33470 Ylöjärvi,

Ilmoitettu laitos / Notified Body

INSPECTA TARKASTUS OY, NB0424

Testausraportti / Test Report

No. 14633-02/2015

Paikka / Place
Ylöjärvi, FINLAND

Päiväys / Date

Valmistaja / Manufacturer:
LEGUAN LIFTS OY
Ylötie 10, FI-33470 Ylöjärvi, Finland

Allekirjoitus / Signature:

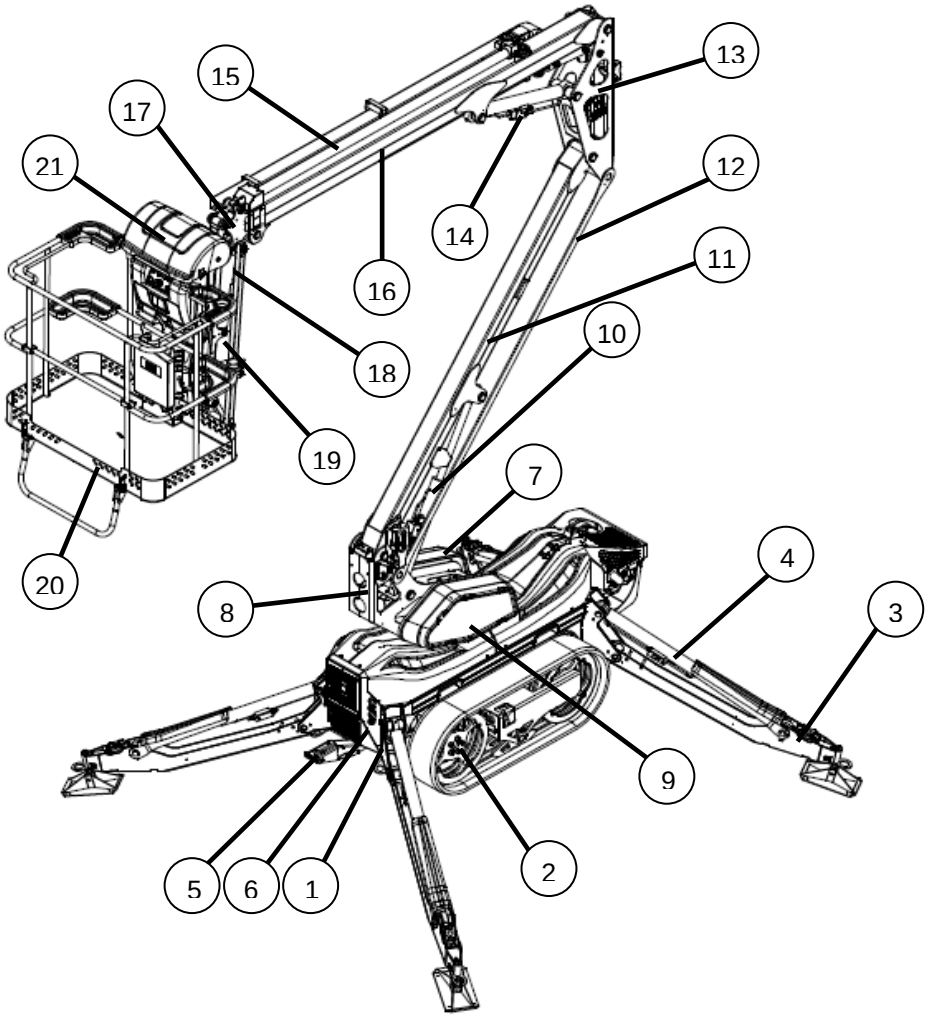
_____

2. GENERAL INFORMATION

LEGUAN 135 is a self-propelled Mobile Elevating Work Platform – or commonly called access platform, designed for indoor and outdoor use. An access platform is destined for lifting of persons and their equipment only. It is not allowed to use an access platform as a crane.
LEGUAN 135 access platform has two nominal loads and two working areas. With max. 140 kg load on the platform the machine can be operated over the whole working area. If the load on the platform exceeds 140 kg, the working area is restricted up to max. 230 kg load on the platform.
LEGUAN is designed and built in accordance with the international safety standards and MEWP (Mobile Elevating Work Platform) standards.

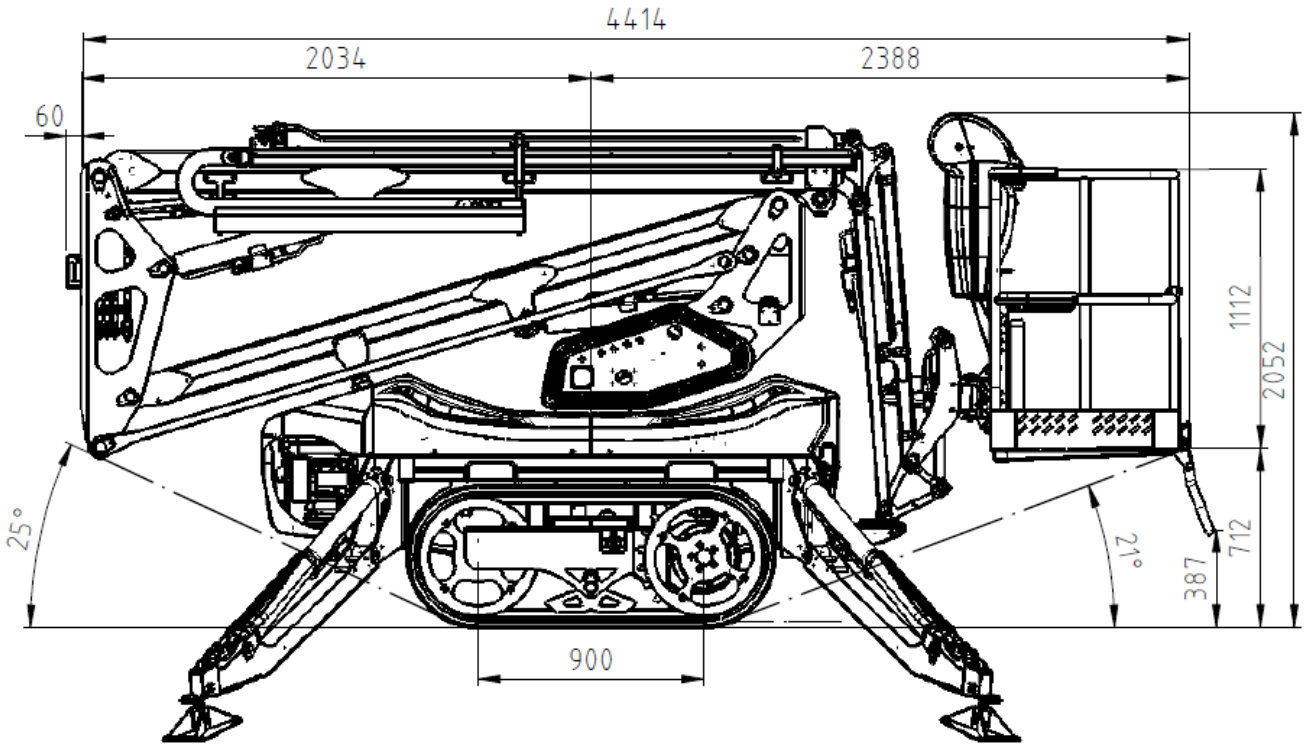
The picture below shows the main parts of this access platform. Leguan 135 on wheels is identical to the machine with tracks, except for the crawler track system.

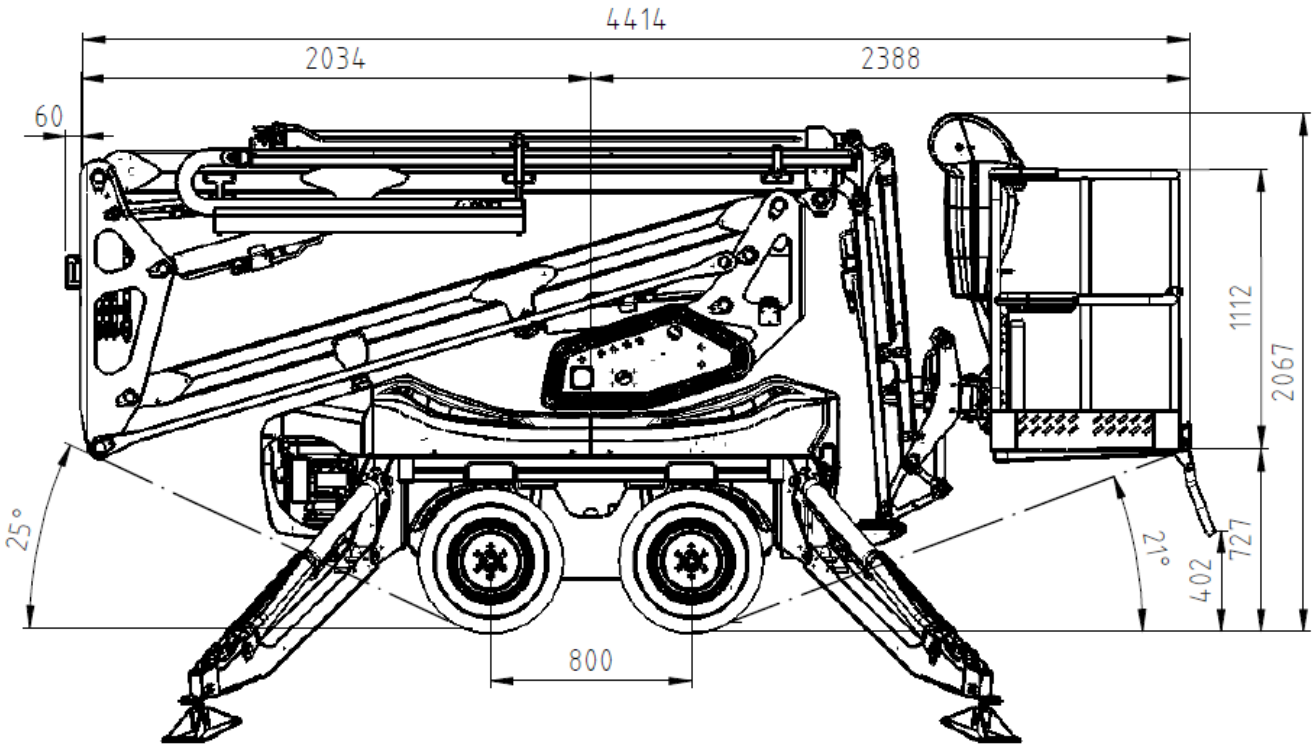
1. Chassis
2. Transmission, either with wheels or with crawler tracks
3. Outrigger
4. Outrigger cylinder
5. Transport support
6. Electric motor
7. Connection box of control system with emergency lowering buttons
8. Pedestal
9. Valve box at ground level
10. Lower boom cylinder
11. Lower boom
12. Self-leveling bar
13. Linkage piece
14. Upper boom cylinder
15. Telescoping cylinder
16. Upper boom
17. Telescoping boom
18. Jib boom cylinder
19. Jib boom
20. Platform
21. Controls box at platform

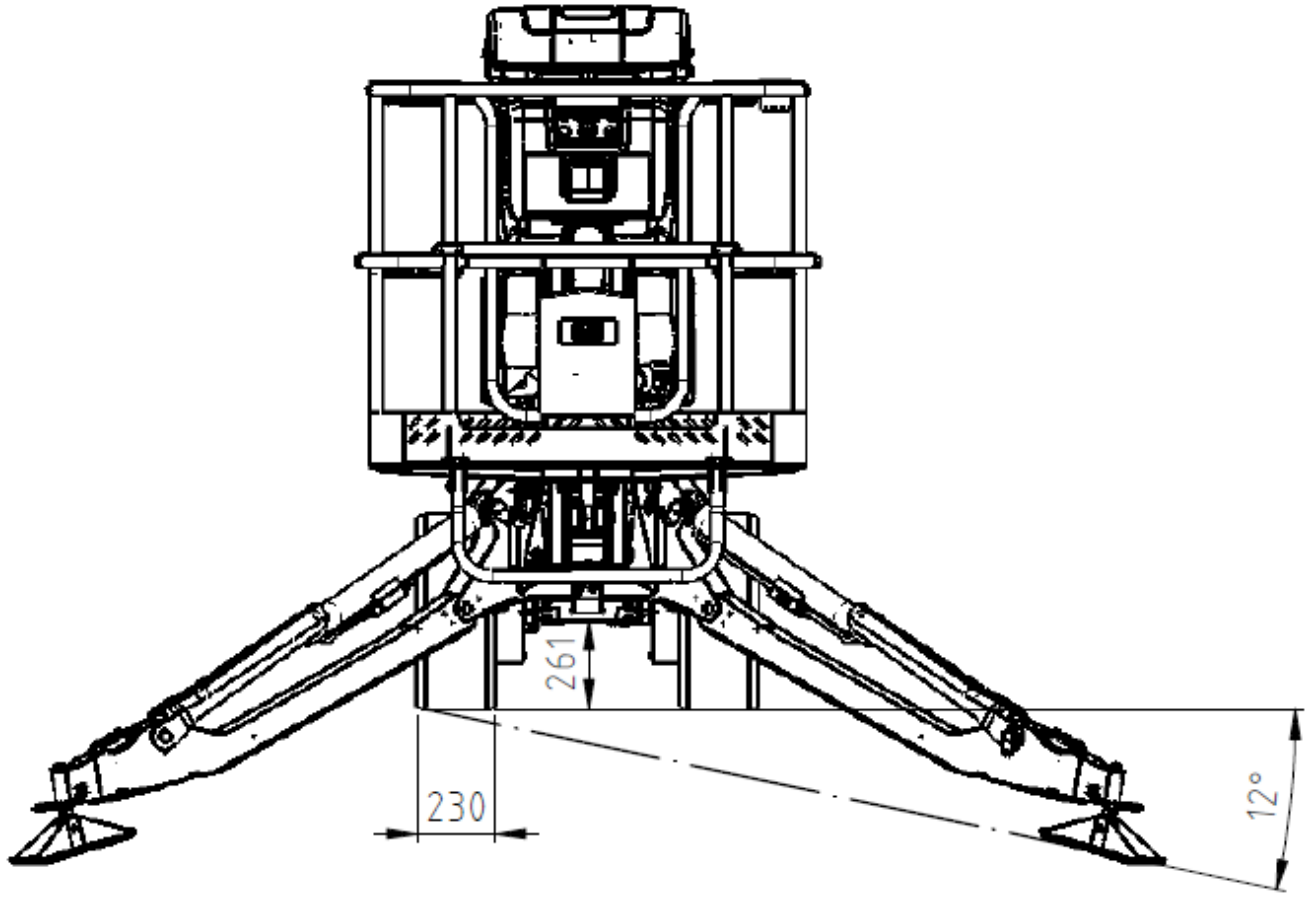


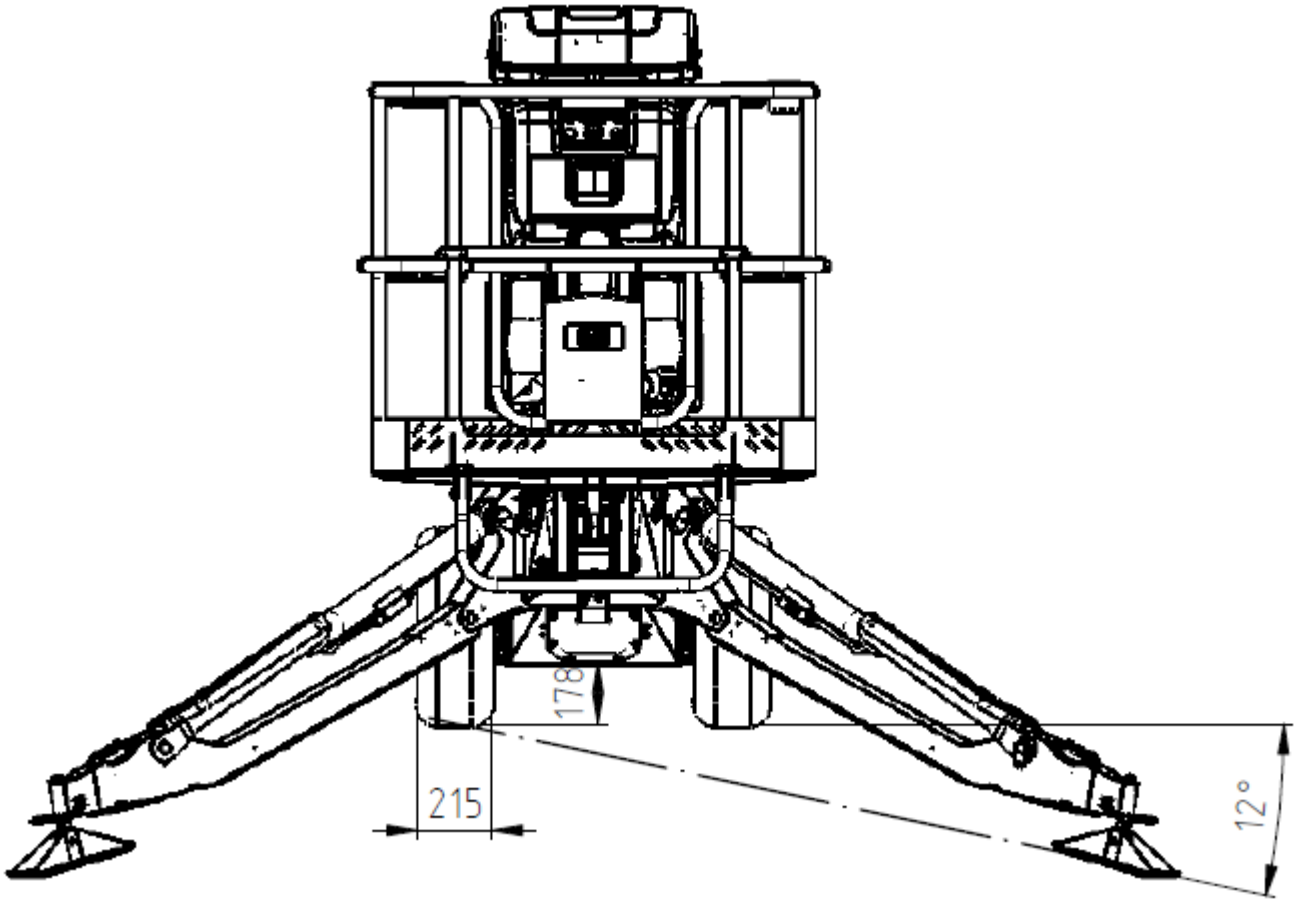
3. TECHNICAL SPECIFICATION, LEGUAN 135

Working height, safe working load		<140 kg	13,2 m
	SWL	140 - 230 kg	12,2 m
Max. platform height,	SWL	<140 kg	11,2 m
	SWL	140 – 230 kg	10,2 m
Max. outreach,	SWL	<140 kg	6,8 m
	SWL	140 – 230 kg	5,8 m
Safe working load, max.			230 kg
Transport length			4474 mm
Transport length without platform			3754 mm
Transport height		23” tyres	2067 mm
		Tracks	2052 mm
Width		23x8,5-12” tyres	1000 mm
		Tracks	1000 mm
Platform dimensions, W x L, 2 persons			1330 x 750
Slewing			360º
Gradeability			35 % (20,5°)
Support dimensions (outrigger spread)			3130 x 3050 mm
Max. unevenness of set up			1,5º
Max. gradient of slope for set up			19 % (11º)
Weight, depending on equipment			1700 kg (tyres) - 1850 kg (tracks)
Drive system			4WD or rubber tracks
Drive speed			3,5 km/h / 3,0 km/h
Lowest operating temperature			- 20 °C
Starter battery / Electric system			12V
Sound power level at platform controls, L_{WA}			75 dB

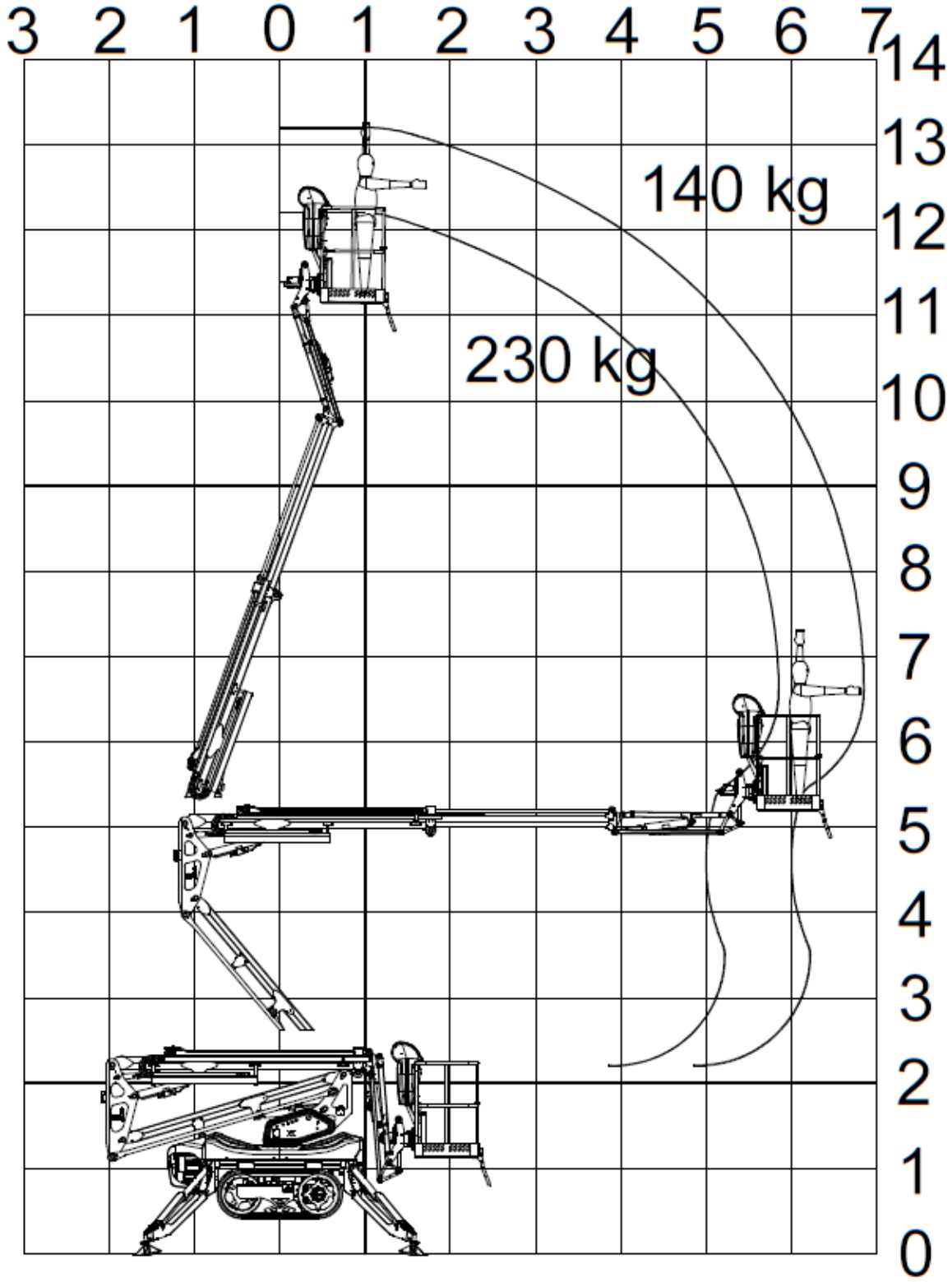

4414
2034
2388
60
1112
2052
25°
21°
387
712
900


4414
2034
2388
60
1112
2067
25°
21°
402
727
800


261
230
12°

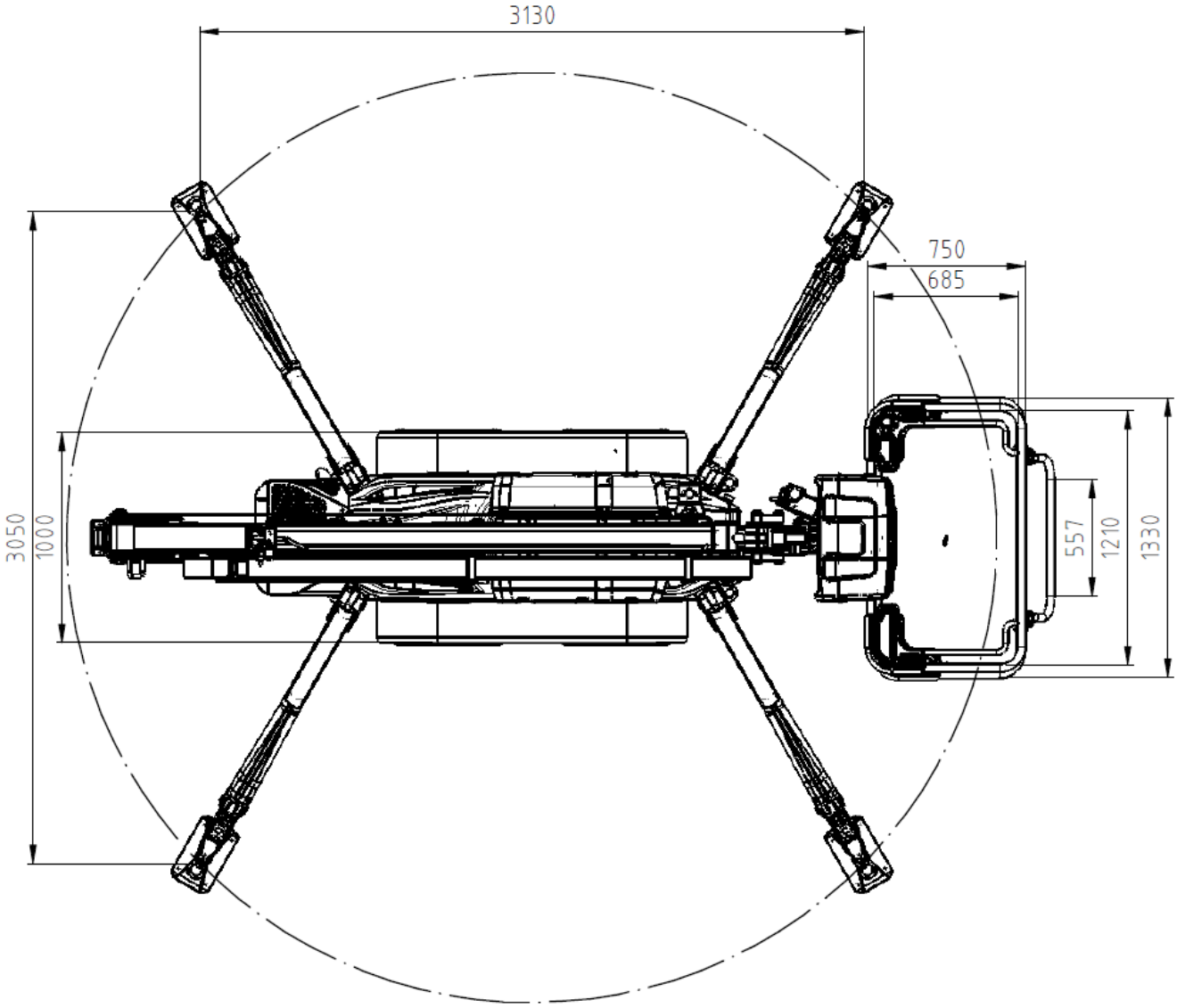

178
215
12°

3.1. Reach diagram



3.2. Set up diagram

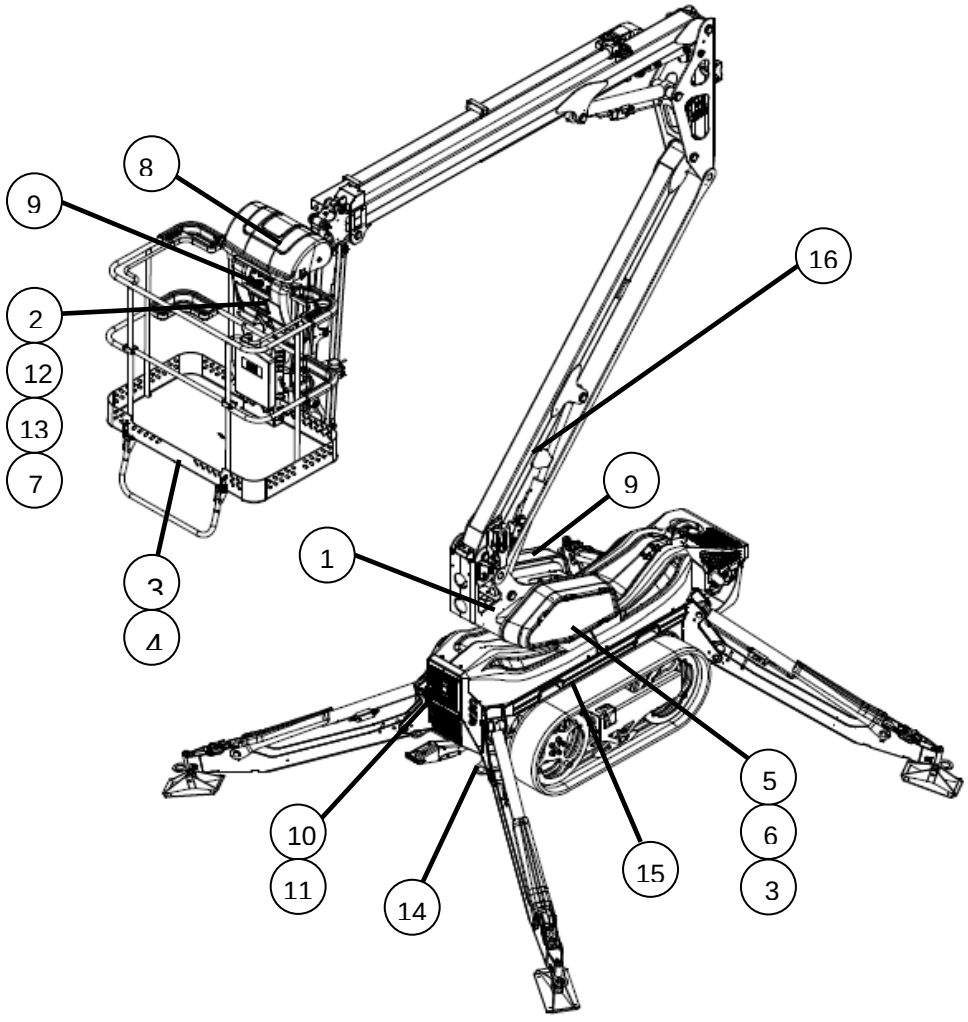
The minimum distances between support points are shown in the picture below.



The minimum dimensions needed to set the outriggers with small outrigger pads are 3650 x 3700 mm (length x width). With large outrigger pads the dimensions are 3800 x 3850 mm (length x width).

4. SIGNS AND STICKERS

1. Type plate and CE marking
2. Reach diagram
3. Safe working load (SWL) and reach diagram
4. Max. horizontal force and wind speed
5. General user instructions
6. Daily inspection
7. Always use outriggers
8. Symbol stickers (pictograms) of controls
9. Emergency lowering
10. Residual current device
11. Voltage of electric motor
12. Max. support force
13. Distance from energized electric wires
14. Tie down points
15. Tyre pressure
16. LEGUAN 135 sticker



5. SAFETY INSTRUCTIONS

The operator must know and follow all safety instructions. The operator must receive sufficient instructions in order to be able to use the lift correctly and safely. This Operators Manual must always be kept in the box on the platform.

ATTENTION!

In order to prevent unpermitted use of the access platform, take the main battery disconnect key that is located on ground level and the engine ignition key, if fitted, with you after ending operation.

CAUTION! DANGER!

THE ACCESS PLATFORM IS NOT VOLTAGE INSULATED. NEVER USE IT NEAR ANY VOLTAGE CARRYING PARTS OR DEVICES. DO NOT DRIVE ANY PART OF THE ACCESS PLATFORM OR PLATFORM CLOSE TO UNINSULATED CABLES OR OTHER VOLTAGE CARRYING PARTS OR DEVICES.

WHEN WORKING WITH THE ACCESS PLATFORM THE OPERATOR(S) MUST ALWAYS WEAR CERTIFIED SAFETY HARNESS WHICH IS PROPERLY CONNECTED TO THE PLATFORM.

5.1. Before starting operation

- All warnings and labels must be read carefully.
- Only persons with min. 18 years of age are allowed to use the access platform. They must have received sufficient operating instructions.
- Operator must know all the functions of this access platform as well as the Safe Working Load, loading instructions and safety instructions.
- If there is heavy traffic in the working area, it must be fenced off widely enough and marked with a fence or with a line. Road traffic regulations must be followed as well.
- Make sure that there are no bystanders in the working area.
- Do not use faulty access platform. Inform about all faults and defects and make sure that they are repaired before starting operation.
- Follow check and service instructions and intervals.
- The operator must check this access platform visually at the beginning of each work shift. This check is necessary in order to make sure that the machine is all right before making the daily inspection prior to starting operation.
- If combustion engine is used indoors, make sure that the ventilation is sufficient.

5.2. Overturning hazard ⚠

- Safe working load, number of persons and additional load on the platform must never be exceeded.
- When wind speed is equal to or greater than 12,5 m/s - 28 mph, the use of the access platform must be discontinued immediately and the platform must be lowered down to transport position.
- Ensure that the access platform is used on dry, solid, level ground only. The ground is solid enough if it can carry min. 3 kg/cm^2. On softer grounds use extra support plates under the outriggers (plate dimensions 400 x 400 mm).
- Do not use a ladder, chair, stool, scaffolding or by any other means try to increase reach capability of this access platform.
- In case the platform has got stuck or jammed, or it is too close to a building or a wall to be moved, do not try to release the platform by operating the controls. All persons must leave the platform first (with the help of a rescue service of fire brigade if necessary), only after that one can try to lower the platform by using the emergency lowering.
- Do not try to increase the area of the platform or the load. Increasing of the area exposed to wind will weaken the stability of the access platform.
- Weight must be equally distributed on the platform. Make sure that additional weight cannot shift on the platform.
- Do not drive on gradients that are steeper than the max. values given for this access platform and for the slope.
- Never use this access platform as a crane or an elevator. This access platform is intended for lifting of the max. allowed number of persons and additional load only.
- Check and make sure that all tyres are in good condition. If the tyres are air filled make sure that there is correct pressure in the tyres.
- In order to ensure the safe operation of this access platform the manufacturer has conducted approved tests for the **LEGUAN 135** in accordance with the standard EN280:2013 : static stability test in accordance with paragraph 6.1.4.2.1 and dynamic overload tests in accordance with paragraph 6.1.4.3 of the EN280:2013.

5.3. Falling hazard ⚠

- The operator(s) must always wear certified safety harnesses when operating this access platform. The harnesses must be connected to the fastening point at platform mounting bracket.
- Do not stretch or reach out over the handrails. Stand steadily on the platform floor.
- Keep platform floor clean.
- Always close the platform gate before starting operation.
- Do not drop or throw any material down from platform.
- It is not allowed to go to or step out from the platform when the booms are lifted.

5.4. Collision hazard ⚠

- Adjust the drive speed so that it is safe with regard to the ground conditions.
- The operator must follow all regulations concerning the use of safety equipment on the work site.
- Make sure that there are no overhead obstacles on the work site that could prohibit lifting of the platform, or objects that might cause a collision.
- Do not operate this access platform in the working area of another overhead lifting device or similar equipment that is moving, unless this lifting device is secured so that there is no risk of collision.
- Beware of crushing hazard when holding the handrail of the platform in an eventual collision situation.
- When operating the machine beware of eventual limited visibility and trapping hazard.

5.5. Electrocution hazard ⚠

- This access platform is not voltage insulated nor protected against contact with voltage carrying parts, or when approaching them.
- Do not touch the machine if it comes in contact with voltage carrying electric line.
- Persons on the platform or at ground level must not touch or operate the platform before power has been cut off from the electric line.
- During welding repairs, it is not allowed to use any part of this access platform as earth conductor.
- Do not use this access platform during thunderstorm or high winds.
  Leave clearance to electric lines, taking into account movements of platform, movements of electric line, and high winds and gusts.

The minimum safety clearances to voltage carrying electric lines are shown in the following table. These clearances must be respected.

VOLTAGE	MIN. DISTANCE
0 – 1000V	2 m
1- 45 kV	3 m
110 kV	5 m
220 kV	5 m
400 kV	5 m

5.6. Explosion / fire hazard ⚠

- It is not allowed to start the motor/engine in a place where one can smell LPG, petrol, solvent or other flammable substance.
- Do not fill with fuel when the engine is running.
- Charge the battery only in places with sufficient ventilation, where there is no open fire or no works which could cause spark emissions (like welding).

In case of fire it is recommended to use a carbon dioxide (CO2) fire extinguisher. A dry chemical extinguisher can also be used to put out a fire, but in this case the access platform must be cleaned and checked carefully and thoroughly, because the dry chemicals are abrasive.

5.7. Daily inspection before starting operation ⚠

- ground
- supports
- horizontal leveling
- emergency stop button
- emergency lowering
- controls
- driving area
- platform
- oil leakages
- working area

ATTENTION! If you note faults or missing equipment on this access platform, do not put it into operation before the faults have been corrected. Never set the access platform up in a place where the ground may be too soft. Beware of soft grounds and potholes in particular.

ATTENTION! If the access platform has been in an accident/has broken down, the operation must be stopped immediately. The functions of the access platform must be checked by Leguan service to make sure that they work properly before starting operation again.

5.8. Using the emergency stop switches ⚠

The emergency stop switches are used by pushing them all the way down in emergency situations, where there is no time to use the normal stopping of the access platform. Such emergency situations are for instance the hazards or accidents caused to the operator or to the access platform.

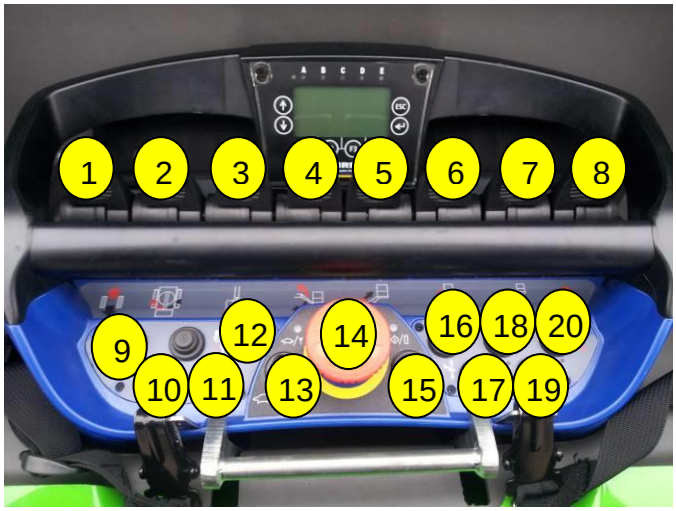
The emergency stop switches stop the engine/electric motor, but the logic of the access platform remains active. The emergency stop switches at ground level and at platform (see 6.1.4 and 6.2.2) are always operational. The emergency stop switch of remote-control can be used in emergency only if the remote-control unit has been selected as active control station. Emergency stop switch is released by turning it.

6. CONTROLS

6.1. Controls at platform

6.1.1 Remote-control switches

Function of the remote-control switches at platform varies somewhat, depending on model. Functions marked as “option” are not available for all models.



1. Control lever, drive, left side
2. Control lever, slewing
3. Control lever, platform rotation (option)
4. Control lever, jib boom
5. Control lever, telescoping boom
6. Control lever, upper boom
7. Control lever, lower boom
8. Control lever, drive, right side
9. Platform tilt up/down switch
10. Drive speed selector switch
11. Drive mode selector switch
12. Engine/electric motor start/stop switch
13. Deceleration switch
14. Remote controllers combined turn off and EMERGENCY STOP switch
15. Remote control start button
16. Left front outrigger switch
17. Left rear outrigger switch
18. Right front outrigger switch
19. Right rear outrigger switch
20. Automatic outrigger set up switch

6.1.2 Optional remote-control switch layout

Optional Scanreco layout has a reduced number of buttons and switches. Some functions have also been modified to simplify the user experience. **Only one drive mode (Easy Drive)** is in use and **boom deceleration cannot be used from the remote-control** (only available at the lower control panel, if installed).

1. Platform tilt up/down switch
2. Engine / electric motor on/off switch
3. Drive speed selector switch
4. Remote control start button

Outrigger and boom switch functions are the same as in 6.1.1 above.

6.1.3 Pairing of remote-control unit

If the wireless controlling isn’t working it is possible to pair the remote control with the receiver in the following way.

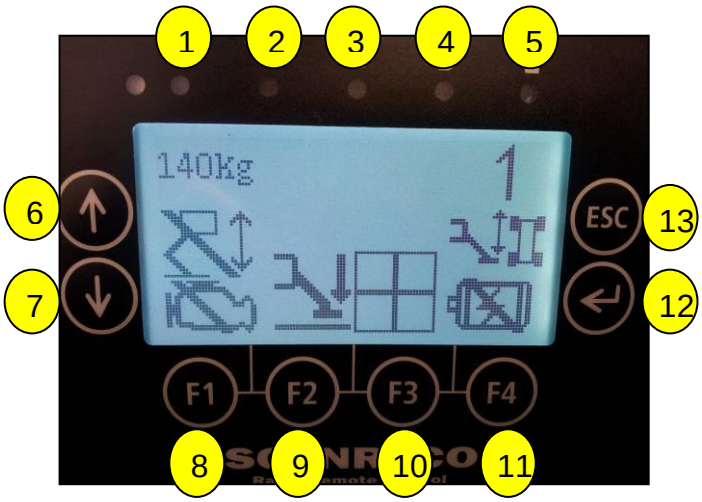
1. Connect the remote control to the cable.
2. Switch on battery disconnect switch of the machine.
3. Switch on the remote-control unit by pushing on its start button and keep the button pushed down until you hear an audible signal from the remote control. After that the remote control goes off.
4. Restart the remote-control unit. It is now paired with the receiver and the wireless control also works.

Attention! The time between switching on the battery disconnect switch and starting of the remote-control unit must not exceed 10 seconds. If the interval is longer, the pairing cannot be done.

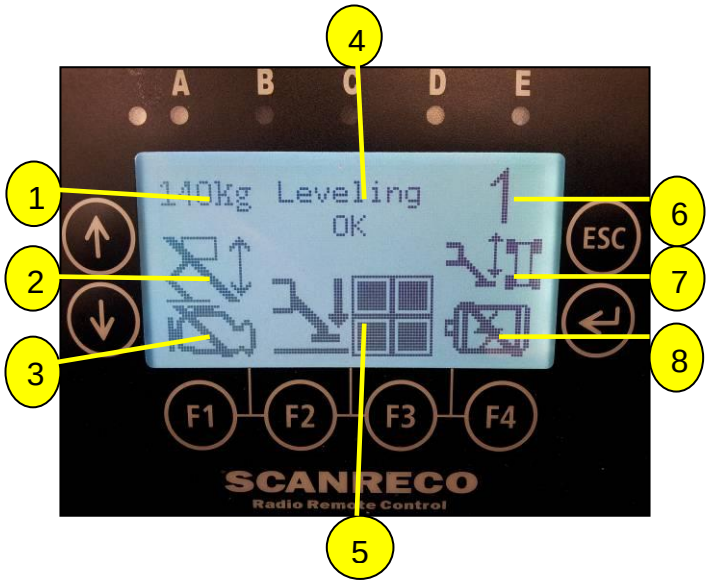
The remote-control unit is equipped with a time-out function. If the remote control is not connected to the cable and the levers nos. 1-8 are not operated during a period of 10 minutes, the remote control will go off to save the battery.

6.1.4 Remote-control display

The symbols and indicators on the remote-control display at platform can vary somewhat, depending on model. Symbols that are marked as option are not available for all models.

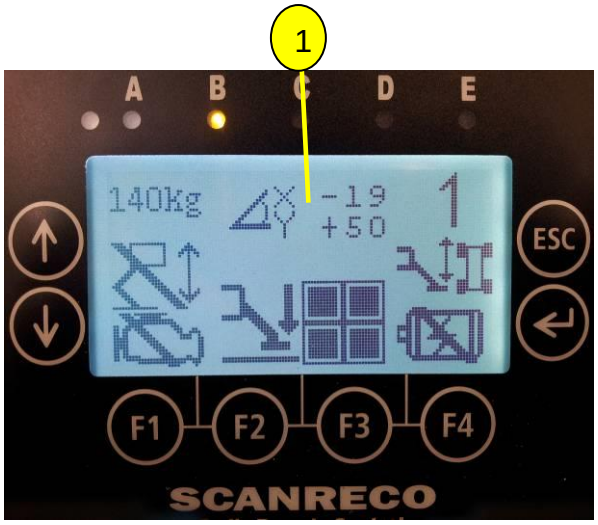


1. Boom operation indicator (green)
2. Inclination warning indicator (orange) (option)
3. Machine battery charge level indicator (orange)
4. Fuel level warning indicator (orange)
5. Overload indicator (red)
6. Main pages browsing upwards / parameter browsing on settings pages
7. Main pages browsing downwards / parameter browsing on settings pages
8. In use only on login and settings pages
9. In use only on login and settings pages
10. In use only on login and settings pages
11. Backlight switch on main pages / otherwise in use on login and settings pages
12. Moving from main pages to login page / page change on settings pages
13. Return to first main page from any page



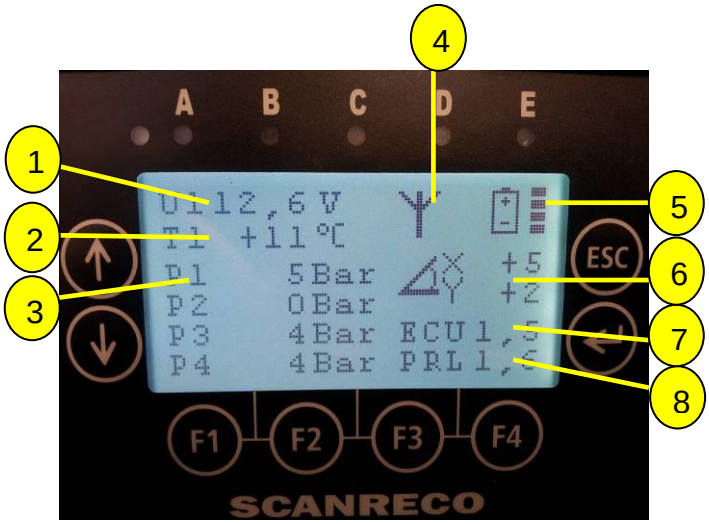
First main page

1. Working area symbol
2. Boom operation allowed symbol
3. Combustion engine symbol
4. Machine is set up within allowed inclination
5. Symbols for outriggers touching the ground. In this field are shown also eventual malfunction codes.
6. Drive speed area (1-4)
7. Drive / outrigger operation allowed symbol
8. Electric motor symbol (option)



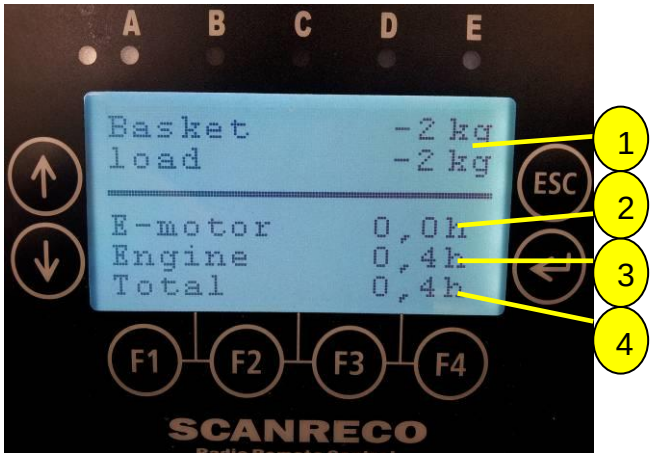
The first main page also shows inclination of the chassis (1) as warning, if it is more than the max. allowed set up inclination. This function is available as an option.

This field also shows a STOP sign if one of the emergency stop switches is pushed down. In addition, this field warns about low battery level of remote-control unit.



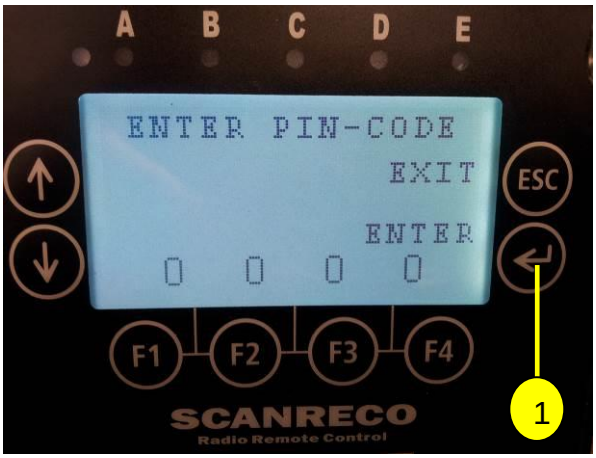
Second main page

1. Voltage of the battery of the machine
2. Ambient temperature sensor reading (option)
3. P1 = pump pressure, P2 = boom pressure (option), P3 = drive pressure (option), P4 = outrigger pressure (option)
4. Radio remote-control symbol
5. Remote-control unit battery charge
6. Chassis inclination, 1/10 degrees (at the picture on left +0,5° and +0,2°)
7. Software version of logic
8. Parameter list version



Third main page

1. Basket load, two channels (in the example picture remote-controller is out of the basket)
2. Operating hours, electric motor
3. Operating hours, combustion engine
4. Operating hours, total electric motor + combustion engine

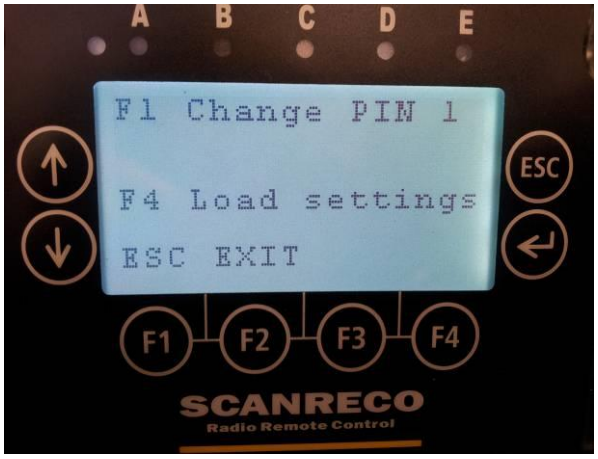


Going to login page happens by pressing on the Enter button (1) on any main page. PIN code is given with the F1-F4 buttons and login is confirmed with Enter button.

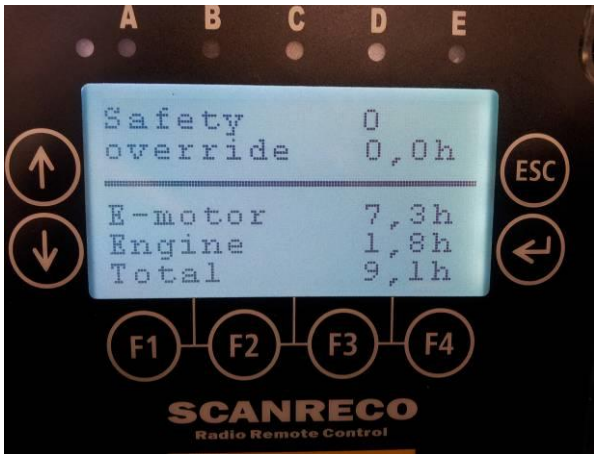
It is possible to change certain parameters on the first service page. The amount of allowed parameter changes depends on the level of the password. Browsing of parameters happens by pressing on the arrow buttons and the active parameters are changed with F1 and F2 buttons. New value is confirmed by pressing on the F3 button. Logout from service page happens by pressing on the F4 button.

Return to main page without logging out from service page happens by pressing on the ESC button. In this case the return to service page happens with the Enter button without the need to give PIN code again. Browsing of service pages happens with Enter button.

User level password (1201) allows changing the parameters of automatic outrigger set up, reaction time of combustion engine for going to idle speed and the temperature unit on the second main page.



On the second service page, with user level password, it is possible to change the password (F1) or reset to factory default values (F4). **After resetting to factory default values the platform load must always be calibrated which can be done by Leguan service**.



The third service page, with user level password, shows engine/electric motor operating hours, number of using of safety functions override switch, and the date of last operation in relation to total operating hours.

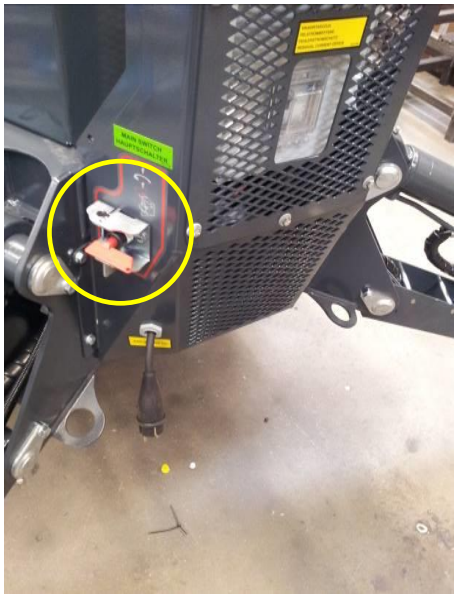
6.1.5 Switches at platform control panel

The switches at platform control panel may vary depending on model. Switches marked as option are not available on all models.

1. Emergency lowering, jib boom
2. Emergency lowering, telescoping boom
3. Emergency lowering, upper boom
4. Emergency lowering, lower boom
5. 12 V outlet
6. EMERGENCY STOP switch
7. Work light switch (option)

6.2. Controls at ground level

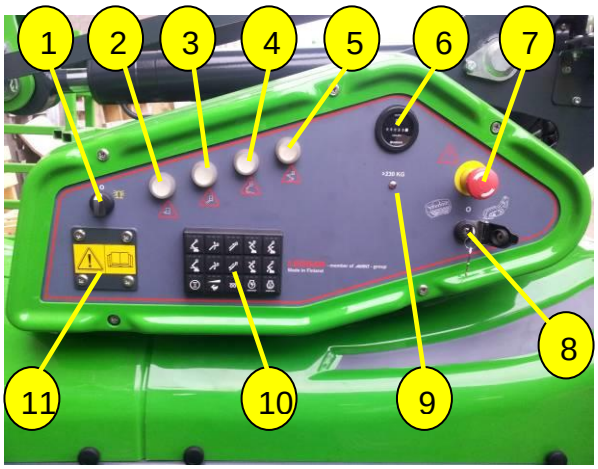
6.2.1 Battery disconnect switch



Battery disconnect switch disconnects the circuit from plus line of the battery. When battery disconnect switch is switched off, all low voltage functions except for emergency lowering and GPS device (option) are switched off.

The battery charger charges the battery also when battery disconnect switch is switched off.

6.2.2 Controls on the connection box at ground level



1. Outrigger blinker indicators switch (option)
2. Emergency lowering, jib boom
3. Emergency lowering, telescoping boom
4. Emergency lowering, upper boom
5. Emergency lowering, lower boom
6. Hour meter
7. EMERGENCY STOP switch
8. Ignition switch, remote controls – 0 – lower controls
9. Overload indicator
10. Lower controls (option)
11. Override switch of safety functions (option, included in lower controls)

6.2.3 Switches at lower controls (option)

1. Slewing
2. Jib boom up/down
3. Telescoping boom out/in
4. Upper boom up/down
5. Lower boom up/down
6. Hold to run switch, ”dead man” switch
7. Speed selector switch, the LEDs on the switch indicate the selected speed area
8. Engine preheater switch (not on petrol engine)
9. Electric motor start/stop (option)
10. Combustion engine start/stop

Operating the lower controls:

1. Turn the ignition switch to lower controls position.
2. When lower controls have been chosen, the engine/electric motor can be started and stopped with the buttons on the lower controls panel
3. Boom movement speed can be selected with the 4-stage switch
4. Boom movements can now be operated – except for platform self-leveling and rotating – with the switches on lower controls panel. The “dead man” switch must be pressed down before boom movement switches will work.

ATTENTION! The EMERGENCY STOP switches at platform and lower controls work always, regardless of the position of the selector switch of lower/upper controls.

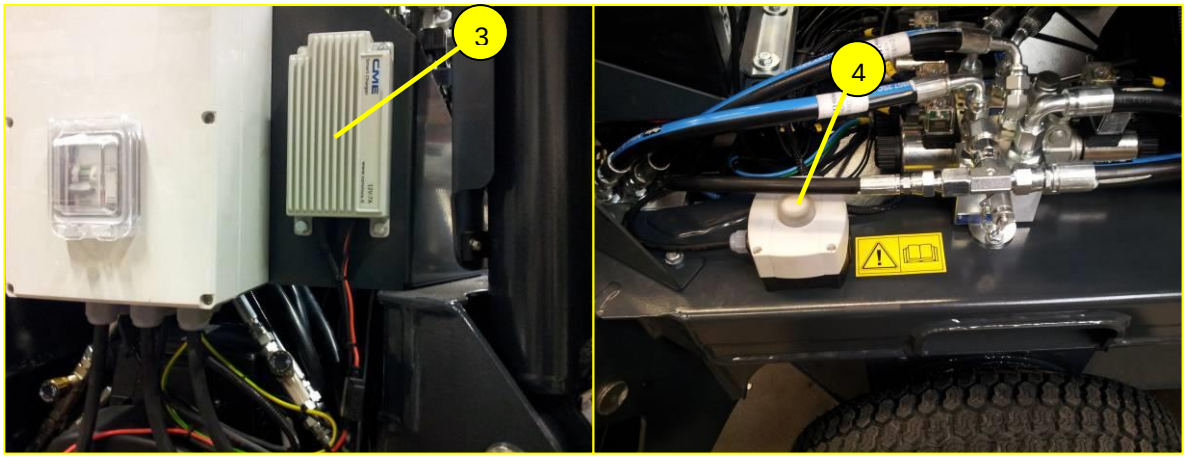
6.2.4 Override of safety functions in emergency situations 

With the override switch of safety functions the emergency stop switch at platform and platform load control can be bypassed. The switch is functional only when lower controls have been chosen. The switch must be kept pressed down all the time. After that lower controls will work normally.

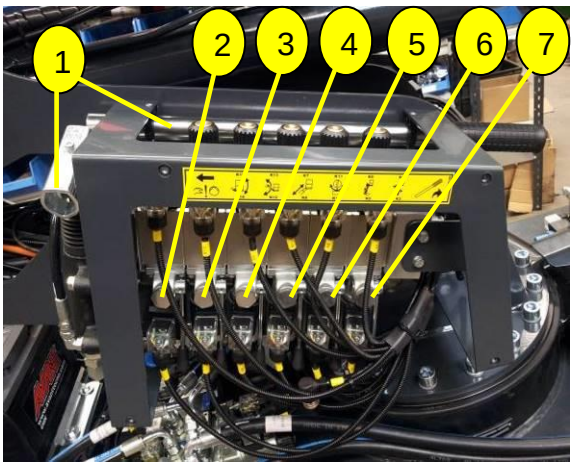
The override switch is intended for extreme emergency situations only, for instance: the operator at platform has passed out and pressed down the emergency stop switch and he must be brought back to ground level immediately for his own safety. When using the override switch it is possible to drive the booms outside the safe stability area, which means risk of overturning of the machine. The manufacturer is not responsible for overturning of the access platform caused by use of the override switch.

6.2.5 230V – connection and switches ⚠

1. 230 V, 50 Hz, 16 A connecting cable.
2. Switch of residual current device. The switch must be in ”ON” position in order that any 230 V device will work, including the 230 V outlets. With the TEST button one can test the function of the residual current device, and also if there is 230V current coming from the network. If the residual current does not go off when pushing the TEST button, it is either defect or there is no current coming from the network (the connecting cable must be connected of course).
3. Battery charger. There are two indicators on the charger which show the charge level of the battery: Yellow indicator on = low charge; Yellow and green indicator on = battery almost fully charged; Green indicator on = battery fully charged / trickle charge
4. Service operation switch. The switch is intended for the use of Leguan service only. It switches on electric motor, when the switch is being pushed down. Allows operation of movements by using the manual control of the valves. A more detailed description on the operation of the switch can be found in the service manual.



6.2.6 Manual pump at pedestal



1. Manual pump and shaft
2. Control valve, platform self-leveling
3. Control valve, jib boom
4. Control valve, telescoping boom
5. Control valve, slewing
6. Control valve, upper boom
7. Control valve, lower boom

Function of the manual pump is explained in chapter 11.

7. STARTING THE ENGINE / ELECTRIC MOTOR

Read carefully this Operators Manual and also the Operators Manual for the engine before starting operation. Read and understand all safety instructions before starting operation.

It is the operator's responsibility to follow all operating and safety instructions.

This access platform is destined for lifting of persons and additional load only. Lifting of materials is unsafe and not allowed.

If several persons are operating this machine during the same work shift, all of them must be trained and they must follow all operating and safety instructions.

1. Turn the ignition switch to desired controls position (at platform/ground level).
2. Switch on the battery disconnect switch.
3. When using the electric motor connect the 230 V cable and check also function of residual current device. With the TEST button you can also check that there comes 230 V to the machine.
4. Make sure that the booms are down in transport position. If necessary, press on the emergency lowering buttons one by one.
5. Check emergency stop switches; release by turning the switch if it is switched on
6. If you are in the basket fasten safety harnesses on the fastening points at platform mounting bracket and close the gate.
7. Start the engine/motor with the switch on the remote-control or with the start button at lower controls.

ATTENTION! The engine must always be stopped with the lever on the remote-control or with the button at lower controls.

7.1. Additional instructions for winter use

The minimum allowed operating temperature for the lifter is -20 °C. Do the actions listed below when the temperature is below 0 °C in addition to the normal actions when starting to use the lifter.

1. Check that the limit switches are free from snow, ice and dirt.
2. If ambient temperature is very low, it may be necessary to use the choke of the combustion engine (manual lever) when starting the engine.
3. Let the engine run for a few minutes before moving the machine.
4. First use driving in full speed with speed selection 1 or 2. After this use outriggers and lastly use boom movements. This way the hydraulic oil circulates through the entire system and warm oil gets to the cylinders.
5. Cover the remote-controller from snow and ice when it isn't used. Remote-controller should be stored indoors when ending the use of the lifter.

8. DRIVE CONTROL

ATTENTION! The machine can only be moved when the booms are down in transport position!

When driving with the machine special attention must be paid to the following things:

1. **Drive on solid and level grounds only**, with sufficient carrying capacity.
2. **Working materials and tools *must be fastened and secured*** against rolling and/or sliding.
3. **Safety harnesses must always be attached to the fastening points at platform mounting bracket** when the engine or electric motor is running if the operator is in the basket.
4. Operate the control levers smoothly, avoid jerky movements.
5. Primary operating position is at the side of the machine.
6. Make sure that booms are in transport position. If the booms aren't firmly on transport support it isn't possible to use drive or drive will stutter. The transport position is detected with a limit switch in the jib-boom's transport support.

Instructions for driving:

1. Turn the ignition switch to remote-control position and start the engine.
2. Make sure that the drive speed area selector switch is in desired position. **Changing of drive speed area is not allowed when the machine is moving!**
3. Make sure that the drive mode selector switch is in desired position (see 6.1.1). When the switch is on the right the traditional skid steer drive is in use, when the switch is on the left the skid steer drive with turning help is in use (Easy Drive) (Drive mode cannot be changed in optional controller layout, see 6.1.2).
4. Driving forward and backward happens by moving the levers of the drive control. By pushing the left lever left side wheels turn forward; by pulling the lever left side wheels turn backward. Right side wheels turn in the same manner by pushing and pulling the right side lever.
5. When skid steer drive with turning help **(Easy Drive)** is in use the right side lever controls drive speed forward/backward, and left side lever controls turning. If only the left lever is moved the machine turns on the spot. Turning of the machine is based on the skid steer principle and the steering characteristics vary depending on ground conditions. Start driving carefully and at low speed. **Easy drive is always in use with optional simplified controller layout (see 6.1.2)!**

Transmission of the LEGUAN 135 is hydrostatic. Each wheel is equipped with a hydraulic motor - the machine is four wheel drive. If the machine is equipped with rubber tracks there are two hydraulic motors in the track system.

If you want to turn the machine on the spot: with traditional skid steer system, push one side control lever and pull the other side control lever to the extreme end position.

ATTENTION! Learn how to drive with the machine at a low speed. Operate the drive control levers with ease in order to avoid abrupt and jerky movements. When driving pay special attention to stability and the dimensions, especially length, of the machine. Do not stand very close to the machine.

8.1. Drive speed selection

The machine is equipped with four different drive speeds. Drive speed is selected with the switch on the remote-control (see 6.1.1). Selected speed is shown on the display (see 6.1.3). The values are as follows:

	Engine rpm	Pumps in use
Value 1	2350	1
Value 2	3600	1
Value 3	2350	2
Value 4	3600	2

In addition, drive speed can be slowed with the deceleration switch (see 6.1.1). The switch is equipped with four positions: full speed and three decelerations. The active deceleration mode is shown with the green LED above the switch. The blinking frequency of the LED indicates the progressivity of deceleration. If the LED does not blink, full speed is selected. The more frequently the LED blinks the slower speed is selected. Slowing down the speed happens by restricting the maximum values of the control levers – that is the logic scales the signal of control lever output to smaller value if the deceleration is in use. The deceleration switch has an effect on drive and boom movement speeds.

8.1.1 Drive speed selection - optional controller layout

If your machine is equipped with the **optional simplified controller layout**, there are only two drive speeds available. Speeds are numbered 1 and 2 in the controller but they are equivalent to traditional drive speed values 2 and 4, respectively (see chapter 8.1).

8.2. Electric drive ramp adjustment

Drive and boom movements are equipped with electric ramps with which the movements start and stop (progressivity of acceleration and deceleration). The ramps can be adjusted by Leguan service at the service page of the remote-control. The ramps are intended to make starting and stopping of the movements smoother.

8.3. Defining the gradient of the slope ⚠

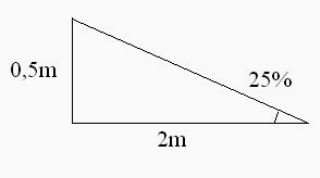
ATTENTION! When crossing slopes always drive up or down the slope, not sideways. If you have to drive sideways on a slope, lower the downhill side outriggers so that they are close to the ground. This prevents the machine from tipping over.

Measure the slope with a digital inclinometer, or do as follows:

Take a water level, a straight piece of wood at least 1 m long, and a pocket tape measure.

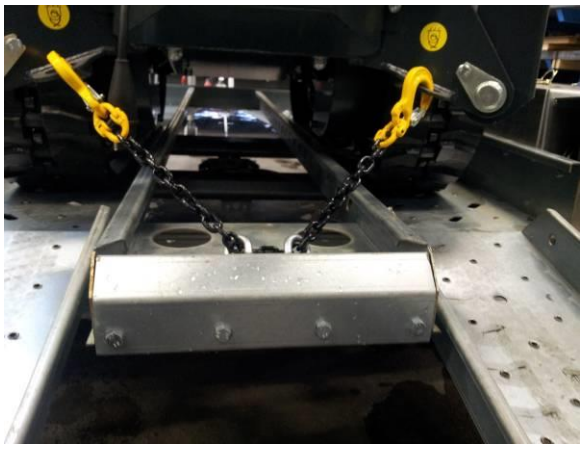
Put the wood stick on the gradient. Put the water level on the lower edge of the stick and lift the stick until it is in horizontal position. Keep the stick level and measure the distance from the lower end of the stick to the ground. Divide the distance (height) by the length of the wood stick (distance) and multiply the result by 100.

Example:
Wood stick length = 2 m
Height = 0,5 m
(0,5 ÷ 2) x 100 = 25 % slope

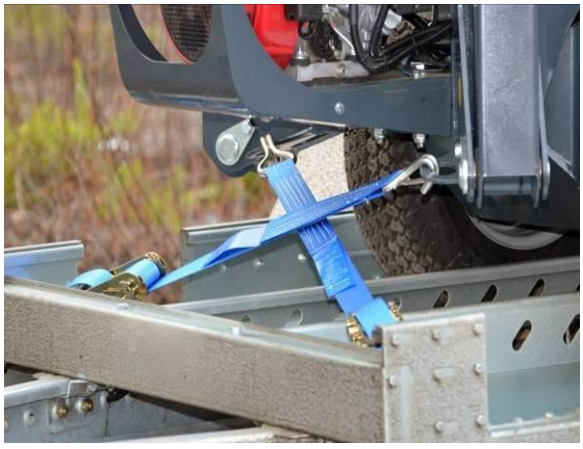


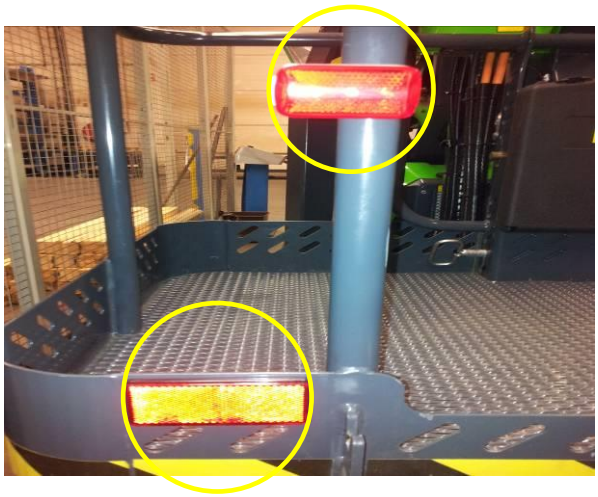
8.4. Driving the lift on trailer

There is a trailer available, specifically designed to transport the Leguan. The trailer must be fastened to the tow car when loading the machine on the trailer. Drive the machine on trailer with nose first with remote-control from the side of the machine and make sure that the lift is in the middle of the trailer in lateral direction. The rear of the lift is tied down with chains (picture on the right). The chains are tightened by driving the lift forward and by ensuring that the front of the lift doesn't rise up. The height from ground to the top of the tow hitch should be about 410 mm while loaded so that the trailer tongue weight is correct.



Drive the machine a bit so that the chains are tight, this way the machine settles in right position on the trailer. Tie down the front with belts in cross (picture on the right).





As the rear of the lift extends over 1 m over the rear of the trailer, a reflector and red light must be mounted on the platform (picture on the left). The reflector is sufficient on daylight, but the red light is mandatory when it is dark.

8.5. Crawler track chassis

General information and lifespan of rubber tracks
An access platform with skid steer chassis, equipped with crawler track chassis, offers many advantages compared when driving on soft terrain. However, certain things regarding working and working environment must be taken into account with an access platform on tracks.

In order to secure the maximum life expectancy for the rubber tracks and crawler track chassis follow the instructions below.

The lifespan of the track system of an access platform on rubber tracks is heavily dependent on the working environment and the way of working. The operator can increase the lifespan by following the below mentioned operating and maintenance instructions. If the access platform is being used in terrains with stones or gravel, on demolition sites where there is concrete, or in an environment with scrap metal, the lifespan of the track system can be significantly reduced. Because of this damages on the tracks, track rollers or crawler track chassis, caused by operation in such environments, are not covered by warranty.

Bolts of the rear sprocket
It is important to check tightening of bolts on the rear sprocket about 2 days after putting the access platform into operation. When driving with a new machine the parts in the track system adapt to each other and ”find their place” so to say. Because of this it is possible that the bolts loosen during operation. Loose bolts can cause serious damage to the crawler track chassis.

- Tighten the bolts first to 300 Nm diagonally opposite.
- After that retighten immediately to 355 Nm final torque diagonally opposite.
- It is recommended to check tightness of bolts once a week.

8.5.1 Instructions for working environment

In order to increase the lifespan of the track system, avoid driving on the following terrains or work sites:

- **Environments with crushed stone, iron bars, scrap metal or similar recycling material.** Rubber tracks are not designed for this kind of environments.
- **Daily / continuous driving on asphalt or concrete.** Continuous operation on these surfaces will shorten the lifespan of rubber tracks.
- **Work sites with sharp objects, like broken stones or concrete waste.** This kind of sharp objects can cut or damage the rubber tracks permanently. Conditions which can damage tyres can also damage rubber tracks. Damaged tracks can normally not be repaired, they must be replaced. Warranty doesn't cover tracks that get damaged in this kind of conditions.
- **Work sites with corrosive substances (fuels, oil, salt or fertilizers).** Corrosive substances can oxidize the metal parts in rubber tracks. If such substances come in contact with the surface of the rubber track, the tracks must be flushed with water immediately after ending operation.

8.5.2 Operating instructions

- **Check track tension regularly.** Too loose tension can make tracks jump off the sprockets. Do not over-tension the tracks, because this causes big power loss and excessive wear on the sprockets and tracks.
- **Change turning direction as often as possible.** Turning continuously only in one direction will cause uneven wear of the sprocket and the rubber track.
- **Check condition of the track system regularly.** Excessive wear on the rollers, idlers, sprockets and bearings can damage the tracks.
- **Avoid driving sideways on a gradient.** Always drive the slopes straight up and down, and turn on flat even surface only. Continuous operation on uneven terrains or driving sideways on a gradient causes wear in the track guides and rollers and makes tracks jump off the sprockets.
- **Avoid continuous sharp turns.** By making wider and more gentle turns you can avoid unnecessary wear of the tracks and/or tracks jumping off the sprockets.
- **Avoid driving with one track on level surface and one track on a gradient.** Always drive on an even surface. If the tracks bend continuously from the inside or from the outside during operation, the metal structure of the tracks can break.

9. OPERATION OF THE OUTRIGGERS

Lifting of the booms without setting down the outriggers is never allowed!

When setting down the outriggers the maximum allowed inclination of the chassis is 1.5°. With automatic leveling it is possible to level the machine within one degree. With the water level it is possible to level the machine within 0.5°.

Drive the outriggers down to support position with automatic leveling as follows:

1. Turn the ignition key to remote-control position and start the engine.
2. Outriggers are deployed and the machine is leveled with the automatic leveling switch. Automatic leveling system drives the outriggers down two at a time. Make sure that the ground under all four outriggers is solid enough – put extra plates on the ground under the outrigger feet if necessary. When all four outriggers are on the ground, the system reduces engine revs and starts leveling. The logic deploys all four outriggers first, in order that the wheels (or tracks) lift off the ground. After that the logic checks inclinations and deploys the outriggers more if necessary so that the chassis becomes level. When the logic detects that the chassis is level, it stops deploying the outriggers and sets engine revs to idle.
3. **The operator must always make sure that all four wheels (or both tracks) are lifted off the ground!** If all four wheels are not lifted off the ground, the outriggers can be deployed further with the automatic leveling switch.
4. **The horizontal position of the lift must also be double checked with the water level** which is mounted on the pedestal on the left side (picture below). **It is not allowed to lift the boom if the machine is not level!**
5. After the machine has been leveled correctly, there will be the ”Leveling OK” text on the first page of the display.
6. If the leveling wasn’t successful lower down the machine and start automatic leveling from the beginning or alternately use manual leveling.

Drive the outriggers down to support position manually as follows:

1. Turn the ignition key to remote-control position and start the engine.
2. Deploy the outriggers by using the outrigger control levers on the remote-control. It is possible to deploy only one outrigger at the time but it is recommended to deploy two outriggers (front or rear) at the same time. Make sure that the ground under every outrigger is solid enough – put extra plates on the ground under the outrigger feet if necessary.
3. Drive the outriggers down on the ground firmly enough. They must be driven down so much **that all wheels/tracks lift off the ground!** (Usually it is not necessary to push the outriggers further unless it is necessary to reach higher). Make sure that the wheels do not touch the ground before starting to lift the booms.
4. When all outriggers are firmly on the ground and wheels lifted off the ground, check the horizontal position of the lift with the water level which is mounted on the pedestal on the left side. **It is not allowed to lift the booms if the machine is not level!**
5. After the machine has been leveled correctly, there will be the “Leveling OK” text on the first page of the display.

The set up diagram can be seen on chapter 3.2.

Setting the outriggers towards a vertical wall is strictly forbidden!

The booms must be in transport position before driving the outriggers up!

ATTENTION! If there is the text “Leveling OK” on the display when the outriggers are not correctly deployed, the operation of this access platform is not allowed! Contact nearest Leguan service!

10. OPERATION OF THE BOOMS

Before starting to lift the booms:

1. Make sure that all four outriggers are on solid ground, wheels/tracks are lifted off the ground, the machine has been leveled correctly and there is the text “Leveling OK” on the display.
2. When using the remote-control, the control unit should be put on its place at platform. The control unit can also be connected to the cable and then it doesn’t have to be in its place, even though it is recommended.
3. Boom movements are operated with the control levers on the remote-control unit.
4. When the symbol “230 kg” is on the display, the telescopic boom is within the restricted outreach area. Thus, the telescopic boom hasn’t come out more than about one meter. If the ”140 kg” symbol is on the display, the telescopic boom is on the full outreach area – in this case the telescopic boom is out more than one meter. LEGUAN 135 is also equipped with an overload control system which prevents boom movements in case the 230 kg safe working load is exceeded, or in case the telescopic boom comes out more than allowed when load on the platform is over 140 kg. Should this happen, there is an audible warning signal, a red blinking LED and a symbol on the display. The booms can be operated again after the overload has been removed from the platform.
5. Boom slewing is disabled when the booms are in transport position.

ATTENTION! If there is more than 140 kg load in the basket and the green strip on the telescopic boom comes out more than 200 mm, operation must be stopped immediately and Leguan service must be contacted. RISK OF TIPPING OVER!

Thanks to the electric controls boom movements are very smooth, exact and stepless. Operate the control levers with ease and without hesitation – learn to operate the booms precisely.

Platform self-leveling system keeps the bottom of the platform automatically level.
ATTENTION! If the level position of the platform must be adjusted – for instance in case the machine has not been used for a long time and the platform has tilted – operate the control lever of platform self-leveling carefully, especially when the booms are up.

ATTENTION! Always lift the lower boom first from transport support before operating other movements. When lowering the booms make sure to drive them straight down to transport supports. It is possible to damage the machine with the jib boom if the booms aren’t lowered straight down to transport supports. It is recommended to use the lower boom as the last movement when lowering the booms to transport position.

Boom movement speed can be slowed with the deceleration switch (see 6.1.1). The switch is equipped with four positions: full speed and three decelerations. The active deceleration mode is shown with the green LED above the switch. The blinking frequency of the LED indicates the progressivity of deceleration. If the LED does not blink, full speed is selected. The more frequently the LED blinks the slower speed is selected. Slowing down the speed happens by restricting the maximum values of the control levers – that is the machine scales the signal of control lever output to smaller value if the deceleration is in use. At lower controls the deceleration mode is shown with the LED indicators of the deceleration switch (see 6.2.3). The deceleration switch has an effect on all movement speeds.

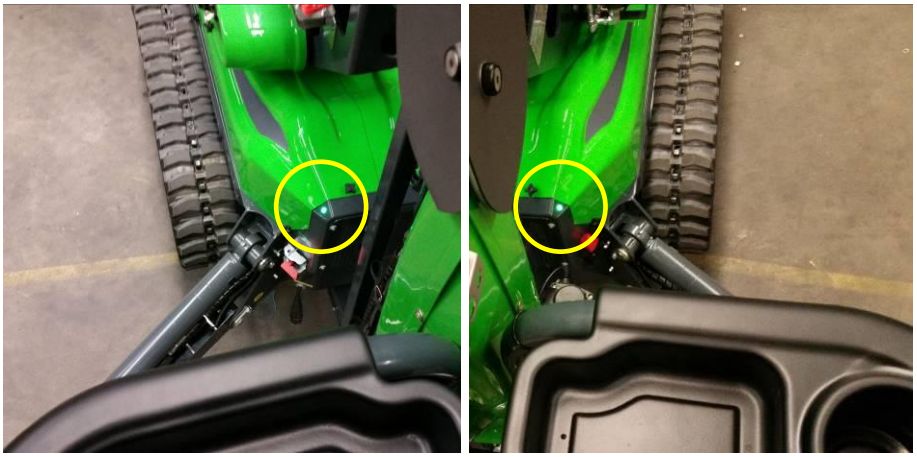
10.1. Boom deceleration

Boom movement speed can be slowed with the deceleration switch (see 6.1.1). The switch is equipped with four positions: full speed and three decelerations. The active deceleration mode is shown with the green LED above the switch. The blinking frequency of the LED indicates the progressivity of deceleration. If the LED does not blink, full speed is selected. The more frequently the LED blinks the slower speed is selected.

Slowing down the speed happens by restricting the maximum values of the control levers – that means the machine scales the signal of control lever output to smaller value if the deceleration is in use. At lower controls the deceleration mode is shown with the LED indicators of the deceleration switch (see 6.2.3). The deceleration switch has an effect on all movement speeds.

10.2. Boom rotation indicator

The center position of the boom rotation can be identified from two green LED lights on the back end of the chassis. You can see the LEDs from both sides of the control box in the platform (picture below). LED lights are on when the main power switch is switched on and the booms are in center position (NOTE: Boom rotation sensor and LED lights have been fitted on lifts manufactured in November 2015 or later).



11. EMERGENCY LOWERING ⚠

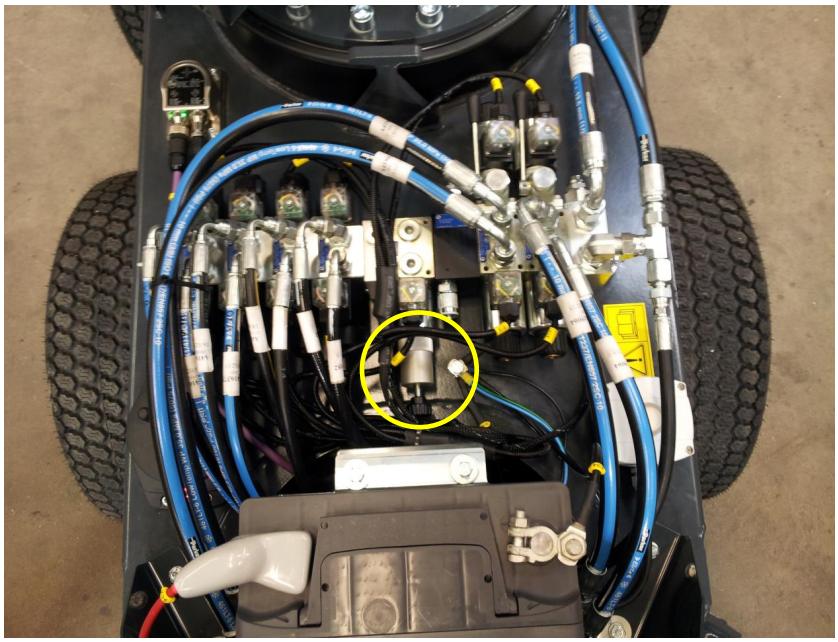
If the power supply for some reason cuts off (e.g. no fuel or electricity cuts off, or connecting cable fails) the booms can be lowered as follows.

1. The lift is equipped with an electric emergency lowering system. There are emergency lowering buttons both on the platform and at ground level. **By pushing the button the selected boom comes slowly down as long as the button is being pushed.** Emergency lowering takes it power directly from the battery – it is not dependent on the position of the main switch. Emergency lowering valves are protected with a 10 A fuse which is located in the connection box at ground level.
2. Use the telescopic boom emergency lowering first. The telescopic boom emergency lowering works only if the upper boom is in upright position. Having the jib boom in upright position also helps the use of telescopic boom emergency lowering. After the telescopic boom emergency lowering use the jib boom emergency lowering. After this use lower boom emergency lowering and last the upper boom emergency lowering. Before lowering the booms to transport supports always make sure that they are properly aligned and going straight down to transport supports. If necessary, the booms can be rotated by using the manual pump mentioned in paragraph 6.2.6.

Always check function of emergency lowering before starting operation.

All hydraulic functions of the access platform can be operated with the manual pump, which works as follows:

1. Remove the plastic cover panel on the right side of the pedestal.
2. Mount the shaft on the pump.
3. All hydraulic functions of the machine can be operated by using the manual pump and the control levers of the valves.
4. When operating the outriggers see to it that their common proportional valve (picture below) is moved in closed position in order that the outriggers can be moved. Remember to return the valve to open position after use.



12. ENDING AN OPERATION

When ending operation:

1. Lower the booms down to transport position.
2. Lift the outriggers completely up to transport position.
3. Stop the engine/motor with the remote-control start/stop switch. Turn off the remote control from its emergency stop switch. Lock the control unit in its place on the platform or take the unit with you. In cold conditions take the remote-control to a warm and dry storage.
4. Remove safety harnesses from the platform and take them with you (harnesses must be kept in their place and in their box/package).
5. Move the ignition switch to 0 position and take the key with you. Move the main disconnect switch to vertical position and take the key with you or lock it in its position.
6. Close fuel valve (see also engine operator's manual).
7. If the machine stays in a place where it can be connected to 230 VAC mains current, it is recommended to connect it, in order to charge the battery (e.g. overnight).

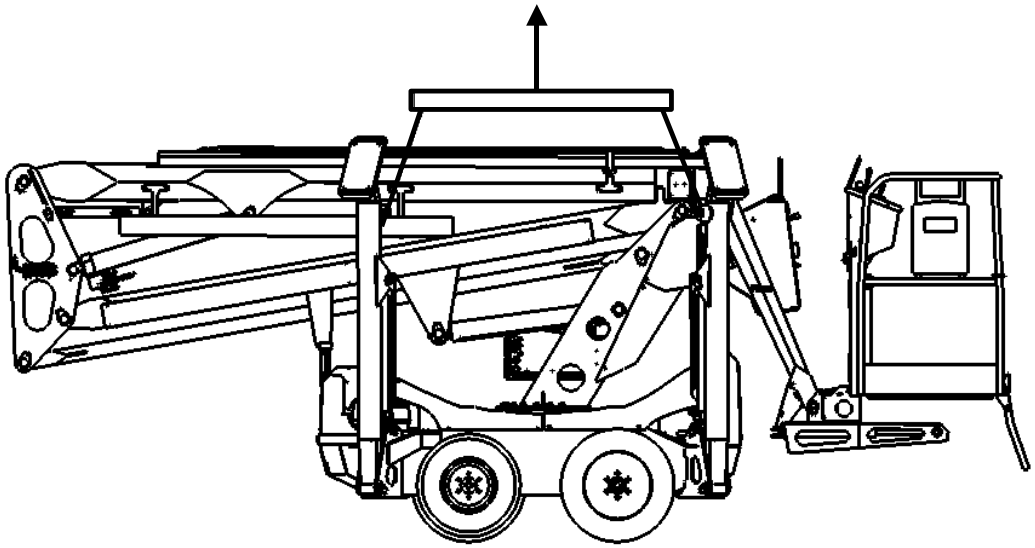
ATTENTION! Prevent unauthorized use of the access platform!

13. TRANSPORTING INSTRUCTIONS

Lower the booms down to transport position and lift the outriggers completely up to transport position.

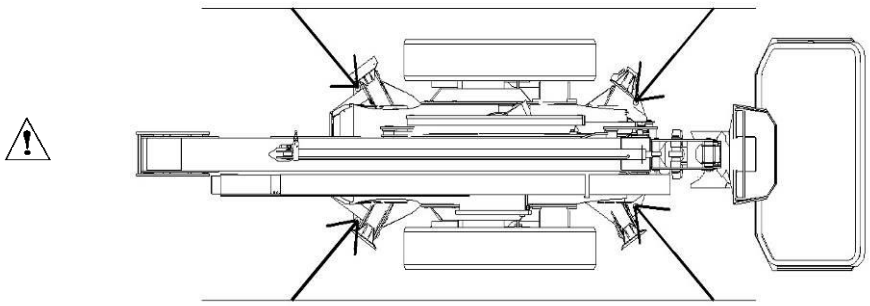
ATTENTION! Transporting of the access platform is allowed in transport position only. No persons or materials are allowed to be transported on the platform.

There are lifting holes for a forklift on the chassis. The outriggers are equipped with lifting points from which the machine can be lifted if necessary. When lifting, it is advisable to use a lifting beam where the ropes are mounted, in order that the outriggers will not get damaged.



There is an automatic hydraulic brake in the rear axle which engages automatically when the engine/motor is not running.

If the machine is transported on a trailer or on a lorry or similar vehicle, it must be tied down properly. There are four tie-down points marked on the corners of the chassis which make it easy to tie down the machine. Always tie the machine down diagonally from every corner. The tie-down to Leguan trailer is shown in the paragraph 8.4.



ATTENTION! It is not allowed to tie down the machine so that the ropes go over the booms. Only marked tie-down points can be used!

ATTENTION! Before longer transports close the fuel valve of the petrol engine in order that engine oil and petrol cannot mix and cause misfiring of the engine.

14. SERVICE, MAINTENANCE AND INSPECTION REGULATIONS

This access platform must be inspected once a year. The inspection can be done by a qualified person only. Persons who conduct periodical services shall familiarize themselves with the operation and technical features of this access platform before doing any service operations. All service and maintenance operations must be made in accordance with the instructions in this manual. If the access platform has not been used for a longer period of time, oil levels must be checked first and made sure that the machine functions correctly before starting operation.

14.1. General instructions

- It is not allowed to make any changes on the construction of the machine without written permission from the manufacturer.
- All defects that may have an effect on the safe use of this access platform must be repaired before starting operation.
- Only professional persons are allowed to open the covers and handle the electric etc. components. Risk of serious injury!
- Make sure that services are made in accordance with this Operators Manual and with the Service Manual of the engine manufacturer.
- Stop the engine before starting any service or inspection operation, DISCONNECT ALSO THE 230 V MAINS CURRENT.
- Do not smoke during service and inspection operations.
- Keep the machine and especially the platform clean.
- Make sure that the operating instructions are complete, readable and in their place in the box at the platform.
- Make sure that all stickers are in their place and readable.
- Make sure that the access platform is serviced.
- Make sure that the checks according to the local regulations are done.

ATTENTION! All spare parts – especially electric components and sensors – must be original Leguan parts.

Always remember when handling the battery:

- Battery contains corrosive sulfuric acid – handle the battery with care! When handling the battery wear protective clothing and eyewear.
- Avoid contact with clothes or skin; if electrolyte gets on your skin or clothes flush with a lot of water.
- In case of contact with eyes, flush with a lot of water for at least 15 minutes and call a doctor immediately.
- Do not smoke when handling the battery.
- Do not touch the battery terminals or cables with tools that may cause spark emissions.
- In order to avoid spark emissions always disconnect the (-) cable first and connect it last.

Handling of fuel and oil products:

- Do not let any oil leak on the ground.
- Use oil qualities recommended by the manufacturer. Do not mix different oil types and/or brands with each other.
- When handling oil always wear appropriate protective equipment.

- Before refueling always stop the engine/electric motor and disconnect from mains current.
- Only use fuels recommended by the engine manufacturer. Do not mix any additives with the fuel.
- If fuel or oil gets into eyes, mouth or open wound, clean immediately with a lot of water or designated fluid and call a doctor.

Check hydraulic hoses and components only when the engine is stopped and with pressure released from the hydraulic system. Do not operate the machine if you have noticed faults or leaks in hydraulic system. Ejection of hydraulic fluid can cause burns or penetrate the skin and cause serious injuries. Consult a doctor immediately if hydraulic fluid penetrates your skin. Wash carefully with water and soap any body part that has come in contact with hydraulic oil. Hydraulic oil is also harmful to the environment – prevent oil leakages. Only use hydraulic oil type approved by the manufacturer.

Never handle pressurized hydraulic components, because in case of failure of a fitting or component ejection of high pressure hydraulic fluid can cause tipping over of the machine and serious injuries. Do not operate the machine if you have noticed a fault in the hydraulic system.

Check hydraulic hoses for eventual cracks and wear. Follow the wear of the hoses and stop operation if the outer layer of any hose has worn out. Check routing of the hoses and adjust the hose clamps if necessary in order to prevent chafing. If there are signs of oil leakage, put a piece of cardboard under the probable leakage place in order to find the leakage.

If you find a fault, operation of the access platform must be stopped immediately and the hose or the component must be replaced. Contact Leguan service.

15. SERVICE INSTRUCTIONS

15.1. Services and checks, maintenance schedule

Regarding the service of the engine see also engine manufacturer's Operators Manual = EM.

CH = Check
CL= Clean
R = Replace
A = Adjust
F = First service at 50 h

Operation		daily	monthly	100 h	200 h / 12 months	400 h / 24 months	1000 h
Engine oil, EM	FR	CH		R			
Air filter, EM			CH /CL		R		
Fuel sediment cup			CH /CL				
Spark plug, EM				CH	R		
Valve clearance, EM							A
Fuel tank and strainer						CL	
Fastening of platform	F	CH					
Hydraulic oil	FR						R
Hydraulic oil level				CH			
Hydraulic oil suction filter							CL
Hydraulic oil filters	FR				R		
Breather cap of the oil tank					CL		
Condition and mounting of the battery			CH				
Locking of bearings and pivot pins	FCH		CH				
Electric wires					CH		
Function of residual current device			CH				
Hydraulic fittings and hoses	F	CH					
Cylinders, load holding & check valves	F	CH					
Function of emergency lowering	F	CH					
Function of emergency stop circuit	F	CH					
Function of set up system	F	CH					
Function of safety devices					CH		
Hydraulic pressure adjustments	FCH				CH		
Function of control valves	F	CH					
Mounting of booms on the chassis			CH				
Condition of steel construction			CH				
Movement speeds of booms	F		CH		A		
Greasing of the machine			R				
Function of load control system	F			CH	A		
Level position of water level	F		CH				

Tightening torque of the M16 fastening bolts of the slewing ring is 210 Nm – torque must be checked once a year and bolts must be changed every 10 years.

Hydraulic oil:	Fuchs Hydraulic Oil 131 HP, (Mineral based hydraulic oil, made for Nordic conditions. Without zinc. Operating temperature -45^0 – 65 °C. Vickers 104 C IP 281/80, FSD 8401)	
Hydraulic system oil volume:	oil tank approx. 25 l, complete system approx. 40 l	
Engine:	See engine manufacturer's manual	
Grease:	Litium NLGI 2 grease (not MoS2), slewing ring with grease containing EP (extreme pressure) additive	
Hydraulic pressure settings:	drive	275 bar
	outriggers	200 bar
	booms	200 bar
	boom slewing	120 bar
	double pump	110 bar
	electric motor	210 bar
	brake release	30 bar
Tyre pressure (cold, max):	23*8.50-12 grass profile	3.0 bar (79 PSI)
	23*8.50-12 TR profile	3.0 bar (49 PSI)
	Leguan TeHo 2014 -trailer	2.9 bar (42 PSI)
	Leguan TeHo 2015 -trailer	4.4 bar (65 PSI)

Do not exceed the maximum inflation pressure marked on the tyres!

Wear pads on the telescopic boom must be checked every 5 years max.

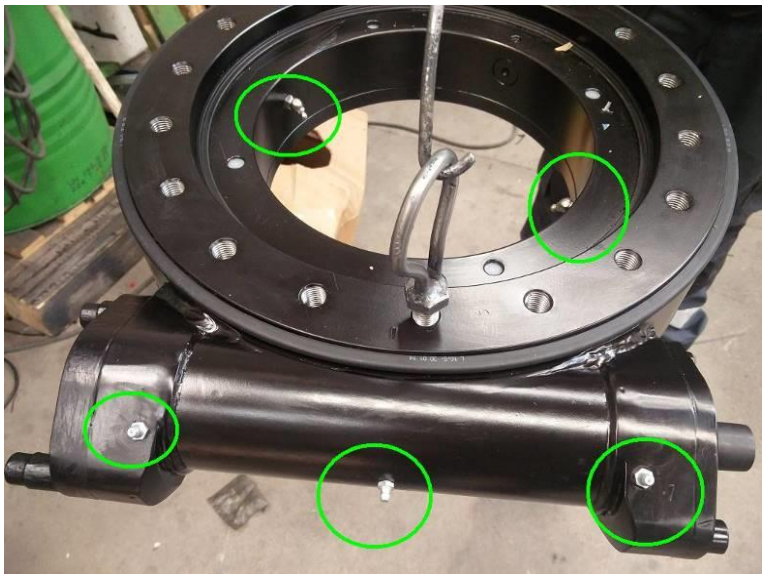
Above mentioned service intervals are recommendations. If the operating conditions are very hard and/or the machine is in heavy duty use the service and change intervals must be shortened.

15.2. Greasing of the machine

Greasing of the machine is of utmost importance in order to prevent wear in joints. Most of the joints are service free - however the slewing ring must be greased in accordance with the maintenance schedule, using grease that contains EP (extreme pressure) additive (see next page). Outrigger bearings and articulation bearings in all hydraulic cylinders must be greased in accordance with the maintenance schedule.

Greasing of the Slewing Ring

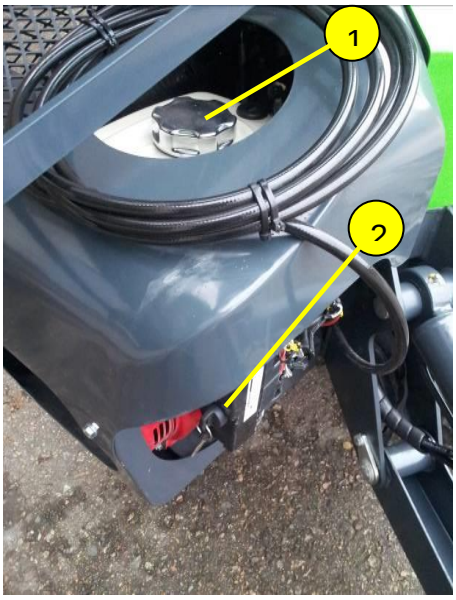
The lift's Slewing Ring must be greased monthly, according to the maintenance schedule. It is important to notice that the Slewing Ring has five (5) separate greasing points (Picture below) which all must be greased individually. The grease nipples on the outside of the Slewing Ring are connected to the gear and its bearings. Two (2) grease nipples on the inside of the Slewing Ring are connected to the Ring's ball bearings. Easiest way to apply grease on these two grease nipples is through the opening on the pedestal.



Slewing Ring's five (5) greasing points. The ring pictured from above.

Greasing the slewing ring through the pedestal (2 grease nipples), pictured from the front.

15.3. Handling of fuel and refueling



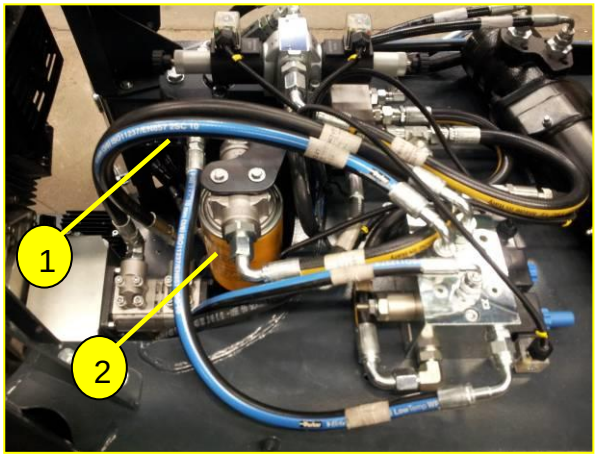
Check fuel level and refuel if necessary (fuel tank, no. 1). Before refueling check which engine: petrol or diesel.

In petrol engine use only fuel defined by the engine manufacturer in the engine Operators Manual.

ATTENTION! Engine ignition switch (2) must be in position “1” in order that the engine will start.

15.4. Hydraulic oil and filter change

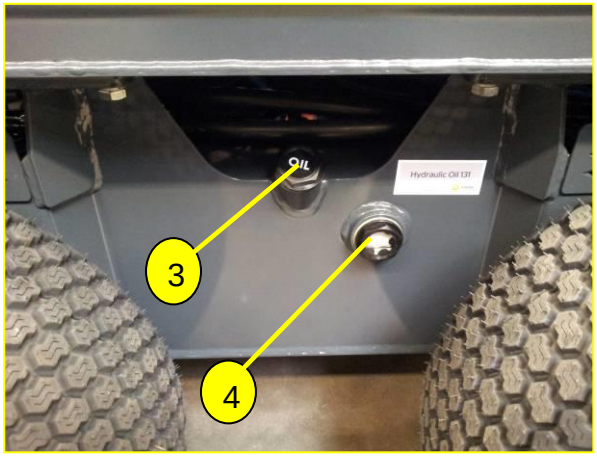
Hydraulic return oil filter (no. 2) is located in the chassis next to the combustion engine. Replace the filter by twisting off the filter cartridge and replacing the filter cartridge with a new one. When changing hydraulic oil, the oil can be removed with a suction pump from the opening of the cork (no. 3), or by opening the drain plug. In both cases it is important to clean the magnetic drain plug.



Hydraulic pressure filter cartridge (no. 1) must be changed always when return filter is changed.

15.5. Hydraulic oil level

Hydraulic oil level can be checked from the visual level indicator on the side of the oil tank (no. 4). Oil level should be in the middle of the indicator when outriggers are completely up and booms down in transport position.



15.6. Battery check

The original batter is maintenance-free. In order to secure the starting and safe operation the battery must be checked regularly. Inspect and clean battery terminals regularly. Check also condition and fastening of battery cables and terminal insulators. Make sure that battery cables cannot chafe against any sharp edges. Check also condition and fastening of battery disconnect switch and cables.

15.7. Check of set up outrigger control system ⚠

Always check the function of the set-up outrigger control system when starting operation.

When the outriggers are lifted up off the ground, this should also be shown with the symbols of outriggers ground contact, on the first page of the remote-control display. That is: all four squares empty. When all four outriggers are on the ground, the squares are black.

ATTENTION! If the set-up control system doesn't work correctly, contact Leguan service. It is not allowed to use this access platform, and the failure/defect must be repaired before starting operation.

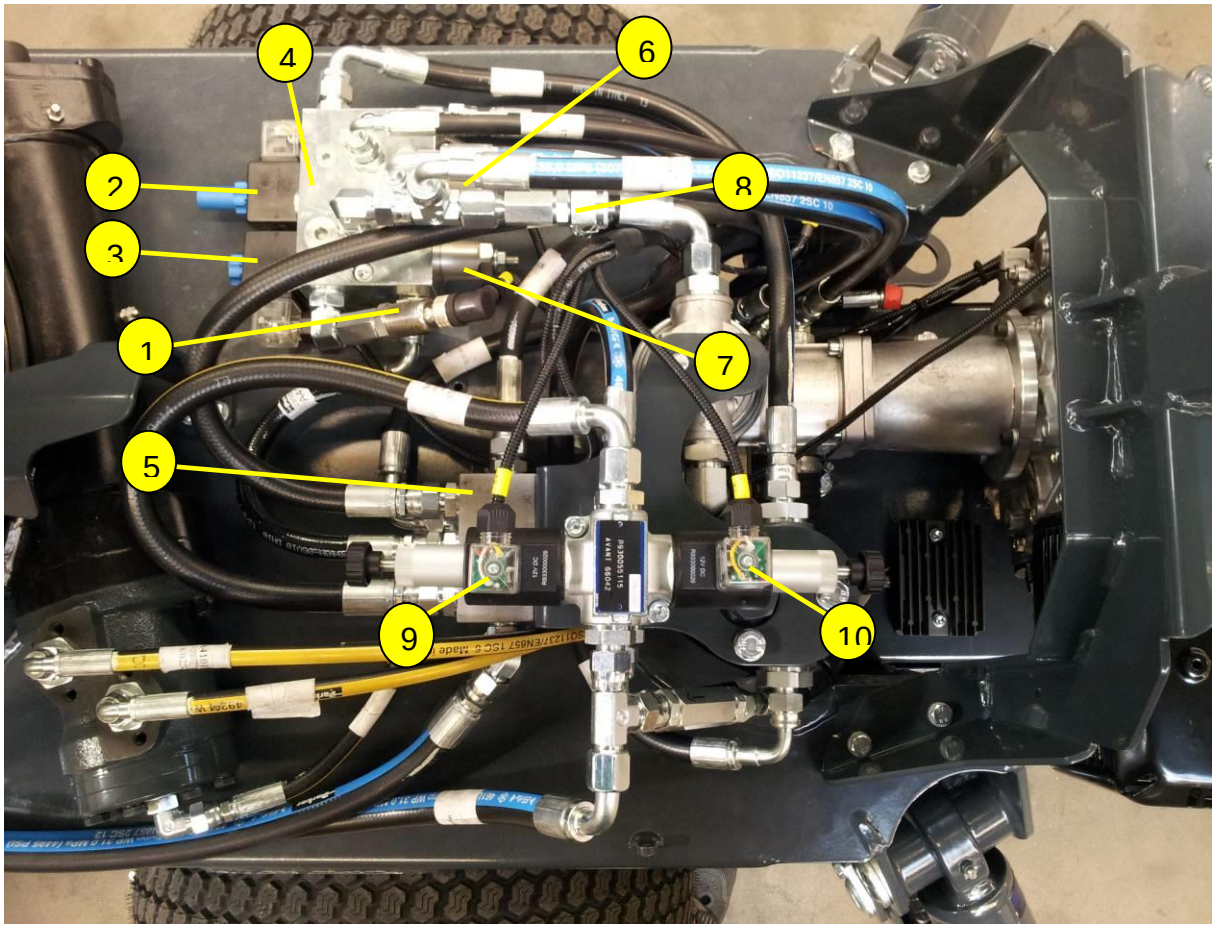
15.8. Water level check

Correct position of the water level (on the left side of the pedestal) in relation to the upper surface of the slewing ring must be checked in accordance with the maintenance schedule, or if there is reason to believe that the position of the water level has changed.

Make sure that the booms are in transport position and put a water level on the slewing ring. Compare the position of this water level to the position of the water level on the left side of the pedestal. If the positions are different, adjust the water level on the side of the pedestal with the adjustment screws so that both levels are in the same position. Do the adjustment both lengthwise and sideways.

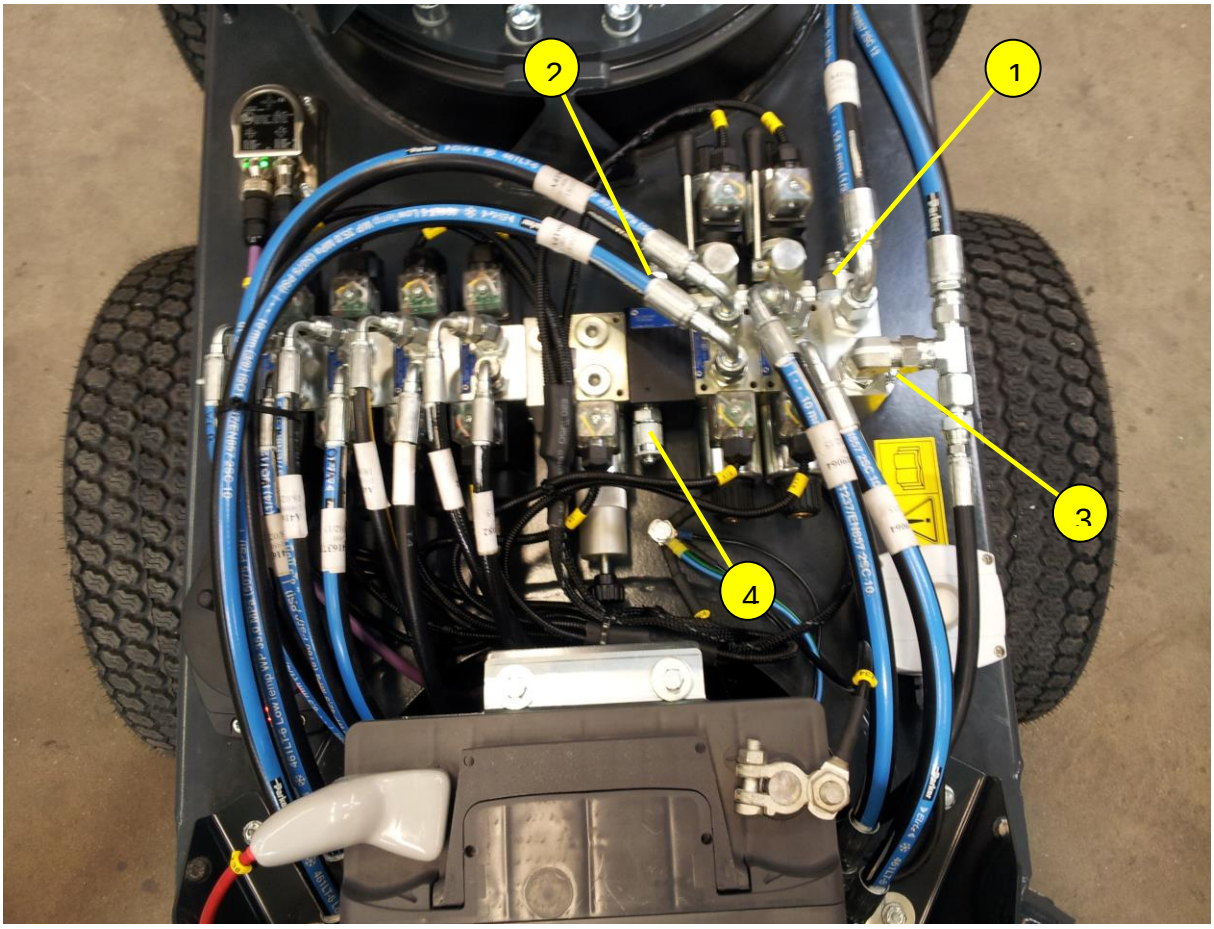
15.9. Adjustments in hydraulic system

All settings of the hydraulic system have been made at the factory and normally there is no need to adjust them.



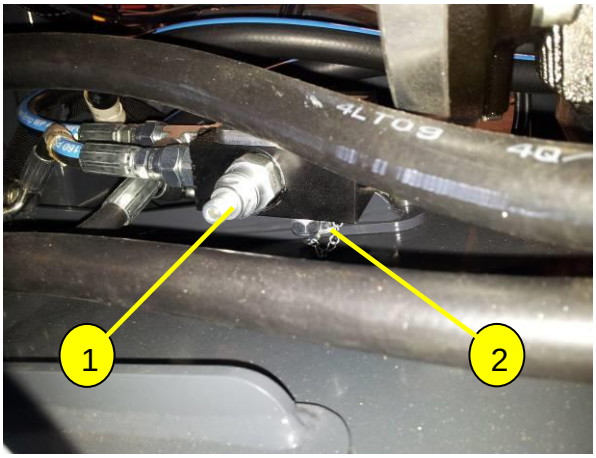
Picture above shows the components next to the combustion engine:

1. Main hydraulic pressure sensor (the reading is shown on the remote-control display)
2. Dump valve, solenoid K2
3. Double pump valve, solenoid K30
4. Pump block
5. Tank block
6. Main pressure adjustment of electric propelling, 210 bar
7. Double pump pressure adjustment, 110 bar
8. Double pump pressure check fitting
9. Selector valve, drive / outrigger operation, solenoid K9
10. Selector valve, boom operation, solenoid K1



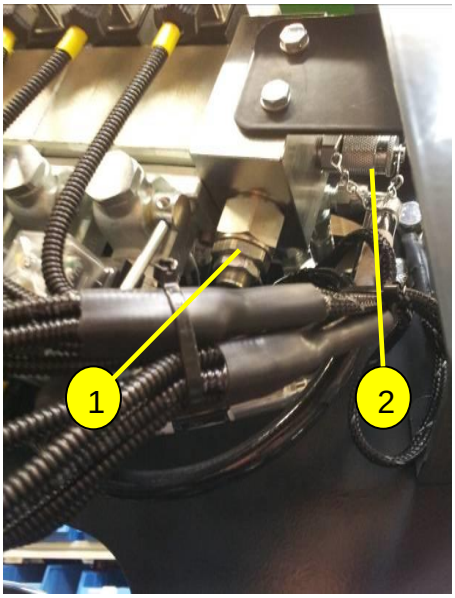
Picture above shows the components next to the platform:

1. Drive pressure adjustment point, 275 bar
2. Outrigger pressure adjustment point, 200 bar
3. Drive pressure check fitting
4. Outrigger pressure check fitting



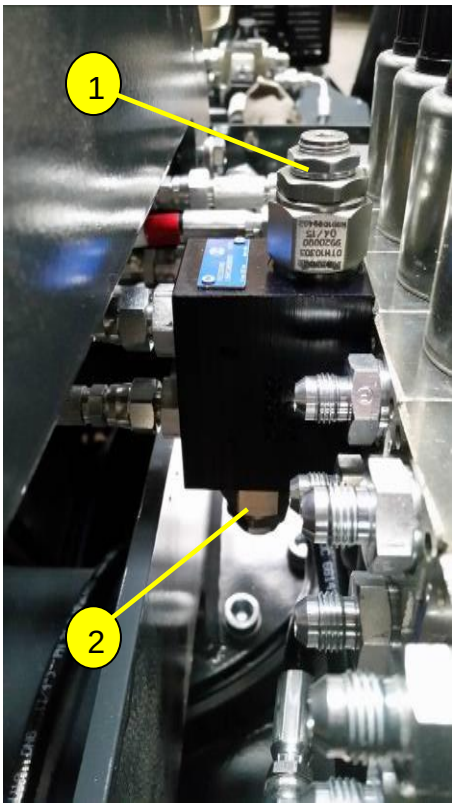
The picture on left shows the brake release block. Brake release can be adjusted by removing the bottom plate of the frame on the platform side.

1. Brake release pressure adjustment point, 30 bar
2. Brake release pressure check fitting



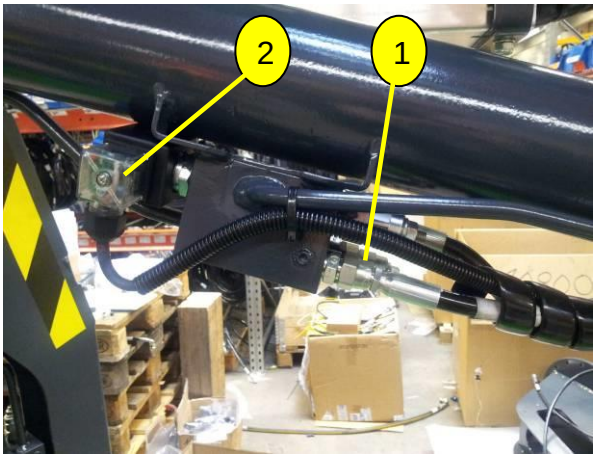
Picture on the left shows the components on the right side of the pedestal:

1. Boom pressure adjustment point, 200 bar
2. Boom pressure check fitting



Picture on the left shows the boom slewing pressure adjustments:

1. Slewing counterclockwise, 120 bar
2. Slewing clockwise, 120 bar

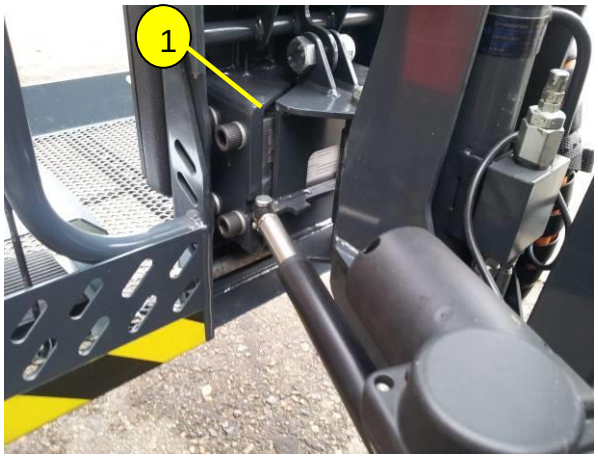


All cylinders – except for the self-leveling ”master” cylinder – are equipped with load holding valves (no. 1 in the picture left), which prevent cylinder movements in case e.g. a hydraulic hose fails.

When using emergency lowering of the booms, the electric solenoid valve in the cylinder (no. 2) opens and oil flows through the flow restrictors into the tank and the boom(s) come down. The restrictors cannot be adjusted, they have fixed setting for slowing down the boom movements correctly.

15.10. Components in overload control system ⚠

Overload control system has been set to correct values at the factory. Changing of the settings without permission and instructions from the manufacturer is strictly forbidden. RISK OF TIPPING OVER!



Overload control mechanism is located between the platform and platform mounting bracket. Load on the platform is measured with a strain gauge (no. 1) which is equipped with two channel measuring. The tare weight of both channels is set following no load on the platform (see service manual).

Readings of both channels are compared with the settings of the load control system, 140 kg and 230 kg. When load on any of the two channels exceeds 140 kg, movement of the telescopic boom is being restricted. The position of the telescopic boom is indicated on the remote-control display, on the first main page in the top left corner. The symbol “230 kg” is shown when the telescopic boom is on the 230 kg working area. When the telescopic boom is extended out to the 140 kg working area the symbol will change to “140 kg”. If the telescopic boom has been extended and more load is added on the platform so that it exceeds the allowed load, all boom movements are prevented.

When load on any of the two channels exceeds 230 kg, there is an audible warning signal and a red indicator blinks on top of the control display, and a weight symbol on the top left corner of the display main page is shown. In this situation all boom movements of the machine are prevented. To continue operation, remove overload from the platform. After that operation can be continued normally.

If the values in the two channels differ more than 30 kg, boom movements are prevented. In this case contact Leguan service. If the sensor needs to be replaced the tightening torque for the screws is 150 Nm.

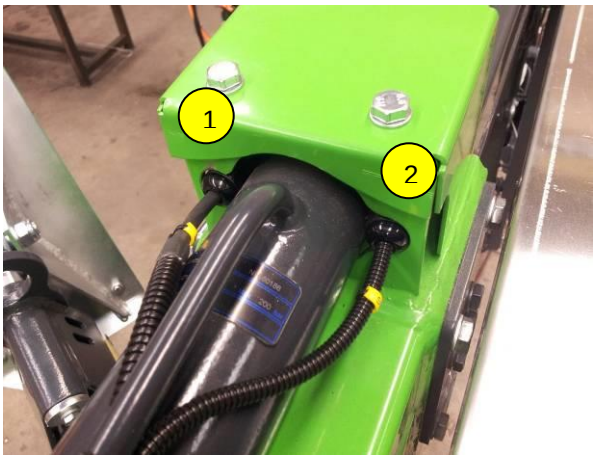
The values of the overload control, in relation to no load on the platform, can be checked from the third main page of the display. Both should be about 0 kg when the platform is empty. If the value on one or both channels differs over 10 kg from 0 kg, or if the difference between the channels is over 10 kg, contact Leguan service. The platform no-load must be calibrated.

⚠

NEVER EXCEED SAFE WORKING LOAD!

15.11. Electric sensors

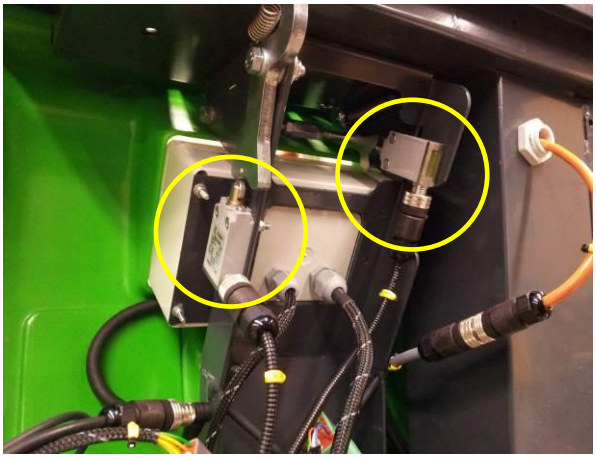
Transport position sensor S4 is located inside the transport support for the jib boom, see picture on the left. All the booms must be lowered down to transport supports in order so that the sensor recognizes that the booms are in transport position.



Limit switches that are monitoring the stroke of telescoping cylinder are mounted at the end of upper boom. Primary limit switch S5 (1) stops telescoping movement – if load on platform exceeds 140 kg – the movement sensing rail activates the sensor. If the telescoping movement didn't stop for some reason, limit switch S6 (2) secures the function by stopping all boom movements.

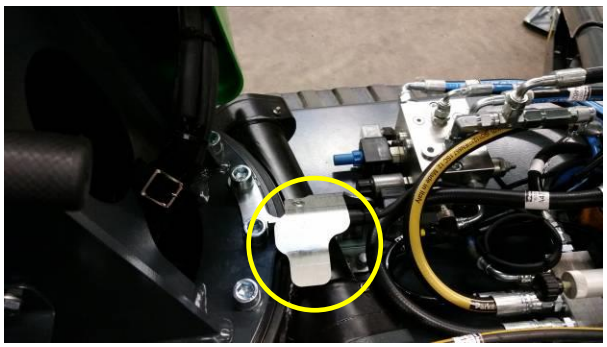
At the end of the outriggers there are the limit switches S7-S10, which detect the ground contact of the outriggers. Ground contact of each outrigger is shown on the first main page of the remote-control display.

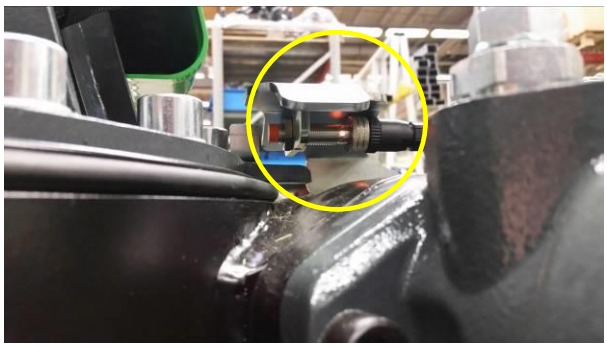
The inclination sensor is located on the chassis next to the drive control valve. Readings of the inclination sensor are used in the automatic leveling of the machine. In addition, it prevents lifting of the booms if the inclination of the chassis exceeds the allowed value. Inclination sensor transmits information through CAN bus.



There are two limit switches at platform which detect if the remote-control unit is properly fastened in its place. The remote-control unit must be in its place and the two limit switches in correct mode in order that booms can be operated without connecting the cable to the remote-control unit.

The center position of the boom rotation is identified with an inductive limit switch, which is located in front of the slewing ring, when looking from the platform (pictures below). When the boom rotation is centered and the main power switch is switched on, green LED lights light up on in the back corners of the chassis, in front of the platform.

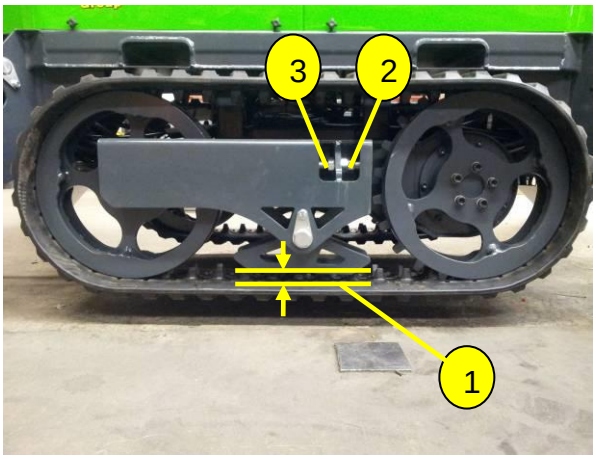




A chart of all safety functions of this access platform is attached.

15.12. Check and adjustment of track tension

Check and adjust track tension with the outriggers deployed and tracks lifted off the ground. First track tension check and eventual adjustment shall be made after first hour of operation. After that track tension shall be checked, and adjusted if needed, once a week. Check also tightness of the bolts and nuts of the sprockets. See to it that track tension is always correct. It has a direct effect on the wear of the tracks and eventual derailing of the tracks.



1. Lift the tracks off the ground by deploying the outriggers.

2. Move the tracks a bit forward and backward by moving the drive control levers. Check track tension by measuring the slack between the track rollers and inside of the track, no. 1 in the picture above. The slack should be 15-35 mm. If it is more than 35 mm, tighten the track.

Adjust track tension

Start adjusting by opening locking nut no. 2. After that tighten the tracks with the tightening nut no. 3 until the slack between the roller and inside of the track is about 15 mm. Finally retighten locking nut no. 2. The width across flats of the tightening and locking nuts is 36 mm and recommended tightening torque 350-400 Nm. The nut at the end plate shall not be tightened when adjusting track tension.

16. REPAIR INSTRUCTIONS

16.1. Welding

All load carrying steel parts are manufactured from S420MC EN10149-2 / S650MC EN10149-2 sheet and S355J2H EN10219 tube.

Welding repairs are only allowed to be carried out by professional welders. When welding, use only methods and additives suited for above mentioned steel qualities.

SFS EN-ISO 5817 quality level D of imperfections in welding is suitable for all weldings, except for load carrying parts. On load carrying parts the damaged part should in principle always be replaced with a new one (instead of welding), and even the smallest repair welding can be performed only by permission from the manufacturer.

ATTENTION! It is not allowed to change the construction and structure of this access platform without written permission from the manufacturer.

17. INSTRUCTIONS FOR TEMPORARY STORAGE

- The cable of the **+** pole of the battery should be disconnected, if the access platform is being stored for a period longer than 1 month
- The machine shall be covered and, if possible, stored inside or under roof in a place where unauthorized persons don't have access.
- Make sure that eventual leaks during storage will not cause waste water or similar environmental problems.

ATTENTION! See also engine manufacturer's instructions for the storage of the engine.

18. DISPOSAL INSTRUCTIONS

When the lifespan of the access platform has come to an end, it must be dismantled and disposed of in an environmental friendly way.

- Battery and other electric components must be recycled or disposed of, in accordance with the national regulations.
- Oils must be collected and recycled following national regulations.
- Plastics must be recycled following national regulations.
- Metals must be recycled following national regulations.

19. TROUBLESHOOTING

Following table shows possible failures and malfunctions of the access platform and the ways how to repair them.

PROBLEM	REASON	CORRECTIVE ACTION
Engine/electric motor does not start when START lever is being moved. Engine and electric propelling	Remot-control is not in connection with receiver.	Turn off remote-control and restart.
Combustion engine does not start when START lever is being moved. (See also engine manufacturer's Operators Manual).	Battery disconnect switch is in "OFF" position.	Move the switch to ON position.
	Ignition switch at lower controls is in "OFF" position.	Move the switch to lower controls position or remote-control position.
	Petrol engine ignition switch is in "OFF" position	Move to correct position.
	Emergency stop switch is pushed down.	Release emergency stop by turning it counterclockwise.
	Fuel valve is closed.	Open fuel valve by moving lever to the right (petrol engine).
	Fuel tank is empty.	Refuel.
	Empty start battery.	Charge by connecting to 230 V or change battery if necessary.
	Fuse inside petrol engine ignition switch is broken.	Replace fuse (see engine manual).
	Fuse inside the connection box is broken. The fuses are inside the connection box.	Replace fuse.
Combustion engine does not start when START lever is being moved. (See also engine manufacturer's Operators Manual).	Faulty contacts in electric wires.	Check wires and terminals; and voltages with a voltage meter.

PROBLEM	REASON	CORRECTIVE ACTION
Electric motor does not start when START lever is being moved.	Mains 230 V cable is not connected to network.	Connect 230 V mains, min. 16A wall socket fuse. Make sure that the socket is electrified.
	Emergency stop switch is pushed down.	Release emergency stop by turning it counterclockwise.
	Battery disconnect switch is in “OFF” position.	Move to ON position.
	Empty start battery.	Charge by connecting the cable to 230 V mains, or change battery if necessary.
	Fuse inside the connection box is broken. The fuses are inside the connection box.	Replace fuse – if the fuse blows again, find out the reason.
Electric motor stops suddenly during operation.	Power failure.	Lower the booms by using emergency lowering. Check that there is current in mains.
	Emergency stop button has been accidentally pushed down.	Release emergency stop and restart.
	Electric motor thermal overload relay (F41) in 230 V box of the machine has gone off.	Wait for approx. 2 min. and start the motor – the relay will return to ON automatically. Find out the reason for overload.
	Connection fault in mains or 12 V wiring.	Check voltages and wirings.
Movements don’t work even though the engine/electric motor is running.	Boom has lifted off the transport support even though the outriggers are not deployed.	Lower down the boom to transport support.
	Failure in hydraulic system – e.g. hydraulic pump broken.	Check hydraulic pressure. If there is no pressure check function of hydraulic pump and the coupling between engine and pump.
	Overload on platform.	Remove overload.
Boom(s) come down by itself.	Dirt in load control valve or faulty valve.	Clean valve with compressed air, if that doesn’t help change valve.
	Dirt in emergency lowering valve or faulty valve.	Clean valve with compressed air, if that doesn’t help change valve.
	Emergency lowering valve(s) don’t work when emergency lowering button is pushed.	Check emergency lowering fuse, if all right check also emergency lowering valve(s) separately.
	Lift cylinder seals are faulty.	Change lift cylinder seals.

PROBLEM	REASON	CORRECTIVE ACTION
Outrigger gives in.	Make sure that the ground doesn't give in.	Put extra support plates under the outriggers or move to another place.
	Air in outrigger cylinder(s).	Drive outriggers completely up and down a couple of times.
	Dirt in outrigger cylinder check valve.	Clean valve with compressed air.
	Faulty check valve.	Change valve.
	Faulty outrigger cylinder seals.	Change outrigger cylinder seals.
Platform tilts backwards by itself when booms are down on transport supports.	Air in hydraulic system.	Start the engine/motor, drive the platform to extreme end positions. If this doesn't help, do the air bleeding of the platform self-leveling system (there are bleeding screws in the self-leveling master cylinder).
	Dirt in load control valve of self-leveling cylinder or faulty valve.	Clean valve with compressed air. If that doesn't help, change the valve.
	Faulty self-leveling cylinder seals.	Change cylinder seals.

20. SERVICE HISTORY

It is advisable to write down all service operations that are included in the periodical service. All services that have been made during the warranty period must be noted on the list below, **otherwise the manufacturer's warranty will void**. The service operations mentioned in the maintenance schedule on chapter 15.1 shall be noted as follows: **First Service (50 hours), 1 Month Service, 6 Month service, 1 Year / 200 Hour Service etc.**

#	Date (dd.mm.yyyy)	Operating Hours	Type of Service (e.g. First service (50 h))	Notifications, additional repairs, etc.
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				