Niko Rapid

more than solutions

Operating instructions RoboFlail One D

Read through the operating instructions before commissioning!!

Operating Instructions Version 2.31 (Sept. 2021)

Device no.: _____

Engine no.: _____

Pump no.: _____

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1. Foreword

Dear Customer,
We thank you for your trust, which you have shown us by purchasing a NIKO product.

Together with our cooperation partner Rapid Technic GmbH, we have made every effort to provide you with a powerful and reliable product.

We ask you to read these operating instructions carefully before operating the machine and to observe the instructions. The operating instructions explain the operation in detail and give you valuable information on commissioning, maintenance and care.

You are sure that warranty claims cannot be accepted for damages resulting from operating errors or improper use.

Technical improvements:

We strive to continuously improve NIKO products. Therefore, we reserve the right to make any improvements or changes we deem necessary to our equipment without prior notice, but without committing ourselves to transferring such improvements or changes to machines already sold.

We would be happy to answer any further questions and hope you enjoy your new NIKO product.

Best regards,

N I K O Maschinen- & Fahrzeugbau GmbH
Dieter Serr, Managing Director

1.1 General warranty terms

All RoboFlail devices that are delivered by Rapid have a guarantee for material defects and processing errors within the first 12 months after delivery of the device to the original purchaser.

Therefore, NIKO provides a **12-month warranty if the devices are not used for more than 300 working hours a year** and if the following conditions are met:

The warranty begins on the date of purchase.

All spare parts supplied by Rapid have a guarantee for material defects or processing errors within the first 12 months after delivery to the original purchaser.

This warranty does not apply if parts of the goods have been overused improperly or negligently, the machine has been independently converted or modified or if genuine NIKO spare parts have not been used during installation. Likewise, any claims for replacement caused by objects (e.g. stones, iron, other material than vegetation) errors, or errors due to lack of maintenance, use of false lubricants that were used too long or due to missed maintenance work will be rejected.

The warranty service is provided exclusively by authorised workshops.

Warranty claims must be asserted at the factory within 30 days of the occurrence of the damage at the latest. Indicate date of purchase and machine number using our warranty application forms.

Repairs for which the warranty is to be provided may only be carried out by the authorised workshop after consultation with the company Rapid or company Niko, please inform your dealer.

The guarantee on hoses is limited to 12 months and excludes hoses damaged by external/exterior damage.

Machines must be repaired immediately after a fault has occurred. If you continue working with the machine after a fault has occurred, this can lead to even more defective parts and damage to the machine and have an impact on the safety of people and the machine, for which Niko GmbH accepts no responsibility.

Rapid reserves the right to either repair or replace a defective part. In the case of a warranty, Rapid will only bear the costs for the defective part, but not the resulting costs such as travel costs of a technician, transport & recovery costs, loss of wages, periods out of operation, environmental damage, etc.

Transport damage is not a factory fault and therefore does not fall under the manufacturer's warranty obligation.
Rubber tracks are wearing parts and are not covered by the warranty conditions.

If you would like to submit a warranty claim, it must be sent directly to Rapid Technic GmbH.
After the warranty application has been received and checked, the affected machine part can be requested from you for inspection by Rapid or the supplier.

The submission of an application is not a guarantee for a replacement or repair. This can only be decided upon after examination of the application and inspection of the defective part by the company Rapid or by the supplier and their warranty conditions.

Any decision made by Rapid regarding warranty is final.

All repairs or service work must be carried out in accordance with the operating and maintenance instructions. If repairs occur that are not in the manual Rapid must be contacted. In case of delayed interventions or incorrect operation, the company Rapid does not assume any responsibility.
In addition, Rapid does not assume any warranty services if untrained or unauthorised personnel cause damage to the machine.

Any error must be reported to an authorised RoboFlail dealer as soon as it occurs. If the machine is used after a fault has occurred, further components can be damaged, for which Rapid does not assume any liability.

Please note!
The warranty protection expires as soon as non-genuine components are installed or used. Non-genuine parts can seriously affect both the safety of the machine and the operator.
Niko GmbH accepts no liability for any resulting machine failures or personal injury caused by non-genuine parts.

1.2 Liability:

Niko GmbH and Rapid do not accept any liability in the event of accidents in which persons or material damage have occurred, which have been caused by the following circumstances:

- failure to comply with the standards described in the operating and maintenance instructions.
- behaviour prohibited by law and the operating and maintenance instructions.
- if self-mounted components that have not been approved by Niko GmbH and Rapid lead to an accident.
- in the event of exceptional events (natural disasters), even when operating the machine correctly.
- If a technical defect leads to an accident, the owner must prove that the part was defective before the accident.

1.3 Information about the device:

The type plate of the machine is located on the cover of the drive motor (battery side).

Important:

When ordering spare parts or if there are any questions about the unit, please note the unit type + manufacturer number as well as the operational hours.

1.4 Operational hour counter (MOTO TIMER)

The operational hour counter installed on the RoboFlail One D gives you information about the machine's running time.

The operational hour counter helps you to observe the maintenance intervals and can give you information about operating times for rental equipment.

<u>Activation for new devices:</u>
To activate, the button on the front panel must be pressed for at least 6 seconds until 0000.0 appears on the display.
The counter starts to count 7 seconds after a steady vibration.
The operational hour counter Rattle then runs after this time.

Function:
- display of the total operating hours, not resettable.
- Display area: 0.1 – 99.9999 h
- Resolution: 1/10h=6min
- Event counter: Shows how many times the counter has been activated. To do this, press and hold the button in the operating hours mode for approximately 6 seconds.
- RPM mode: By briefly pressing the button, the counter switches to RPM mode. This is only used for filtering interference vibrations and has no function for the user.

2nd Area of application of the machine:

The RoboFlail is an equipment designed for professional personnel and intended primarily for tillage, cutting natural materials such as branches, undergrowth and grass. Any other use is improper and the manufacturer excludes any liability for possible damage to persons, property or the machine that may result from it.
The equipment is suitable for machine cutting at a speed of 4-5 km/h and depends on the soil conditions which is being worked upon and the type and condition of the material (length, wet or dry, density, etc.). The RoboFlail was developed for use in the care of the slopes (steep slopes). The machine is normally used during the day; if in exceptional cases it is necessary to use it at night or in conditions with limited visibility, it must be used in conjunction with an auxiliary lighting system. Operate in daylight or in good artificial lighting, which ensures a minimum visibility of 100 m.
This equipment may only be used for the usual agricultural, forestry and municipal cutting operations as well as for extensive landscape maintenance.
Any use beyond this is not intended and the manufacturer is not liable for any damage resulting from it. The intended use also includes compliance with the safety regulations of manufacturers and marketing providers. Installing/removing, commissioning, operating and maintenance conditions!
The operator of the RoboFlail models must have attended a driver training course from Rapid or a dealer. If the future driver of the RoboFlail has not done so, all claims will become invalid .

2.1 Categorically avoid the following Types of use:

In any case, the following applications must be avoided under all circumstances:
Use of the machine by unauthorised or untrained personnel or by persons under 18 years of age.
Use of the machine to lift and move various objects.

- The machine should not be used on loose stones, glass, metal pieces or other surfaces contaminated with foreign bodies that could be thrown into the air by the blades/knives of the mowing units or damage the mowing units.
- Switching on the machine if the physical or chemical properties are classified as dangerous (e.g. highly flammable, explosive, toxic substances, etc.)

Hazard warning:

If the machine is used incorrectly, there is a risk of tipping or failure of the same, which can lead to a danger for the operator due to injury or death.

2.2 Operation

Passenger transport, Passenger, Operating personnel:
Do not carry people on board.

Driving mode:
The speed level must always be adjusted to the ambient conditions and the attachments. When driving round bends with trailed or mounted equipments, take into consideration the wide protrusion and the dynamic forces of the equipment.

Attachments
Do not switch on the equipment/attachment on elevated vegetation (earth, grass, etc.). Only switch the attachment on outside of the mowing material to ensure a free start of the mulcher. Only secure the devices with the prescribed devices. Do not operate the track unless all guards are in place and in the protective position.

Only Rapid/NIKO attachments may be used, NIKO does not assume any liability for third-party installations.

Remote control
The RoboFlail control is designed in such a way that the control is clear when you are standing behind the machine. With the control lever right/left, the RoboFlail moves to the right/left. Please remember that when you stand in front of the RoboFlail, the control is reversed! (right and left are reversed!)

4.2 Operator workstations
The operator's workstation of the RoboFlail is operated exclusively via the remote control.
Please observe the information on the working and danger area described in section 11.2!
Before commissioning, ensure that the machine is in a safe position and that eye contact with the machine is ensured at all times.

Danger:

Do not use drugs or alcohol before or during operation of the machine. The use of alcohol or drugs may impair your ability to concentrate and coordinate, which may affect the safe use of the device. When taking medication, the authorisation to operate the device must be clarified with the doctor.

3.0. Safety information

3.1. General safety information

The following information applies for your safety. Follow all the instructions and always keep these documents in direct access for all operators! If you do not understand any information contained in this safety data sheet or the product-specific assembly or operating instructions, please contact your seller or contact Rapid directly!

3.2 Warning and information signs

The warning and information signs attached to the device provide important information for safe operation. Make sure that the signs are not removed and that they are always easy to read. If necessary, signs must be replaced!

The attention is for your safety!

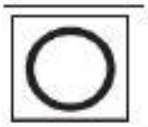
	Read the operating instructions and warnings. Read and observe the operating instructions and warnings before operating the machine. The operating instructions explain the operation in detail and provide valuable information for handling, maintenance and care.
	Before cleaning, maintenance and repair work, switch off the engine.
	Maintain sufficient distance during operation to the mulching blade.

	Do not touch machine parts unless they have come to a complete standstill.
	Danger from moving parts when engine is running keep a safe distance.
	Never open or remove protective devices while the engine is running.
	Before parking, secure the machine with a chock to prevent unintentional rolling away.
	Keep enough distance from hot surfaces.

	Measures to avoid danger
	Passenger transport prohibited
	Wear head protection
	Wear ear protection
	Wear safety shoes.
	Wear protective gloves
	Wear tight-fitting clothing
	Wear face protection

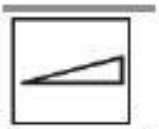

Parking brake


On/Start

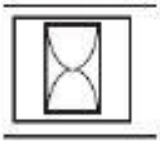

Off/Stop


Risk of falling


Fast


Infinitely adjustable


Pinch point


Hours counter


Discharge side
Danger to people present
Objects thrown Around.


Gearbox


Rotating blades


Spring tension of
V-Belt tension roller


Oil


Danger due to
flying objects


Slow


Mower blades


Mower blades
Switching on


Mower blades
Switching off


CE symbol

4.0 General information on maintenance and care:

To avoid machine damage or life-threatening injury when servicing the machine, the following points must be observed:

- All work steps for the maintenance of the machine must be carried out in the specific order.
- First, secure the area for the maintenance work over a wide area.
- Switch off all power sources and secure the power sources against unintended re-switching.
- Depressurise all pressure units.
- Use only the specified operating materials.
- Use only genuine spare parts, which are listed in our spare parts lists.

Many incidents of damage and accidents are caused by maintenance errors, such as:

- Lack of oil, grease and frost protection in the device
- Lack of cleaning
- Emergency stop, function stop not checked daily
- Wear of the hydraulic system (damaged hoses, loose fittings, etc.)
- Carry out the maintenance work precisely for your own safety.
- Never delay repair work.
- Only transfer the repair work to specialised or authorised personnel.
- Always check all safety standards, even if you know all the elements and manoeuvres very well.

- Before starting work, check that all movements, the stop and the protective elements work and are not impaired in their function.

- Keep hands, feet, clothes, jewellery and long hair away from all moving parts to prevent them from being seized.

- Never leave a running machine unattended. Always switch off the blades of the mowing units, stop the RoboFlail engine.

- It is easy to lose control on slopes, resulting in accidents caused by tipping over which can cause serious injury or death. Operation on slopes requires additional attention!!

- Watch out for traffic when working near roads or on at road junctions. Stop the attachment before crossing roads or pavements.

- **ATTENTION:** If you bump against an object or if an abnormal vibration occurs, stop the machine and inspect it. Perform repairs before operating the machine.

- If you encounter a foreign object, stop and inspect the machine. If necessary, perform a repair before continuing.

- When using, especially in harsh weather conditions such as strong wind, carefully select your location to avoid exposure to fumes, dust or cut grass.

- Do not use the machine when it is hidden (hills, buildings, high grass, etc.). Complete visual contact with the device must always be ensured.

4.1 Running-in and maintenance of the machine in the first 50 hours

Every machine that leaves the Niko GmbH plant is checked again in a categorical manner before it is delivered. Similar to other motorised vehicles, the RoboFlail must be used carefully during the first 50 hours to ensure a good running-in of the various components.
If the machine is subjected to excessive work load during the first phase of use, its maximum performance may be impaired at an early stage and may therefore reduce or impair its later functionality.

Please note the following points:
- After starting, run the engine at low engine speed for approximately 5 minutes
- Avoid fully breaking the power limit in the first 50 hours
- Also avoid sudden acceleration of the machine and abrupt deceleration of the machine.

In addition, after the first 50 hours of operation, perform the following maintenance operations:
- Change filter (engine)
- Change primary fuel filter
- Change engine oil
- Check all hoses and their connections and tighten if necessary
- Check rubber tracks several times in the first few hours and tighten
- Check screw connections and tighten if necessary

Further maintenance intervals can be found in the attached interval table!!

Mulcher

Check that the nuts & screws are firmly seated regularly and tighten if necessary.

4.2 Maintenance intervals

X Kontrolle ✦ Austausch ■ Den autorisierten Yanmar-Industriemotorenhändler konsultieren

System	Kontrollpunkte	Täglich	regelmäßiger Wartungsintervall: Alle 50 Stunden	Alle 250 Stunden	Alle 500 Stunden	Alle 1000 Stunden	Alle 1500 Stunden	Alle 2000 Stunden
Kühlsystem	Motorkühlmittel kontrollieren und auffüllen	X						
	Kühlerrippen prüfen und reinigen		X					
	Lüfterkeilriemen prüfen und einstellen		X 1.Mal	X 2. Mal und danach				
	Kühlsystem ablassen, durchspülen und mit neuem Kühlmittel füllen					✦ oder jedes 1 Jahr (es gilt der frühere Wert)		
Zylinderkopf	Ein-/Auslassventilspiel einstellen					■		
Elektrische Bauteile	Anzeigen überprüfen	X						
	Batterie kontrollieren		X					
	elektromagnetische Kupplung Spaltmaß prüfen ggf. nachstellen			X				
Motoröl	Motorölstand kontrollieren	X						
	Motoröl ablassen und füllen		✦ 1. Mal	✦ 2. Mal und danach				
	Motorölfilter austauschen			✦ 2. Mal und danach				
Garantie der Abgasregelung	Kurbelgehäuseentlüftung überprüfen							
Kraftstoff	Kraftstofftankstand prüfen und auffüllen	X						
	Kraftstofffilter/Wasserabscheider ablassen		X					
	Kraftstofffilter/Wasserabscheider prüfen	X						
	Kraftstofffilter/Wasserabscheider reinigen				X			
	Kraftstofffilter erneuern				✦			
Schläuche	Kraftstoffsystem und Kühlsystemschläuche erneuern							■ oder alle 2 Jahre
Ansaugung und Auslass	Luftfiltereinsatz reinigen oder austauschen	X		X und danach				
Kompletter Motor	Tägliche Sichtprüfung	X						
Ketten	Kettenspannung prüfen und ggf. nachspannen	X						
	Kette vollständig entspannen und Kettenspanner auf Funktion prüfen				X oder jährlich			
	Sichtkontrolle auf Undichtigkeit	X						
	Verbindungen auf Festigkeit prüfen		X					
	Keilriemenspannung prüfen		X					
	Hydraulikölstand prüfen	X						
	Hydraulikölwechsel +Hydraulikölfilter				X			

Attention:

When replacing the oil filters, the oil should be checked for wear. If you notice any abrasion in the oil, you must first find the cause and then correct the damage before you can put the machine back into service.

4.3 Maintenance

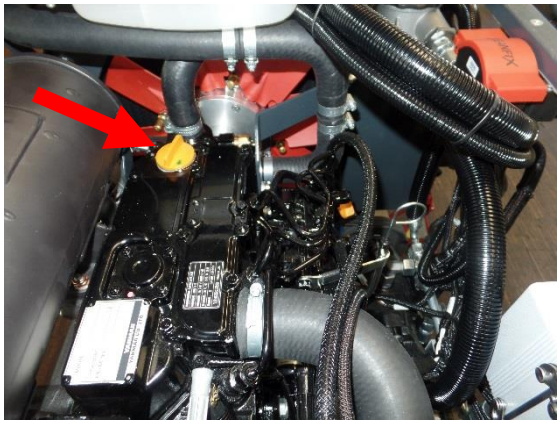
Attention:

The maintenance operations must only be carried out by qualified personnel. Always put on protective equipment before working on the machine.

Pre-requisites

In order to achieve a maximum service life of all components of the machine, it is necessary that the maintenance intervals are strictly adhered to by the persons responsible for the machine.
As the machine usually comes into contact with water, sand, soil, etc., regular lubrication of certain components is required. This is necessary not only for a long service life of the RoboFlail, but also to minimise its operating costs.

4.4 Engine oil



The choice of the right engine oil is a decisive factor in the service life of your device.
Therefore, only use the lubricants approved by Niko GmbH or by the manufacturer of the affected component.
(refer to the engine oil selection according to the attached table in section 4.5)

The main measures relating to the engine oil are:

- Daily level check
- Regular oil change

(see maintenance interval – Table 4.2)

4.5 Recommended oils and lubricants

	Lubricant
Engine	Agrifarm Stou SAE10W30MC
Hydraulic oil	Agrifarm Stou SAE10W30MC
Coolant	Ethylene glycol -35°C
Lubrication points	Multi-purpose grease

Attention:

The warranty will be invalidated if incorrect oil types are filled in or used!!

4.6 Fuel

Use only fuels according to the specification EN590.
Make sure the machine is always refuelled with the appropriate fuel. Other fuels with different specifications can damage the engine or reduce performance.

Attention:

Fuel and its fuel vapours are extremely flammable/and explosive. Fire or explosion can cause serious burns or death. When adding fuel, stop the engine and allow to cool down for at least 2 minutes before removing the fuel cap. Only fill the fuel outdoors or in a well-ventilated area. Do not overfill the fuel tank. To allow space for the fuel to expand, do not fill beyond the bottom edge of the fuel tank neck. Keep fuel away from sparks, naked flames, permanent flames, heat sources and other ignition sources. Fuel lines, tank, covers and their connections must be regularly inspected for cracks and leaks and replaced if necessary. If fuel is spilled, wait for the vapours to evaporate before starting the engine.

4.7 Coolant

Check the coolant level in the radiator daily before starting the machine and top up if necessary.

An incorrect level can cause irreparable damage to the engine.

Attention:

Pressurised tank!! Do not open the lid when the engine is warm!!

4.8 Hydraulic circuit

The following maintenance procedures should be carried out regularly.

Please also observe the regular maintenance intervals to be performed according to the table in section 4.2

- Daily checking of the oil level in the tank at operating temperature.

- Regular replacement of the oil filter cartridge (see maintenance table in section 4.2, if the filter is clogged)
- Regular replacement of the complete hydraulic oil (see maintenance table in section 4.2)

Always check the condition of all hydraulic lines and O-rings for leaks.
For this purpose, a cardboard box can be placed underneath to detect any leaks.
If leaks occur, replace the component to be replaced if it is defective or damaged.

Attention:

Always take care when servicing the hydraulic system, as the oil may be very hot immediately after work is carried out! The pressure in the circuit is high, not only while working with the device, but also after the work is complete. Protect hands and body from high pressure fluids.

4.9 Electrical maintenance

Check the gap dimension of the electromagnetic clutch, adjust if necessary

The electromagnetic clutch should be adjusted every 250 hours or, if necessary.

Setting the brake

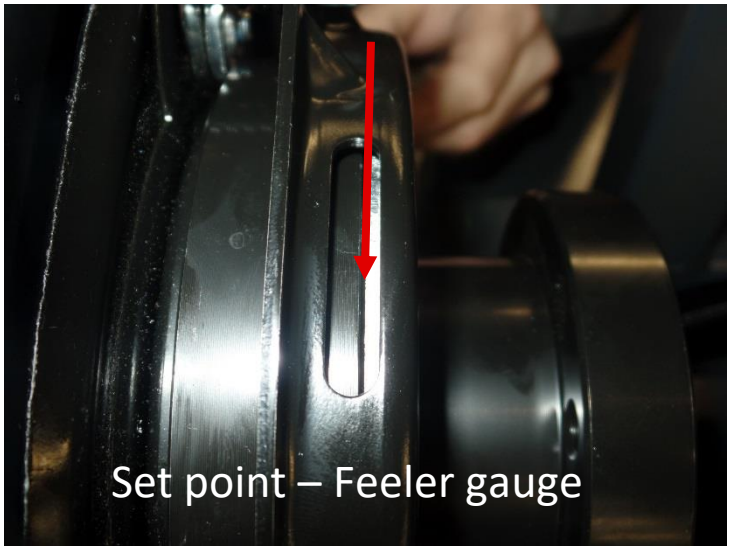
Tools required:
Feeler gauge

Adjusting the brake (Electromagnetic clutch)

Feeler gauge
Settings: 0.4 mm
(For 25-31 HP engines)

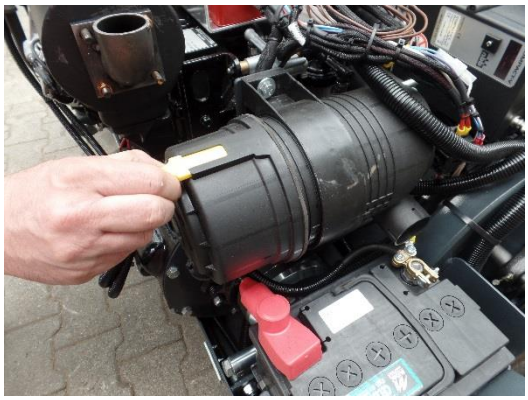
Explanation of the setting:

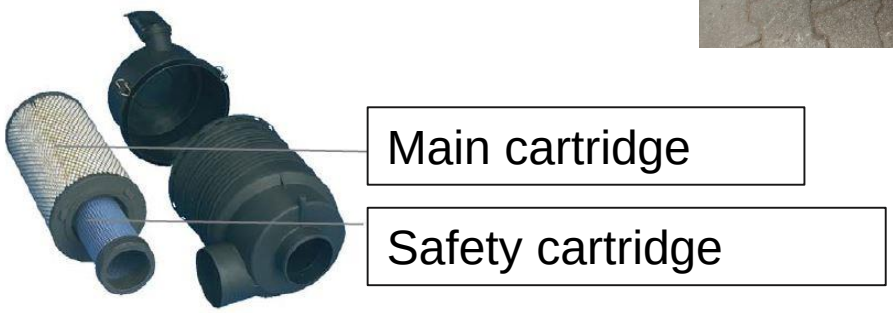
Push the feeler gauge between the two jaws (metal+black). Gradually tighten the screws until the feeler gauge slightly jammed at all 3 adjustment slots.
This can take some time, as the adjustment on all adjustment slots has to be adjusted and checked again and again with the 3 nuts!!



4.10 Air filter cartridge

The air filter consists of a main high capacity cartridge and a safety cartridge. The main element can be blown out for cleaning with air, the safety cartridge must be replaced after contamination. Replace the cartridge after 6-8 cleanings of the main cartridge or after 12 months.When replacing the safety cartridge the main cartridge must also be replaced.

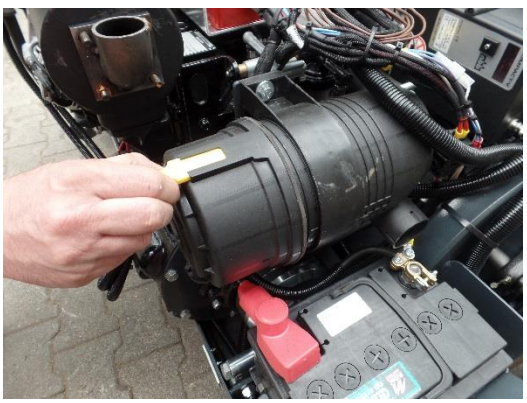




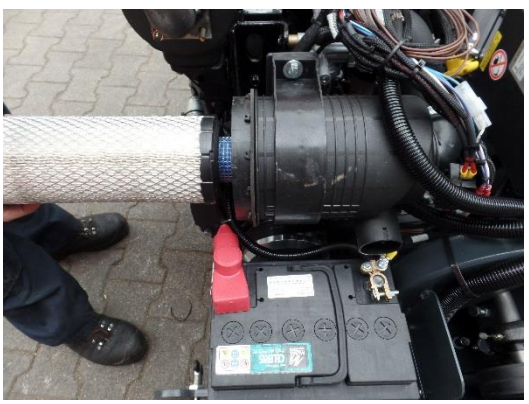
Attention:

Do not remove the air filter until the machine is stopped and the engine is off. Wear protective gloves when cleaning.

Remove cartridge:
Pull out the yellow tab and turn the lid 1/4 turn to the left. The lid can then be removed.



Pull the main cartridge out of the overall filter by turning it slightly.
Clean it with an air jet or replace it if necessary,



also pull out the safety cartridge by a slight twist and replace it each time, when the main cartridge is replaced.

Reinstall the filter elements by reversing the procedures described.

Attention:

Do not wash out air elements with water. Do not use solvents for cleaning. The compressed air could damage the elements. Do not apply oil to the filter elements.

4.10 Cleaning the primary filter

The primary filter removes up to 75% of air contamination by centrifugal force.

The cleaning of the primary filter must be carried out at the latest after the dirt indicator mark has been reached on the glass on the bowl.
To do this, proceed as follows:
Loosen the wing screw (1) on the cover, remove the cover, remove the bowl and empty it – no tools required

4.11 Cleaning the radiator

It is quite normal that by mowing shredded material is attracted to radiator and thus the protective grilles are clogged.
The CleanFix fan control is pre-programmed so that it cycles every 15 minutes through a reverse function. A manual reverse can be applied if necessary.

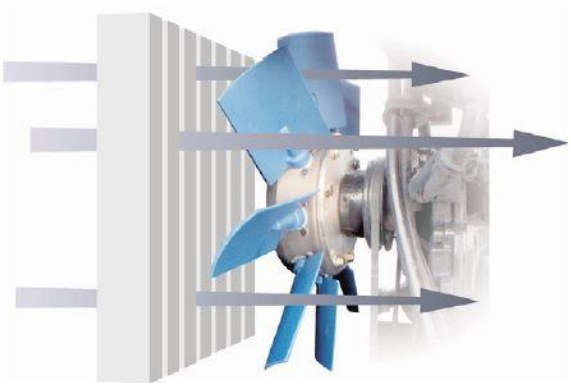
Warning notices:

If the diesel engine exceeds the maximum permissible temperature, the warning light on the hood lights up!!

4.12 CleanFix reversing fan control

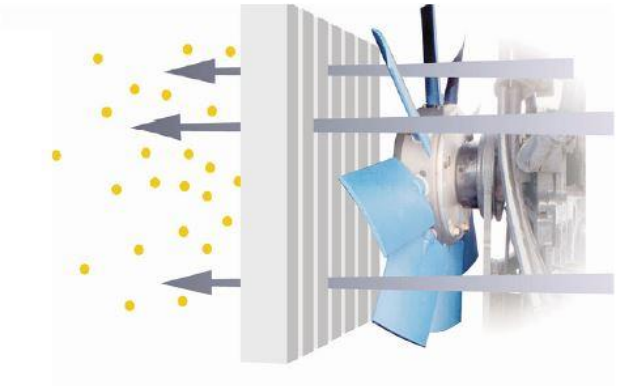
The blades of the CLEANFIX fans can be turned around their own axis – via the transverse position! A brilliantly simple idea, but the only one that guarantees that the blade profiles are always in the optimal position to create maximum airflow and pressure for efficient cooling and thorough cleaning.

The air is directed through the radiator for cooling.



When the control switch is actuated, the blades change their angles as shown in Figure 2 so that the air is directed back through the cooler, which removes dirt and dust particles through the fan reversal. The operating unit allows the operator to carry out additional cleaning cycles in very dirty and dusty environments.

The air is reversed to clean the radiator.

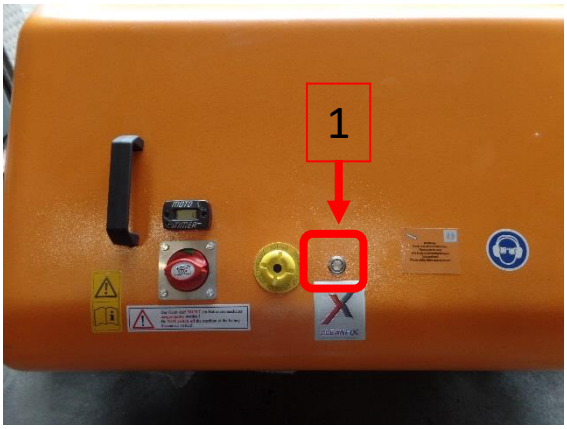


Procedure for manual control:

Before reversing the blades, bring the engine to the minimum speed. Then enable the fan reverse function.

4.12 Manual operation - CleanFix

Depending on the degree of contamination of the radiator, the CleanFix reversing ventilation can also be operated manually via the switch (1) (at the touch of a button) on the bonnet if necessary (outside the set interval of 15 min.).



Procedure for manual control:

Before reversing the blades, bring the engine to the minimum speed. Then enable the fan reverse function.

4.12 CleanFix reversing fan control

4 Einstellungen (MINITIMER, MULTITIMER)

Es gibt zwei Varianten der Ansteuerung (MINITIMER und MULTITIMER) von Kompressor und Ventil. Die MINITIMER Steuerung regelt einen einmaligen Reinigungszyklus, von Kompressor und Ventil, sobald der Druckknopf gedrückt wird. Die MULTITIMER Steuerung ermöglicht eine zusätzliche automatische Steuerung der Reinigungszyklen in regelmäßigen Abständen.

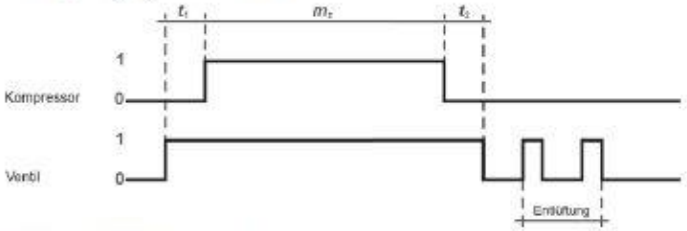
4.1 Einstellungen mit MINITIMER Steuerung

Die MINITIMER Elektronik steuert den Reinigungszyklus von Kompressor und Ventil.

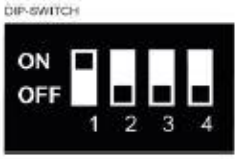
4.1.1 MINITIMER Standardeinstellung

Im Auslieferungszustand sind folgende Zeiten voreingestellt:

STEUEREINHEIT (mit Elektro-Kompressor):
Kompressor (m_z) ca. 20 s.
Ventil (t_1+m_z+t_2) 23 s.



VENTILEINHEIT (ohne Elektro-Kompressor):
Ventil (v_z) 10s



4.1.2 Zwischenreinigung aktivieren

Jede Reinigung muss hierbei manuell über einen Schalter (zum Beispiel in der Kabine) ausgelöst werden.

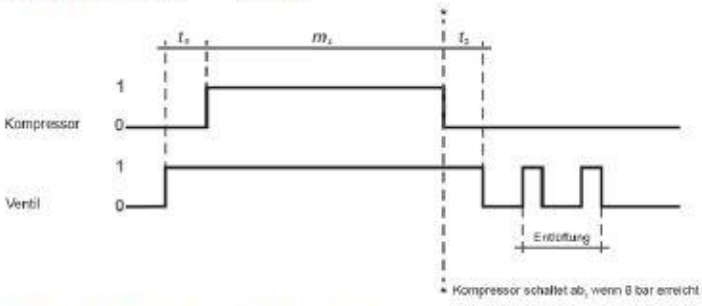
4.2 Einstellungen mit MULTITIMER Steuerung

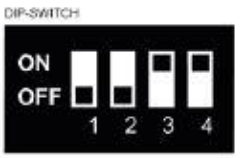
Die MULTITIMER Elektronik steuert die Reinigungszyklen automatisch in regelmäßigen Zeitabständen.

4.2.1 MULTITIMER Standardeinstellung

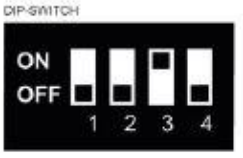
Im Auslieferungszustand sind folgende Zeiten voreingestellt:

STEUEREINHEIT (mit Elektro-Kompressor) und E-BOX:
Kompressor (m_z) Kompressor schaltet ab, wenn 8 bar erreicht sind, oder maximal nach 30 s.
Ventil (t_1+m_z+t_2) t_1 = 1s ; t_2 = 2s
Reinigung Intervall 30 min





VENTILEINHEIT (ohne Elektro-Kompressor):
Ventil (v_z) 10s

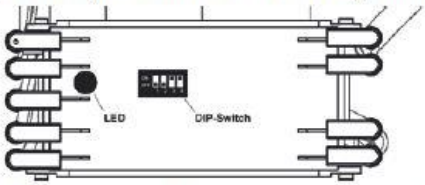


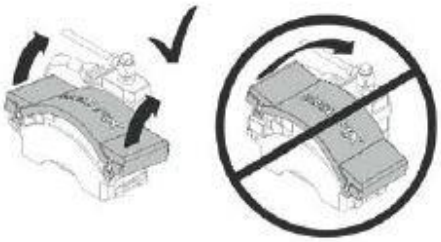
4.12 CleanFix reversing fan control

4.2.2 MULTITIMER - Intervallzeit

Die Pausenzeit zwischen den Reinigungsvorgängen kann im Bereich von 5 min (Minimum) bis 90 min (Maximum) verändern werden. Im Auslieferungszustand beträgt die Pausenzeit 30 min. Um die Pausenzeit zu verändern, muss die Abdeckung der Steuereinheit entfernt werden.

Die Häufigkeit der Reinigungszyklen ist vom jeweiligen Maschineneinsatz abhängig und kann durch verschieben der Regler am Dip- Switch in 7- Stufen eingestellt werden.





Zeit	Pause [min]	Dip switch Nr. [1	2	3]
z1	5	1	0	0
z2	10	0	1	0
z3	15	1	1	0
z4	30	0	0	1
z5	45	1	0	1
z6	60	0	1	1
z7	90	1	1	1

⚠ **Achtung**

Gewaltsames Verschieben der DIP Switches verursacht bleibende Schäden.

Hinweis

Wenn alle Dip- Switches Nr. 1- 4 auf „Off" stehen führt die Elektronik einen Selbsttest durch. In diesem Fall werden Kompressor und Ventil 1s lang gleichzeitig eingeschalten, danach 1s lang aus. Dies wiederholt sich solange, bis die Spannungsversorgung unterbrochen wird oder ein Dip- Switch auf „On" geschaltet wird und somit eine Pausendauer gewählt ist.

Nach der manuellen Einstellung der Pausenzeit muss die Abdeckung der Elektro-Komponente wieder geschlossen werden.

4.2.3 MULTITIMER - Zwischenreinigung

Durch kurzes Anlegen des grauen Kabels an die Masse (z.B. über einen Schalter in der Kabine) wird eine zusätzliche Zwischenreinigung ausgeführt. Anschließend beginnt wieder der normale Reinigungszyklus.

Wird die Zwischenreinigung nicht verwendet, ist das graue Kabel zu isolieren!

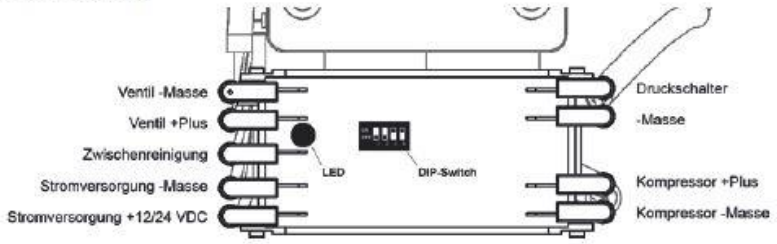
4.2.4 Externe Druckluftanlage

Die Steuereinheit kann mit einer Druckluftanlage genutzt werden. Am Dip- Switch Nr. 4 kann der Kompressor ein- und ausgeschalten werden. Das heißt, wenn der Steuereinheit in Verbindung mit einer Druckluftanlage des Fahrzeugs verwendet wird und nur das Ventil angesteuert wird muss Dip- Switch Nr.4 auf „Off" sein.

4.12 CleanFix reversing fan control

5 Störungsbehebung

Die Steuereinheit überwacht den Stromkreis auf elektronische Fehler. Im Fall eines Kurzschlusses schaltet die interne Sicherung die Steuereinheit ab. Nach dem Abkühlen der Sicherung lässt sie sich wieder einschalten. Temperaturen über 70°C können ebenfalls zur Abschaltung führen. In diesem Fall ist es notwendig einen kühleren Ort für die Steuereinheit zu finden.



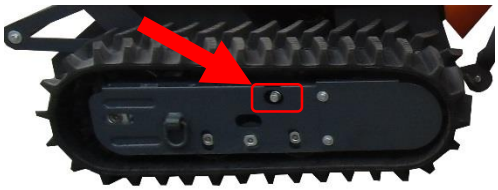
	LED	URSACHE
	Blinkt 1x pro s.	Normalzustand
	Aus	Betriebsspannung prüfen
	Blinkt 1x pro 12 s.	**Fehler Kompressor:** Wenn DIP Switch Nummer 4 auf „On“ geschaltet ist: - Kurzschluss gegen Masse - Übertemperatur der Elektronik erreicht - Kabelbruch zum Kompressor
	Blinkt 2x pro 12 s.	**Fehler Ventil:** Wenn DIP Switch Nummer 4 auf „On“ geschaltet ist: - Kurzschluss gegen Masse - Übertemperatur der Elektronik erreicht Wenn DIP Switch Nummer 4 auf „Off“ geschaltet ist: - Kabelbruch zum Ventil

4.13 Replacing rubber tracks

A track change must be carried out if only a profile depth of > 10mm is available, the track has cuts, breaks or other damage.

To change the tracks, the machine must be raised and parked on a stable platform.

Use a **27 mm** ring spanner to loosen the nut on the grease nipple. If it has been loosened, grease will come out of the threaded hole. Continue to loosen until no more grease escapes and the nut is loose. It is not necessary to remove the nut completely.



Once the track has been loosened over the tension unit, using a suitable pry bar or lever arm, push the guide rollers toward the drive wheel until there is sufficient slack in the track to allow it to be removed.

Pull the drive wheel teeth out of the track guide. The track is heavier than it appears. Do not try to carry their weight and it is better to let them fall to the ground.

Place the new track to be installed on the guide rollers, then on the track wheel (pinion) while pushing in the top of the track.

Re-tighten the 27 mm grease nipple, if necessary, replace the seal underneath and use the special grease gun supplied to pressurise the track tension cylinder. The pressure gauge on the grease gun must read 180 bar to ensure correct track tension.

5.0 General tests before each working day

Before each working day with the RoboFlail One D, a detailed visual inspection of the following described parts should be carried out to carry out repairs if any abnormalities occur.

- Check the operation of the acoustic/visual warning devices and their safety-related parts such as: Emergency STOP button, sticker, brake, etc.
- Check protection/safety devices
- Check and clean the radiator
- Wear of the machine components
- Check for oil, fuel and coolant loss
- Check for loose bolts and nuts
- Check the air filter

5.1 Checking the coolant level

The coolant level can be read from the expansion tank.
The optimum level should be in the area of the centre edge (seam) of the expansion tank.
If the level is too low, add fluid to the cooling circuit until the ideal level is reached again.
Then close the lid properly again.

Hazard warning:

A pressurised cooling system can cause severe burns. Do not remove the radiator cap unless the engine is cold or cold enough. Slowly loosen the cap to the first stop to release any pressure before removing it completely. The test must be performed with the engine stopped. Make sure that the RoboFlail One D is placed on a flat surface.

5.2 Fuel level

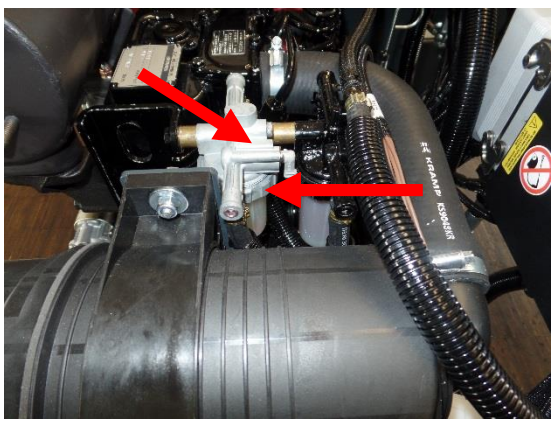
The fuel level in the tank is visually checked when the engine is switched off and on a flat surface.
To refuel, loosen the fuel tank cap and refuel. Do not fill the tank to the top edge, but allow some space for the fuel to expand. Then close the lid again.

Hazard warning:

ATTENTION fuel and fuel vapours are extremely flammable and explosive. Fire or explosion can cause serious burns or death. Keep fuel away from sparks, naked flames, permanent flames, heat sources and other ignition sources. Check fuel lines, tank, cap and connections regularly for cracks and leaks and replace if necessary. Before cleaning or replacing the fuel filter, drain the fuel tank or close the fuel tap. If fuel is spilled, wait for the vapours to evaporate before starting the engine.

5.3 Water separator

Water accumulates in the water separator tank, which must be drained from time to time. The frequency of this task depends primarily on the quality of the diesel fuel used. The water separator tank should be checked regularly and water drained if necessary.



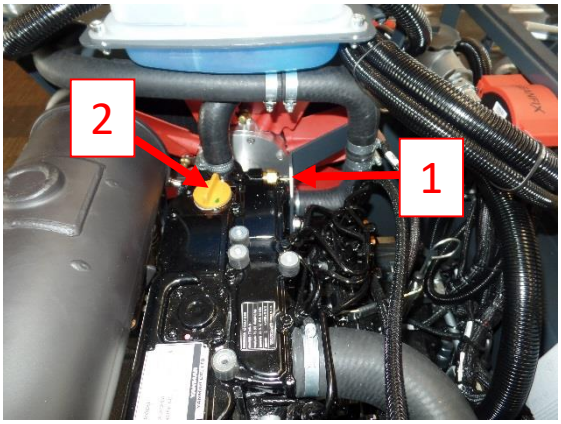
Follow these steps:
- close the tap on the water separator.
- loosen the castle nut
- remove the container and empty it completely.
- Dispose of the removed fluid according to environmental regulations.

Hazard warning:

This operation must be carried out with the engine switched off. Keep away from sparks, naked flames, heat sources, and other ignition sources during the process. Wear protective clothing during this procedure.

5.4 Engine oil

To check the engine oil level, open the hood. The fill level of the engine oil is checked via the dipstick (1) and must be on the MAX. sign (marks). The engine fill level must be checked while the machine is parked on a horizontal surface with the engine cold. If the engine oil level is within the MIN. sign range, refill it by unscrewing the engine oil cap (2) and top up the oil until the level is back on MAX. Character is displayed.
Wait a moment to check the level again using the dipstick.



Warning notices:

The engine is very hot after the device is switched off. Do not test the engine oil until the engine has cooled down. Wear protective gloves when checking and refilling oil.

5.5 Test – Pressure – Track tension

For optimum maintenance of the track and to avoid pressure loss or the like, the test must be carried out regularly. As before, check the track tension after ten hours, then every 50 hours or as needed. Note that the rubber tracks must be checked and tightened several times during the first hours.

To check the track, place the sleeve coupling ③ of the grease gun on the flat grease nipple. The specified pressure should be 180 bar. To re-tension the track Close the screw ① and press the grease into the cylinder with 180 bar.
At 180 bar on the display ②, open the screw 1 again. The pressure in the system is released and you can remove the grease gun again. After clamping, it is necessary to check the track manually again (tight fit of the track), as there is the possibility of jamming the clamping device.

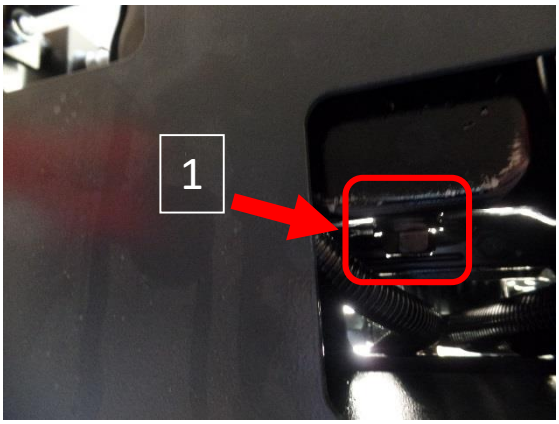
To relax, the grease nipple must be loosened until the necessary relaxation of the track becomes apparent.

Warning notices:

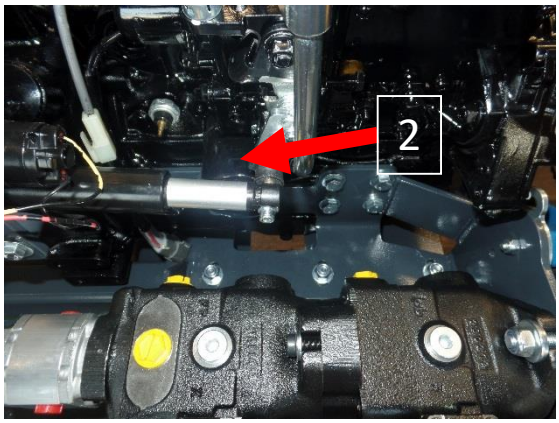
Please note: Never apply more than 180 bar of pressure to the cylinder,
!!!Danger of bursting!!!

5.6 Changing engine oil + filter

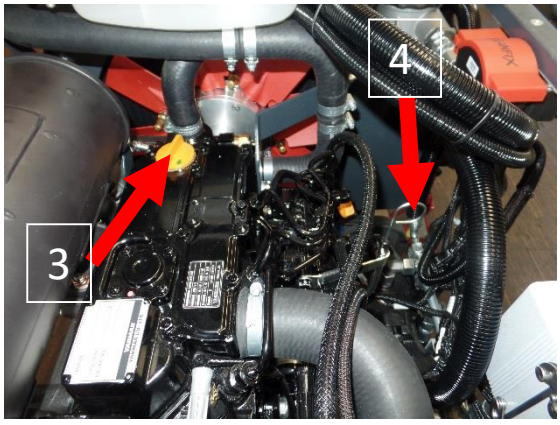
To change the oil, proceed as follows:



- Place the RoboFlail One D on a solid and level surface.
- Remove the drain plug on the engine (1) (underbody) and drain the oil into a suitable container.
- After all the oil has drained, replace the drain plug and tighten it to 21 Nm.
- Unscrew and remove the engine oil filter.



- Now take a new filter and rub its rubber seal with some oil before inserting it.
- Then remove the cap (3) of the oil filler neck and carefully fill approximately 4.5 litres of combination oil Fuchs Agrifarm STOUE MC SAE 10W-30
- Then put the cap of the filler neck back in.
- Now let the engine run for 5 minutes until the oil has spread in the circuit.
- Then check the oil level using the dipstick. If necessary, add oil.

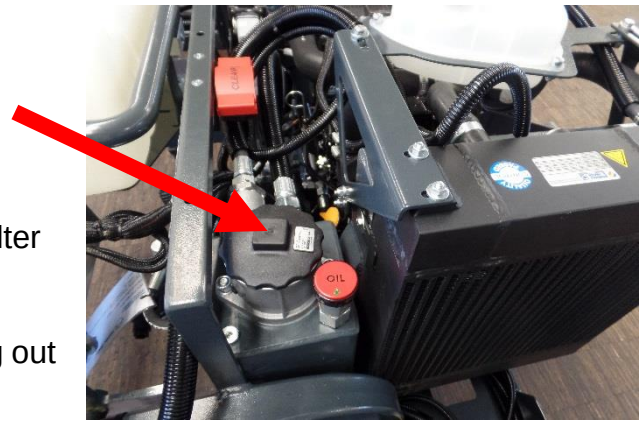


Warning notices:

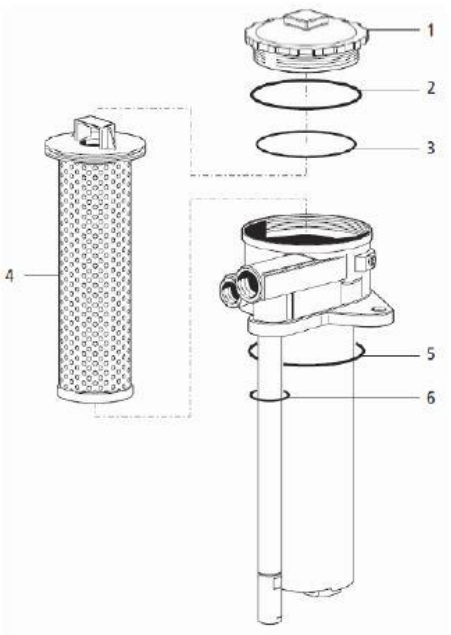
Do not change the oil immediately after using the device. Wait until the engine is lukewarm (40°C maximum).
Oils and filters are considered hazardous waste and must be treated in accordance with the environmental standards.

5.7 Changing hydraulic filter

To change the hydraulic filter, proceed as follows:



- Unscrew the black cap on the hydraulic filter using a 32 mm open-ended spanner.
- Remove the inner filter element by pulling out the handle.
- The filter should be replaced before it is completely clogged.
- Then reinstall the new filter element. .
- Close the black cap to a torque of 20 Nm.

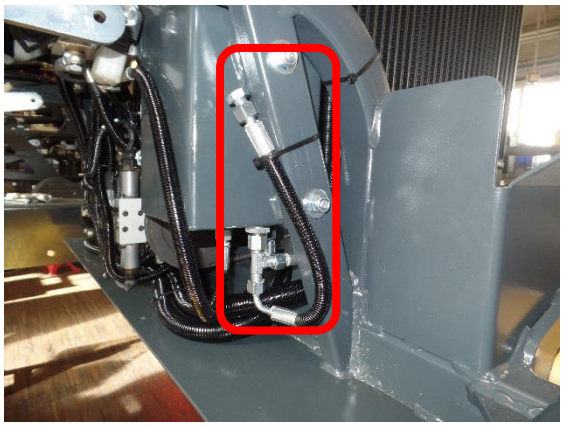


Warning notices:

Do not change the hydraulic filter immediately after using the device. Wait until the engine is lukewarm (40°C maximum). Oil contamination may occur during this process. If necessary, clean the dirty area immediately to avoid the risk of fire or slipping. Hydraulic filters are considered hazardous waste and must be disposed of in accordance with environmental protection standards. Wear protective clothing.

5.8 Changing hydraulic oil

The hydraulic oil must be replaced at regular intervals to ensure permanent lubrication of the relevant components.



- The hydraulic oil is drained via the drain hose. To do this, remove the plug screwed onto the hose. Provide a suitable container for collecting the used oil (25 litres).
- When the oil has completely drained out, screw back the plug to the drain hose.
- Refill the system with the specified hydraulic oil to its ideal level.
- Using the dipstick, check by fitting the dipstick until the filling level is correct.
- Start the engine and wait for about 10 to 20 seconds.
- Stop the engine and repeat 3 times. Then check the level again via the using the dipstick and top up if necessary if the oil level has fallen.
- Also, after the first 20 minutes of operation, check the oil level again after the oil has expanded by heating.
- Then check all the screw connections opened for these applications again.

Warning notices:

The use of an oil other than the one approved by Niko GmbH can lead to significant damage to the hydraulic system. The use of another oil or mixing of the manufacturer's approved oil (see table section 4.5) with other oils can also cause damage to the hydraulic system. Always keep in mind that if you use other oils that are not approved by the manufacturer, you jeopardise your warranty claim.

5.9 Changing coolant

When changing the coolant fluid proceed as follows:

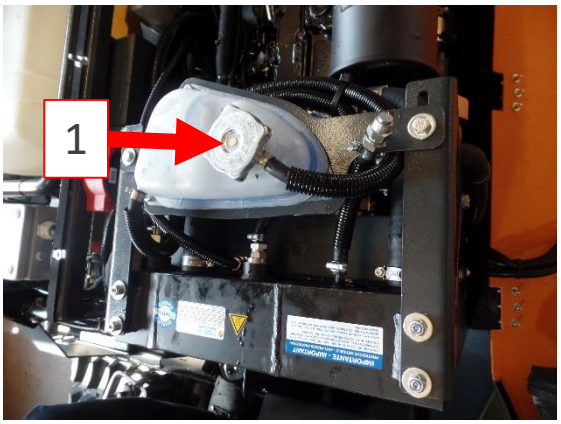
- Place the machine on a firm, level surface. The machine should be in cold condition.

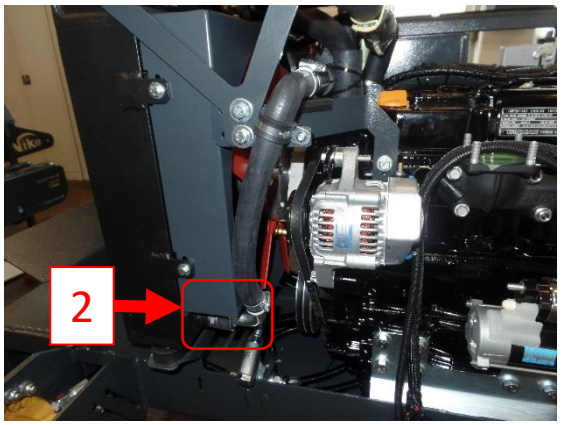
- Slowly loosen the lid of the expansion tank (1) to allow any residual pressure to escape.

- Remove the lower radiator hose (2) with a 36 open-ended spanner and collect the cooling fluid that is leaking with a suitable container.

- Then, lock the disconnected radiator hose (2) properly again after the coolant has completely drained out.

- Refill the radiator via the cap on the expansion tank (1). The level in the expansion tank must be higher than the radiator).



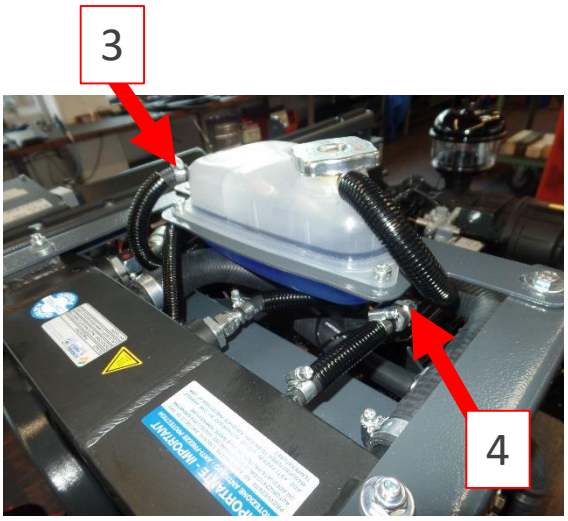


Warning:

Hot coolant can cause burns. Therefore, only change the coolant when it is cold. Slowly loosen the cap to release residual pressure. Coolant is toxic and must not be simply thrown away or included with household waste. Your local council will provide information about where the nearest hazardous waste collection point is located.

5.9 Changing coolant

Bleeding the cooling system!



- To bleed the system, first remove the hose (3) on the expansion tank.
- Then open the fitting on the breather hose (4) with a size 19 spanner.
- After opening the breather hose (4) it must be positioned below the radiator by holding it.
- After water has been discharged from breather hose (4) close the fitting again!!

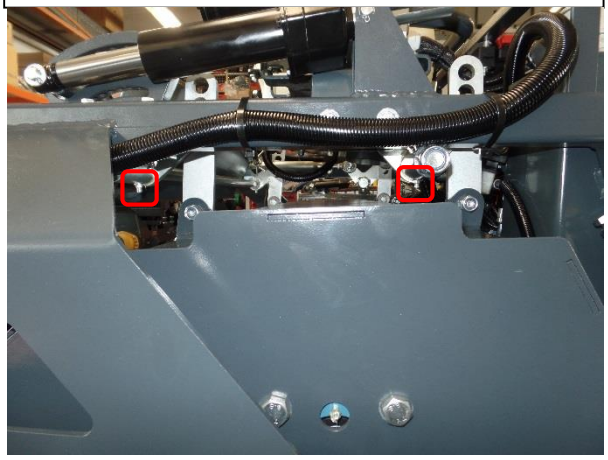
- As soon as the system has been bled via the breather hose (2), reconnect the hose (6).
- Check the coolant level again and close the cover (1) on the expansion tank!
- Start the engine and let it run at idle speed for approximately 4 to 5 minutes and then turn it off again.
- Check the coolant level again and refill as needed.

5.10 Lubrication points (grease gun)

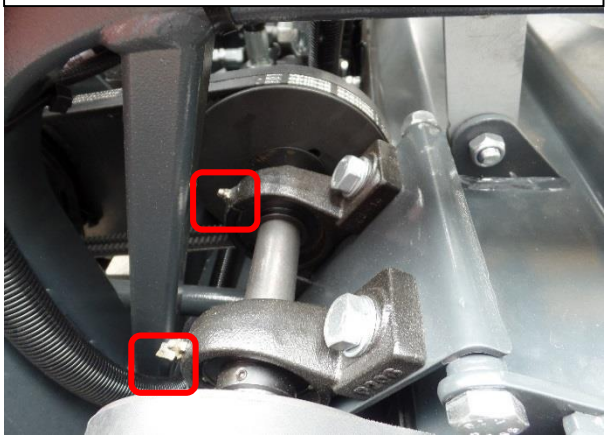
All specified lubrication points must be lubricated regularly, see specification, with the enclosed grease gun:

1. Track suspension weekly

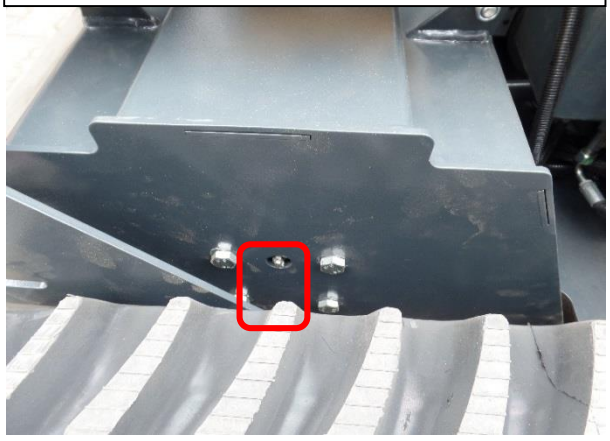
2. R/L hitch weekly



3. Mulcher daily



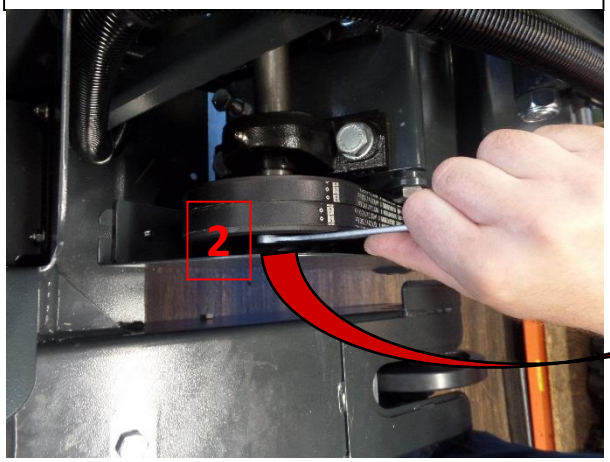
4. Mulcher daily (use extension)

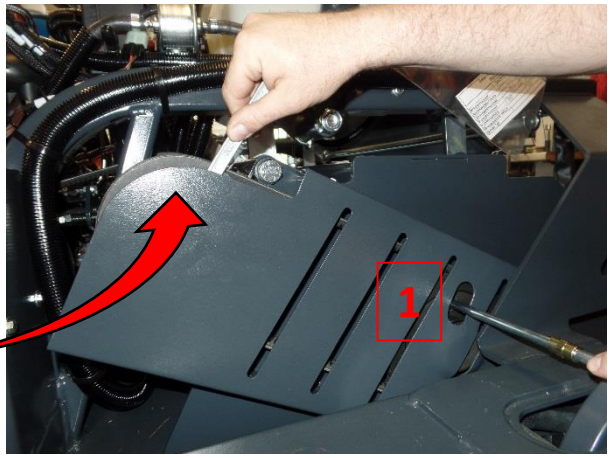


5.10 Lubrication points (grease gun)

For the difficult to access lubrication points, we recommend using the extension provided

2. Mulcher daily (use extension)





To move the specified lubrication point of the mulcher (1) under the cover into position, place a 17 mm open-ended spanner on the shaft (2) and turn it clockwise until the grease nipple (oval opening) is visible under the cover.
Then place the grease gun on and lubricate this point.

Warning:

The described points may only be lubricated (grease gun) when the battery cut-off switch (position at 0) is switched off.
Please always remember that maintenance work may only be carried out when the engine is switched off and taking all safety precautions into account!!

5.11 Fan - Checking and adjusting V-belt

Der Keilriemen rutscht, wenn er nicht richtig gespannt ist. Dadurch kann die Lichtmaschine nicht genügend Strom erzeugen. Außerdem überhitzt der Motor, weil die Riemenscheibe der Motorkühlmittelpumpe rutscht.

Die Keilriemenspannung (Durchbiegung) wie folgt prüfen und einstellen:

1. Den Keilriemen mit dem Daumen mit einer Kraft von etwa 22 ft-lb (98 Nm, 10 kgf/m) eindrücken, um die Durchbiegung zu prüfen.

   Es gibt drei Stellen, um die Keilriemenspannung zu überprüfen **(Abbildung 4, (A), (B) und (C))**. Die Spannung kann an der am besten zugänglichen Stelle überprüft werden. Die richtige Durchbiegung eines eingelaufenen Keilriemens an jeder Stelle ist:

Spannung des eingelaufenen Keilriemens		
A	B	C
3/8 - 1/2 in. (10 - 14 mm)	1/4 - 3/8 in. (7 - 10 mm)	5/16 - 1/2 in. (9 - 13 mm)

Hinweis: Ein „eingelaufener Keilriemen" bezieht sich auf einen Keilriemen, der fünf Minuten oder länger in einem laufenden Motor benutzt worden ist.

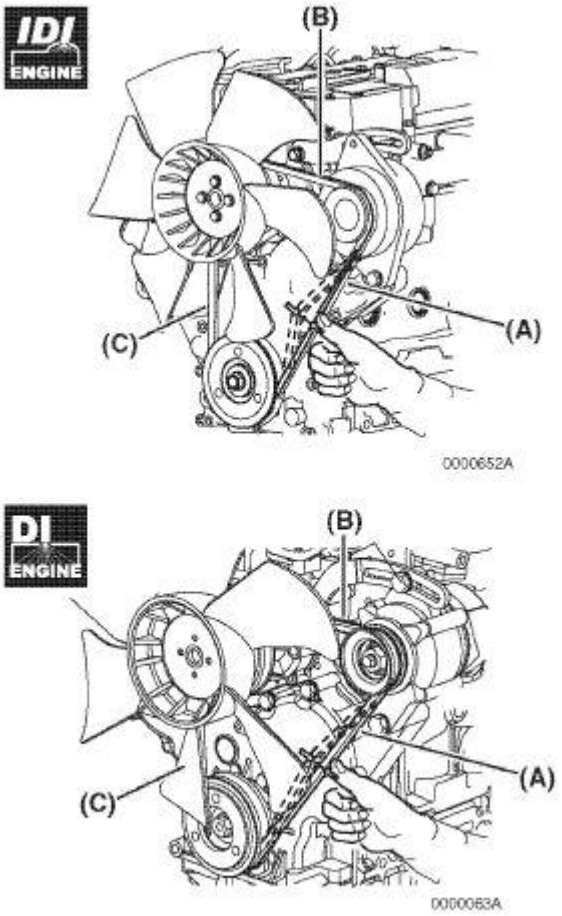


Abbildung 4

2. Ggf. die Keilriemenspannung einstellen. Die Einstellschraube **(Abbildung 5, (1))** lösen und die Lichtmaschine **(Abbildung 5, (2))** mit einer Brechstange **(Abbildung 5, (3))** bewegen, um den Keilriemen auf die gewünschte Spannung festzuziehen. Anschließend die Einstellschraube festziehen.

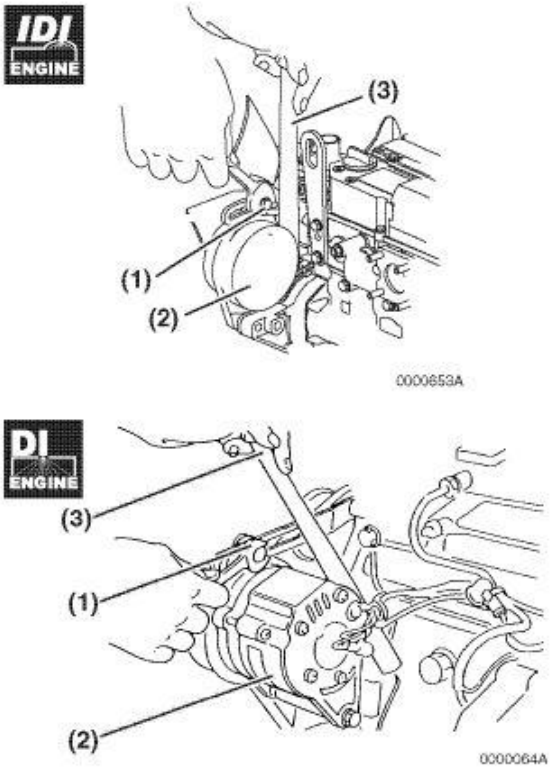


Abbildung 5

3. Den Keilriemen auf die richtige Spannung festziehen. Es muss ein Spalt **(Abbildung 6, (1))** zwischen dem Keilriemen und der Unterseite der Scheibennut sein. Wenn kein Spalt **(Abbildung 6, (2))** zwischen dem Keilriemen und der Unterseite der Scheibennut vorliegt, den Keilriemen erneuern.

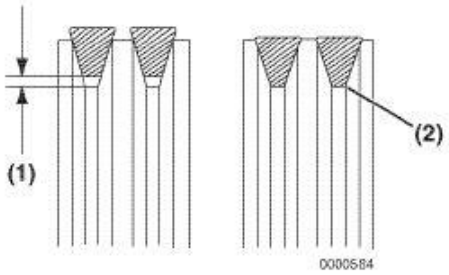


Abbildung 6

4. Den Keilriemen auf Risse, Öl oder Verschleiß untersuchen. Liegt einer dieser Zustände vor, den Keilriemen erneuern.
5. Den neuen Keilriemen aufziehen. Siehe Tabelle zur richtigen Spannung.

Spannung des neuen Keilriemens		
A	**B**	**C**
5/16 - 7/16 in. (8 - 12 mm)	3/16 - 5/16 in. (5 - 8 mm)	1/4 - 7/16 in. (7 - 11 mm)

6. Nach dem Einstellen den Motor 5 Minuten oder länger laufen lassen. Die Spannung anhand der Angaben für einen eingelaufenen Keilriemen erneut überprüfen.

Spannung des eingelaufenen Keilriemens		
A	**B**	**C**
3/8 - 1/2 in. (10 - 14 mm)	1/4 - 3/8 in. (7 - 10 mm)	5/16 - 1/2 in. (9 - 13 mm)

5.12 Checking and adjusting pump drive belt

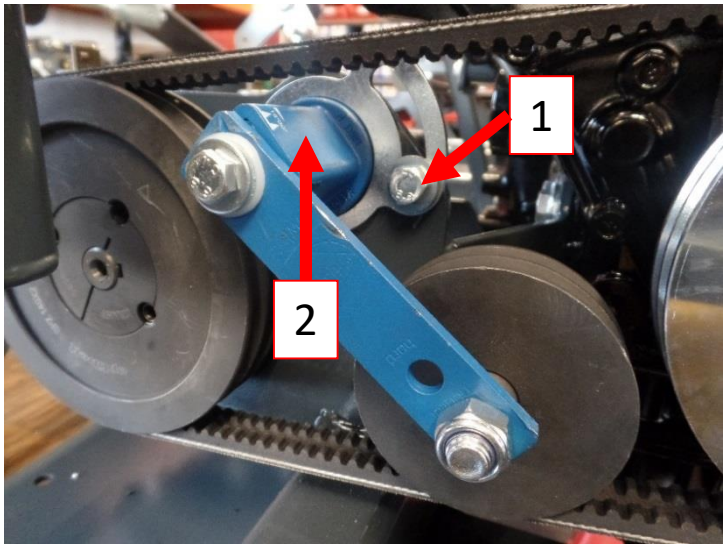
Instruction:
V-Belt tension:

1. Undo screw (1)

2. Turn the square element (2) on the clamp clockwise with a 36-open-ended spanner until a value of 15° appears on the scale fitted!!

3. Then lock screw (1) again.

4. The V-belt should be able to be moved by pushing/pulling about 10-15mm during the tension control.



5.13 Cleaning

- During normal daily maintenance, it is not allowed to perform a high pressure cleaning of the electrical parts with water (high pressure cleaner), such as:
- Receiver and remote control
- Drive (engine)
- Fuse and relay box

6.0 Technical data - Characteristics

Weight:

Total weight (with tracks)	= 730 kg
Total weight (with tracks + mulching deck)	= 920 kg

Engine:

Brand:	= Yanmar diesel engine
Model:	= 3TNV76
Number of cylinders:	= 3
Max. power (KW/HP)	= 19 KW/25 HP
Cooling	= water-cooled
Displacement	= 1116 cm^3
Max. torque	= 63 Nm
Air filter	= dry

Dimensions:

Length	= 1.65 m
Width	= 1.80 m
Height	= 0.95 m

Operating noise:

Noise level	= approx. 95 dBA

Main machine:

Fuel tank	= 30 litres, swivel-mounted
Speed	= 0-6km/h, VMAX continuously adjustable
Device drive	= V-belt via electromagnetic coupling
Travel drive	= hydrostatic via two pumps with two wheel motors with accumulator brakes (zero turning radius)
Drive	= Self-aligning rollers
Control	= remote control forward/reverse, right/ left, speed, differential speed right/left (Hill-top assist), engine start/stop, engine speed, cruise control (for export outside EU only)

Remote control:

Manufacturer	= NBB Germany
Frequency band	= 434.050 – 434.750 MHz
Transmit power	= 10 mW
Range	= max. 300 m
Gain	= approx. 1 dB
EIRP	= < 10 mW

Usable attachments: NIKO mowing system

Type	= KM110
System	= flail mower
Mowing width	= 1.10 m
Knife type	= Y-knife
Knife	= 48 pieces
Weight:	= 140 kg

Electrical equipment

Voltage	= 12 V
Alternator	= 80 A/40A
Battery	= 60 Ah

Hydraulic system

Transmission	= axial piston pump
Mowing unit	= mechanical

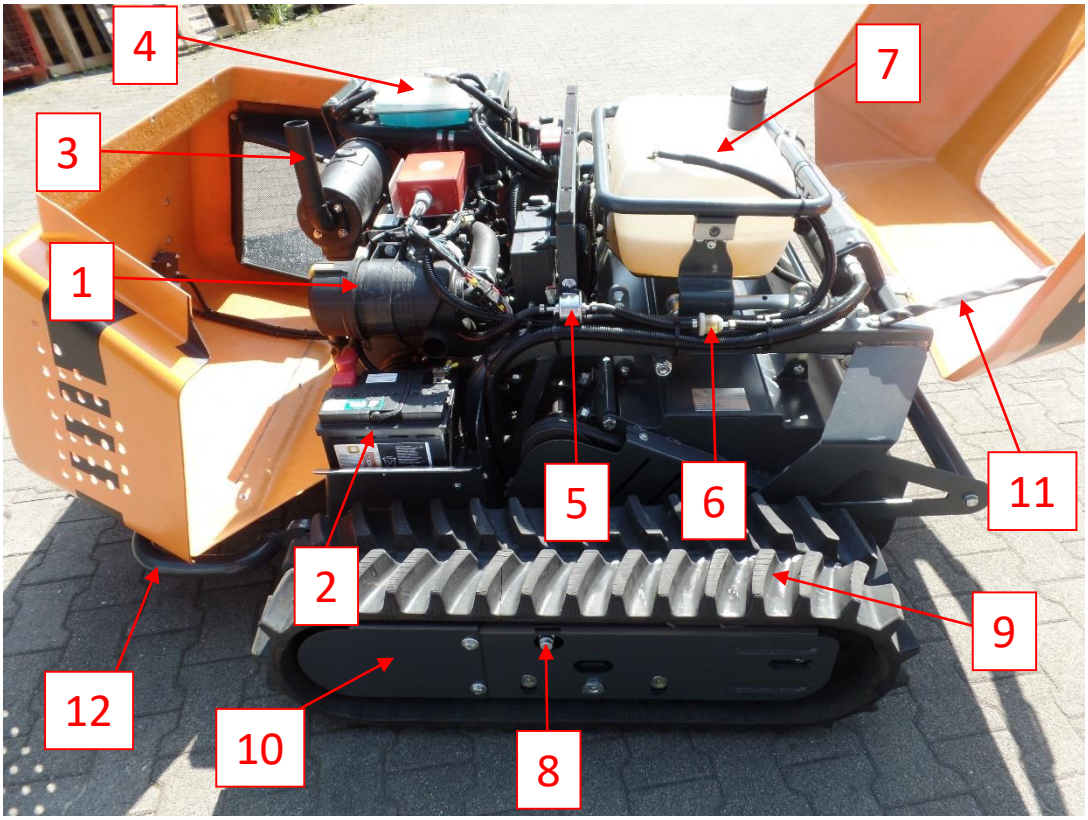
Tracks/Models

Rubber track 250x72x34	= approx. 50 kg

Capacities - Liquids

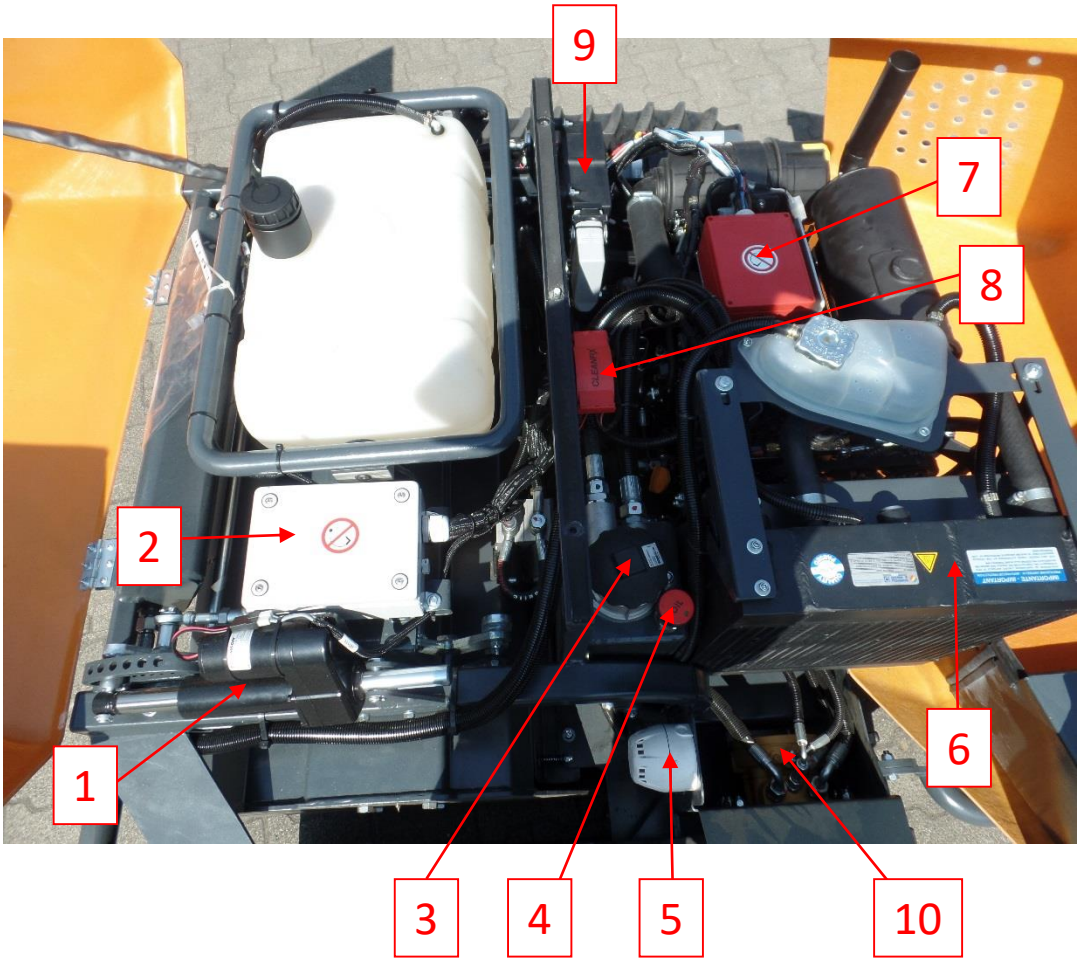
Hydraulic oil	= 22 litres
Engine oil	= 3.4 Litres
Fuel	= 30 Litres

6.1 Structure of the machine



1. Air filter
2. Battery
3. Exhaust system
4. Coolant expansion tank
5. Fuel pump
6. Fuel primary- filter
7. 30 litres fuel tank
8. Track tensioner grease nipple
9. Rubber track
10. Track drive gear cover
11. Hood safety track
12. Protective bar

6.1 Structure of the machine



1. Mowing unit adjustment cylinder
2. Board box
3. Hydraulic filter
4. Hydraulic oil filler neck
5. Horn
6. Radiator
7. Electrical box (softstart board)
8. CleanFix control unit
9. Radio remote control receiver
10. Drive engine

6.2 Working with the machine

1. Be sure to wear the right work clothes. Wear approved safety shoes, no sandals or tennis shoes.

2. Check the blades of the mowing units. Bent blades, blades with cracks or other damage must be replaced with spare parts from the manufacturer.

3. Fill the tank outdoors. Clean up any spilled fuel.

4. Check that the oil level is within the acceptable limit.

5. Read the manufacturer's operating instructions and follow all engine and accessory instructions. These instructions are for your own safety and the safety of others.

6. Exhaust gases are dangerous. Therefore, start the engine outdoors.

7. Make sure that all safety devices are in place and correctly functioning.

8. This device may only be operated by people who have experience and routine with it and who have received training/instruction from Rapid or its partners. Persons under 18 years of age are prohibited from using the RoboFlail.

9. Wet grass can be dangerous. Wait for the grass to dry.
Caution: danger of slipping.

10. Instruct children and others to stay away from the area to be mowed

11. Never mow without good lighting conditions and poor visibility into mowing terrain.

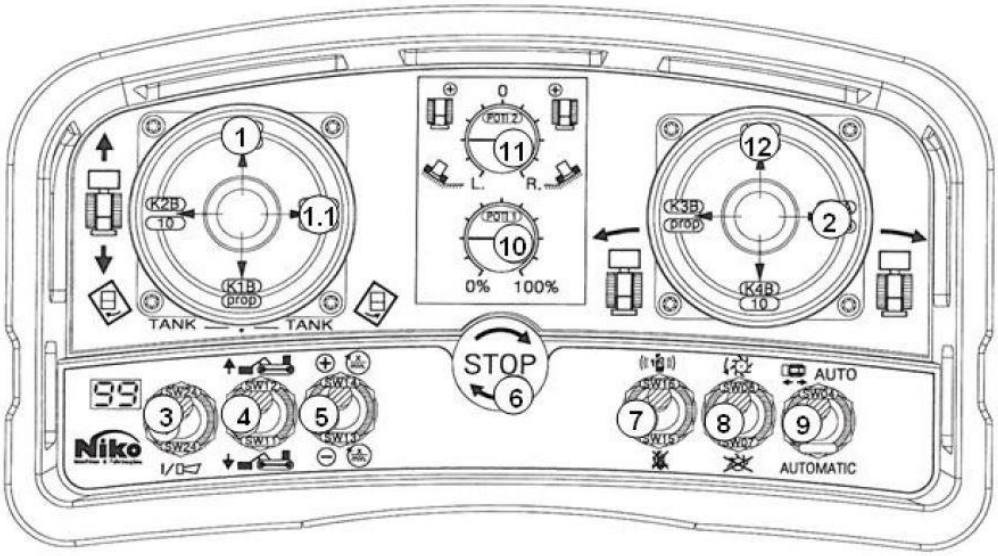
12. Pick up any objects lying around from the ground and remove them from the surface to be mowed.

13. Look for obstacles and fixed objects. These can damage the machine or cause injury.

13. A hot engine, silencer, or exhaust can cause burns.
Do not touch these parts.

14. Check that the installed safety devices are correctly functioning.
- Emergency stop button on the machine
- Stop button on the remote control

7.0 Description of the radio remote control



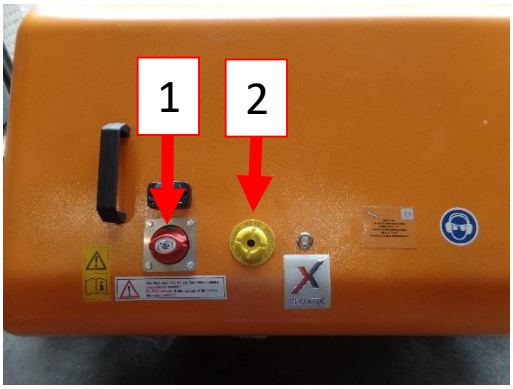
1. Forward, neutral, back
1.1 Tank swivel right/left
2. turn right, turn left
3. Signal configuration
4. Mowing deck UP/DOWN
5. Engine speed +/-
6. Emergency stop switch on/off remote control
7. Engine start/Engine stop
8. Mowing deck ON/OFF
9. Cruise control ON/OFF (outside the EU only)
10. Speed range fast/slow, continuous 0-100%
11. Lateral slope function, run the track on the right or left faster
12. Without function (FREE)

Please also read the operating instructions of the manufacturer of the radio remote control before commissioning!

Attention:

Before starting the engine, read the instructions thoroughly again and check your knowledge of the commands. From the time the engine is started, the operator is immediately responsible for any damage that may occur as a result of improper manoeuvres and non-compliance with safety and traffic laws.

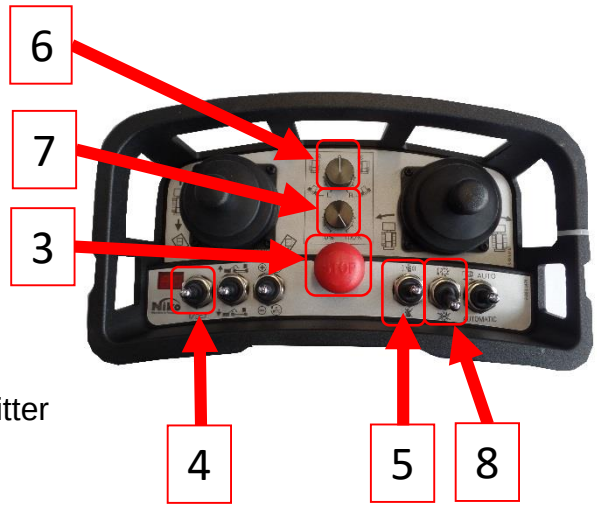
7.1 Starting the engine



1.) Turn the battery cut-off switch (1) on the RoboFlail (basic appliance) to 1.
Then press the on/off switch (2) by pressing the black button and simultaneously pulling out the yellow button.

2.) Before switching on the transmitter (remote control) the following settings on the remote control must be checked:

- **Lateral tilt rotary knob (6)potentiometer set to 0**
- **Speed potentiometer rotary knob (7) set to 100%**
- **Equipment power on Toggle switch (8) set to OFF**



3.) Release the stop button (3) on the transmitter by turning clockwise

4.) Turn on/Horn the device by tilting the switch (4) forwards
(longer or more times if necessary)
→ Warning light on the hood FLASHES!!
Tuning transmitter – Receiver

5.) Then press button (5) to start the engine.

Important!
If the starter motor is actuated once and the engine does not start, its function is disabled.
For a second start attempt, first set the switch to the engine stop position (1x tilting the switch (5) backwards), then the starter can be operated again.

Attention:

Avoid unnecessary damage! The starter motor can be affected if it is operated at a time for more than 15 seconds. If necessary, wait 1 to 2 minutes before attempting to start the machine again.
Burned-out starters are not a guarantee!!

7.2 Forward and reverse movement

To operate the forward and reverse movement of the machine, use the left joystick on the remote control; push the lever forward to move the machine forward and pull the lever back to move the machine backwards. The joystick works proportionally, so the more the lever moves, the faster the machine moves. The maximum speed available depends on the throttle and potentiometer settings.

7.3 Changing direction R/L

The direction of the RoboFlail One D is controlled by moving the right joystick sideways; by pushing the lever to the right the machine steers to the right and by pushing the lever to the left the machine steers to the left.

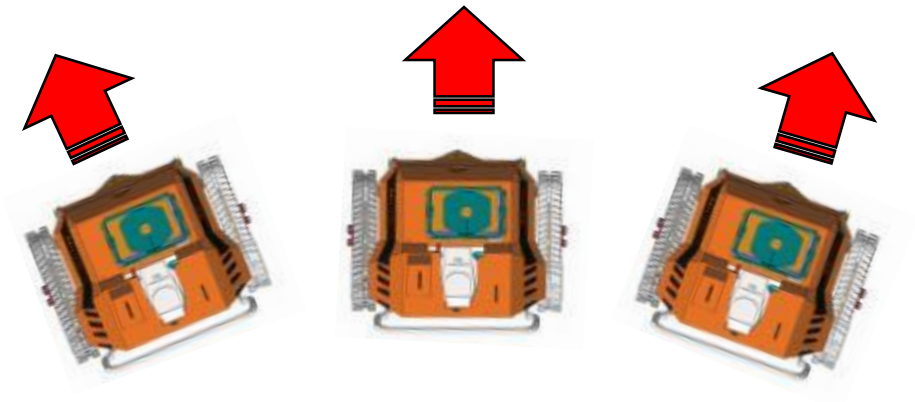
7.4 Potentiometer

The control of the basic speed (rotary switch) determines the maximum moving speed capacity of the machine from 0-100% when the joystick is operated. It is an adjustable speed control. The adjustment is made by turning the switch to the desired speed position (%); the selected setting depends on a number of factors, but should always be within a range where the operator has optimal control over the machine.
When starting the engine, the potentiometer setting should be set to 100%.

Important:
The RoboFlail One D control is designed in such a way that the control is clear when you are standing behind the machine.

7.5 Steering potentiometer

The steering potentiometer function allows a gradual pre-setting of the steering for the use of the machine on slopes or on steep slopes. The adjustment is done by means of the rotary switch marked in red. Turn the switch clockwise or counter-clockwise for right or left. The further it is turned, the greater the speed difference between the upper and lower tracks will be to ensure a straight line. Although the steering must continue to be monitored and operated normally, it operates to a much lower degree.



7.6 Lifting and lowering the mowing unit

The lifting of the mowing unit is controlled by an electric cylinder and can be adjusted continuously in height. By moving the switch up and down, the mowing unit used can be adapted to different materials and conditions.
To ensure a constant cutting height even after lifting and lowering the mowing unit, this can be preset by inserting a locking pin.

7.7 Controlling the engine Speed

The engine speed can be manually adjusted by pressing the red-marked toggle switch. By pushing it upwards, the engine speed increases and by pushing it downwards it decreases.

7.8 Turning the mowing unit ON/OFF

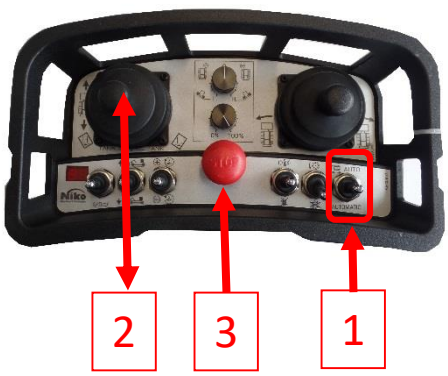
The mowing unit can be switched ON/OFF via the remote control after starting the device. Pushing the rocker lever forward will turn the mowing unit on. By tilting the switch downwards, it is switched off again. Important: When starting the RoboFlail, the mowing unit must be switched off, otherwise the engine cannot be started.

7.9 Cruise control

Cruise control function is only permitted outside the EU.

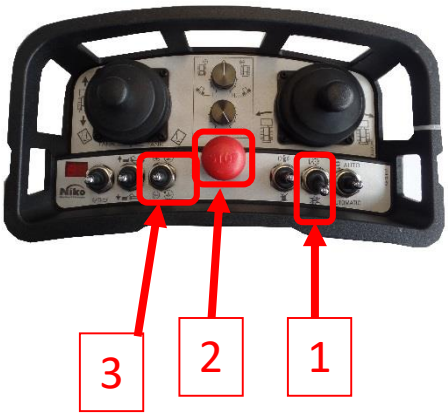
The cruise control can be activated with the device via the switch (1) while driving.
The subsequent speed level can now be increased or decreased by operating the lever (2). Releasing the lever automatically keeps the current speed level constant. The cruise control is deactivated by pressing the switch (1) in the reverse direction of switching on.

Deactivation of the cruise control function can also be performed by pressing the emergency stop switch (3).



7.10 Stopping the engine

Before the engine is switched off, all machine movements must be stopped, switch (1) (mowing unit) is set to "off" and the engine speed switch (3) must be reduced to the minimum value. Allow the machine to run at this level for approximately one minute to stabilise the pressures and temperatures. The machine is then switched off by pressing the emergency STOP BUTTON switch (2), which stops the engine.
When the engine is stopped, the process is completed by additionally pressing the on/off switch and the battery cut-off switch position set to 0 on the RoboFlail One D.



Important:

Also refer to the enclosed operating instructions of the radio remote control manufacturer.

8.0 Troubleshooting

A large part of the functional defects can be attributed to improper use of the machine. The following table lists malfunctions and the actions that can be taken to prevent them.

Important note:
If you have any problems or doubts, always contact our sales representative Rapid or your RoboFlail dealer. In this case, please note down your equipment type, serial number and operating hours of your equipment.

If the error you are having is not shown in the table below, contact Rapid or your RoboFlail dealer for the necessary repair.

Technical support

Rapid Technic GmbH
Industriepark 7
D-74706 Osterburken

Tel. +49 6291 415 9590
Email info@rapid-technic.de
Home page: www.rapid-technic.de

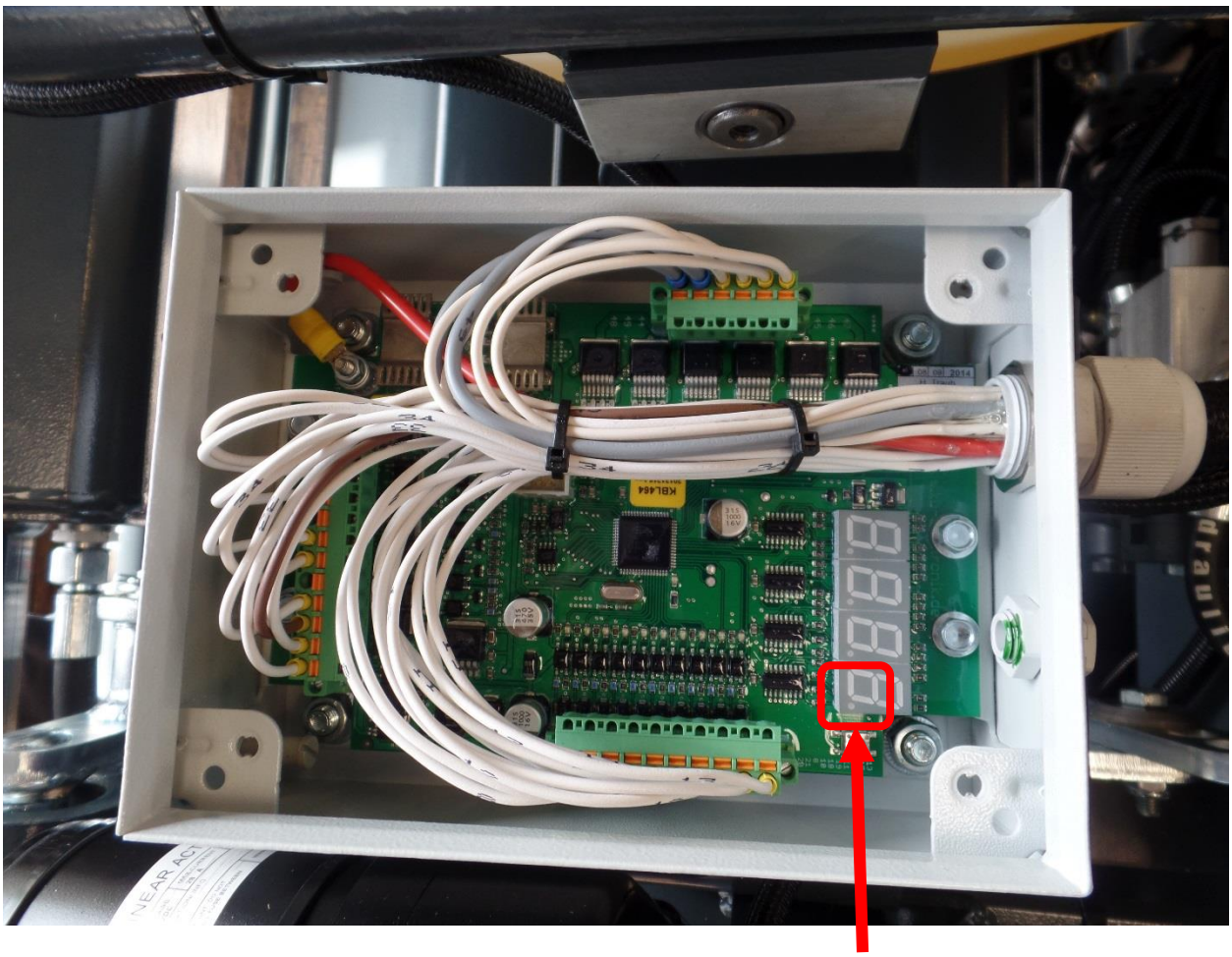
8.1 Diesel engine

The low oil pressure horn stays on even when the engine is running at high speed.	- Low oil level in the oil pan - The oil is unsuitable for the season - Oil filter clogged	- Restore the level - Replace the oil - Replace the filter
Fluid leaks from radiator cap breather tube	- Low fluid level, fluid leakage - The radiator is clogged - Fan belt	- Add fluid, repair - Clean the radiator - Check belt tension
Engine does not start	- Voltage on the battery too low	- Check the battery voltage.
Engine shuts off when working.	- Check fuel level (tank empty) - Primary fuel filter clogged - Faulty fuel pump	- Add fuel - Replace the primary fuel filter. - Replace the fuel pump

8.2 Hydraulic system

The pump makes a strange noise.	- no oil in the tank - Defective pump - The hydraulic oil is not suitable for this temperature	- Restore the oil level - Repair or replace - Replace

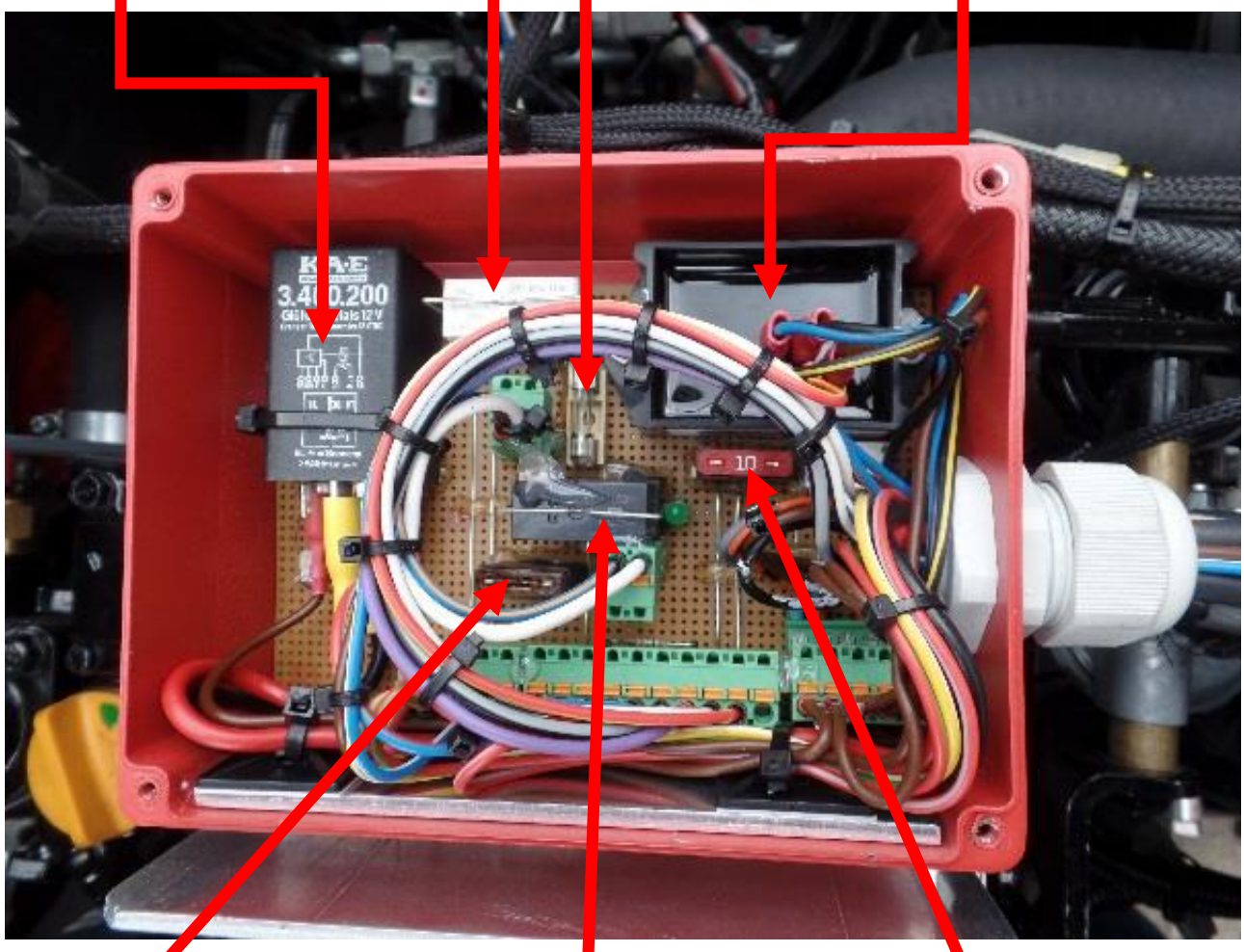
8.3 Electrical system - Reading error code (circuit board)



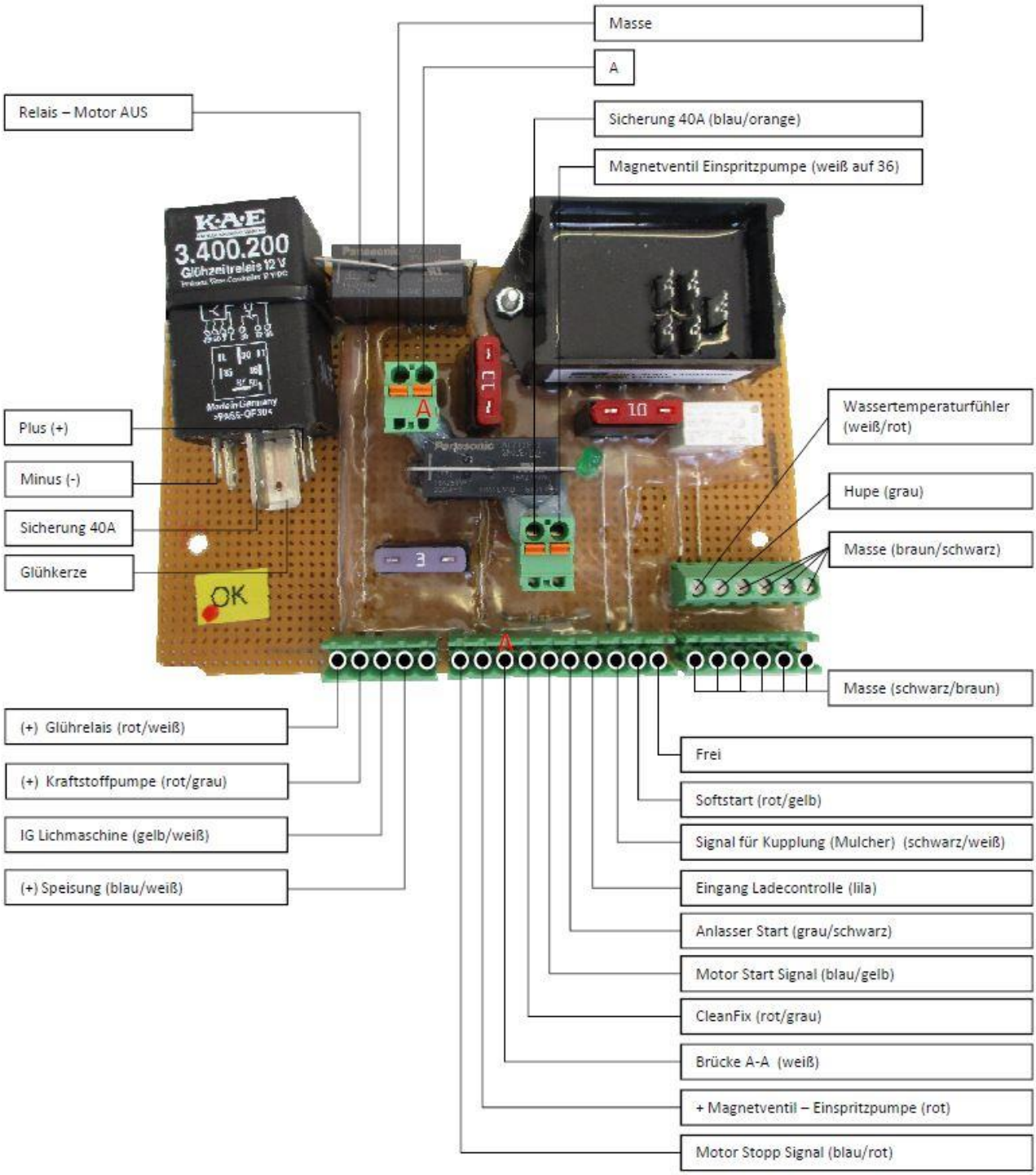
To read an electronic error,
press the button next to the display – 4x.
Following this, possible error messages (F000?) can be read from the adjacent display.
Type of error: See error table → Section 9.3

8.4 Fuses and relays (up to serial no.: 2023)

The fuses and relays are located in the red electrical box under the hood.
Carefully remove the protective cover by unscrewing it and replace the fuses or relays, if necessary, with fuses/relays of the same capacity.



8.4 Fuses and relays (up to serial no.: 2023)



8.4 Fuses & relays
Board KBL491 (from serial no.: 2024)

The fuses and relays are located in the attached electrical box under the hood.
Carefully remove the protective cover by unscrewing it and check the internal board (SMD/TSM) for any visual damage.

Info:
Circuit boards – software KBL486 includes an "automatic - shutdown" of the circuit board KBL486 & KBL491 from the circuit after 4 min.
To reactivate the device, the main switch must be switched off and on!
(From SN: 2131)

8.4 KBL 491 board – Error messages:

RF One D - KBL491 Error list:
In the event of an overcurrent, the semiconductor outputs are switched off.
Outputs 1...10 measure the overcurrent active and switch off permanently at approx.10 A.
In addition to the active measurement, the block is internally protected against overtemperature.
This message is not displayed.

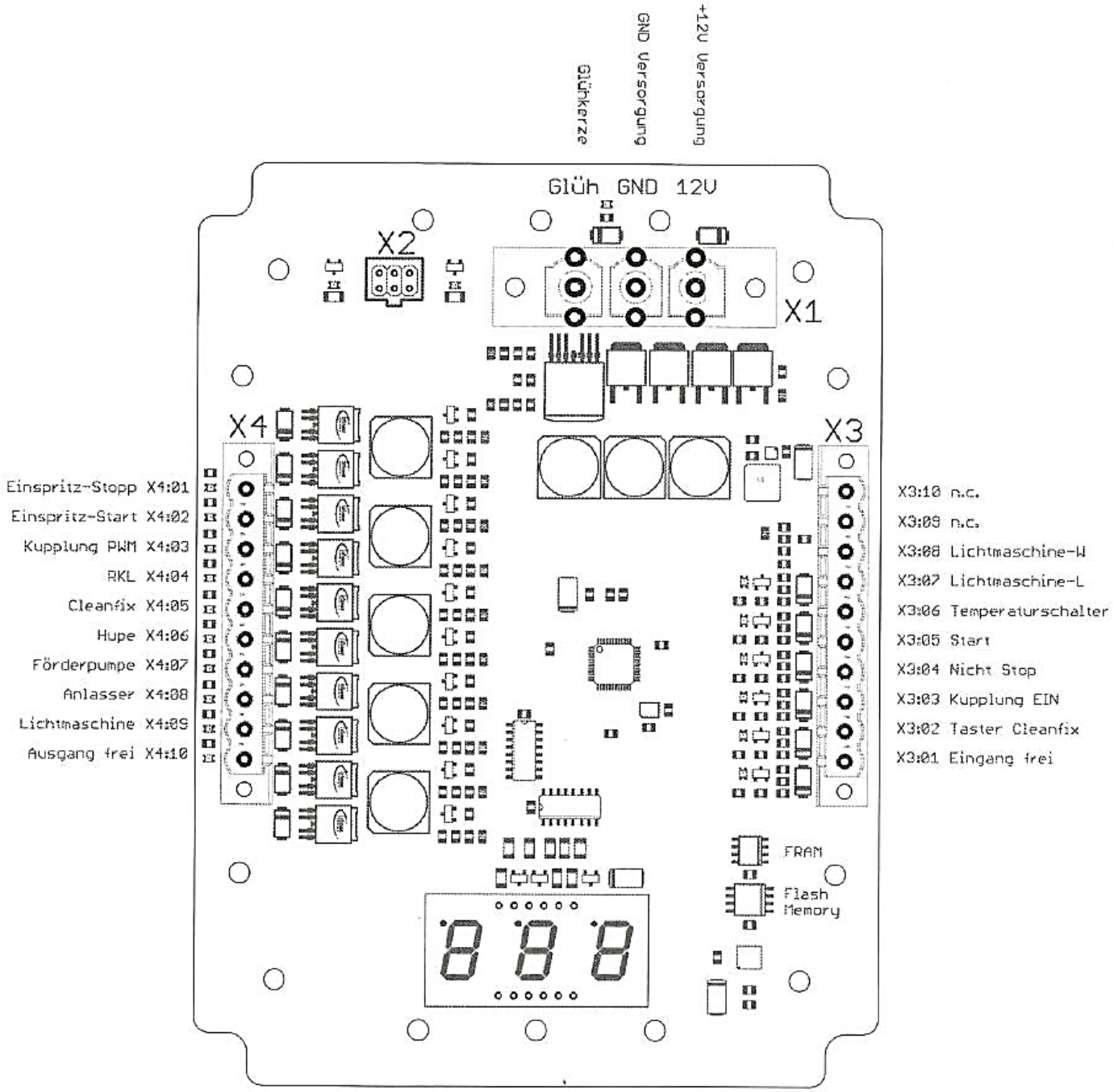
The outputs are reset by switching the power supply off and on.

The overcurrent of the output is shown in the display and is assigned to the output in each case.

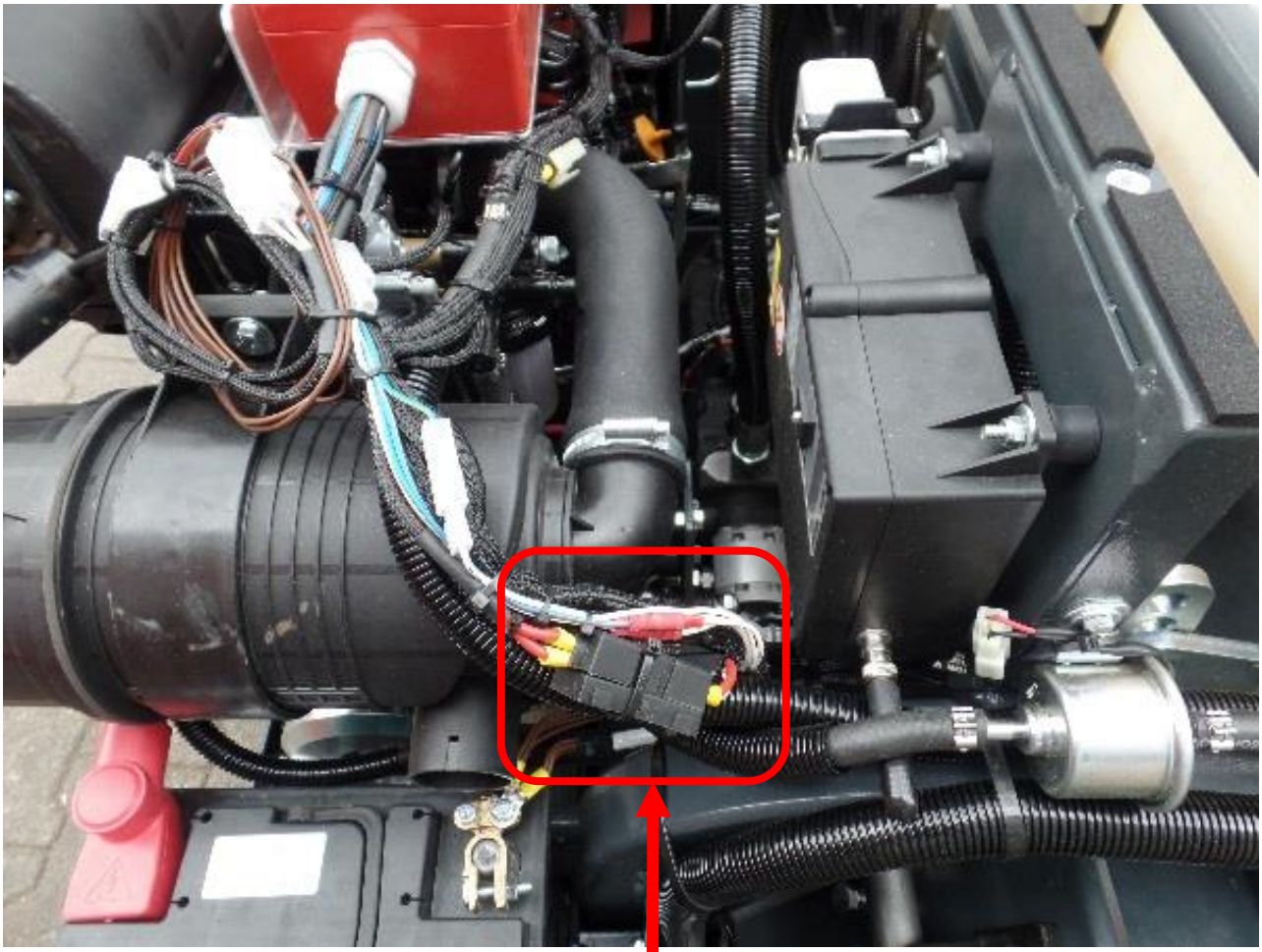
- F01 X4:01 Injection stop overcurrent > approx.l 10 A for longer than 0.5 seconds
- F02 X4:02 Injection start overcurrent > approx. 10 A for longer than 0.5 seconds
- F03 X4:03 PWM clutch overcurrent > approx. 10 A for longer than 0.5 seconds
- F04 X4:04 RKL signal lamp overcurrent > approx. 10 A for longer than 0.5 seconds
- F05 X4:05 CleanFix overcurrent > approx. 10 A for longer than 0.5 seconds
- F06 X4:06 Horn overcurrent > approx. 10 A for longer than 0.5 seconds
- F07 X4:07 Supply pump overcurrent > approx. 10 A for longer than 0.5 sec
- F08 X4:08 Starter motor overcurrent > approx. 10 A for longer than 0.5 seconds
- F09 X4:09 Alternator overcurrent > approx. 10 A for longer than 0.5 seconds
- F10 X4:10 Reserve overcurrent > approx. 10 A for longer than 0.5 seconds
- F11 X4:11 Glow plug overcurrent > approx. 35 A for longer than 0.5 seconds

- Horn 0.5 sec. On, 1.0 sec. from overtemperature coolant.

8.4 Board KBL491 (from serial no.: 2024)



On the strand of the cable harness, is the
fuse that protects the harness from over voltage.
(Fuse 40A)



Fuse 40A: Main supply voltage

8.4 Softstart controller

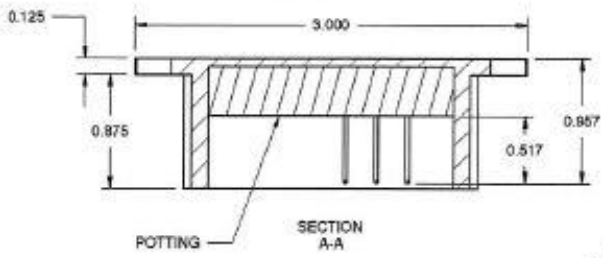
"What you need in a clutch"®

SOFTSTART CONTROLLER

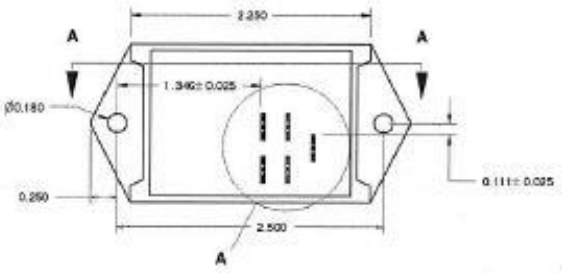
The patented Softstart Clutch Controller offers a simple solution to all of these issues!

- **Mechanical Life:** The Softstart lessens forces to mechanical parts and improves the life of bolts, decks, brackets and other mechanical parts.
- **Belt Life:** Reduce wear and breakage for belts and improve the quality & reputation of the equipment.
- **Engine Stall:** The Softstart eliminates engine stalling and RPM droop by utilizing closed loop RPM monitoring while engaging the electric clutch.
- **Mechanical Jolt:** Smooth engagement means less jolt to the equipment and customers.
- **Engine Cost Savings:** The Softstart Clutch enables OEM's to reduce equipment engine size to save money.

SIDE VIEW



TOP VIEW



Gas Version, Absolute Maximum Ratings - Model 3112300000

	Min	Nom	Max	Units
Operating Voltage	8		16	Volts
Max On resistance:			0.05	Ohms
"On" Response Time:	220	250	280	mS
Soft Start Ramp Time:	900	1000	1100	mS

Tachometer Input (for closed loop versions)

	Min	Nom	Max	Units
Impedance:		1.5		Mohms
Input Range:	1000		4000	RPM*

*Note: RPM input spark pattern 1:1
(1 Pulse per Revolution, other patterns available)

Protection
Load Dump ISO 7637-2 test pulse 5A

	Min	Nom	Max	Units
Over current (13.8 VDC)	47	89	131	Amps

Diesel & Electric Version, Absolute Maximum Ratings - Model 3112800000

	Min	Nom	Max	Units
Operating Voltage	8		16	Volts
Max On resistance:			0.05	Ohms
"On" Response Time:	220	250	280	mS
Soft Start Ramp Time:	900	1000	1100	mS

Alternator Tachometer Input (for closed loop versions)

	Min	Nom	Max	Units
Impedance:		100		Kohms
Trigger (VIL)			3.3	Volts
Trigger (VIH)	4.7			Volts
Frequency Range:	170		700	Hz*

*Note: Other frequency ranges available

Protection
Load Dump ISO 7637-2 test pulse 5A

	Min	Nom	Max	Units
Over current (13.8 VDC)	47	89	131	Amps

Ogura Industrial Corp. 100 Randolph Road Somerset, NJ 08873
www.ogura-clutch.com info@ogura-clutch.com

"What you need in a clutch"®

The patented Softstart controller senses the exact point at which the friction surfaces contact, then rapidly reduces the current to a level that allows the clutch to safely slip, but not release. Using engine RPM feedback, the patented controller adjusts the clutch current in a manner that drives the engine RPM to a fit a desired profile.

Design Features:

- Closed loop control for consistent performance throughout the entire clutch life.
- Precise current measurement for accurate and repeatable pull-in detection.
- Closed loop PWM current control unaffected by charging system voltage.
- One controller part number
  - Ratiometric RPM control automatically scales to RPM at time of engagement.
  - On-the-fly current calibration automatically adapts to different sized clutches.
- Default to open loop control if RPM signal is unavailable.
- Optional fixed current calibration possible for special applications
- Optional open loop available (no tachometer feedback)
- Short Circuit protected / Load dump protected

Operating and Environment Specs:

- Operating Temperature Range: -40 to +70C
- Vibration: 20g's @ 10—80 Hz SAE J-1378
- Shock 55g's SAE J-1378 (tested and passed to 150gs. which is nearly 3 times the SAE specification)
- Humidity: 95% H SAE J-1378
- Salt Spray Test: MIL-STD-202G, Method 101E (5% NaCl @ 35C, 48 hrs)
- Dust: Unit is 100% encapsulated—dust cannot enter
- Immersion: ASAE EP455 5.6 level 2

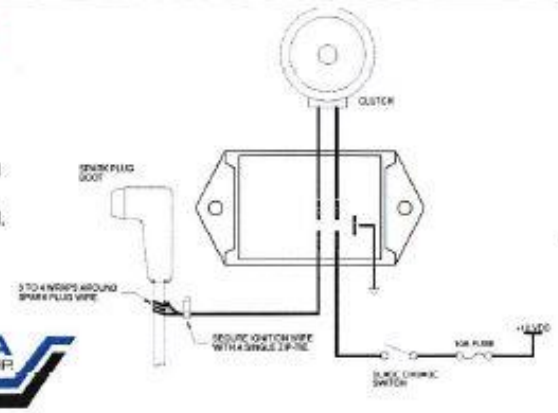
Immerse controller in tap water at temperature of 18C +/- 5C to a component top surface depth of 460mm. Orient in each of 3 orthogonal planes for 5 min in each plane. Upon removal, immediately subject to a cold soak of 019C for 30 min. Return to dry atmosphere of 25C for 60 min. No impaired function, no water entry

Ultraviolet: Q-Sun Xe-1-UV Chamber—720 Hours

- Thermal Shock: Controller stabilized at 70C for 30 min. Removed from oven and immediately immersed in 0C water mixed with UV sensitive dye for a minimum of 5 minutes—repeated for a total of 10 cycles. Controller stabilized at -40C for 30 min. Removed from chamber and immediately immersed into 25C water mixed with UV sensitive dye for a minimum of 5 min—repeated for a total of 10 cycles. No functional failures or ingress of water.
- Chemical: ASAE EP455.5.8.2 chemicals brush exposure
- Chemical test: Apply with a brush over the normally exposed surface area. Repeat once per day for three days. Check for impaired function or detrimental corrosion during the test and at the end of a 100 hour min interval following exposure to test condition. No defect from wiping the surface with the following chemicals at room temperature: engine oil, transmission fluid, gasoline.

HOOKUP: Gas Powered, Diesel or Electric Versions PIN OUT

A Ground
B +12VDC Supply
C Clutch OUT +
D Clutch RETURN
E RPM Tachometer trigger (for closed loop versions). Inductive for gas equipment, alternator output for diesel, other pickup options available



OEM Options

- Other tachometer feedback (rotating shaft, controller interface, etc.)
- Open loop soft start version with no tachometer feedback
- Voltage input options
- Multiple clutch engagement and tachometer profiles

OGURA INDUSTRIAL CORP.

Ogura Industrial Corp. 100 Randolph Road Somerset, NJ 08873 www.ogura-clutch.com info@ogura-clutch.com

9.0 Additional information for program description

KBL464 3 Roboflail One

Programmbeschreibung Stand Juni 2015

Funktion des Programms

Nach dem Einschalten des Hauptschalters, wird ein kurzer Systemtest durchgeführt. Dabei wird kontrolliert, ob der Öldruckschalter angeschlossen ist und ein Massesignal liefert. Der Motor kann nur gestartet werden, wenn dieser Test erfolgreich beendet wurde. Vor einem Systemstart muss sichergestellt sein, dass der Öldruck abgefallen ist.

Wenn der Motor gestartet wird, wird der Öldruckschalter bei der Überwachung für 15 Sekunden ausgeblendet. Innerhalb dieser Zeit muss die Masseverbindung im Öldruckschalter unterbrochen werden. Sollte diese Verbindung länger geschlossen sein, so wird der Motor wieder gestoppt. Sollte im laufenden Betrieb der Öldruckschalter für länger als 1 Sekunde ein Massesignal schalten, wird der Motor ebenfalls gestoppt. Für einen Neustart, ohne dass der Hauptschalter betätigt wurde, muss der Öldruckschalter nicht melden.

Wenn im Betrieb der Öldruckschalter kein Massesignal liefert, läuft der Betriebsstundenzähler. Der Betriebsstundenzähler für das Mähwerk läuft, wenn der Ausgang für das Mähwerk geschaltet ist. Die Laufzeit wird in Stunden angezeigt.

9.1 Terminal assignment

Klemmenbelegung KBL464_3

Die folgende Belegung ist zu Platinen stand KBL464_3 die im Gerät benutzte Kabelliste ist im Gehäusedeckel eingeklebt.

Stromversorgung:

Schraube M4	36	Batterie Masse
Schraube M4	38	Zuleitung Plus nach Hauptschalter und Vorsicherung max. 35A

Digitale Eingänge:

Min. Eingangsspannung >7,5V max. Eingangsspannung < 17,0V

X2:30	Hauptschalter +12V
X2:31	Hauptschalter geschaltet
X2:42	Öldruckschalter
X3:20	Mähwerk heben
X3:21	Mähwerk senken
X3:8	Drehzahl +
X3:10	Drehzahl -
X3:18	Tank schwenken rechts
X3:19	Tank schwenken links
X3:11	Motor Start
X3:12	Motor Stop
X3:15	Anbaugerät aus
X3:13	Mähwerk ein

Digitale Ausgänge:

X2:32	Motor Stop	
X2:1	Versorgung Funkempfänger	Abgesichert F1 ca. 12A bei T_{Case} 80°C
X2:12V	Anschluss +12V für Systemgeräte	Abgesichert F1 ca. 12A bei T_{Case} 80°C
X2:34	Motor Start	Abgesichert F2 ca. 12A bei T_{Case} 80°C
X2:39	Mähwerk EIN	Abgesichert F3 ca. 12A bei T_{Case} 80°C
X2:41	Reserveausgang	Abgesichert F1 ca. 12A bei T_{Case} 80°C
-X33	Vergaserventil	Abgesichert F1 ca. 12A bei T_{Case} 80°C
X3:48	Mähwerk heben / senken	Abgesichert gegen Überstrom
X3:49	Mähwerk heben / senken	Abgesichert gegen Überstrom
X3:44	Motordrehzahl + / -	Abgesichert gegen Überstrom
X3:45	Motordrehzahl + / -	Abgesichert gegen Überstrom
X3:46	Tank schwenken r / l	Abgesichert gegen Überstrom
X3:47	Tank schwenken r / l	Abgesichert gegen Überstrom

9.2 Functions

Funktionen

- **Mähwerk heben**
- **Mähwerk senken**

Geht, wenn keine Übertemperatur und keine Überlast
Richtungswechsel nach 3 mal Überlast nötig

- **Drehzahl plus**
- **Drehzahl minus**

Geht, wenn keine Übertemperatur und keine Überlast
Richtungswechsel nach 3 mal Überlast nötig

- **Tank rechts**
- **Tank links**

Geht, wenn keine Übertemperatur und keine Überlast
Richtungswechsel nach 3 mal Überlast nötig

- **Motor start**

Geht, wenn Eingang Motor start und Eingang Motor stop high sind
Öldruckschalter muss nach Systemstart Masse melden

- **Motor stop**

Geht, wenn Eingang Motor stop low ist oder der Öldruckschalter Masse anlegt
Motor stop kann erst gelöscht werden, wenn Öldruckschalter beim Einschalten der Spannungsversorgung Masse geschaltet hat

- **Betriebsstundenzähler Motor ein**

Zählt, wenn Öldruckschalter keine Masse schaltet, wenn Ausgang Motor aus Masse schaltet läuft Zähler weiter

- **Betriebsstundenzähler Mähwerk ein**

Zählt, wenn Ausgang Mähwerk ein high ist

- **Versogungsspannung Funk und 12V dauer und Vergaser**

Werden beim Einschalten über Ausgang Dauer 12V ein eingeschaltet

- **Mähwerk ein**

Geht, wenn Eingang Mähwerk ein high, Eingang Gerät aus low ist, Öldruckauswertung OK ist und die Platinentemperatur nicht zu hoch ist.

9.3 Functions/Error messages Board KBL464

Anzeige

Funktion

- **Anzeige (Auswahl über Taster)**
- Nach dem Anlegen der Spannung ist Anzeige gelöscht
- Bei fehlendem Öldruck, Eingang ist low, zeigt das Display „oil" an
- 1. Betätigen des Tasters — Anzeige 8888
- 2. Betätigen des Tasters — Anzeige Betriebsstundenzähler Motor ein
- 3.Betätigen des Tasters — Betriebsstundenzähler Mähwerk ein
- 4.Betätigen des Tasters Fehlermeldung

F0000	Kein Fehler
F0001	Überlast Mähwerk heben
F0002	Überlast Mähwerk senken
F0003	Überlast Drehzahl plus
F0004	Überlast Drehzahl minus
F0005	Überlast Tank rechts
F0006	Überlast Tank links
F0007	Öldruckauswertung
F0008	Übertemperatur Platine (>100°C)

Anzeige Fehlerspeicher

Die Software beinhaltet einen Fehlerspeicher der letzten 20 aufgetretenen Fehler. Diese werden in aufsteigender Reihenfolge angezeigt.
Um den Fehlerspeicher auszulesen, muss der Taster für ca. 10 Sekunden gedrückt werden. Während dieser Zeit wird im Display von 0 bis 10 gezählt. Danach werden die Fehler der Reihe nach bei jedem Tastendruck angezeigt. Die ersten zwei Stellen sind die fortlaufende Fehlernummer, die dritte und vierte Stelle zeigt die Fehlerart an.

Absicherung der Ausgänge

Alle Ausgänge von der Platine sind Überlastsicher und schalten bei einem zu großen Strom diesen Ausgang ab. Die Zuleitung ist mit einer Schmelzsicherung 40A abgesichert.

9.4 Board versions

Platinenversionen

- KBL464_0
  - DC-Motoren für Mähwerk, Drehzahlverstellung und Tankschwenken mit 6,3mm Lötstiften
- KBL464_1
  - DC-Motoren für Mähwerk, Drehzahlverstellung und Tankschwenken mit 2-poligen Steckkontakten
  - X9-Pin 5 Leitung 18 statt 28 anschließen
  - X9-Pin 6 Leitung 19 statt 30 anschließen
- KBL464_2
  - DC-Motoren für Mähwerk, Drehzahlverstellung und Tankschwenken mit 6-poligem Stecker ohne Schraubsicherung
- KBL464_3
  - DC-Motoren für Mähwerk, Drehzahlverstellung und Tankschwenken mit 6-poligem Stecker mit Schraubsicherung

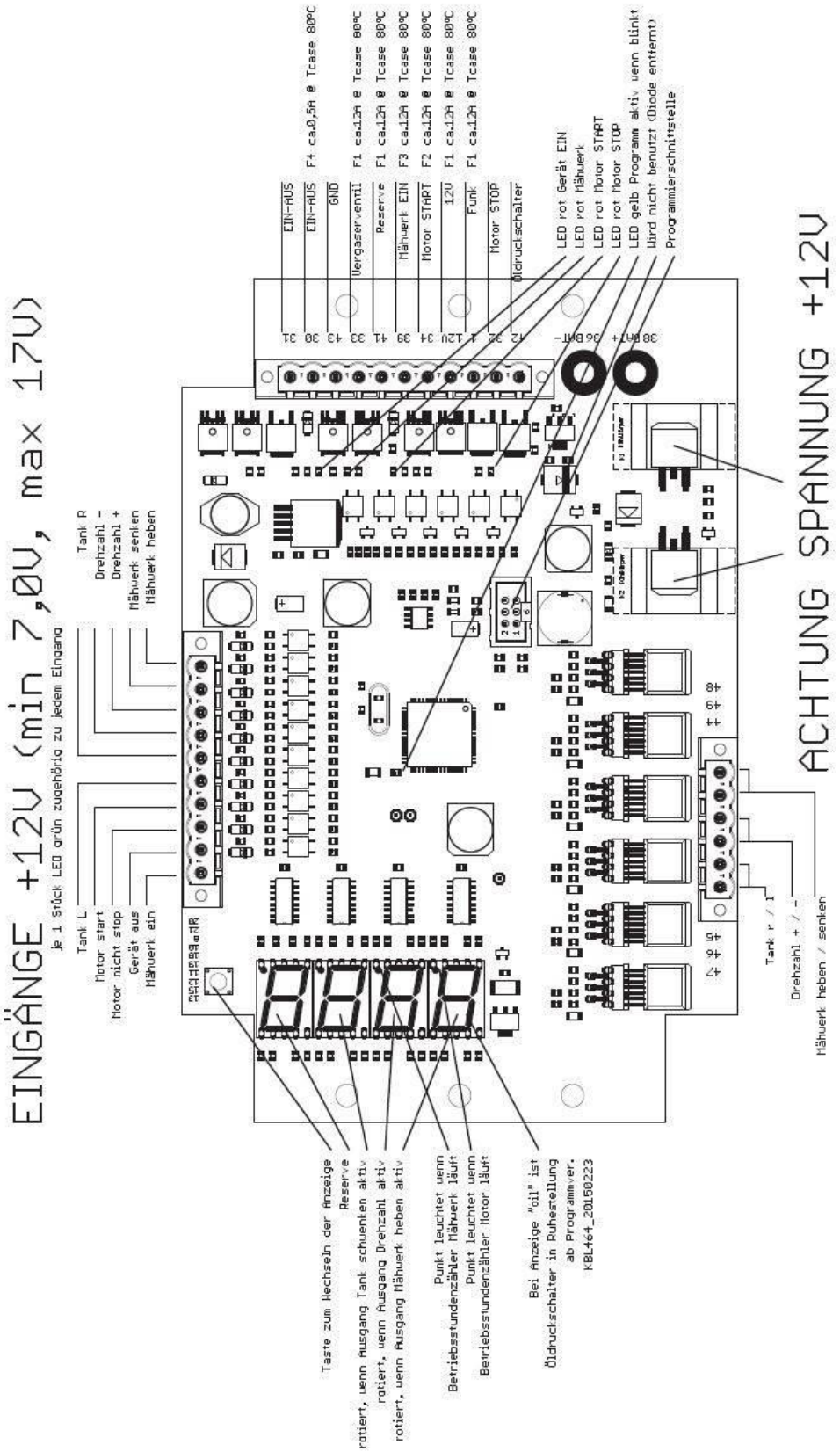
- KBL486_0
  - Identical to KBL464_3 (see above)
    Board size not identical to KBL464_X.
    KBL486_0 installed from serial no.: 1876

9.5. Cable list

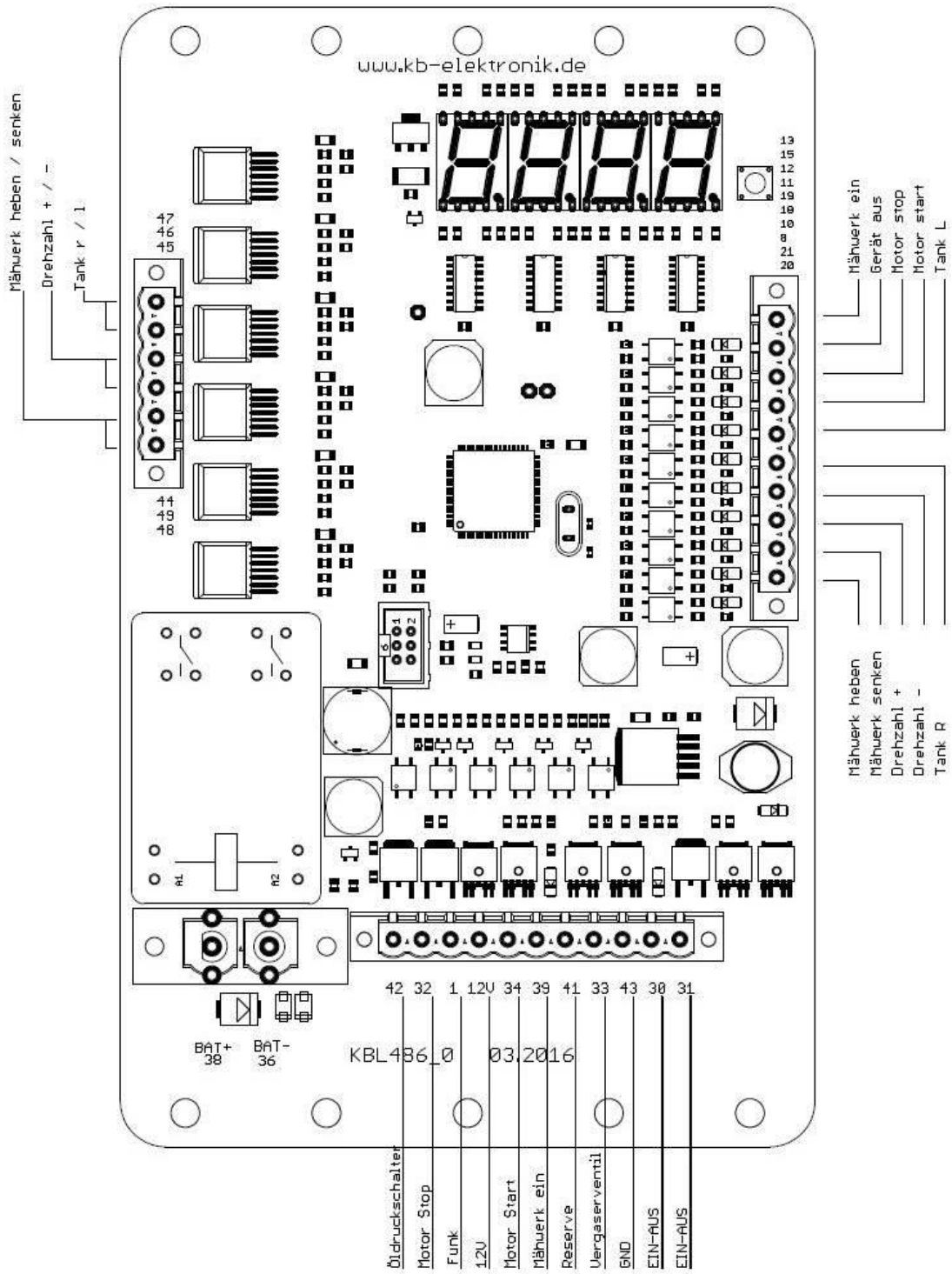
Kabelliste RoboFlail one

Ader	Funktion	von	Kontakt	nach	Kontakt
1	Versorgung Fernbedienung +12V	Ilme-Stecker 24-pol.	1	Platine Stecker 6	1
4	Fahren links vor Leistung	Ilme-Stecker 24-pol.	4	Fahren links vor	2
5	Fahren links zurück Leistung	Ilme-Stecker 24-pol.	5	Fahren links zurück	2
6	Fahren rechts vor Leistung	Ilme-Stecker 24-pol.	6	Fahren rechts vor	2
7	Fahren rechts zurück Leistung	Ilme-Stecker 24-pol.	7	Fahren rechts zurück	2
8	Drehzahl + Signal	Ilme-Stecker 24-pol.	8	Platine Stecker 10	8
9	Versorgung Fernbedienung GND	Ilme-Stecker 24-pol.	9	BAT --	
10	Drehzahl - Signal	Ilme-Stecker 24-pol.	10	Platine Stecker 10	10
11	Motor START Signal	Ilme-Stecker 24-pol.	11	Platine Stecker 10	11
12	Motor STOP Signal	Ilme-Stecker 24-pol.	12	Platine Stecker 10	12
13	Mähwerk EIN Signal	Ilme-Stecker 24-pol.	13	Platine Stecker 10	13
14	Antriebe AUS	Ilme-Stecker 24-pol.	14	Ventilstecker-Freigabe Antrieb	2
15	Gerät AUS Signal	Ilme-Stecker 24-pol.	15	Platine Stecker 10	15
18	Tank verstellen rechts Signal	Ilme-Stecker 24-pol.	18	Platine Stecker 10	18
19	Tank verstellen links Signal	Ilme-Stecker 24-pol.	19	Platine Stecker 10	19
20	Mähwerk heben Signal	Ilme-Stecker 24-pol.	20	Platine Stecker 10	20
21	Mähwerk senken Signal	Ilme-Stecker 24-pol.	21	Platine Stecker 10	21
24	Hupe Leistung	Ilme-Stecker 24-pol.	24	Signal	
25	Fahren links vor Leistung	Masse		Fahren links vor	1
26	Fahren links zurück Leistung	Masse		Fahren links zurück	1
27	Fahren rechts vor Leistung	Masse		Fahren rechts vor	1
28	Fahren rechts zurück Leistung	Masse		Fahren rechts zurück	1
29	Mähwerk EIN Leistung	Masse		X1 - Mähwerk Ein	T-hoch
30	Gerät EIN/AUS Signal	Maschine Hauptschalter	1	Platine Stecker 5	30
31	Gerät EIN/AUS Signal	Maschine Hauptschalter	2	Platine Stecker 5	31
32	Motor STOP Öldruck Leistung	Anlasser Zündspule		Platine Stecker 6	32
33	Vergaser Leistung	Vergaser		Platine Stecker 5	33
34	Motor START Leistung	Anlasser Starterrelais		Platine Stecker 6	34
35	Zuleitung von Sicherung 40A	Lichtmaschine		Sicherung 40A	2
36	Zuleitung von Batterie	BAT –		Schraubanschluss M4	BAT-
37	Hupe Leistung (Masse)	BAT –		Signal	
38	Zuleitung von Sicherung 40A	Batterie / Sicherung 40A	2	Schraubanschluss M4	BAT+
39	Mähwerk EIN Leistung	X1 - Mähwerk Ein	T-quer	Platine Stecker 6	39
40		Anlasser Starterrelais	BAT+	Sicherung 40A	1
42	neu: Öldruck Signal Y3	Öldruckschalter (Öffner)		Platine Stecker 6	42
43	Bremse (Masse)	Ventilstecker-Freigabe Antrieb	1	Platine Stecker 5	43
44	Drehzahl - Leistung	Antrieb Drehzahlverstellung		Platine Stecker 2a	44
45	Drehzahl + Leistung	Antrieb Drehzahlverstellung		Platine Stecker 2a	45
46	Tank verstellen links Leistung	Antrieb M2 Tankverstellung		Platine Stecker 2b	46
47	Tank verstellen rechts Leistung	Antrieb M2 Tankverstellung		Platine Stecker 2b	47
48	Mähwerk verstellen Leistung	Antrieb Mähwerksverst. AUF/AB	T-hoch	Platine Stecker 2c	48
49	Mähwerk verstellen Leistung	Antrieb Mähwerksverst. AUF/AB	T-quer	Platine Stecker 2c	49

9.6 Board KBL464



9.6 Board KBL486



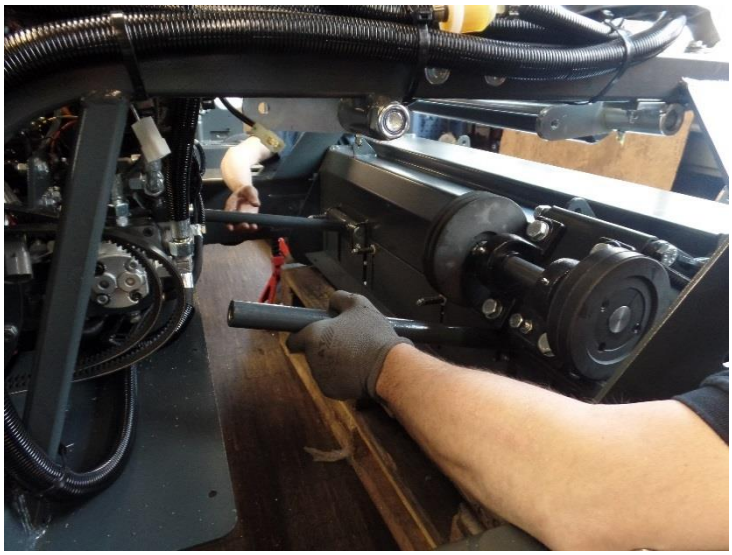
10.0 Mounting the mulcher

The RoboFlail One D is equipped with a lower lifting device on which approved attachments of Niko GmbH / Rapid can be attached.
Follow these steps to complete this process:

Installing Niko – Mulcher RoboFlail One D

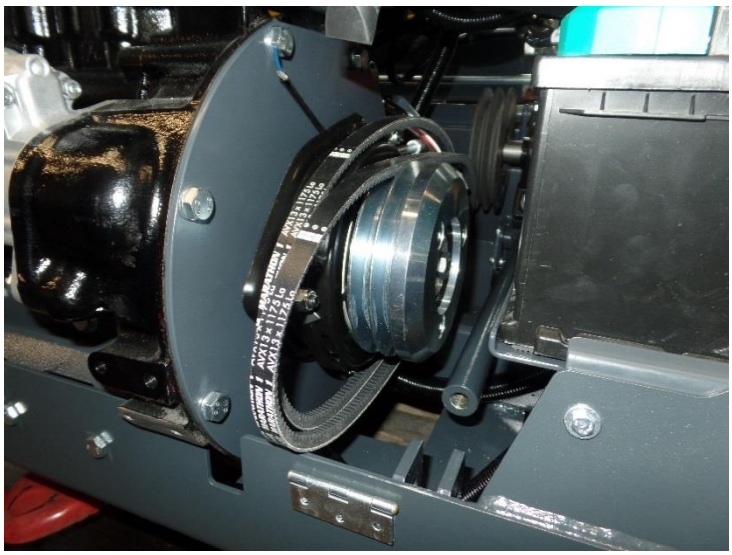
Assembly / Installation of the Mulcher

Push the Mulcher under the RoboFlail One D



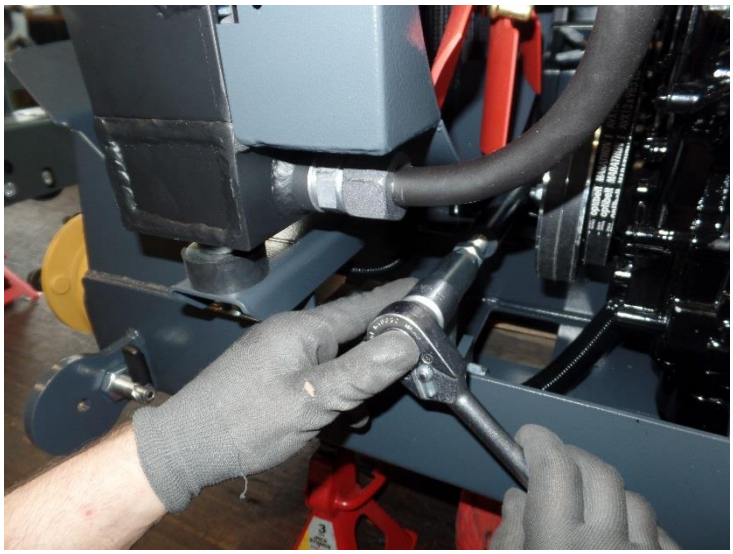
V-belt fitting on the coupler

Before re-attaching the joint to the frame below, fit the V-belt



Joints/Tensioning arm

Screw in the joints with the tensioning arms evenly R and L !!



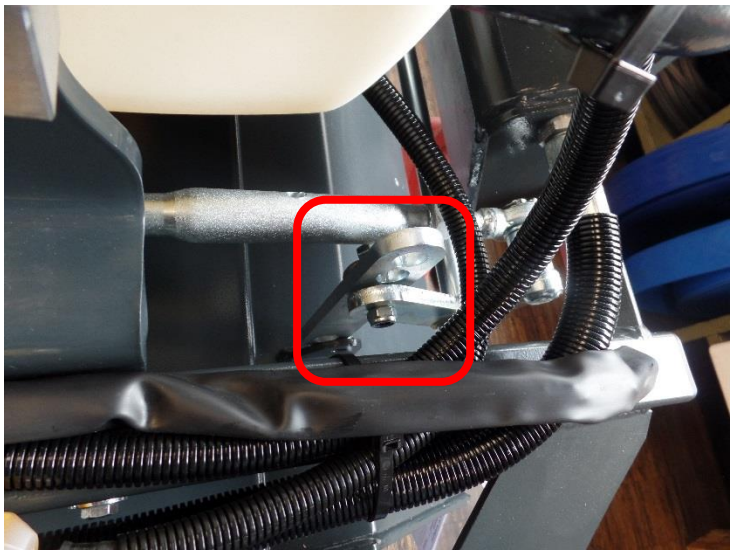
Hanging tab

To install the hanging tab use the third hole from top (see picture) and insert the bushing.

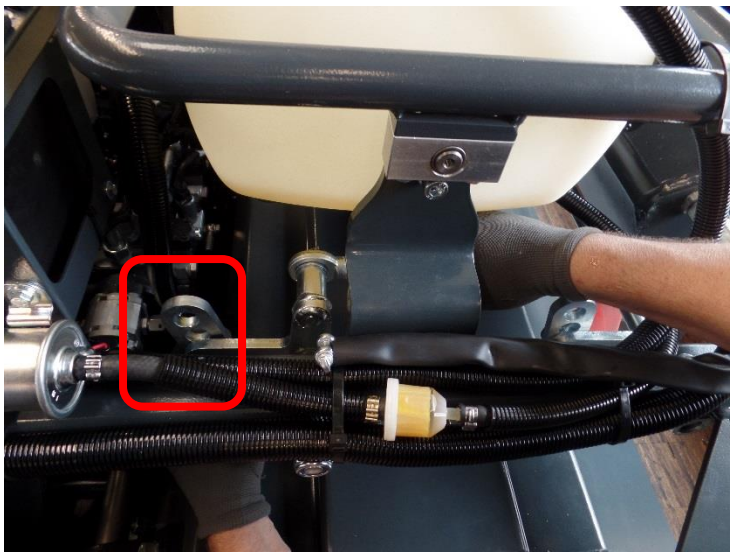
Hanging tab 1

Attach the hanging tab 1
to the top of the lift at the rear
→ **3. Mounting hole from top**

Screw joint size M10

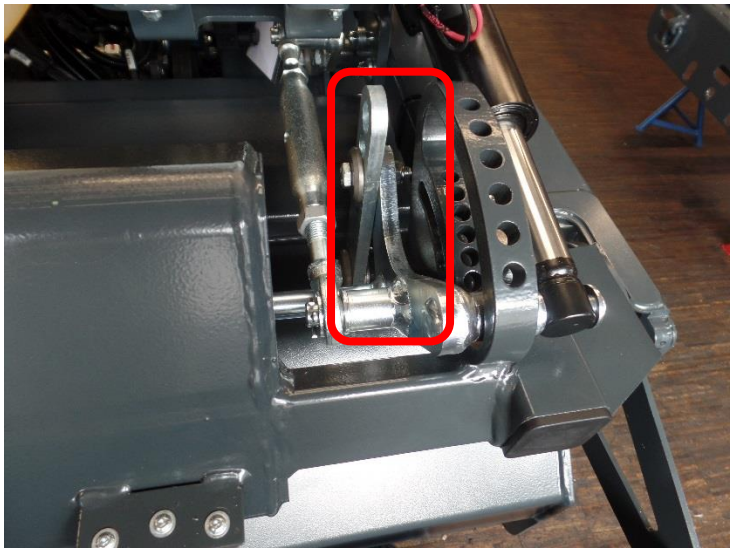


Hanging tab 2



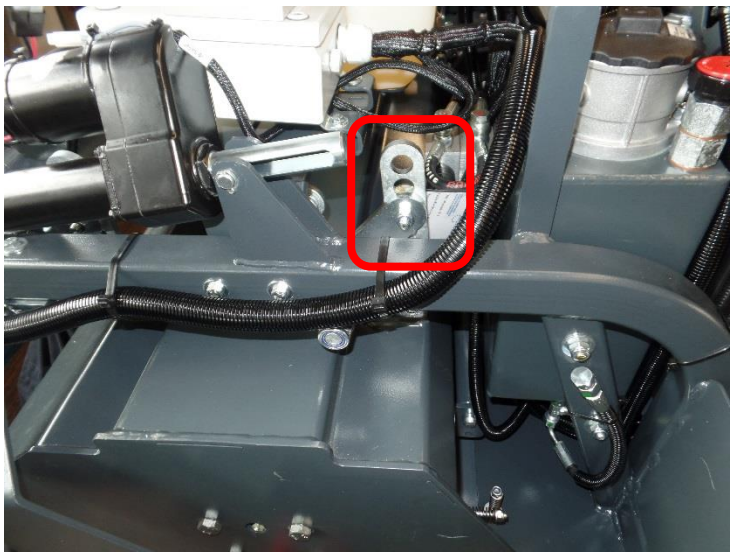
Hanging tab 2
→ 3. Mounting hole from top
Attach to the coupler at the top

Hanging tab 3



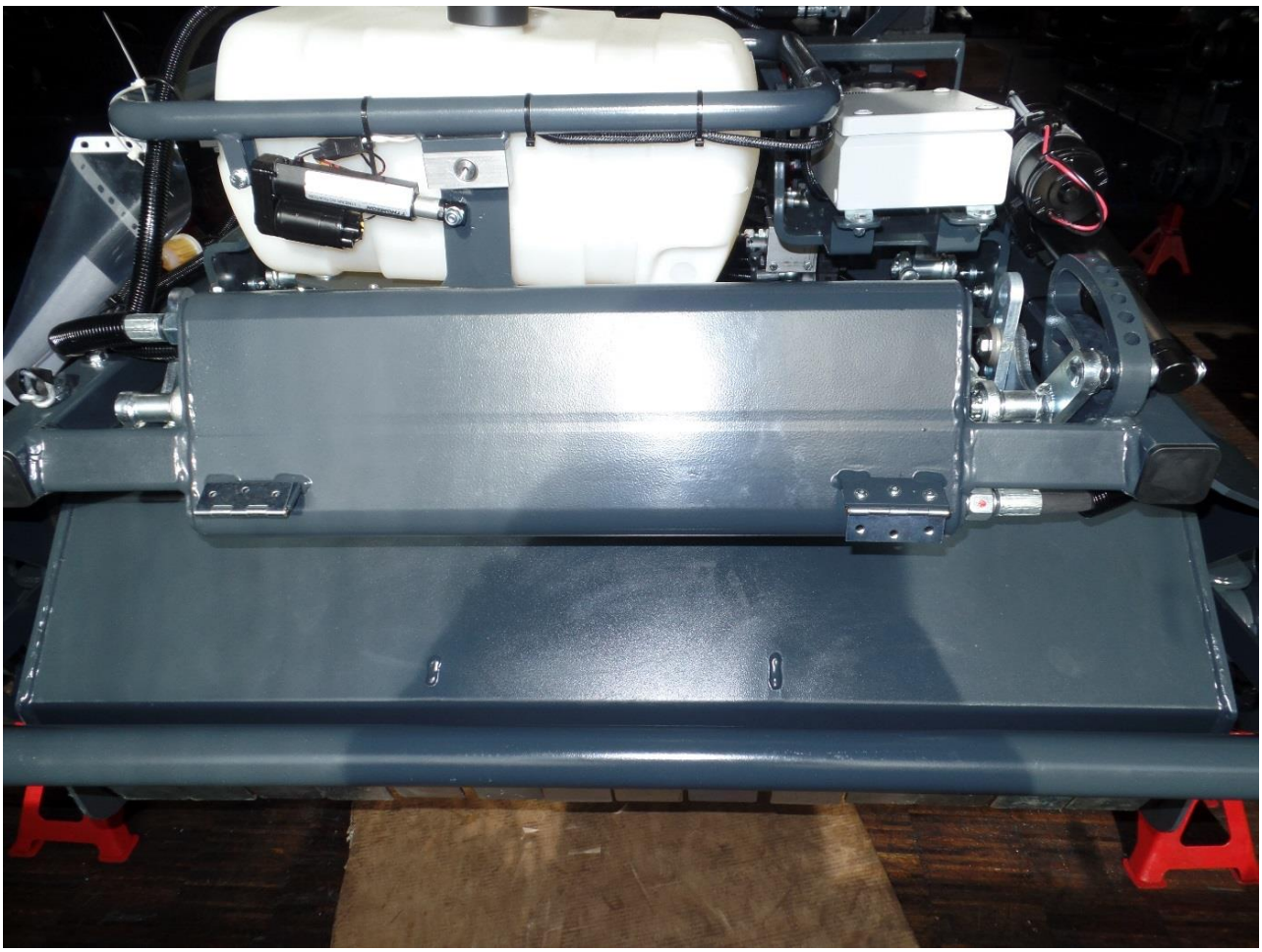
Hanging tab 3
→ 3. Mounting hole from top
Attach

Hanging tab 4



Hanging tab 4
→ 3. Mounting hole from top
Attach

Mount the mounting tabs on the mulcher!!
Please observe the sequence!!

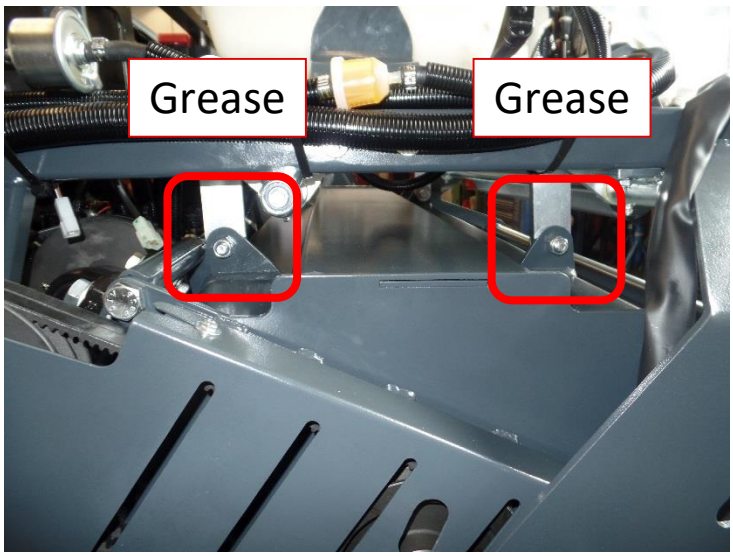


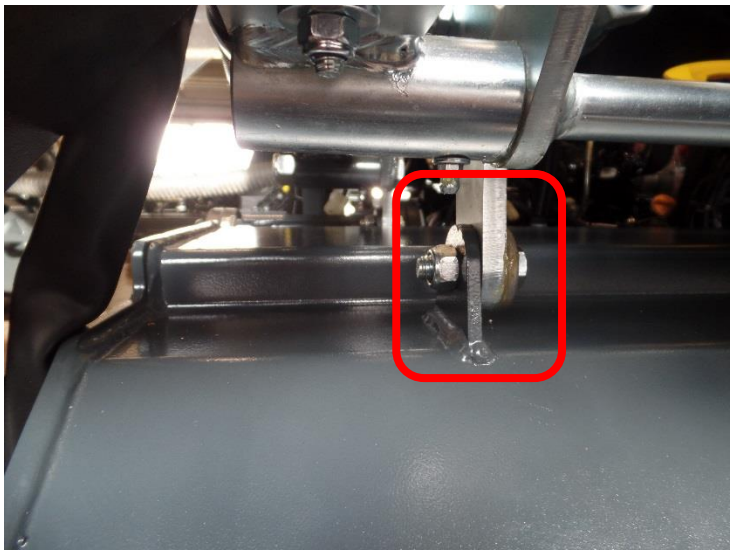
Start left

Attaching the hanging tab to the mulcher

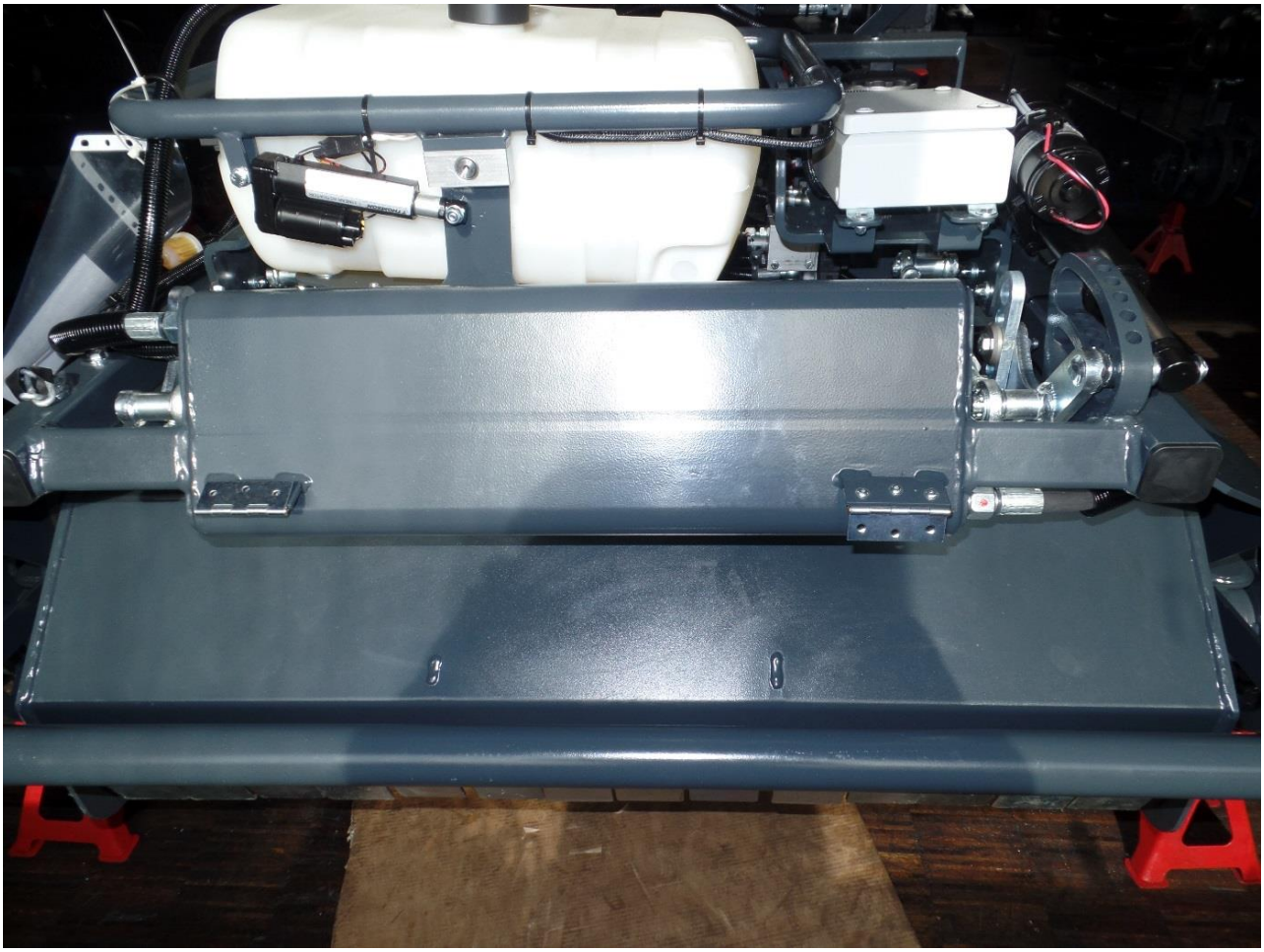
Attach the hanging tab using the hitching lugs on the mulcher

→ Start on the belt side of the mulcher





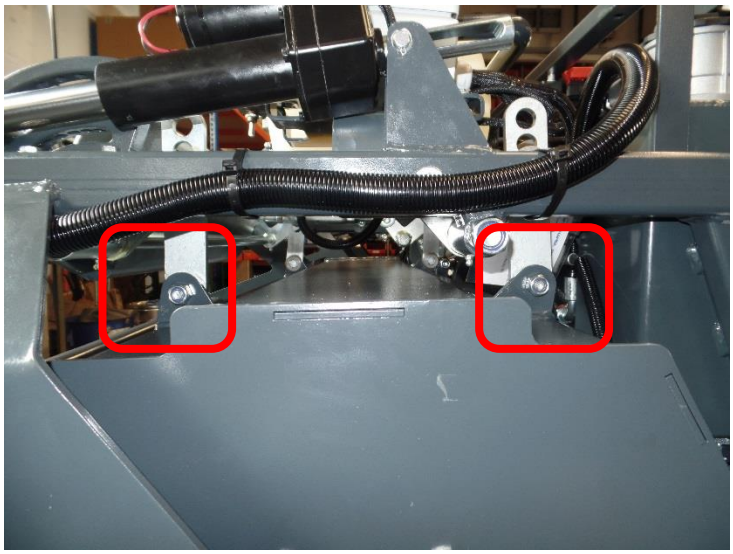
Mount the mounting tabs on the mulcher!!
Please observe the sequence!!



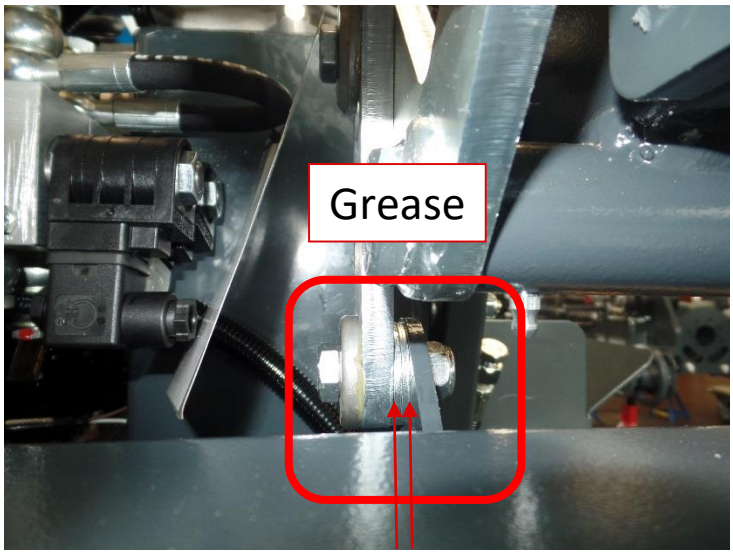
Continue right

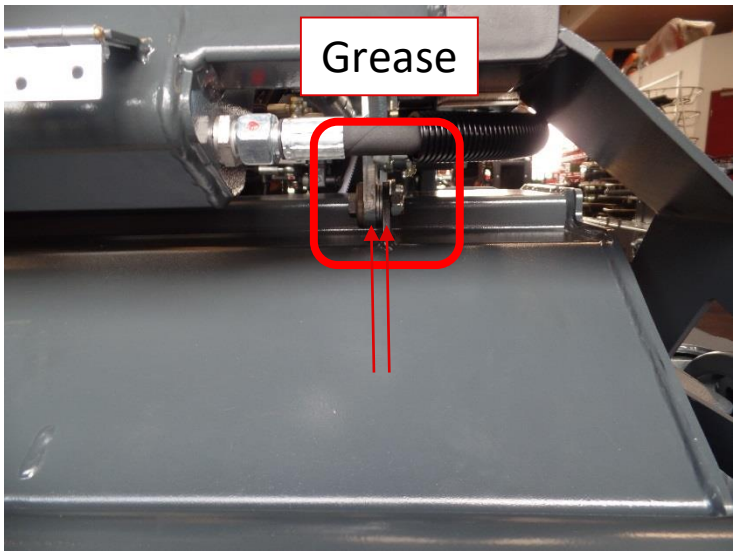
Attaching the hanging tab to the mulcher

Attach the hanging tab using the hitching lugs on the mulcher.
Fasten the tabs so that they are not under tension, if necessary, compensate with washers.



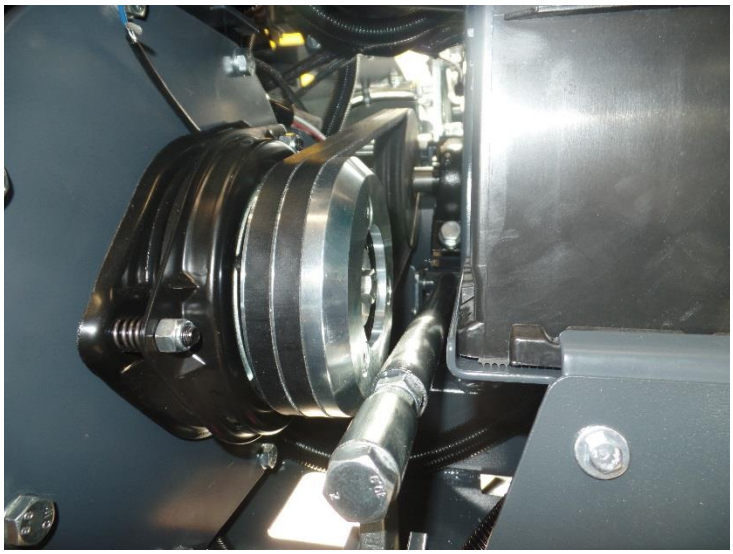
On the side of the lifting cylinder, it may be possible to place washers on the mulcher lugs when fixing them!!! (See picture)

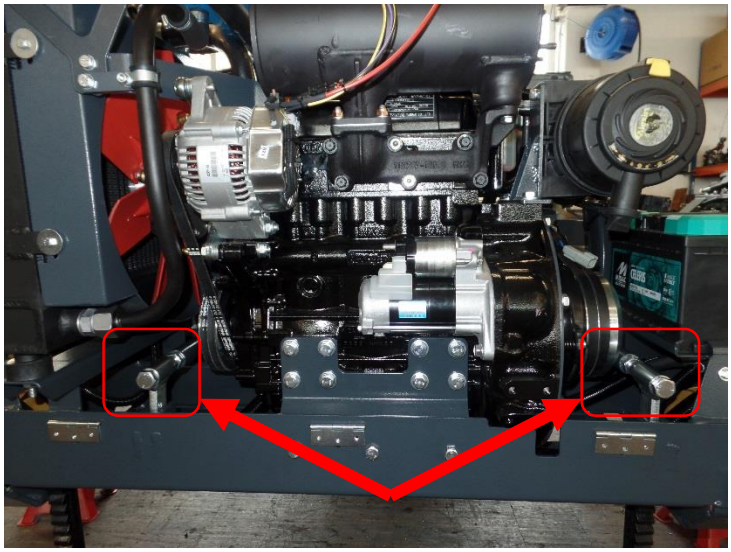




V-belt hoisting

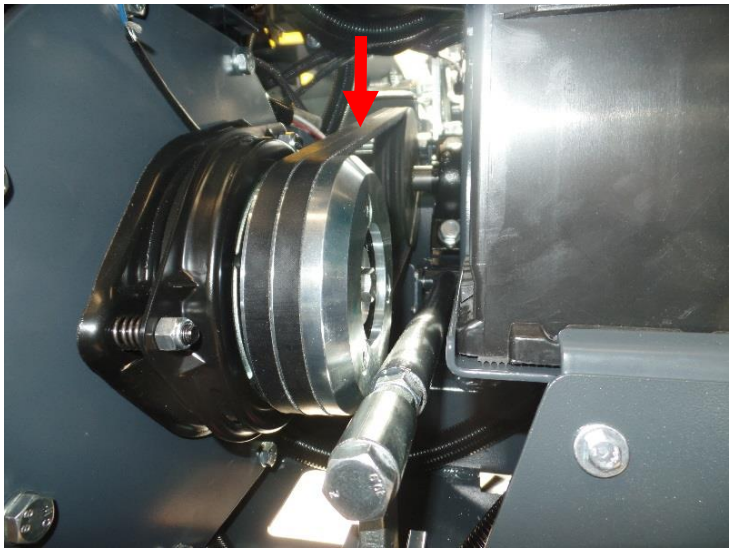
The tension of the V-belt is increased by unscrewing the two tension screws evenly.





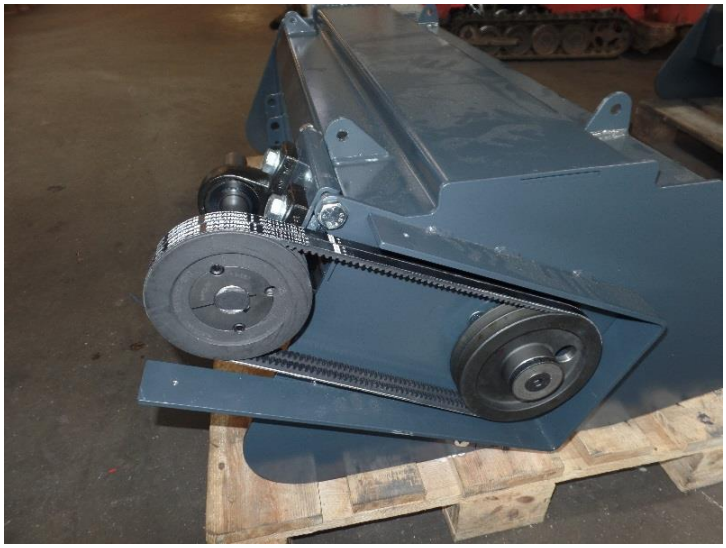
V-Belt tension checking

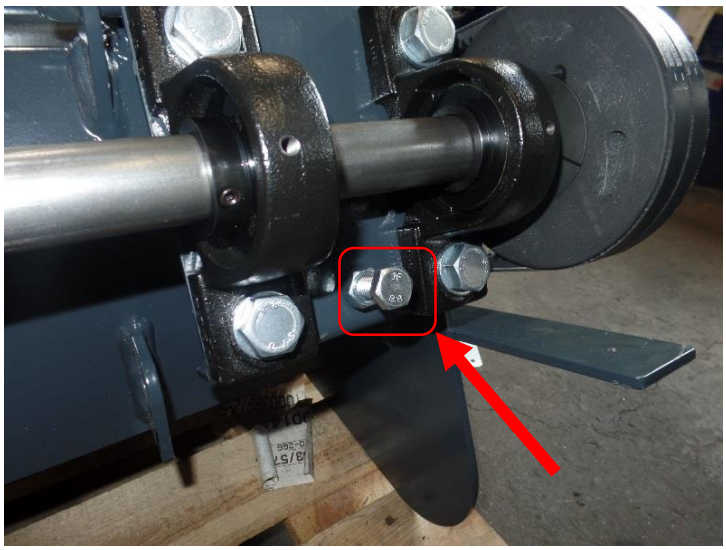
The V-belt should be moved by pushing/pulling about 10-15mm during the tension control.



V-Belt tension

The V-Belt tension can be re-tensioned using the following tensioning element.





Loosen the lock nut, when the screw is screwed in, the V-belts are tensioned, then lock the lock nut again.

Additional info:

When tensioning the mulcher belt, the drive belt on the magnetic clutch relaxes. Please note this for the belt tension!!!

Attention:

Check the V-belt tension after the first hour of operation and, if necessary, re-tension it!!

10.1 Commissioning the mulcher

Each time before commissioning, the working tools and their mounting must be checked for their perfect condition, and if necessary, retighten or replace the screws and nuts.
Only original spare parts should be used for defective working tools. The working tools must not be extended, shortened, reoriented or welded. Risk of imbalance!!!!

Mowing unit
The cutting height is adjusted by moving the mowing deck up or down.

Attention:
The working tools must not work in the ground! Worn or damaged working tools may only be replaced by a specialist.
Do not operate the device unless all protective devices are in place.

Maintenance:
- Repair, maintenance and cleaning work as well as the elimination of malfunctions must always be carried out when the engine is switched off and the shaft is stationary.
- Check that the nuts and screws are firmly seated regularly and tighten if necessary.

Attention:

Imbalance of the shaft occurs when:

- Working tools are missing (knives/shackles)
- Working tools are worn on one side
- Working tools (knives/flail) are reground
- Due to bearing damage
- The flail shaft is warped by external action.

11.0 Guiding and manoeuvring the machine

Attention:

Before operating the machine, make sure that you are perfectly familiar with the function, commands and the associated safety standards. The operator must be in the vicinity of the machine. Before moving the RoboFlail One D, make sure that no one is within the operating radius of the machine (100m) and that the operating range is free of dangerous obstacles.

Prior to any operation of the mowing unit, complete inspection and maintenance is required to ensure that the mowing unit is in good and safe condition.

Damaged and/or defective parts must be repaired and/or replaced immediately.
Replace worn, defective, and missing parts immediately.
Check that all bolts and fittings on the attachment are tight. Also check the cutting blades and blade bolts for tightness and wear.
Never stand below the machine in the direct direction of fall!!

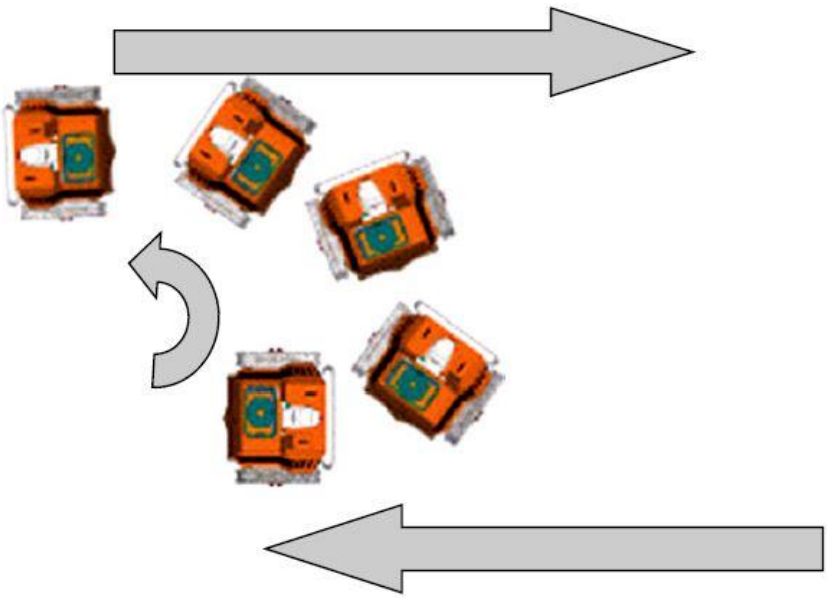
Do not change the direction while moving the RoboFlail One D over curbs, stones, or surfaces with large elevation differences.
In these cases, always move the machine at a right angle to the obstacles.

Do not move along the edge of a slope or uneven surface while one rubber track is in horizontal position and the other is tilted or partially raised.
→ If the machine is at an angle of more than 10°!
Always drive the machine so that both tracks move on the same horizontal surface to avoid the risk of track damage.

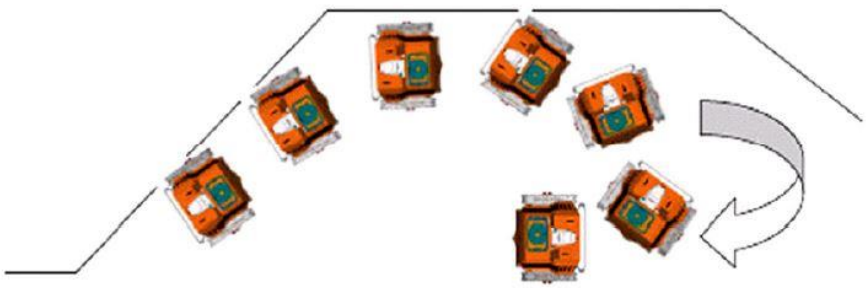
11.1 Driving on a slope

- Drive carefully
- Drive slowly
- Always drive up and down diagonally down the slope, if this is not possible, drive backwards up the slope, so you use the maximum climbing possibility.
- When turning on a slope, the rear must always be at the top of the slope.
- Drive as constantly as possible and only change the direction if necessary.
- Use the cruise control on large surfaces (Outside the EU only) and the Side slope function
- Look out for stones, debris and tree stumps.

Turning up on a slope



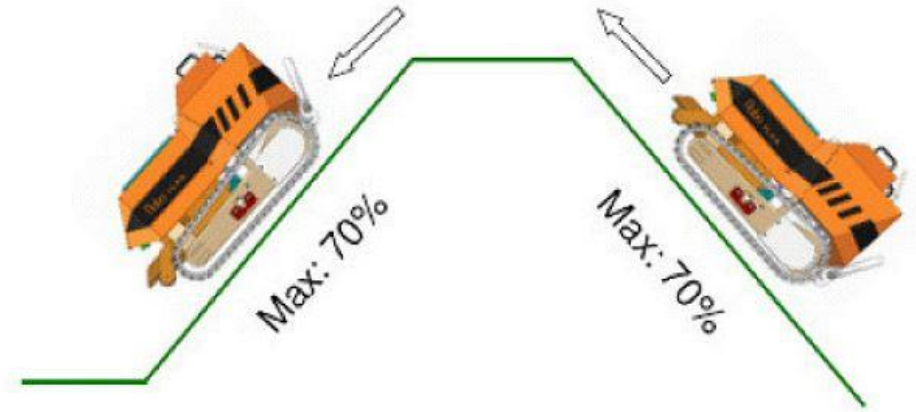
Turning down on a slope

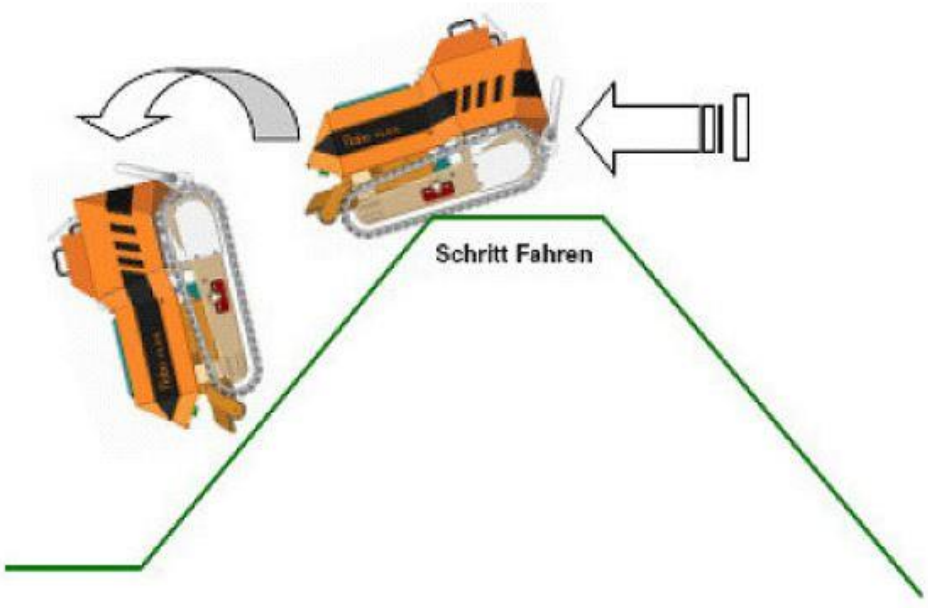


Attention!

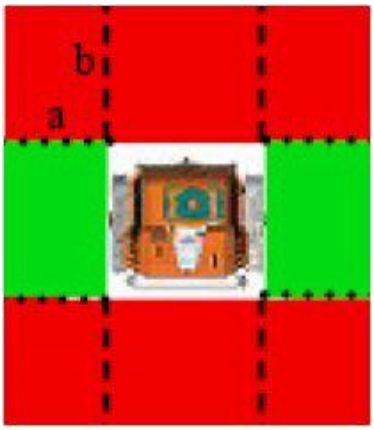
The equipment is designed for a maximum gradient of 70%. Drive up a slope 70-100% in a reverse direction, drive up a slope > 100% in a diagonal reverse direction.
Extreme caution should be exercised when driving over hilltops!
Only drive at walking speed and never stand below the equipment on steep slopes and hilltops!

Driving over hilltops





11.2 Working and danger zone



Please keep the following safety distances:
b= 20 m
a= 10m (only when the mowing unit is running)

Green area: When the knives are stationary, you can approach the stationary machine in this area safely.

Red zone: **Danger zone!** Never step in this area closer when the engine is running than 20 m!

12.0 Transport (loading and unloading)

The RoboFlail is transported to its place of operation by a truck or trailer.
Make sure that the means of transport you are using has sufficient load capacity.

For driving onto a trailer or commercial vehicle, we recommend the use of drive-on ramps.
Before driving on the ramps, make sure that they are aligned with the tracks and that a lateral slip can be prevented.

To avoid machine damage or life-threatening injury when transporting the machine, it is essential to observe the following points:
Transport work may only be carried out by persons qualified for this purpose, observing the safety instructions. The machine may only be lifted at the provided stops. Only the load-bearing and lifting equipment specified here may be used for transporting the machine.
Never stand under a suspended load!

Attention!

Due to its purpose-oriented, constructive design and application, not all possible hazards can be eliminated.
The operator must ensure that these residual risks are handled responsibly!

12.1 Storage

When not mowing, the device must be stored in a safe place. It is recommended that the mowing unit be kept fully lowered to the ground.
Proper preparation and storage of mowing unit at the end of the season is of the utmost importance in maintaining its appearance and ensuring years of reliable operation. The following storage procedures are recommended:

- Carefully remove any type of contamination from the mowing unit to prevent damage from rotting grass and standing water.
  Lubricate all grease points of the mowing unit.
- Tighten all screws and bolts.
- Check the mowing unit for worn or damaged parts. Immediately perform any pending repairs and replacement of components so that the mowing unit is ready for use at the beginning of next season.
- Store the mowing unit in a clean and dry place.
- If necessary, use a sealing spray to prevent rust and preserve the appearance of the mower.
- Disconnect the battery when the machine is not used for an extended period of time.
- Do not leave the RoboFlail outdoors unprotected. (Cover etc.)

12.2 Use of an additional battery

If it is necessary to start the engine using an additional battery, proceed as follows:

Attention:

Powerpack/starting aids must not be used!!
Risk of overvoltage!!
Avoid damage! The electrical charge of the auxiliary battery can damage the electronic components.

1 – The battery is located on the right-hand side of the direction of travel next to the track drive engine. (See picture)

2 – Connect the positive (+) auxiliary cable to the auxiliary battery and the other end to the battery on the RoboFlail.

3 – Connect the negative (-) auxiliary cable to the auxiliary battery and the other end to the ground of the battery.

Start the engine and run the machine at 1000 rpm for a few minutes.

Carefully disconnect the auxiliary cables in the exact reverse order: First the negative cable and then the positive cable.

Danger:

Never check the battery voltage by placing a piece of metal over the terminals. Use a voltmeter. Always remove the grounded battery terminal (-) first and replace it last. The sulphuric acid in battery electrolytes is toxic. It is strong enough to sever the skin, eat holes in clothing and cause blindness when it splashes into the eyes. The terminals and connectors and associated accessories of batteries contain lead and lead compounds and these compounds are known to cause cancer and genetic damage. Wash your hands after handling.

12.3 Disposal

In case of free delivery free of charge return of equipment by Rapid company.

12.4 Fire

In the event of a fire, use a co2 fire extinguisher in accordance with the applicable standards.
In the event of a fire, keep sufficient distance from the object to be extinguished.
If necessary, contact the fire department to extinguish the fire.

13.0 EC Declaration of Conformity

EC Declaration of Conformity

According to the Annex II A of the EC Machinery Directive (2006/42/EC)

The Manufacturer:	**NIKO GmbH** **Maschinen- & Fahrzeugbau** **Im Mühlgut 1a** **77815 Bühl, Weitenung; Germany**
Hereby declares that the machine described below:	**RoboFlail One D tracked vehicle**
Meets the safety and health requirements of the following EC directives:	**EC Machinery Directive 2006/42/EC and EMC Directive**

Harmonised standards applied:

DIN EN ISO 12100 Part 1 Part 2	Safety of machines: Basic terminology, Methodology technical principles
DIN EN 294	Safety distances against reaching danger points of the upper limbs
DIN EN 349	Minimum distances to avoid crushing of body parts
DIN EN 13850	Safety of machines; Emergency stop device
DIN EN 60204-1	Safety of machines; Electrical equipment of machines, General requirements
DIN EN 141211 DIN EN 982	Risk assessment Hydraulics

Design changes that have an effect on the technical data specified in the operating instructions and the intended use, i.e. substantially alter the machine, invalidate this declaration of conformity!

Bühl, 07/05/2015

Serr Dieter, Managing Director