

WS/18D Stage V

OPERATING MANUAL

saelen.fr ts-industrie.eu

SAELEN® TS INDUSTRIE®

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DECLARATION OF CONFORMITY

The **TS industrie** Company

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47906 KEMPEN (Germany)

Tel.: +49 2152 / 99294545

HEREBY DECLARE THAT THE MACHINE:
Trade Name: **TS industrie**
Type : **WS/18D**
Engine performance: **19 kW**
Technical documentation held by Mathieu Willerval.

is in conformity with the following european directives:

- **2006/42/EC** Directive „Machinery“
- **2014/30/EU** Directive „Electromagnetic compatibility“
- **2016/1628** Directive „Emissions“
- **2000/14/EC** Directive „Noise emissions“

Conformity evaluation procedure concerning directive 2000/14/CE Annex V.

Power at 2450 rpm	*Measured sound pressure level*	*Guaranted sound pressure level (Lwa)*
19 Kw	**113 dBA**	**115 dBA**

RONCHIN, september 22, 2020

Mathieu Willerval (Directeur Fabrication TS Industrie)

Attention!

Before our machines are delivered they pass a tight quality control in the works.

Given that we no longer have a bearing on the machine after it leaves the works, the dealer has to perform another check before the delivery to the end customer.

The following is to be checked:
- Exterior damages produced by transport etc.
- Tight seat of all screw and hose connections
- Filling level of oil, water and fuel
- Complete functional control of all parts

This control is to be confirmed with stamp and signature on the **Machine Delivery Document**. If the fully completed and signed delivery document is not returned there is no right for warranty!

Furthermore, it is required to check all screw connections for tight seat and the laid hoses for marks of abrasion!
Agree a date for this directly with your customer.
Regular inspections according to the operating manual are to be met!

Controlled quality – an important step towards customer satisfaction!
Play your part!

It is strictly forbidden to use the machine if emergency stops, cables, or any other safety device or control device are damaged or not present

Guarantees

Processing of warranty claims

Warranty claims according to the General Business Terms of the manufacturer are valid for the period of 1 year starting with the day of delivery.
Determinative for the moment of the transfer of risk is the date written in the **Machine Delivery Document**. As a matter of principle, warranty claims are to be announced to the supplying franchised dealer. For the preservation of evidence, all parts of the delivered machine covered by this have always to be stored unchanged until the final processing of the warranty claim brought to notice.

Technical modification at machines and/or parts thereof will result in loss of any and all right of warranty claims. The same is applicable in case of inappropriate treatment or use of lubricants and spare parts or accessories not approved by the manufacturer. Transport damages and damages cause by usual wear after commissioning of the machine do not create any warranty claims.

The delivered machine has to be subjected to the obligatory check and inspection intervals specified in the enclosed maintenance schedule. If the obligatory visual check and inspections schedule is not complied with, any and all warranty claims become void. Another requirement for a valid warranty claim is the presentation of a complete proof about the executed obligatory visual checks and inspections.

All warranty and maintenance works are only allowed to be carried out by a specialist dealer authorised by **TS industrie**.

It is pointed out that warranty works exceeding an amount of 150.00 Euro is unconditionally to be agreed with **TS industrie** and authorised by **TS industrie**. In this case, the manufacturer reserves the right that he carries out the repair.

Prerequisite for the assertion of a warranty claim is the return of the fully completed and signed Machine Delivery Document.



Modifications on the equipment and programming of the electronic system are prohibited because these might have a negative effect on the operational safety and life time of the machine.

DO NOT FORGET TO REGISTER THE WARRANTY, OTHERWISE IT WILL BECOME VOID

www.ts-industrie.eu
Section: Services / Warranty

Préface

We thank you very much for deciding to purchase an universal chipper from **TS industrie**.
Your universal chipper was manufactured with utmost care and high quality standards. In order to meet these requirements also for the mostly professional applications, we kindly ask you to diligently read this operating manual and to comply especially with the warning and maintenance information.
Only if complying with all maintenance works within the specified maintenance intervals we can concede the full manufacturer's warranty for your universal chipper from **TS industrie**.

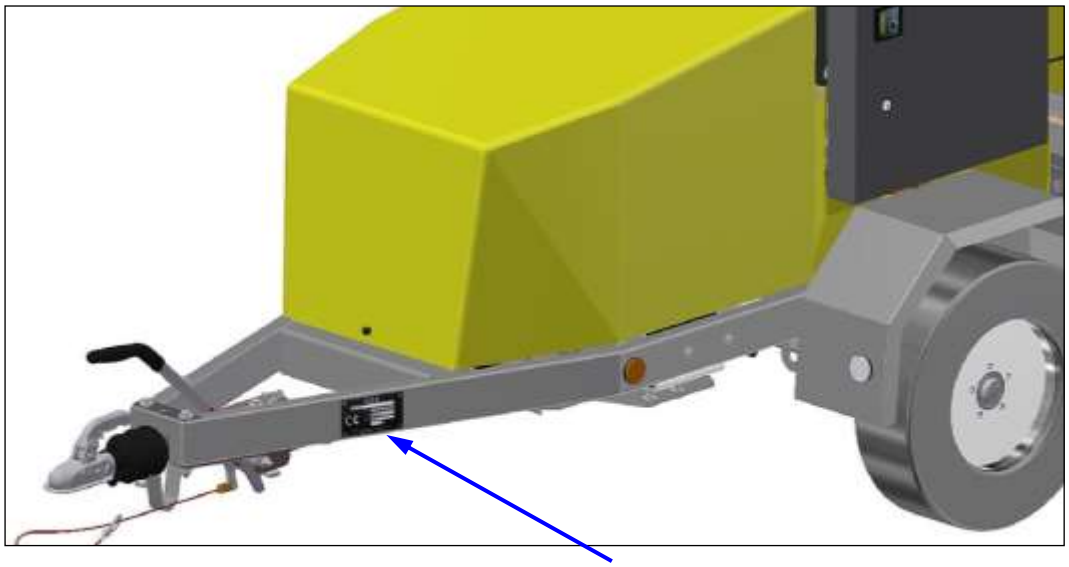
The operating manual includes several models such that in the introduction is explained how to orient yourself with the help of small pictographs.





Location of the serial number

For any spare parts order or a question regarding technical information have always the serial number of your **WS/18D**



Manufacturer's type plate



Do not state the **number** on the type plate **of the trailer.**

The **TS Industrie** serial number is located as shown in the image. It does always have **six-digit number**.

Serial number



Safety instructions

1. The machine is only allowed to be used according to the operating manual!

2. In case of machines with engine also the operating instructions of the engine are to be observed.

3. Folding the intake extension up (as far as present) is only allowed after standstill of the chipper disk.

4. Maintenance, cleaning and setting works as well as the removal of protective devices are only allowed after the engine is shut down, the ignition switched off, the drive decoupled and the tools immobile. Remove the ignition key such that unintended start is impossible.

5. Prior to operation it is required to remove foreign matters, e.g. ferrous parts, stones etc.

6. After maintenance or repair it is to be checked if all protective devices are mounted.

7. The wood chipper is not allowed to be operated in closed spaces because of the risk of intoxication.

8. The chipper disk must not be uncovered before it has reached standstill. That is to say, the propulsion engine (tractor) is parked and the ignition is in 0-position.

9. The machine operator is responsible that no third persons are staying in the working and danger area.

10. For repairs it is to be observed to use approved original spare parts only.

11. Only persons of over 18 years are allowed to operate the wood chipper.

12. Safety shoes and tight fitting clothes, work gloves with tight gauntlets as well as ear protection and goggles are to be used.

13. For transporting the wood chipper it must be moved into transport position.
A) Fold the hopper (as far as present) up and check if the locking device is engaged.
B) Move the wood chipper into transport position an check if the safety pin has engaged.
C) Turn the ejection channel such that it does not jut laterally out over the machine.
D) If necessary lift all parking sustainers.

14. When driving on public roads the lighting must correspond to the Highway Code.

15. For work, the wood chipper must be parked stable.

16.
a) Single-axle machines with engine are attached to tractor vehicles, and the parking brake is applied as far as present.
In case of machines without brakes it is required to push the supplied chocks under the wheels.

b) For operation without tractor vehicle it is required to lower the parking sustainers (front and rear).

17. For safety reasons a minimum distance of 10 metres should be kept from the machine. **The expulsion must always be directed away from the operating personnel**.

18. Only after the engine is shut off and the chipper disk is standing still, it is allowed to reach with the hands into the infeed mouth.

19. The admissible hydraulic operating pressure set ex works is not allowed to be changed.

20. Only trunks up to a diameter of 18 cm are allowed to be processed.

21. The hydraulic system is to be competently checked every year. The hydraulic hoses are to be replaced after 5 years.

22. During feed of the wood chipper do not reach into the feed hopper. Congestions are to be removed in a safe manner (shut the engine down, use an aid). For pushing in short pieces or shrubbery material do only use solid wooden rods or other aids made of wood. Our wood chippers are designed only for manual feed. Do not use mechanical resources (gripper) for feeding the machine.
Do not move in the area of the expulsion.

23. Carry out an functional check every day before starting the machine, especially of the safety equipment (**trailer coupling**, gear linkage, shifting block, cut-off switch on the hoods in case of the M version etc.). Chipping knives and counter-knives are also to be checked for proper functioning and tight seat.

24. Prior to starting the machine the operator must be trained in detail.

25. The chipper disk must not be uncovered before standstill and the engine is switched off.

26. Danger because of flying off pieces. It is to be observed that also in the operating range pieces such as wood chips might fly out of the hopper area. Body protection is always to be used. Operation is to be carried out lateral of the hopper.

27. Note for all machines with engine:
The inclination of the engine during operation (driving) must amount to max. 25°. In case of reduced oil level the lubrication of the engine is not ensured even at 25°!

28. Caution when parking the machine on a slope. The machine operator has to ensure that the machine is safely stationed for the time of the work.

29. The machine must only be fed with wood. Ensure that no stones or metal objects enter the machine.

30. The machine must not be used for transporting material or persons.

31. The machine must not be used for pushing or towing.

32. Battery acid is a caustic fluid. Therefore any contact with eyes, skin and clothes must be avoided. In case of contact rinse all affected areas with water and go see a doctor, if required.

33. Always disconnect the battery before any work on the electric installation.

34. Only **trained personnel** is authorised to carry out these works. The execution of all installation and removal works as well as special maintenance works is reserved for an authorised specialist dealer.

35. Pay attention that you are not drawn into the infeed roller with the clothes.

36. Regularly clean the lateral skirt such that it remains transparent.

Pictographs

Wear eye and ear protection!



Use protective gloves with specially tight gauntlets!



Wear safety shoes!



Do only touch machine parts after they are at a complete standstill!



STOP feedrollers





Pictographs

Keep sufficient distance to rotating machine parts!



While the drive is running never open and remove protective devices!



Read the operating manual before start-up!



Do not stay in the area of the expulsion if the machine is running! Hazard area!



Shut down the engine and remove the key prior to any maintenance and repair work!



Caution! Entanglement.

Never reach into the infeed hopper while the engine is running.



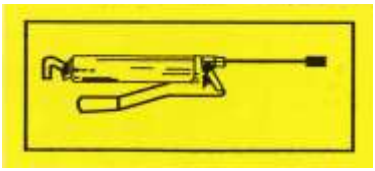
Fill the fuel tank with **diesel fuel**.



The machine is operated with hydraulic oil HV46.



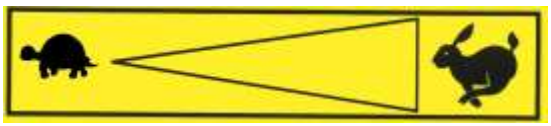
Lubrication points



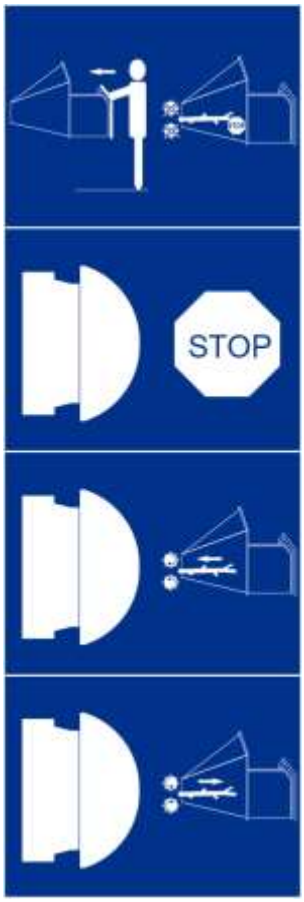
The sound level of the working machine is not the value of the standard level on the sticker.



Min. engine speed



Max. engine speed



Moving direction commands for the conveyor belt

Stopping rotation of the infeed rollers

Engine emergency stop and roller advance

Material chipping (forward **max. speed**)

Loosening material (backwards)

1) Observe the valid Highway Code.

2) Ensure that the machine is always fitted with signal lights, which are clean and visible for other road users.

3) Reduce speed when driving on rural roads and unlevel routes.

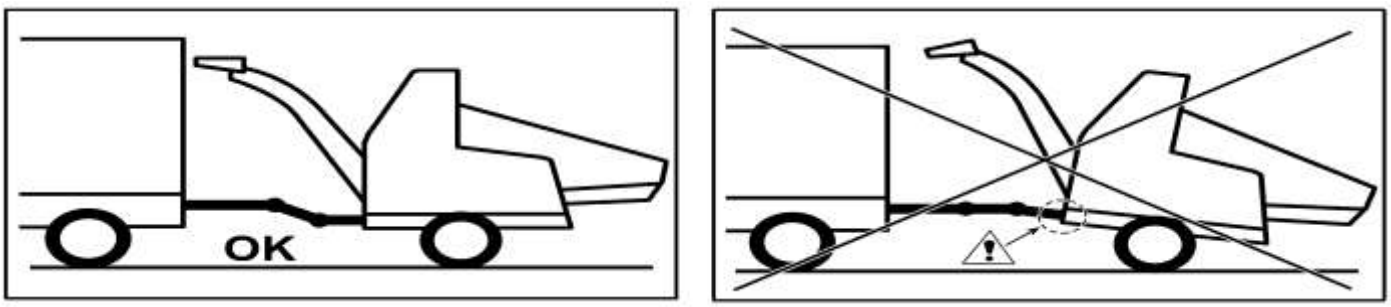
4) Remove all remaining material from the machine.

5) Turn the expulsion channel completely to the front and fold the expulsion hatch completely down.

Coupling wear indication:
Check the wear indication each time the machine is hooked up to the tractor vehicle. Acquire the habit to replace the coupling dog and / or coupling ball of the vehicle as soon as the wear indication hits the negative area, such that you cannot loose the chipper when driving on rough roads or driving against a kerb when reversing.



Coupling to a vehicle:
The chipper should always be coupled in horizontal position such that the machine is prevented from tilting backwards AND check every day that the drawbar adjusting devices are secured to prevent jerky movements, which damage coupling and towing device and reduce the life span.

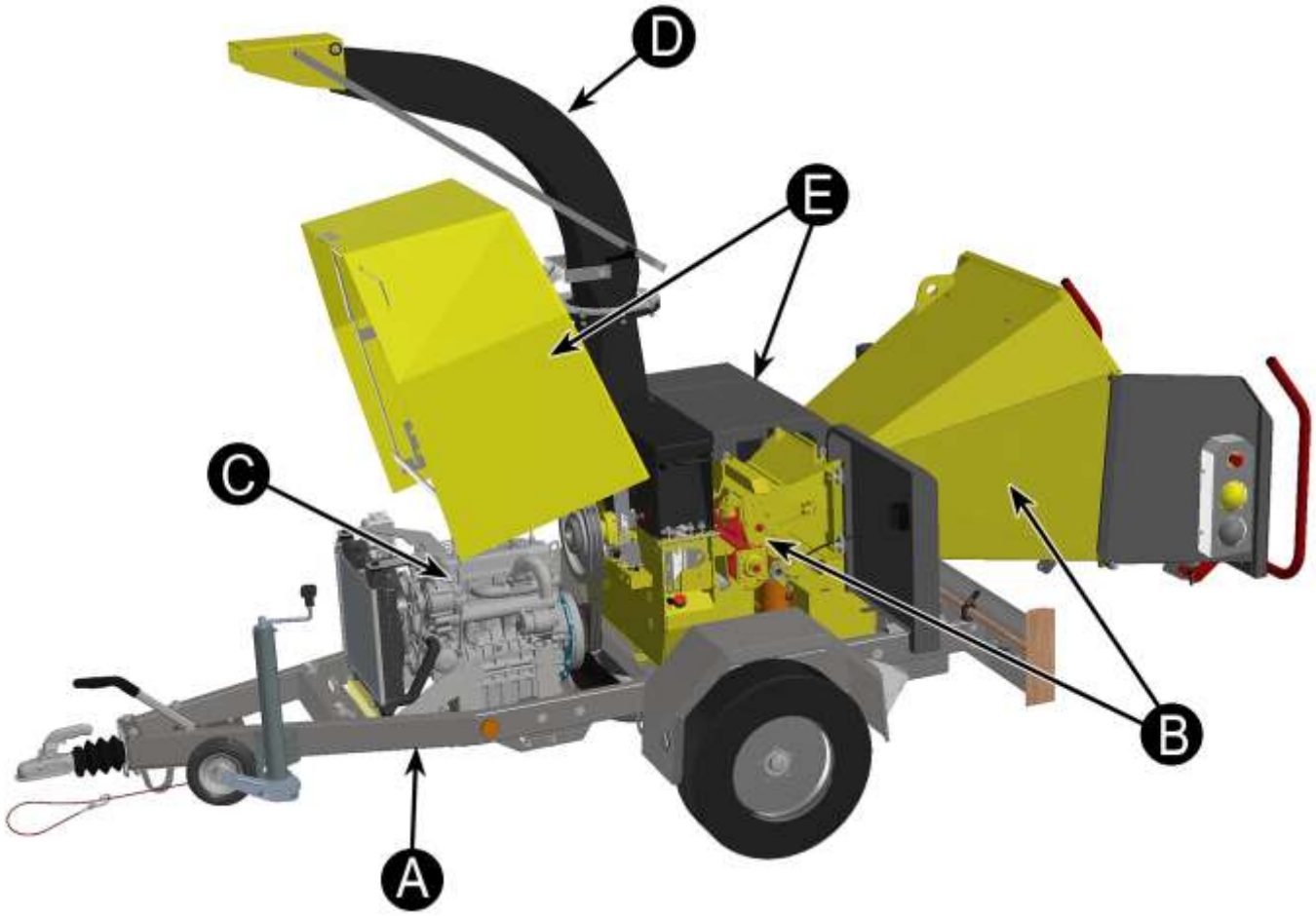


GENERAL DESCRIPTION OF THE MACHINE

The chipper **WS/18D** is designed for chipping branches up to a **diameter of 180 mm**.

The machine consists of the following main components:

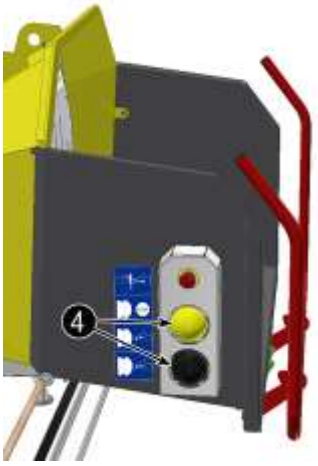
(A) : Frame
(B) : Chipping unit
(C) : Engine and drives
(D) : Expulsion channel
(E) : Noise protection hoods

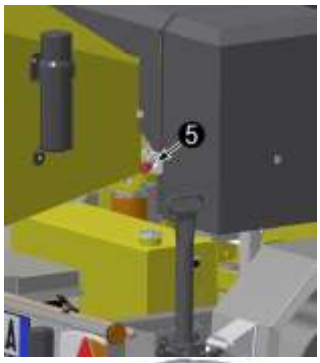


A. Frame
The frame is used for allocating the different components of the chippers WS/20DT and 23DT and allows an independent movement of the machine.



B. Chipping unit
The unit consists of a foldable infeed table **(1)**, an infeed hopper **(2)**, two serrated infeed rollers **(3)** and one chipping disk.
Infeed rollers:
They transport the chipping material at constant speed in direction chipping disk. An anti-blocking system disconnects the infeed if the speed of the chipping disk falls below the minimum speed (chipping unit jammed) and automatically connects again after the speed of the chipping disk is sufficient for correct chipping work.
The infeed can turn into both directions (forward and backwards) when using the yellow and the black button **(4)** located on the left side of the infeed hopper.
The turning speed can be adjusted to the diameter of the chipping material using the regulating screw **(5)** on the left side of the cover panel.





Chipping disk:
The disk is the main component of the machine and has the task to chip the material coming from the infeed roller. After the engine accelerates, the disk connects and rotates at a constant speed.



C. Engine and drives

The diesel engine is located beside the chipping unit. It supplies the required energy for the drive of the chipping disk and the hydraulic oil pump **(1)**.
The machine is driven by a 4-cylinder diesel engine with an output of **19 kW** at 2450 rpm.

Further information regarding this engine you can find in the operating instructions of the manufacturer.

The chipping disc is driven by the output shaft, the centrifugal clutch with free wheel **(2)** and 2 V-belts.

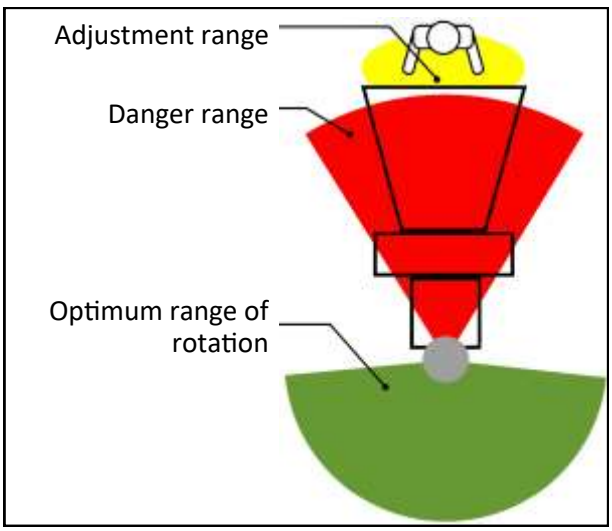


D. Expulsion channel

This expulsion channel expulses the chipped material. The upper part can be swivelled by 170° in horizontale position. The expulsion hatch can be adjusted in vertical position.

Caution:
When connecting the wood chipper residual chips can be expulsed.

The electric circuit disconnects the engine and prevents a restart if the expulsion channel is open towards the chipping disk.



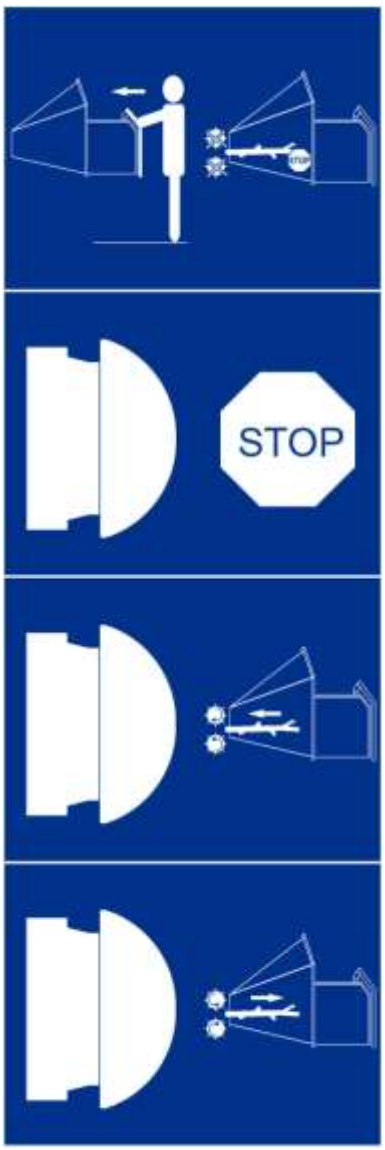
E. Engine hood

Different hoods protect against rotating parts making work safe.
An electric switch disconnects the engine and prevents a restart when opening the engine hood.

MATERIAL INFEED

The **WS/18D** are fitted with an electrically controlled hydraulic distributor, which is activated with two buttons at the rear of the infeed hopper for running forwards and backwards, and with a red control rod for disconnection of the infeed roller and the conveyor belt.

<u>Note</u>: The engine has to run at max. speed for making the conveyor belt and the infeed roller turn.



<u>STOP THE INFEED:</u>

1. Push the red control rod to make the infeed stop.

<u>EMERGENCY STOP</u>

Stops the diesel engine and immediately stops the rotation of the infeed roller.

<u>FORWARDS MODE:</u>

1. Move the red control rod back such that the infeed roller moves to forward motion.
2. Push the **yellow** button to make the roller move forwards.

<u>BACKWARDS MODE:</u>

1. Move the red control rod back.
2. Push the **black** button.

Coupling the machine to a vehicle

When hooking the wood chipper to a vehicle the procedure is as follows.

With the support wheel adjust the height of the drawbar such that the trailer coupling is standing above the vehicle. Now reel the support wheel in and the open ball head coupling has to engage on the ball of the trailer coupling.
Ensure that the trailer coupling safely engages!

Then connect the arrestor cable with the vehicle and plug in the connector for the lighting.

check the lighting.

IMPORTANT: The wear indication on the coupling must be in the green area (see page 15). Fold the infeed table up, turn the chipping unit into **TRANSPORT POSITION**.

CHECKS PRIOR TO INITIAL START-UP OF THE MACHINE

Every operator has to read and understand the provisions, and has to observe all safety measures included in this chapter. A list with the checks for initial start-up is available to the operator. These checks have to be carried out for safety reasons to ensure the safe and efficient operation of the chipper.

The following points are to be checked before using the machine:

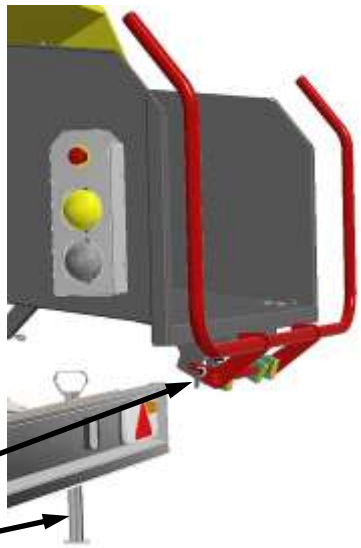
1. The machine is sufficiently lubricated as indicated in the operating manual?
2. Check the following filling levels:
   - Engine oil
   - Coolant
   - Fuel
3. Check the hydraulic oil level.
4. Check that the air filter is clean.
5. Check that the engine radiator is clean.
6. Ensure that all hoods are closed and locked.
7. The machine must not be operated in confined spaces. Risk of intoxication because of the diesel engine exhaust gases and dust generation by the chipper.
8. The expulsion channel and the expulsion hatch are only allowed to be adjusted by an authorised operator.

Operate the machine only with Non-Road fuels or commercially available diesel fuel.

ATTENTION!

In case the machine shows difficulties in chipping the material and has to be switched off, **restart the engine only after having removed the cause and the material was removed from the chipping disk!!!**

START-UP



Each time before start-up of the machine ensure that is standing stable on solid ground and the parking brake is applied.

1) Check if the hatch of the expulsion channel is open.

2) Remove the safety pin, open the latch and lower the infeed table.

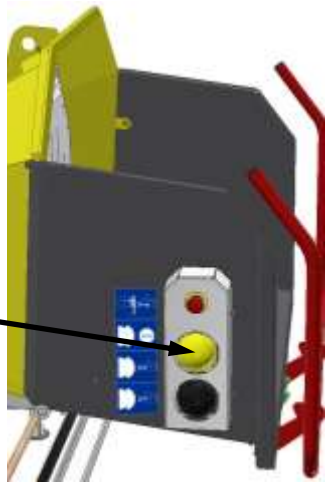
3) Unlock the handrail, lower the rear stand



4) Turn the key to position **1** and connect the ignition**.**

5) Wait until the preheat lamp is off (approx. 10 sec.)

6) Turn the key to position **2** and start the engine. Let the engine run until it has reached operating temperature.



7) Accelerate the engine up to max. speed.

8) As soon as the engine has reached working speed, press the **yellow button** on the infeed table to starting the infeed rollers.

9) Now work can be started.

Material infeed and operation

INSTRUCTIONS FOR CHIPPING

Watch out for solid foothold of the operating personnel!

Place chipping material on the hopper bottom and move it with the thicker en (trunk) towards the infeed rollers (chamfer the thick end of the trunk).

As soon as the material is captured by the rollers move to the side, because due to unevenness of the trunk there might be material kick-out.

The captured material now is automatically chipped and hurled into the direction (distance) into which the expulsion channel was set to beforehand.

After the material infeed from time to time attention is also to be paid to the thrown out chippings, and maybe readjust the direction of ejection. The ejection distance of the material is controlled with the ejection hatch.

When chipping splints, barks and brush-wood splintering can be avoided by always feeding the material side-by-side and lengthwise positioned into the infeed channel.

If the feed stops (jamming because of too much material or forked branches), press the **black** button (rollers rotate backwards) and the chipping material is pushed back. Now reduce the material quantity, cut the forked branch, and restart the infeed.

The hopper can only be cleaned using appropriate wooden aids.

Caution**:**
While the machine is running do not reach into the hopper! If required, push the kindling further using a wooden slat or wood slider! Never push the chipping material into the hopper using a metal rod or metal slider! It is also prohibited to stay in the danger area! In case of especially thick or hard wood, it makes sense to slow down the engine, reduce the speed until it has reached the rated speed.

If the area of the expulsion channel is jammed, the hood must not be opened before standstill of the chipping disk and shut-down drive engine, and then the material can be removed with an appropriate tool.

Noise emission

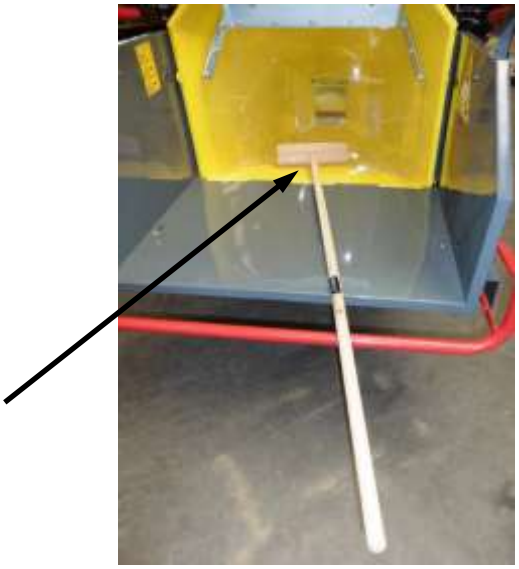
The chipper produces a guaranteed sound power level according to Directive 2000/14/CE:

Model	Sound power level LWA [dB]	Sound pressure level [dB(A)]
WS/18D	115	113



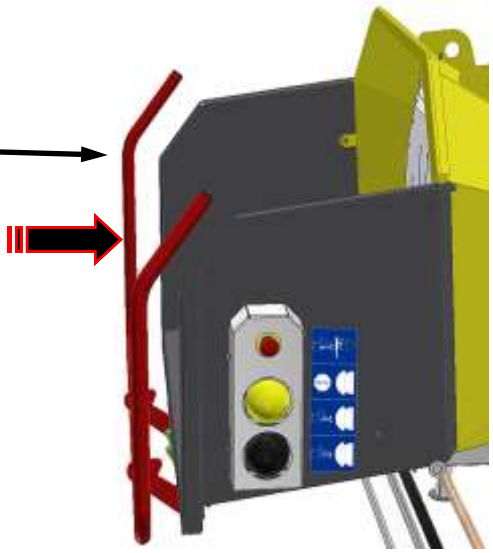
SHUT-DOWN

1) **Have the chipper run for some minutes empty for removing the residual material behind the infeed roller in the chipper to prevent that the chipping disk becomes jammed in the next application.**



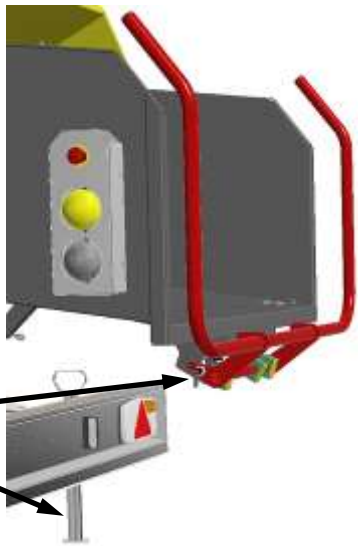
2) Ensure the integrity of the wood pusher. It must be used at the end of the work, in order to push the last debris into the feed elements

3) For stopping the infeed roller move the control rod forward.



4) Set the engine to idle speed.

5) Turn the key on the control element to the left and shut the engine off.



6) Lift the jockey wheel, the rear stand, the shelf and lock the red bar before returning to the road.

BIO
LUBRIFIANT
DÉGRADABLE



BIODEGRADABLE LUBRICANTS FOR REDUCING ENVIRONMENTAL POLLUTION

Just by their function, the chippers from **SAELEN** are used as a solution for the sustainable development for the production of compost, mulch and wood chips.

SAELEN chippers are often used in woods, parks, landmarks, in the proximity of lakes and rivers, where leaks and hydraulic fluids signify a risk for the environment.
Therefore, the company **SAELEN** contributes to the environmental protection by supplying their machines with **biodegradable high performance lubricants**.

Corresponds to the agricultural Directive 2006/11/EG.

Advantage of biodegradable lubricants:

- No risk for the environment
- Increase biodegradability
- Not toxic (based on rapeseed and sunflower oil)
- Regenerative
- Very high viscosity
- Excellent wear and anticorrosive properties
- Increased safety for the user
- Increased duration of the components
- Reduced volatility properties



SAFETY INSTRUCTIONS

1) Securely park the machine, remove the contact key and wait until the standstill of all mobile parts before starting the maintenance and repair works.
2. After termination of the maintenance works ensure that all protective devices are properly mounted and are operative.

All machines pass a test-drive before leaving the works. On delivery the hydraulic tank is filled up to the upper mark of the sight-glass with hydraulic oil. The filter has to be replaced after 150 operating hours. Thereafter, the replacement takes place according to the maintenance schedule. The first inspection is integral part of the warranty terms.
Only trained personnel is allowed to carry out maintenance and repair works.
The maintenance of the engine is to be carried out according to the enclosed operating instructions of the engine manufacturer.
On delivery, the bearings are lubricated and the transmissions are filled with oil. It is recommended to perform an inspection of the machine prior to initial start-up.

LUBRICANT capacities:

Fuel: 25 l.

Hydraulic oil: 11 l.

Engine: See operating instructions of the engine manufacturer

Freewheel drive for cutting wheel: see page 29

Recommended **LUBRICANTS**:

1. Lubricants for bearings, joints and different components:
   Multi-purpose high-performance grease SAE (EP).
   "SAELEN BIOPLEX "

2. Hydraulic oil:
   AFNOR NFE 48603 Type HV ISO VG 46
   "MINERVA BIO HYDRO 46 "

3. Engine oil: See operating instructions of the engine manufacturer

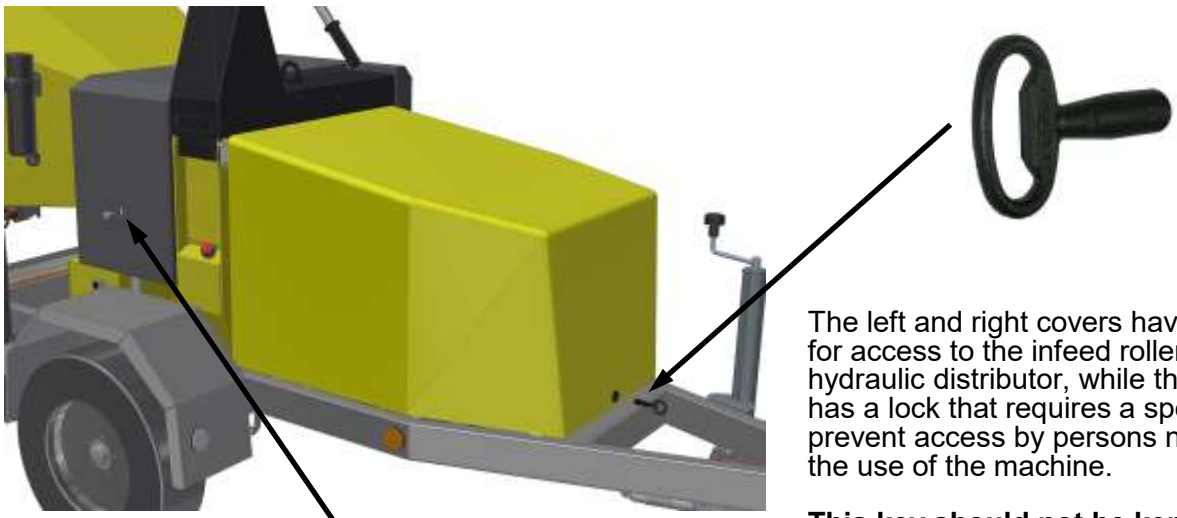
ENGINE MAINTENANCE INTERVALS:
See operating instructions of the engine manufacturer

MACHINE MAINTENANCE INTERVALS

Operating hours	Maintenance works
Every day	**- Check tight seat of the adjusting joints front side of the trailer coupling/ drawbar** **- Check function of the safety switches and the red control rod** - Check the engine oil level - Check the coolant level - Check the cleanliness of engine radiator - Check the trailer coupling - Check the tight seat of wheel nuts - Check the lighting equipment
First time after 4 operating hours	- Check the tight seat of all fastening screws - Check the tension of the chipping disk drive belts
First time after 20 operating hours	- Change the oil in the cutting wheel drive freewheel (then every 2000h)
Every 50 operating hours	- Check the vertical/horizontal knives and counter-knives - Check both bearings of the chipping disk - Check if material is wrapped around the bearings and remove - Check the tension of the chipping disk drive belts - Check the hydraulic oil level
Every 300 operating hours	- Check the battery acid level
Every 500 operating hours	- Replace the hydraulic oil filter (or every 2 years) - Replace the hydraulic oil (or every 2 years)
Every 2000 operating hours	- Change the oil in the cutting wheel drive freewheel

OPEN THE HOOD

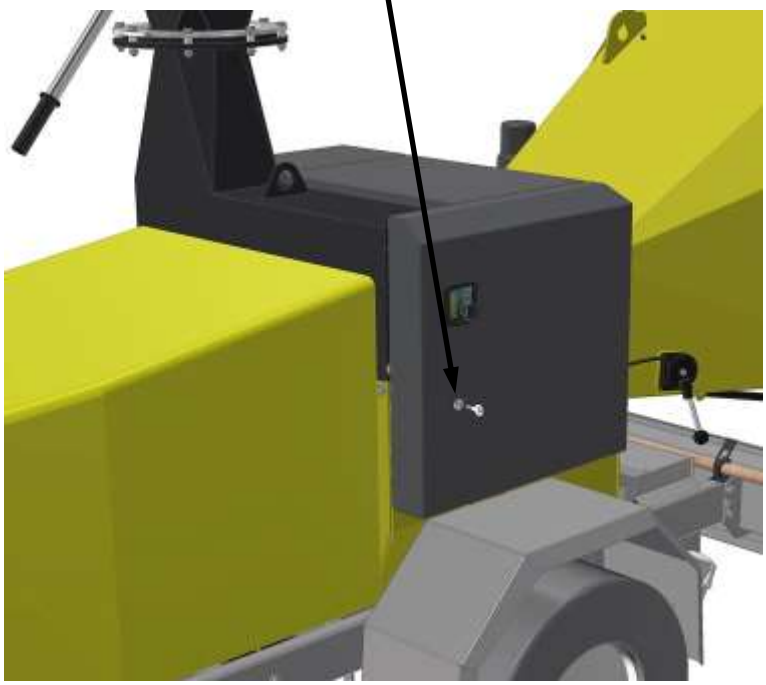
Special key



The left and right covers have a cylinder key for access to the infeed rollers and the hydraulic distributor, while the engine cover has a lock that requires a special key to prevent access by persons not familiar with the use of the machine.

This key should not be kept together with the contact key, otherwise the operation of the engine could be disturbed **(see page 33)**.

Cylinder locks

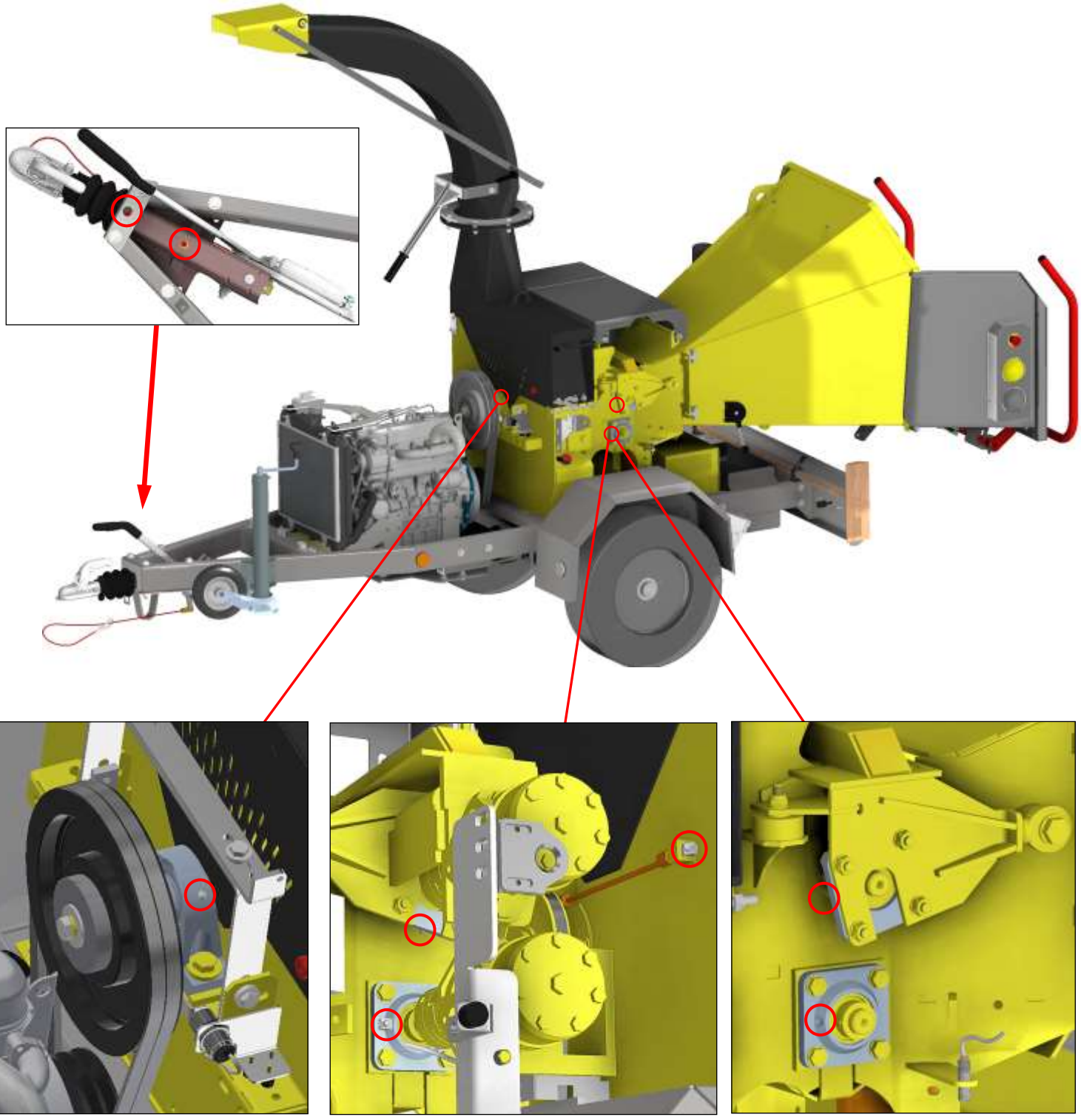


Before transporting the machine ensure that the hood is correctly locked.

LUBRICATING POINTS



Shut the engine off and remove the key before the lubricating and maintenance works.





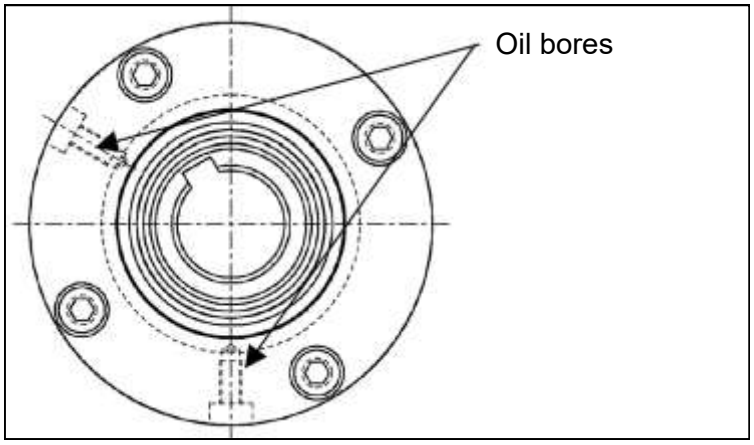
OIL LEVELS

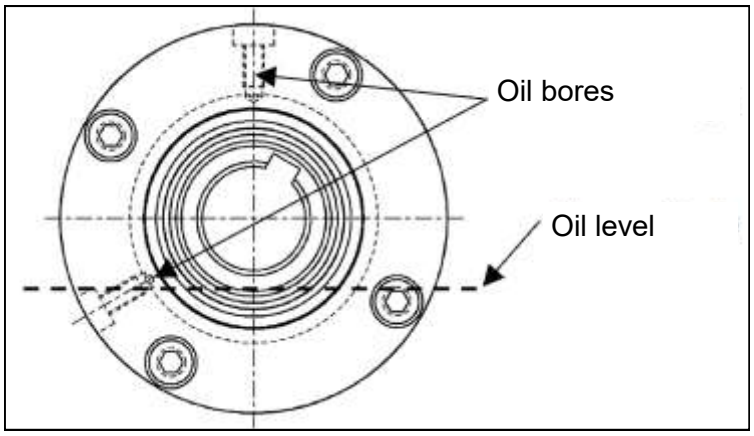
Shut the engine off and remove the key before the lubricating and maintenance works.

CUTTING WHEEL FREEWHEEL

Attention!
The first oil change must be performed after 20 hours of operation!

During the first oil change, all particles accumulated during the "running in" procedure should be removed from the freewheel. That is why this oil change is required to ensure the service life of the freewheel.
Subsequent oil changes must be performed after every 2,000 operating hours, at a minimum





Drainage procedure:

· Turn the freewheel so that an oil hole in the cover points vertically downwards

· Remove the two screws and oil seals from the cover.

· Collect and dispose of the old oil in accordance with applicable regulations.

· Clean the freewheel with cleaning oil and dispose of the cleaning oil in accordance with applicable regulations.

· Turn the freewheel so that an oil bre stands vertically upwards.

· Fill oil into the vertical oil bore until its runs out of the opposite oil bore.

· Close the two oil bores with the gaskets and screws.

For ambient temperatures from 0° to 50° C	**For ambient temperatures from – 15° to + 15° C**
Gearbox or hydraulic oils without solid lubricants **ISO-VG 46/68**	Gearbox or hydraulic oils without solid lubricants **ISO-VG 32**
Caution! Oils that contain friction-reducing additives like molybdenum disulfide or the like, may only be used with our authorisation.	

REPLACEMENT OF KNIVES AND COUNTER-KNIVES

The state of knives and counter-knives is to be checked every 50 operating hours. Fibrous chips and reduced performance are clear proof of blunt knives and counter-knives.

Remove the contact key before beginning to work.

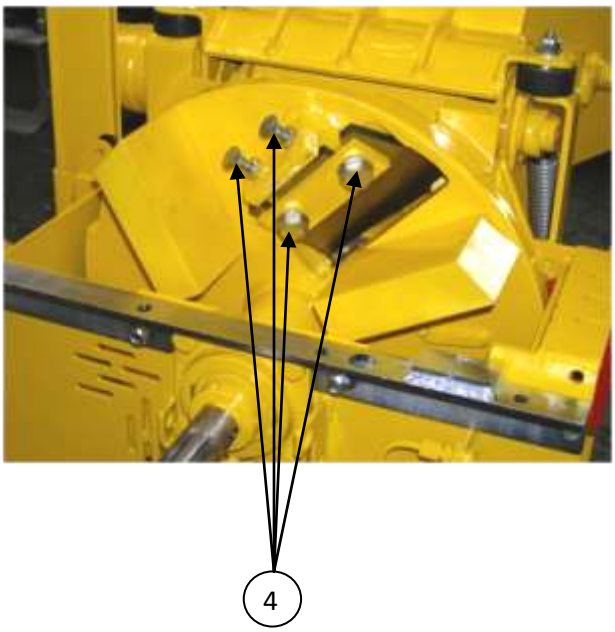
Tool for locking the cutting disc



The chipping knives are removed by loosening the screws Pos.4. These have to be tightened again after the replacement.

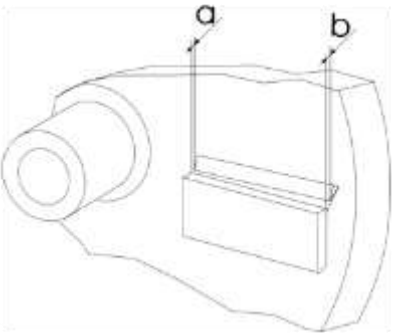
Knives and counter-knives are made of special steel and cannot be cut open by welding. Only correspondingly trained personnel is allowed to replace the knives.

After sharpening pay attention that the edges are completely smooth and regular. Burrs, which might still be existing have to be removed by honing.
Please, observe the following sharpening instructions! (see page 30)



Notched knives produce chips of poor quality and complicate the infeed of material.
The distance between knife and counter-knife is to be re-adjusted after each replacement.

Too big a distance leads to defibration of the material and an increased power requirement of the machine. With too small a distance (less than 1 mm) the knife might strike against the counter-knife.



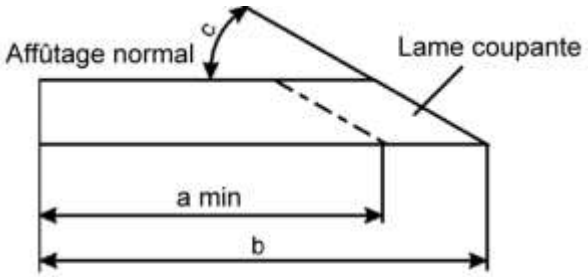
Size a [mm]	Size b [mm]
1	2

Caution:
Please, never open worn chipping knives with a welding torch.

Caution:
The tightening moment of the knife screws (rotating - static knife) is of 221 Nm (approx. 22 Mkg).

Chipping knives and counter-knives are to be checked every day before use for optimal adjustment and condition. Blunt knives and counter-knives demand an enormously high force, and produce very high wear of the drive belt. The bearings are submitted to excessive strain, and the fuel consumption increases.

By standard the chipping disc is fitted with two chipping knives, which cut the fed material into slices. Then these slices are crumbled because of the special arrangement of the knives.
The chipping knives have to be sharpened or replaced as soon as they look blunt, or the infeed becomes difficult (i.e. the knives push the wood back). When opening the cover have in mind that there is a stop delay of the chipping disk.



Caution:
Only instructed persons are allowed to change the knives.

Caution:
Before executing adjustment, cleaning and maintenance works the drive must be uncoupled and the tools in standstill. For working on the chipping disc or the cutting tools (e.g. knife change), the chipping disc must always be arrested with the supplied chipping disk pawl. Risk of injuries!

Side a [mm]	Side b [mm]	Side c [°]
80	100	30

Sharpening instructions

The knives are to be sharpened or replaced as soon as they have become blunt, or the infeed of material in the machine becomes difficult (the knives push the material off).

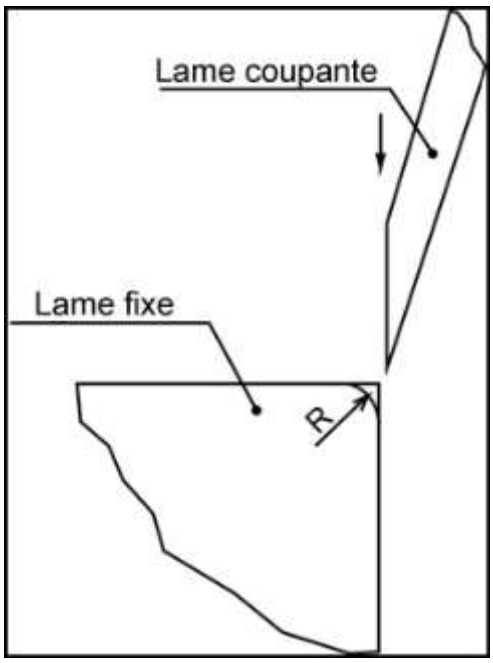
IMPORTANT: Only a specialist is allowed to sharpen the knives on an appropriate machine and not on a portable grinding machine.

The knives can be re-sharpened several times. However, it must be observed that both knives have the same weight to ensure a perfect concentricity of the chipping disk.

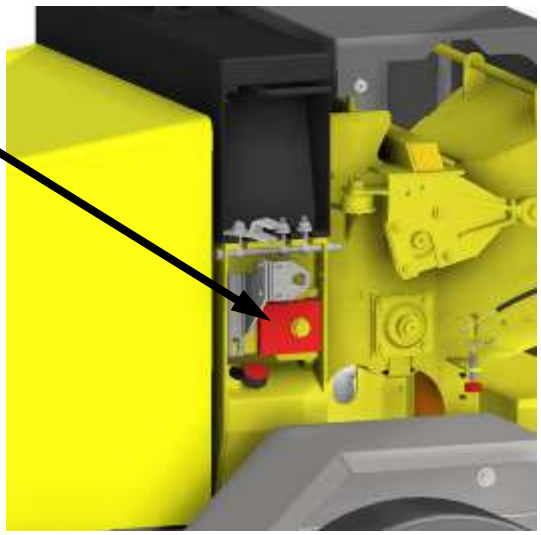
- Set the angle right (30 °)
- Forward this instruction sharpener sharpening your customers.

Should the chipping quality decline, it is required to check the condition of cutting knives and counter-knife.

As soon as the radius of the counter-knife hem is bigger than 1mm it should be turned or replaced. The proper counter-knife can be turned and the four sides can be used. Contrary to the chipping knife it cannot be re-sharpened.



For detaching the counter-knife it is required to loosen the retainer at the side of the housing.
Behind there is the counter-knife, which then can be turned or replaced.
There is a thread in the counter-knife facilitating the extraction with the help of a screw.



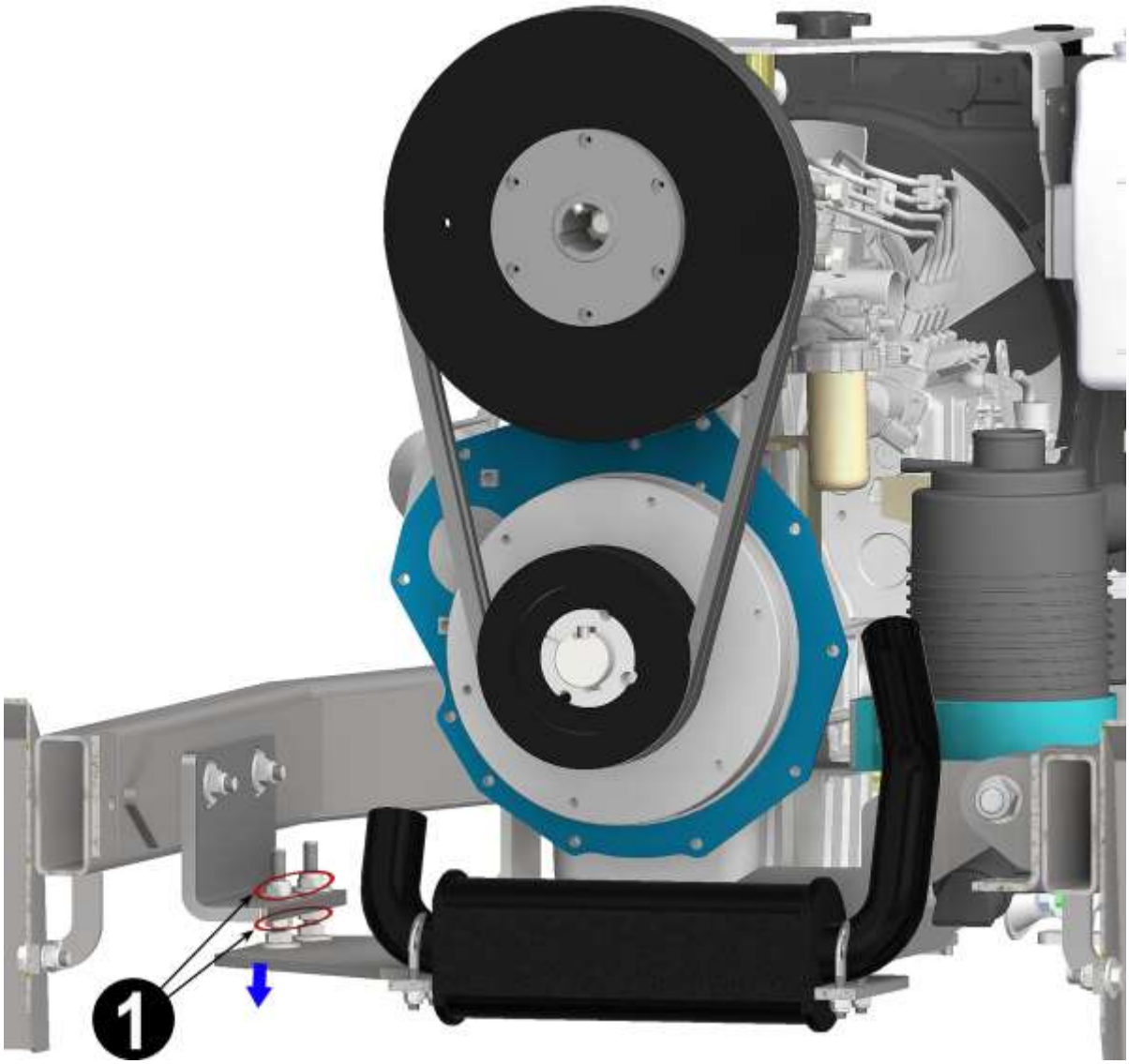
In case of the vertical counter-knife, first the big cover hood has to be removed. Thereafter, the two tension springs are detached and the upper frame is tilted up and secured. Now, the screws on the left side of the hood are loosened.
The hood has to be tilted up, to be able to loosen the screws of the vertical counter-knife and to pull the knife upwards out.

TENSIONING THE V-BELT FOR THE CHIPPING DISK DRIVE

The belts of the chopping wheel are tensioned by lowering the engine plate.

The belt tension is adjusted by acting on the nuts and counter nuts **(1)** so as to lower the engine plate.

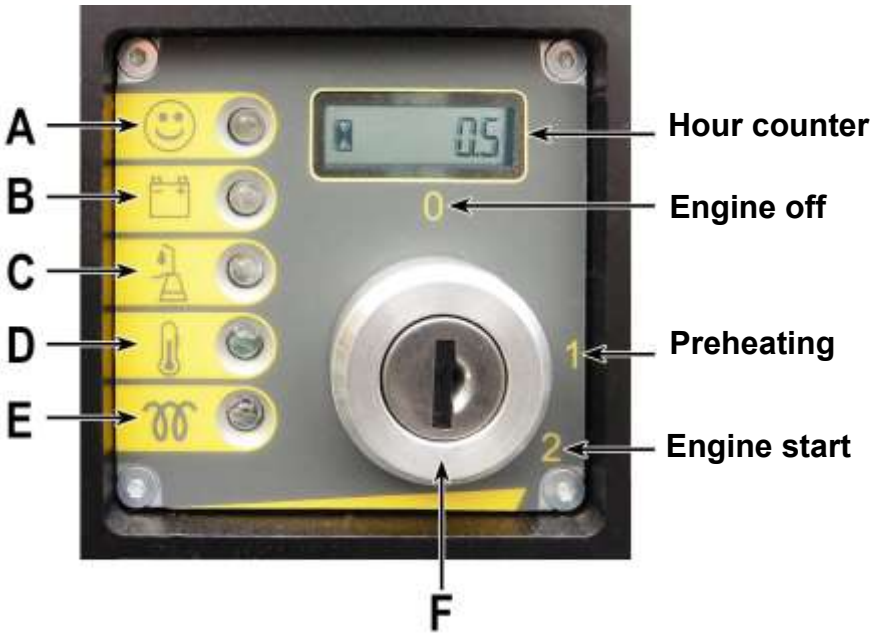
Only trained personnel can carry out this work



CONTROL ELEMENT OF THE ENGINE

A: Green warning light - operating control light (OK)
B: Warning light battery charge control
C: Warning light oil pressure
D: Warning light coolant temperature
E: Preheating light (8 seconds)
F: Ignition lock

In case of a defect, the engine is automatically shut off, and the warning lights C and D light up



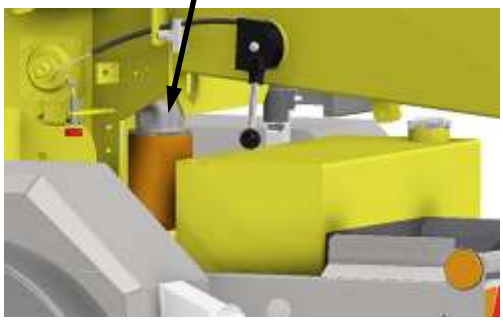
Do not put the contact key on a heavy bunch of keys, this might produce disconnection of the ignition during the operation.

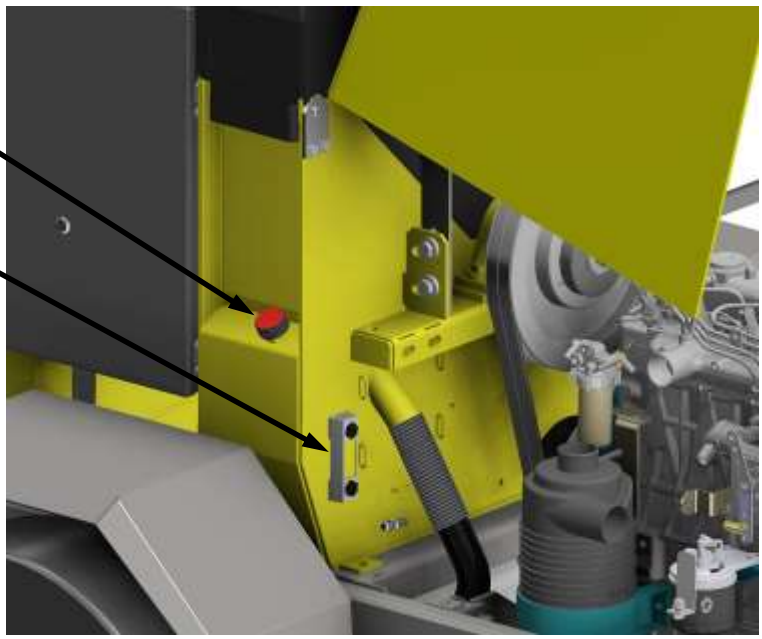


TANKS

The machine is fitted with two tanks:

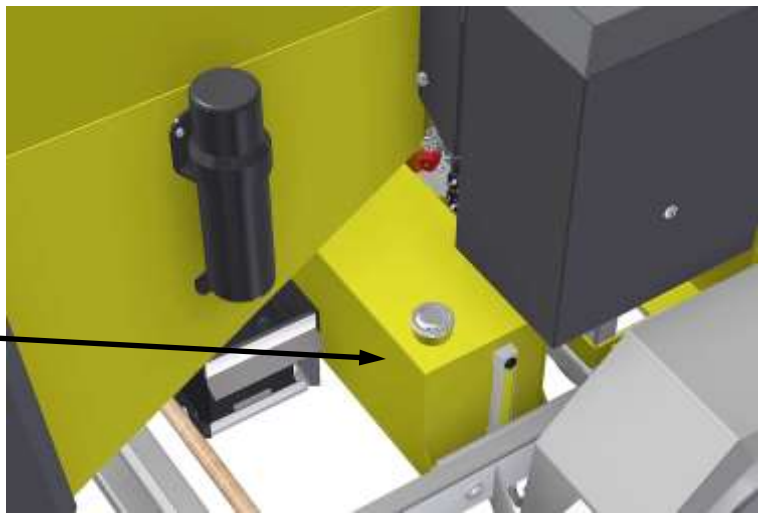
Hydraulic oil tank with a capacity of 11 litres, consisting of:





Fuel tank

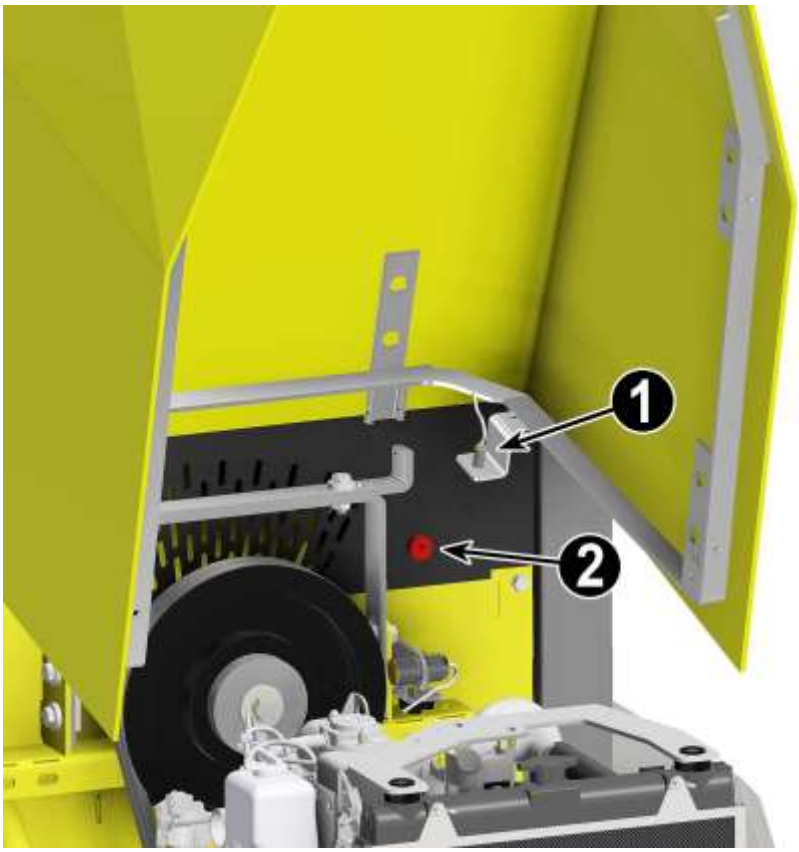
capacity 34 litres



HOOD SAFEGUARDS

The machine is fitted with a hood safeguard:

This safeguard consists of one proximity sensor **(1)**, which is fastened to the engine/pulley hood. The electric switching contact is established if the sensor approaches the magnet **(2)** fixed on the belts hood cover. When opening the hood the contact is interrupted and the engine is shut off.



The proximity switch must not enter in contact with the magnet. The distance between sensor and magnet must amount to 6 mm +/-	

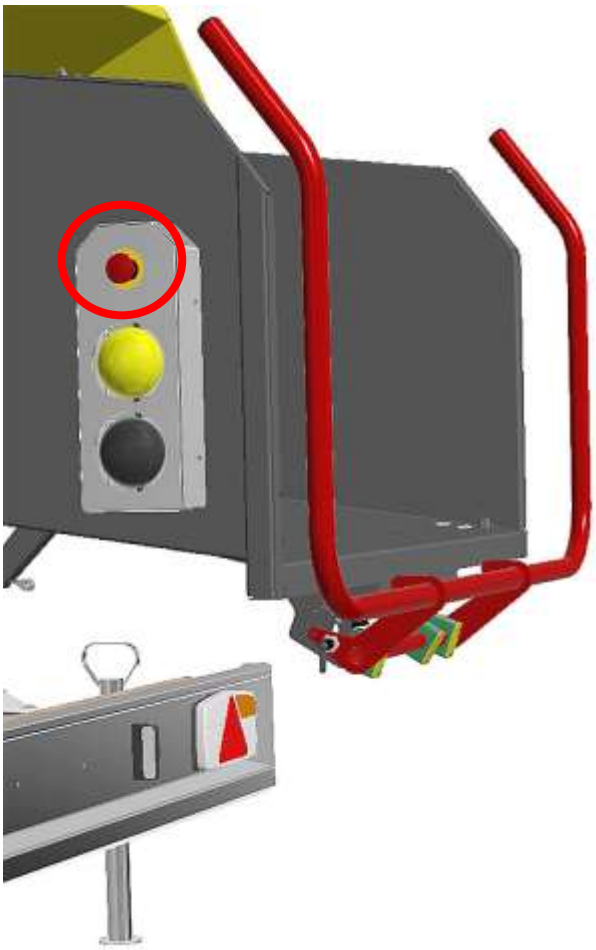
EMERGENCY STOP SWITCH

The machine is also fitted with two emergency stop switches, one on each side of the machine.

When activated, these switches have the following functions:

1. Diesel engine shut off

2) Infeed roller shut off

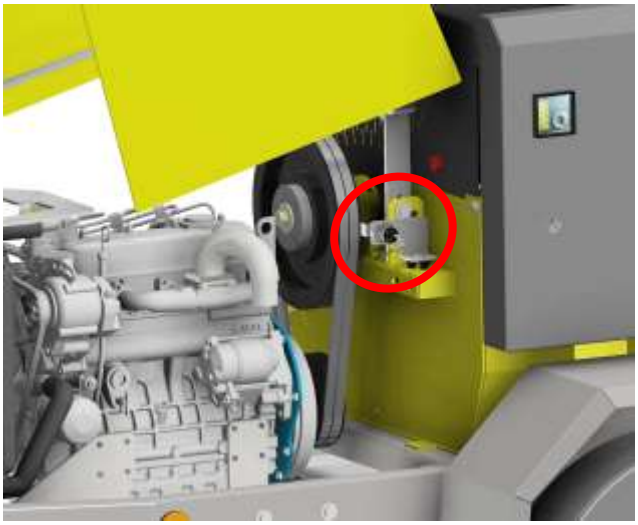


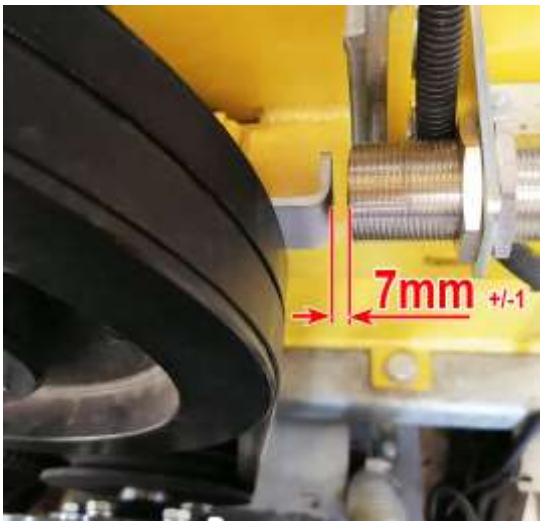
PROXIMITY SENSOR AND FUSES

The WS/18D is equipped with a Ø30 rotation NoStress sensor for the cutting wheel.
This prevents the machine from becoming saturated: in fact, when the speed of the cutting wheel drops below the speed set at the factory (1250 rpm motor / 625 rpm cutting wheel), the hydraulic supply to the feedrollers is cut off, as a result the feedrollers stop, the machine is no longer supplied with material and the motor can resume its working speed (2500 rpm). When the speed returns above the low threshold, the feedrollers are recharged with oil and start rotating again.

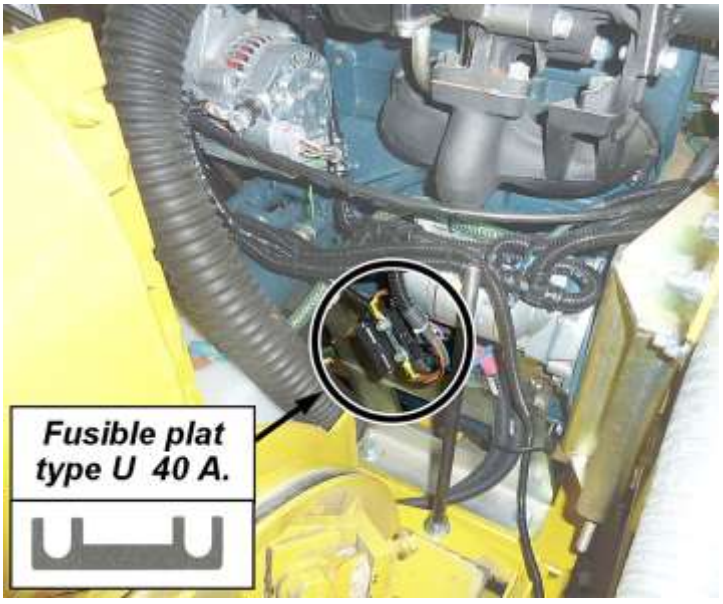
The proximity NoStress sensor M30 (Ø30) on the V-belt pulley of the chipping disk captures the speed .

The distance between sensor and metal pin opposite of the V-belt pulley must amount to **7 mm** $^{+/-1}$





One blade-type fuse **40A** is located in the fixture on the battery cable beside the starter



EXPULSION CHANNEL

The expulsion channel can be turned by 270° and blocked with the latch on the carrier.



TROUBLESHOOTING

In this chapter we have compiled a list of possible errors, their causes and their solutions. In case an error appears, which is not listed in chapter "Troubleshooting", please contact your dealer. Have your operating manual and the serial number of your machine on hand.

FAILURE	CAUSE	REMEDY
The engine does not start	- Emergency stop switch activated	- Unlock switch
	- Hood open	- Check locking of the hoods
	- Hood safeguard wrong adjusted or defective	- Check sensor (see page 35)
	- 40A-fuse defective	- Replace fuse (see page 37)
	- Battery empty	- Charge or replace battery
	- Supply cable damaged	- Check electric circuits
Reduced engine output	- Radiator clogged	- Clean radiator
	- Knives blunt	- Sharpen or replace knives
	- Fuel filter clogged	- Replace filter
The engine shuts off and cannot be restarted	- Hood not correctly locked	- Check locking of the hoods
	- Hood safeguard defective	- Check sensor (see page 35)
	- Fuel tank empty	- Fill with fuel
No forward or backward motion of the conveyor belt or of the infeed roller	- Regulating screw at infeed completely screwed down	- Loosen the regulating screw
	- Hydraulic motor or pump defective	- Check defective part or replace
	- Oil deficiency in hydraulic tank	- Check oil level
The machine is chipping with difficulties	- Knives blunt	- Sharpen or replace knives
	- V-belt damaged or loose	- Replace or tension V-belt
The infeed roller does not regulate, neither under the switch-on limit of the NoStress	- Failure of the electric or hydraulic installation	- Contact dealer

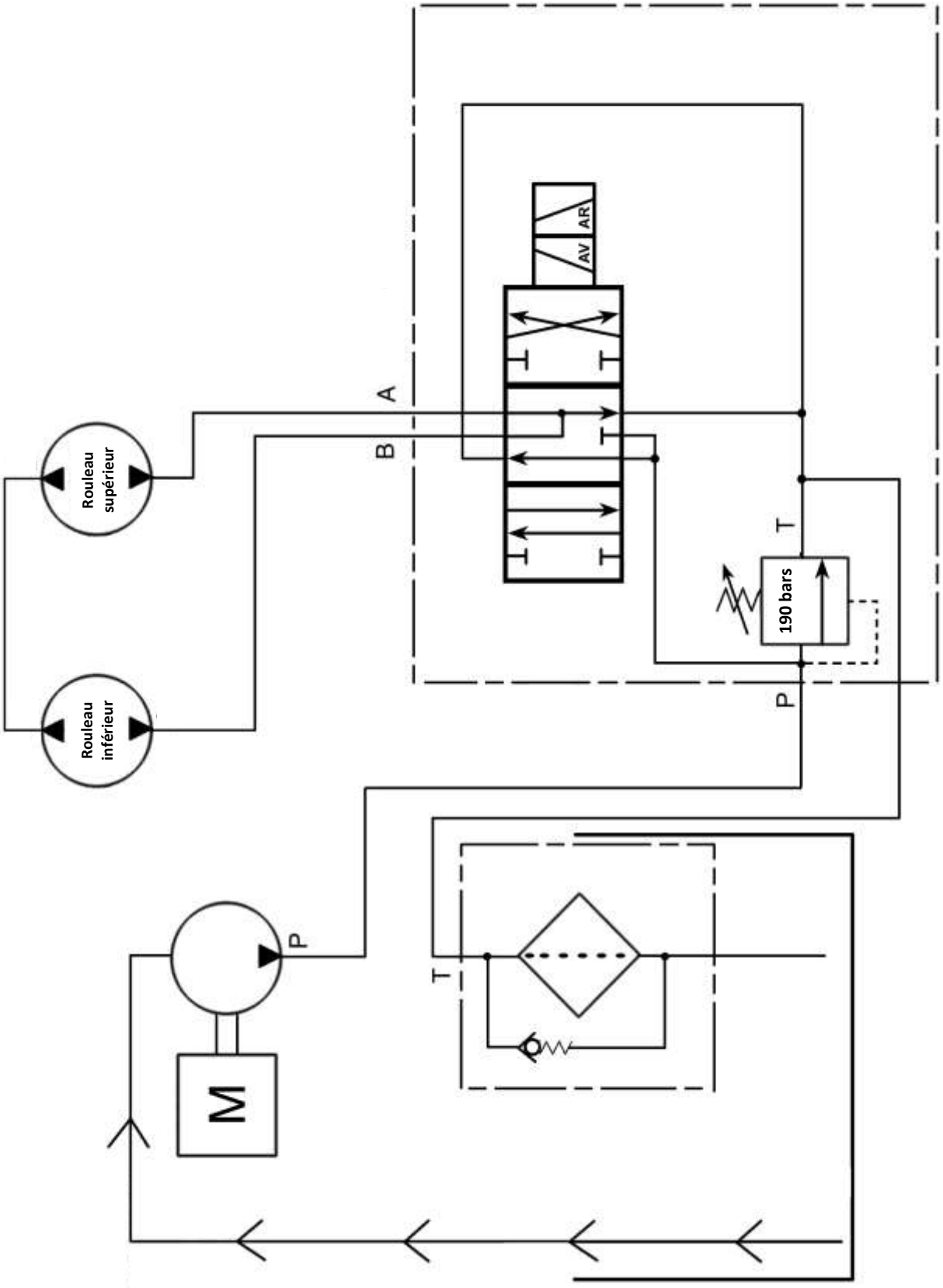
Spécifications

	WS/**18**D
Performance:	180 mm / 7,09 inch
Length:	4,00 m / 157,48 inch
Width:	1,52 m / 59,84 inch
Height:	2,53 m / 99,60 inch
Weight:	1085 Kg
Number of knives:	2
Chipping disk diameter:	670 mm / 26,37 inch
Weight of chipping disk:	92,5 Kg
Engine:	19Kw Kubota V1505 St V
Fuel tank capacity:	34 L
Engine speed:	2450 rpm
Chipping disk speed:	1250 rpm
Overload protection:	YES
Hydraulic supply:	YES
Hydraulic oil tank capacity:	11 L
Hydraulic pressure:	190 bars
Test drive:	YES
Number wheels:	2
Tyres:	165 R13
Tyre pressure:	3,5 bars

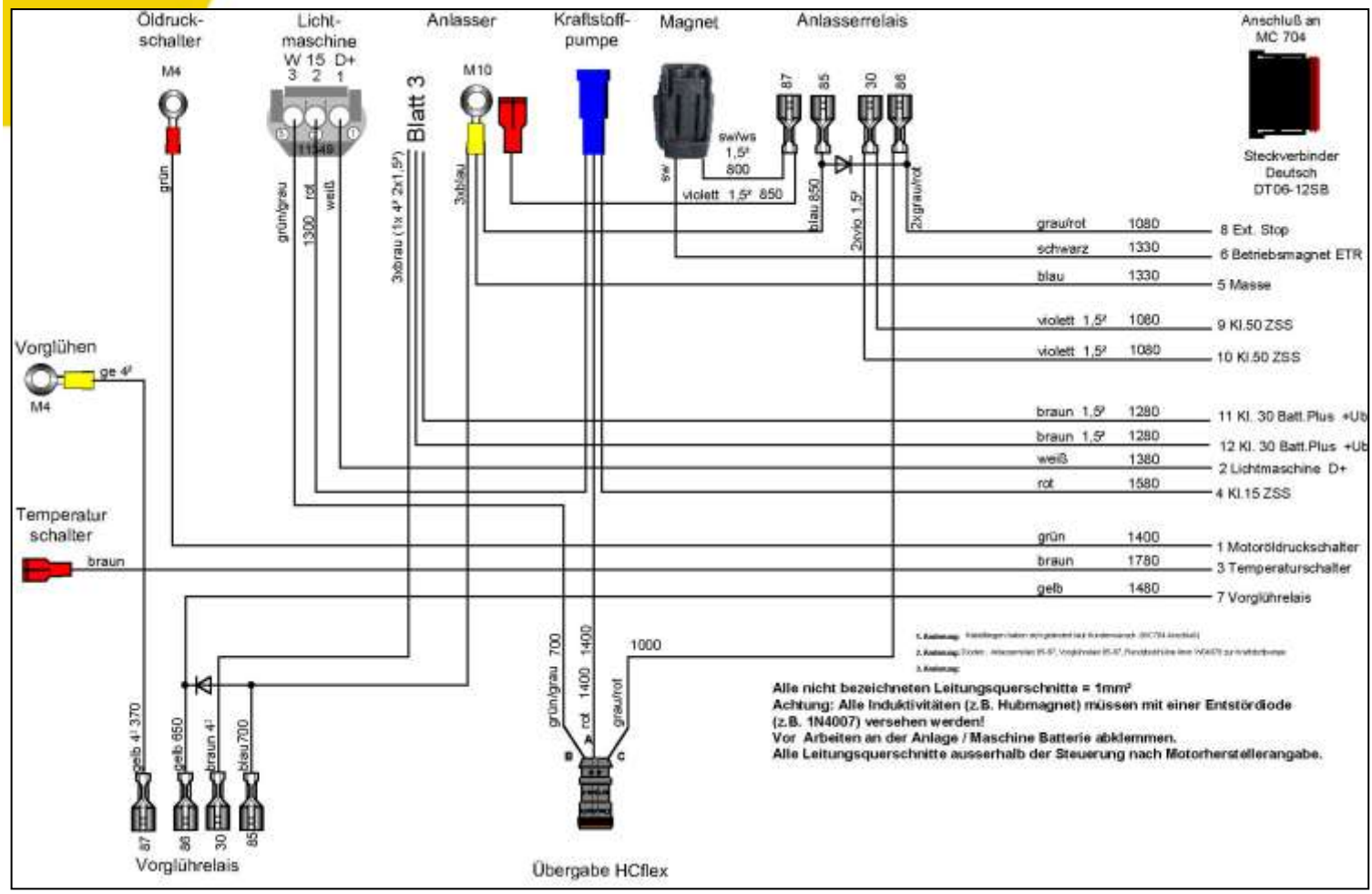
Hydraulic connections

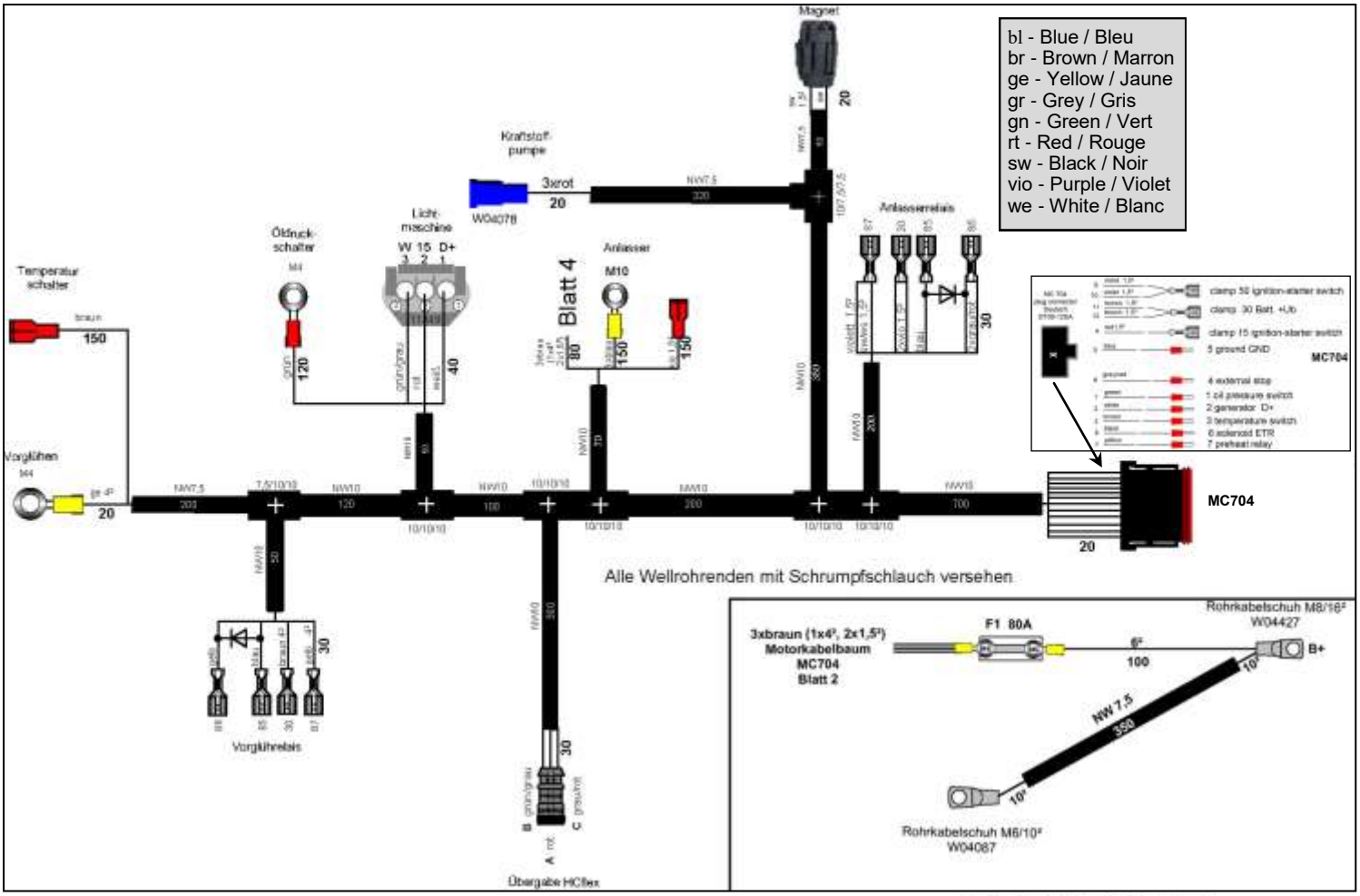
1	FLEXIBLE lg440 HF16
2	FLEXIBLE lg500 HF16
3	FLEXIBLE lg470 HF10
4	FLEXIBLE lg410 HF10
5	FLEXIBLE lg270 HF10
6	FLEXIBLE lg420 HF10
7	FLEXIBLE lg650 HF13

Hydraulic Circuit Diagram

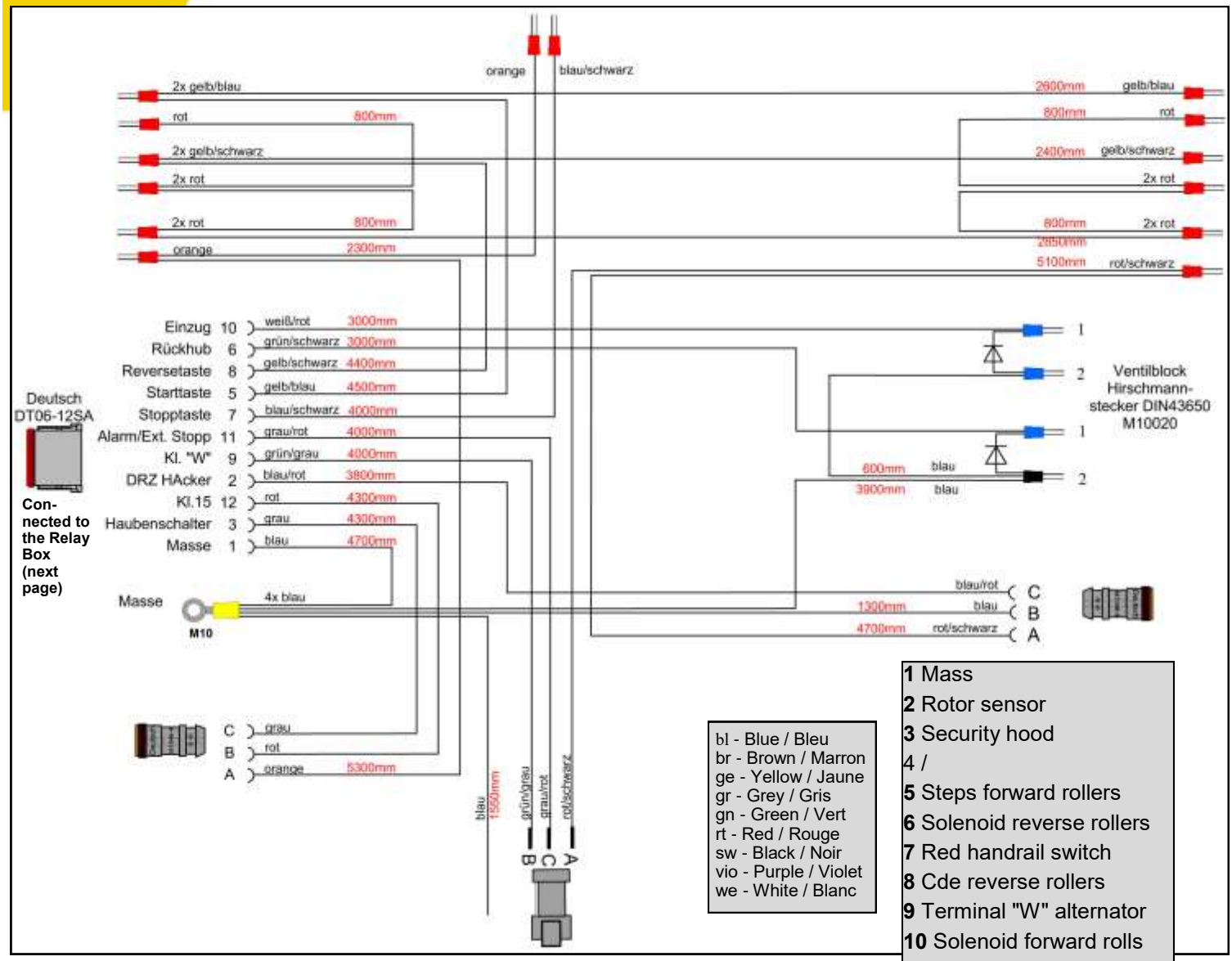


Electric Circuit Diagram Engine



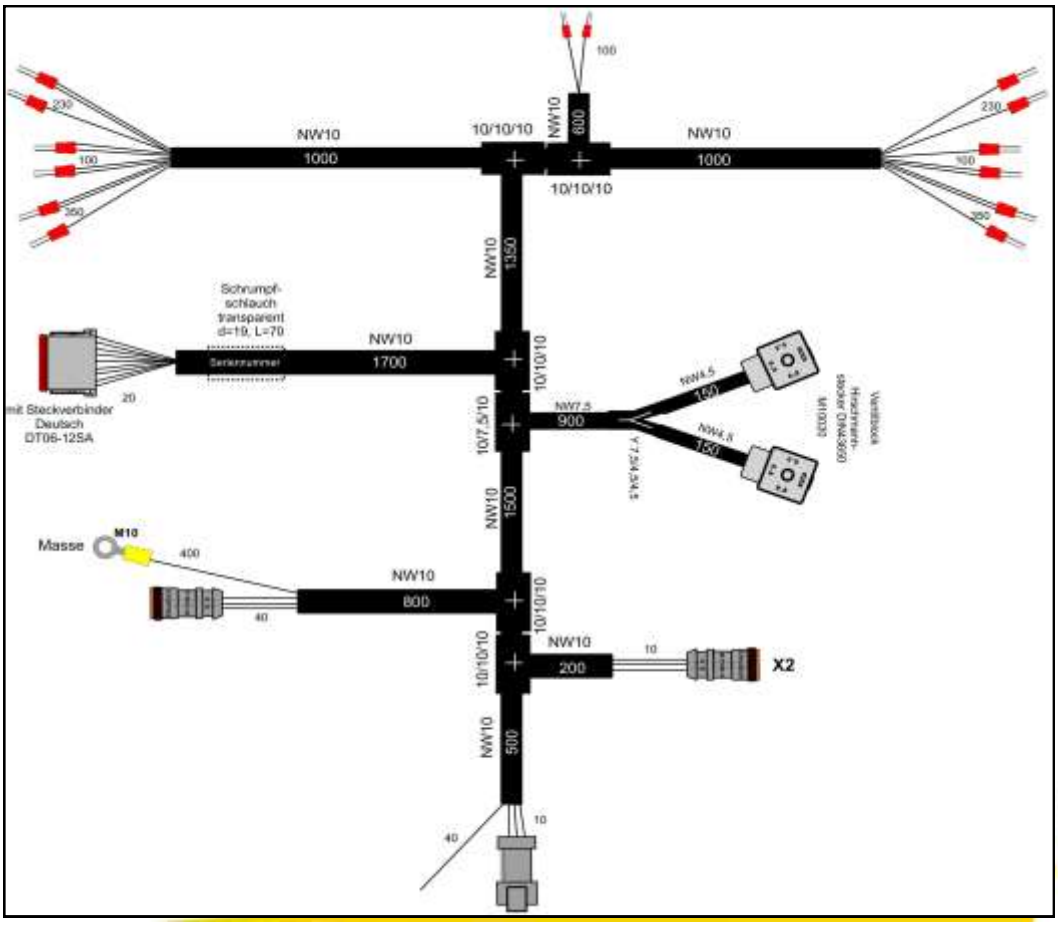


Electric Circuit Diagram Machine

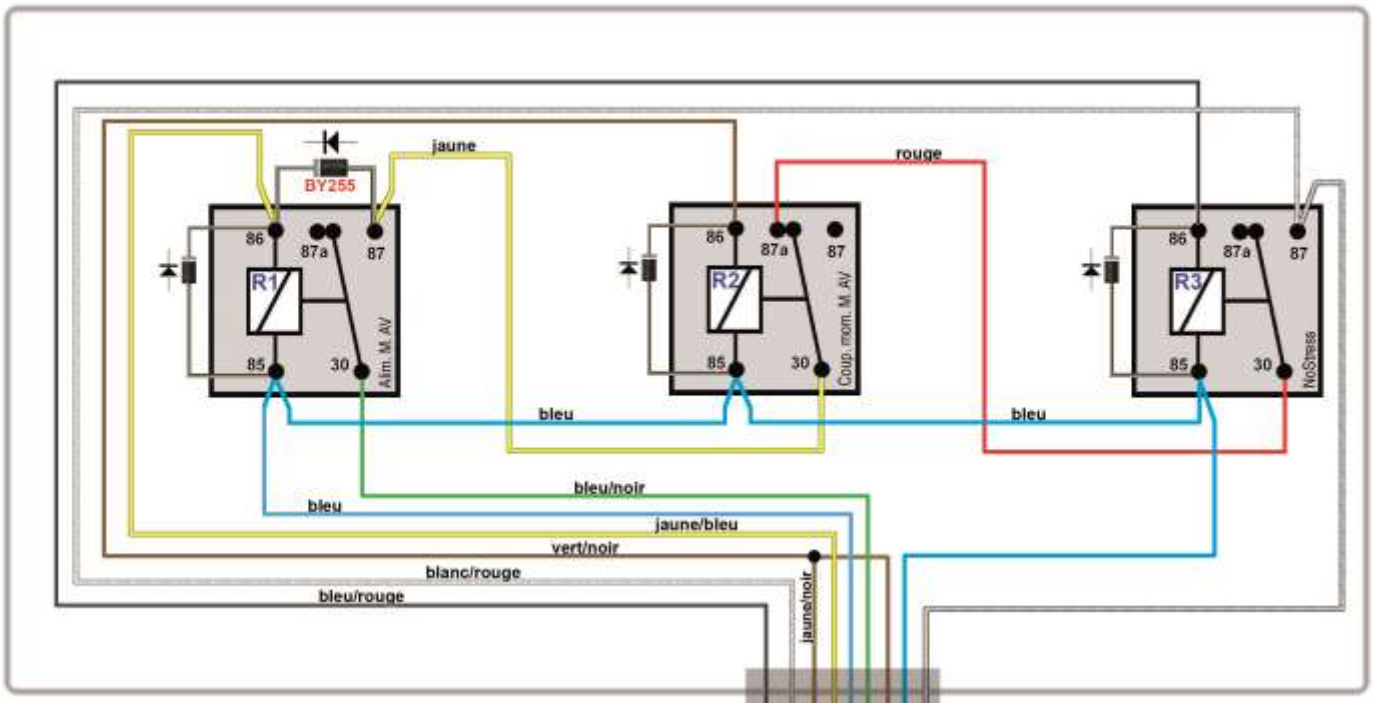


bl	Blue / Bleu
br	Brown / Marron
ge	Yellow / Jaune
gr	Grey / Gris
gn	Green / Vert
rt	Red / Rouge
sw	Black / Noir
vio	Purple / Violet
we	White / Blanc

1 Mass
2 Rotor sensor
3 Security hood
4 /
5 Steps forward rollers
6 Solenoid reverse rollers
7 Red handrail switch
8 Cde reverse rollers
9 Terminal "W" alternator
10 Solenoid forward rolls
11 Motor stop switch
12 12V after contact



Electric Circuit Diagram Relay Box NoStress and Feed Roller



R1: Front roller control

R2: Stops front rotation momentarily during reverse rotation

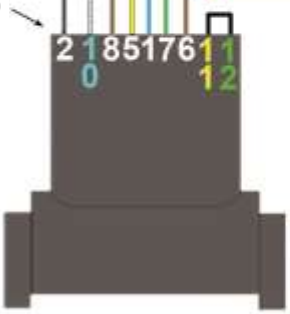
R3: NoStress for front rotation



Hour meter for PTO machine
Not used here



Caps on 3, 4 and 9



Blue / Bleu
Brown / Marron
Yellow / Jaune
Grey / Gris
Green / Vert
Red / Rouge
Black / Noir
Purple / Violet
White / Blanc

1 Negative polarity
2 NoStress command
5 Yellow button front rotation control
7 +12V power supply solenoid valve front rotation
8-6 Black Stop Button Forward Rotation During Reverse Rotation
10 Power supply front rotation solenoid valve
12 +12V to 11 for relay activation of starter

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