GREEN/SERIES



GS/COBRA D

TECHNICAL SPECIFICATIONS

Declaration of Conformity 3

Foreword 4

Warranties 4

Safety 5

- General 5
- Safety instructions 6
- Pictograms 9
- Transport safety 12

General description 13

- General description of the machine 13
- Identification 14
- Technical data 15

Composition and functions 17

- Composition 17
- Regeneration 28
- CO2 reduction (optional) 30
- Operation – Start-up and shutdown 34
- Loading and handling 35

Maintenance and servicing 41

- Maintenance intervals 43
- Lubrication points 44
- Technical checks 47
- Troubleshooting 60
- Hydraulic diagram 62
- Electrical diagrams 63

DECLARATION DE CONFORMITE

LA SOCIETE S.E.E 3 rue Jules Verne L'Orée du Golf 59790 RONCHIN France

*La société **SEE** détient 100% du capital de **SEE PRODUKTION GmbH** (site de production du Groupe).*
Adresse du site de production : Industriering Ost 42, 47906 Kempen, Allemagne.
Les machines portant la plaque d'identification « SEE Produktion GmbH » sont conçues, assemblées et contrôlées sur ce site de production, sous l'entière responsabilité de la société SEE.

DECLARE PAR LA PRESENTE QUE LA MACHINE :

Désignation :	**Broyeur multi-végétaux (SHREDDER)**
Type / Modèle :	**GS/COBRA D**
Numéro de série :	**XXXXXX**
Puissance moteur :	**55,4 kW**

EST CONFORME AUX EXIGENCES ESSENTIELLES DE LA DIRECTIVE 2006/42/CE,
ainsi qu'aux autres réglementations européennes en vigueur qui lui sont applicables :

Directive 2006/42/CE	relative aux machines / Réf JOUE : JO L 157 du 9.6.2006, p. 24–86.
Directive 2014/30/UE	relative à la compatibilité électromagnétique (CEM) / Réf JOUE : JO L 96 du 29.3.2014, p. 79–106.
Directive 2014/35/UE	relative au matériel électrique destiné à être employé dans certaines limites de tension (DBT) / Réf JOUE : JO L 96 du 29.3.2014, p. 357–374.
Règlement (UE) 2023/1542	relatif aux batteries et aux déchets de batteries / Réf JOUE : JO L 191 du 28.7.2023, p. 1–117.
Directive 2000/14/CE	concernant les émissions sonores dans l'environnement des matériels destinés à être utilisés à l'extérieur des bâtiments / Réf JOUE : JO L 162 du 3.7.2000, p. 1–78.

Procédé d'évaluation de conformité concernant la directive 2000/14/CE Annexe V

Puissance installée à 2600 Tr/Min	*Niveau de puissance Acoustique mesurée*	*Niveau de puissance Acoustique garantie (Lwa)*
55,4 kW	124 dBA	126 dBA

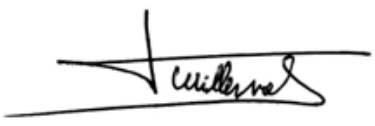
Normes harmonisées appliquées :

EN 13525 : 2020	Machines forestières - Broyeurs de bois-Sécurité.
EN ISO 12100 : 2010	Sécurité des machines - Principes généraux de conception Appréciation du risque et réduction du risque.
EN 60204-1 : 2018	Sécurité des machines - Équipement électrique des machines Partie 1 : règles générales.
EN 55012 : 2008 + A1	Compatibilité électromagnétique Émissions des véhicules, bateaux et moteurs à combustion interne.

Documentation technique détenue par Mathieu Willerval.

Fait à RONCHIN, le 04 mars 2022

Mathieu Willerval (Président de la société SEE)



Foreword

Thank you for choosing the TS Industrie multi-purpose shredder.

Your TS Industrie shredder has been manufactured with the utmost care and to the highest quality standards. To ensure that these standards are met, including most professional requirements, please read this user manual carefully and pay particular attention to the warnings and maintenance instructions.

Only by carrying out all the maintenance work specified within the prescribed maintenance intervals can we guarantee the full manufacturer's warranty for your TS Industrie shredder.

The user manual comprises several sections. An explanation is provided in the introduction on how to navigate the manual quickly using the small pictograms.

Warranties

Settlement of warranty claims

(see the full warranty terms and conditions provided with the CE certification documents supplied upon delivery of the machine)

Warranty entitlements, in accordance with the manufacturer's General Terms and Conditions of Sale, apply to new TS Industrie shredders for a period of two (2) years (or a total of 650 hours of machine use), from the date the machine is put into service, subject to a limit of 12 months following the date of the invoice issued by TS Industrie to the authorised dealer. The invoice issued by the dealer to the end customer shall serve as proof.

Registering the new shredder on the website www.ts-industrie.eu (dealer access) entitles the owner to a third year of warranty (or a total of 1,000 hours of machine use). This mandatory registration of the machine must be carried out by the authorised TS Industrie dealer no later than one month following the sale. It must be accompanied by the sales invoice to the machine's first owner.

Any technical modifications to the machines and/or their parts will result in the loss of warranty rights. The same applies in cases of improper handling or the use of lubricants, spare parts or accessories that are unauthorised or not prescribed by the manufacturer. Damage and deterioration caused by transport, where the cause results from normal wear and tear following the machine's commissioning, do not, in principle, give rise to any warranty claim.

The delivered machine must undergo the mandatory visual checks or inspections prescribed in accordance with the existing maintenance schedule at the specified intervals. Warranty rights shall lapse in the event of failure to comply with the mandatory visual checks and the inspection schedule. A further condition for warranty entitlement is the provision of full documentation regarding the mandatory visual checks and inspections carried out.

All warranty and maintenance work must be carried out by an authorised TS Industrie distributor.

It is specified that any work carried out under warranty costing more than €500 must be subject to prior authorisation from the manufacturer. In such cases, the manufacturer reserves the right to carry out the repair itself.

A prerequisite for claiming warranty rights is the return of the machine handover form, duly completed and signed.

It is not permitted to modify the equipment or the electronic programming in any way. Any unauthorised modification could affect the operation or safety of the equipment and may shorten its service life.

Important: remember to register your machine to ensure your warranty remains valid

Safety

General

It is strictly forbidden to use the machine if the emergency stops, cables or any other safety or control devices are damaged or missing

Our machines undergo strict quality control prior to delivery.

Once they have left the factory, transport and handling conditions are beyond our control. It is therefore essential that the dealer carries out a full inspection of the machine upon receipt.

Before any delivery to the end customer, the following points must be checked:

- external damage caused by transport, etc.
- that all screws and hydraulic pipe connections are securely fastened
- the hydraulic oil level
- a full functional check of all parts

This inspection is confirmed by a stamp and signature on the machine handover form. The warranty is not valid unless the completed and signed machine handover form is returned!

In addition, you must check that all parts are securely fastened after first use and inspect the friction points where the hydraulic hoses pass through!

Arrange an appointment with your customer directly regarding this matter.

Regular inspections must be carried out in accordance with this user manual!

For your safety, in the event of breakage of the red side cables or emergency stop buttons, please refer to the parts diagram or contact the spare parts department to order the parts

Safety instructions

1. The machine must only be used in full compliance with the operating instructions!
2. For motor-driven machines, the operating instructions for the drive motor must also be followed.
3. The feed table extension (if fitted) must only be raised when the grinding rotor has come to a complete stop.
4. Maintenance, cleaning and adjustment work, as well as the removal of the guard, must only be carried out with the engine switched off, the ignition key removed, the clutch disengaged (PTO-driven machines) and the tools switched off. Remove the ignition key so that the engine cannot be started accidentally.
5. Any foreign objects mixed in with the material to be shredded, e.g. metal parts or stones, must be removed before the machine is started.
6. Check that all safety guards are in place after maintenance or repair work.
7. The shredder must not be operated in enclosed spaces due to the inherent risk of poisoning.
8. The rotor must only be accessed when it has come to a complete standstill. This means that the drive motor has been switched off and the switch is in the 0 position.
9. The machine operator must ensure, on their own responsibility, that no unauthorised persons are present in the working and danger zones.
10. Ensure that only verified original spare parts are used during repairs.
11. Only trained persons aged 18 or over may operate the shredder.
12. Safety footwear and close-fitting clothing, as well as work gloves with tight cuffs, a safety helmet and safety goggles, must be worn.
13. The shredder must be positioned correctly during transport:

    - Lift the hopper flap (if fitted) and check that the lock is engaged.
    - Tilt the shredder into the transport position and check that the safety bolts are engaged.
    - Move the discharge chute so that it does not extend beyond the side of the machine.
    - Raise all supports if necessary.
14. When driving on public roads, the lighting must comply with the Highway Code of the country of registration.
15. The shredder must be stable during operation and must not be able to tip over.
    The necessary safety measures must be taken to secure it.
16. - Single-axle motorised shredders are towed by tractor vehicles; a parking brake may be applied if fitted.
    If they are not fitted with brakes, the immobilisation chocks supplied with the machines must be used.
    - When not being towed by a tractor vehicle, the supports (jockey wheel at the front and stand at the rear) must be lowered.

17. For safety reasons, a minimum distance of 10 metres must be maintained between the machine and the discharge point. **The discharge point must always be operated by the operating personnel.**

18. Inserting hands into the feed opening is permitted only when the engine is switched off and the shredding rotor has come to a complete standstill.

19. The factory-set permitted operating pressure must not be altered.

20. Only logs with a minimum diameter of **21 cm** may be processed by the shredder.

    Permitted materials: All types of wood

    Prohibited materials: Stone, metal parts, building materials, plastics and glass

21. The hydraulic system must undergo a professional inspection every year. Hydraulic hoses must be replaced every 5 years.

22. When loading the shredder, do not hold the feed hopper. To feed in short pieces or shrubbery, use only sturdy wooden sticks or other wooden tools. Our shredders may only be used for manual loading. Never use mechanical loading (grapple). Do not stand in the ejection zone.

23. Carry out a daily operational check before starting work, paying particular attention to the safety devices (**tightness of the drawbar linkage**, cover locks, safety switches for engine covers and chimney access). The operational condition and secure attachment of the blades and hammers must also be checked.

24. The operator must be given detailed instruction before starting work.

25. The shredding rotor must only be accessed when it has come to a complete standstill and the drive motor has been switched off.

26. Projection hazards. It must be borne in mind that items such as wood chips may be projected out of the hopper into the working area. Personal protective equipment must always be worn. The machine must be operated from the side of the hopper.

27. Instructions for all motorised machines:
    The engine must not be tilted by more than 25° during operation (driving).
    If the oil level is too low, lubrication of the engine at 25° is no longer guaranteed

28. Take care on sloping ground. The machine operator must ensure that the machine is securely immobilised and remains stable whilst working.

29. After coupling the machine to the towing vehicle, raise the jockey wheel as high as possible, or preferably remove it.

30. The machine must only be loaded with wood. Ensure that no stones, metal parts, building materials, plastics or glass enter the machine.

31. Under no circumstances may the machine be used to transport materials or people.

32. The machine must not be used to push or pull anything.

33. Battery acid is highly corrosive. Therefore, avoid contact with the eyes, skin and clothing. Rinse any splashes immediately with water and, if necessary, seek medical advice.

34. Before touching the electrical circuit, always disconnect the cable connected to the positive terminal of the battery.
35. Work must be carried out by a qualified technician. All installation, dismantling and/or specific maintenance work must be carried out by an authorised dealer.
36. In the feed hopper, take care not to get your loose clothing caught on the protrusions formed by the drive teeth of the feed belt.
37. Clean the anti-spill guard regularly to ensure it remains clear.
38. The machine must be used at an altitude below 1,000 metres.
39. Under no circumstances should the shredder be cleaned using a high-pressure washer or water in general. Electrical components must not be cleaned with water. The use of an air blower is recommended
40. In the working position, the shredder must be installed parallel to the ground and in such a way that there is a minimum height of 600 mm between the ground and the feed hopper.

Pictograms

Safety goggles and a helmet must be worn!



Wear protective gloves with tight cuffs!



Wear safety footwear!



Only touch machine parts when

they have come to a complete standstill!



Keep a safe distance from

of the machine that are rotating!



Never open or remove safety devices whilst the machine is running!



Read the operating instructions before use!



Do not remain in the ejection zone whilst the machine

in operation!

Establish a danger zone with a radius of at least 10 metres around

the point where the chips land



Switch off the engine before carrying out

and remove the key!



Caution: feed roller.

Never lean over or climb into the hopper or onto the conveyor belt

whilst the engine is running.



Hydraulic oil to be used: HV46



Lubrication points



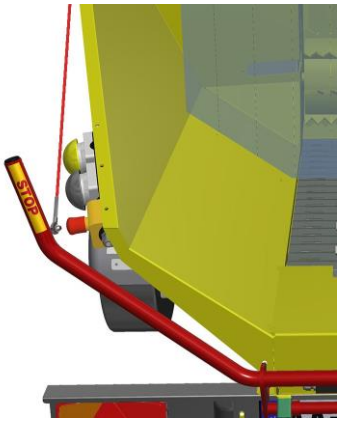
The noise level of the machine in operation does not exceed the standard

shown on the sticker on the machine



STOP feed roller and metal belt





Feed roller rotation controls

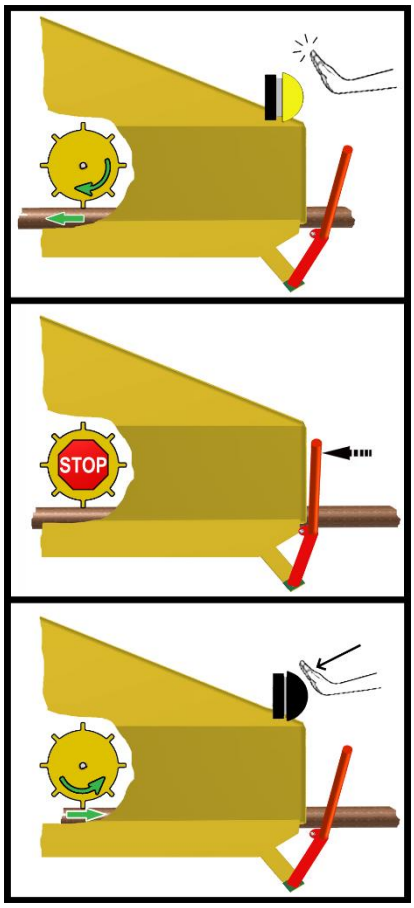
Shredding of materials (forward motion at maximum speed):

press once to start the movement

To stop the feed rollers from rotating: push the bar

Clearing material: hold down the black button

to activate reverse



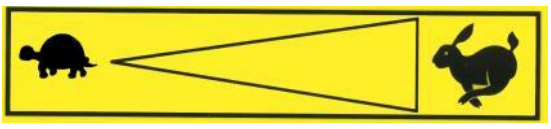
It is strictly forbidden to lean over, climb into the hopper or onto the conveyor belt



Fill the fuel tank with GNR or road diesel



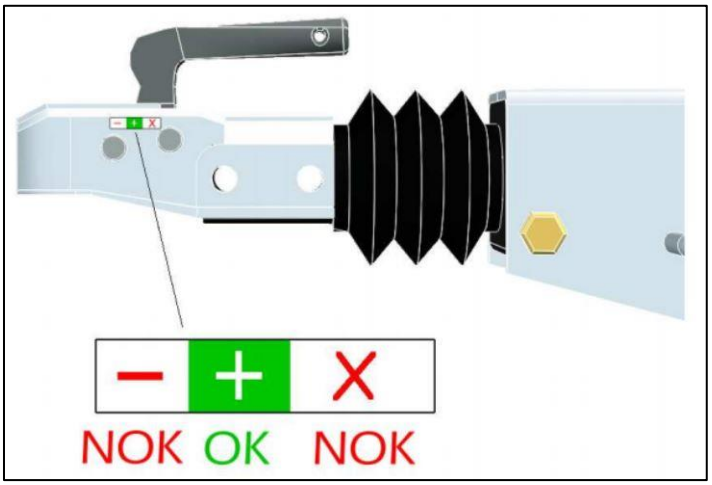
Minimum engine speed



Maximum engine speed

Transport safety

Hitch wear indicator:



Check the wear indicator every time you hitch the machine.

Always replace the vehicle's coupling head and/or ball if the indicator is in the 'MINUS' zone, as there is a risk of losing the shredder on a speed bump or when reversing against a kerb.

YOU ARE LIABLE IN THE EVENT OF AN ACCIDENT

- Ensure you comply with the laws set out in the current Highway Code.
- Make sure your vehicle always has clean, working lights so that other drivers can see you.
- Reduce your speed on bumpy tracks and surfaces.
- Empty and thoroughly clean the hopper of all branch debris
- Position the chimney as far forward as possible and lower the chimney cover as far as possible

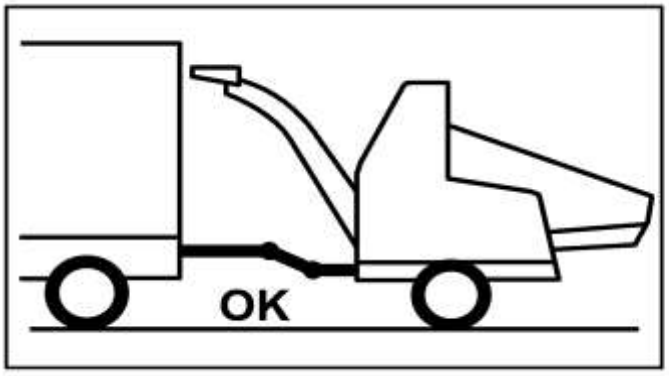
Hitch to the vehicle:

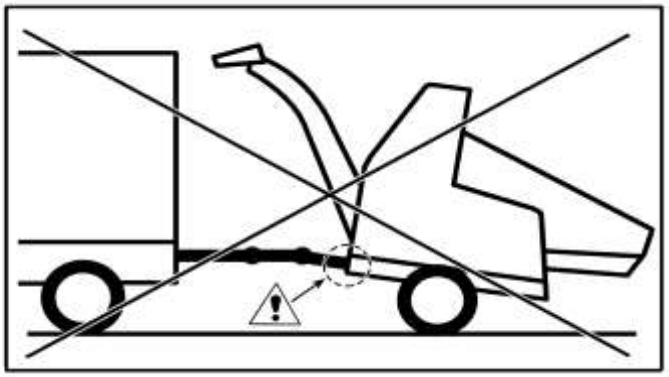
Always hitch the mulcher horizontally to avoid weight transfer to the rear AND check daily where applicable:

- The tightness of the parallelogram drawbar pins

- The tightness of the adjustable drawbar's splined joints

, to eliminate any jolts that could affect the longevity of the drawbar-trailer assembly.





General description

General description of the machine

The GS/COBRA D multi-purpose shredders are designed for shredding vegetation and branches up to 210 mm in diameter.

The machine comprises the following main components:

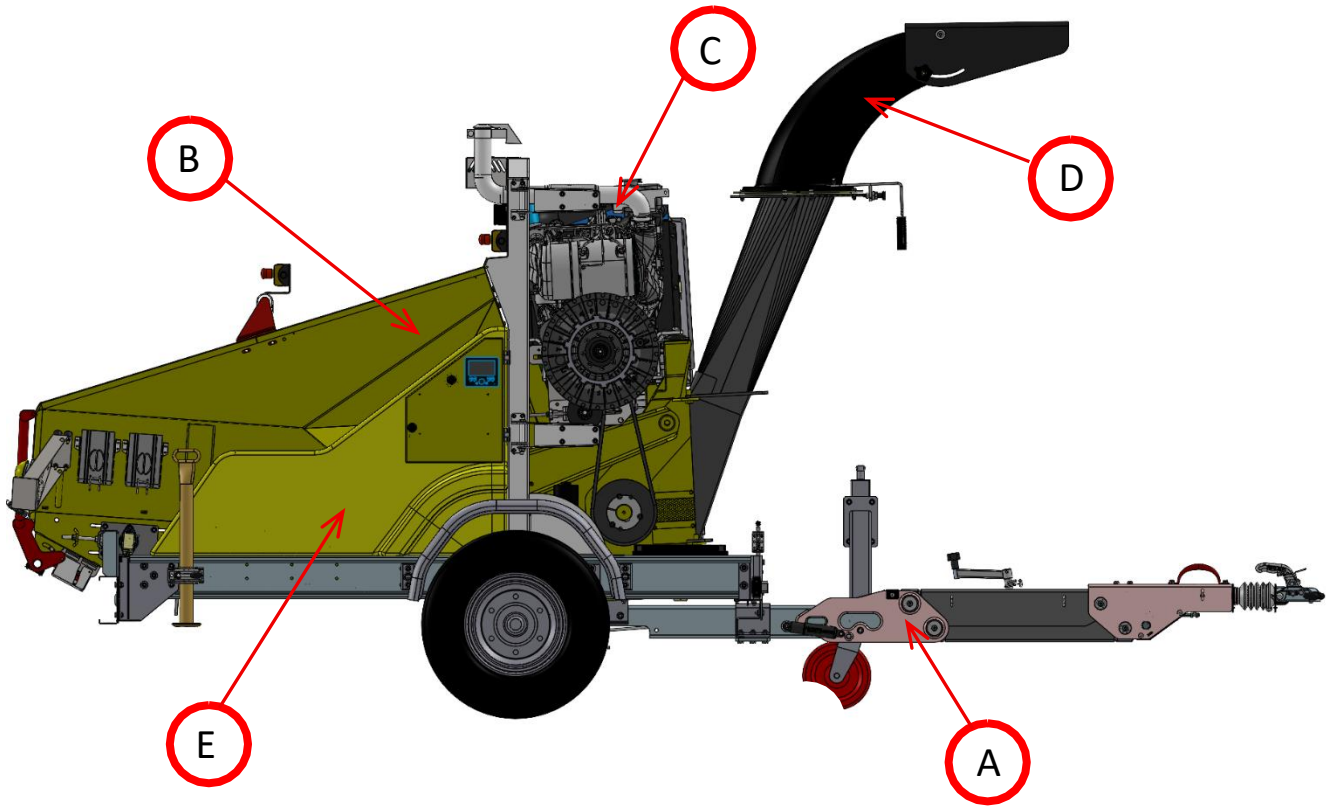
(A) : the chassis

(B) : the shredding unit

(C) : the engine and its various transmission systems

(D) : the exhaust flue

(E) : the cowling



Identification

The manufacturer's plate is riveted to the machine's chassis, located at the front left of the chassis.



The TS INDUSTRIE manufacturer's serial number always consists of six digits

Model: SHREDDER

Model: GS/ COBRA D

S/N: 6-digit serial number

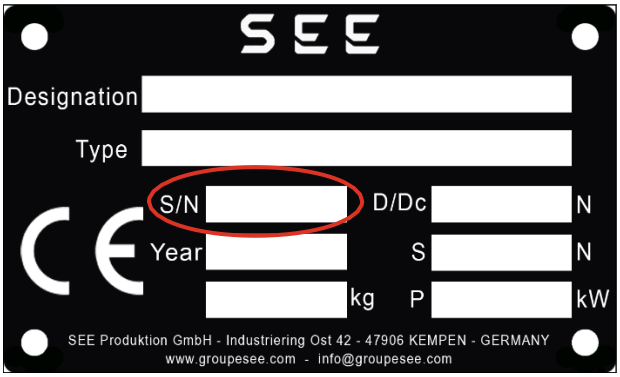
Year: Year of manufacture

Weight: in kg

D/Dc: Maximum permissible tensile force on the coupling, in N

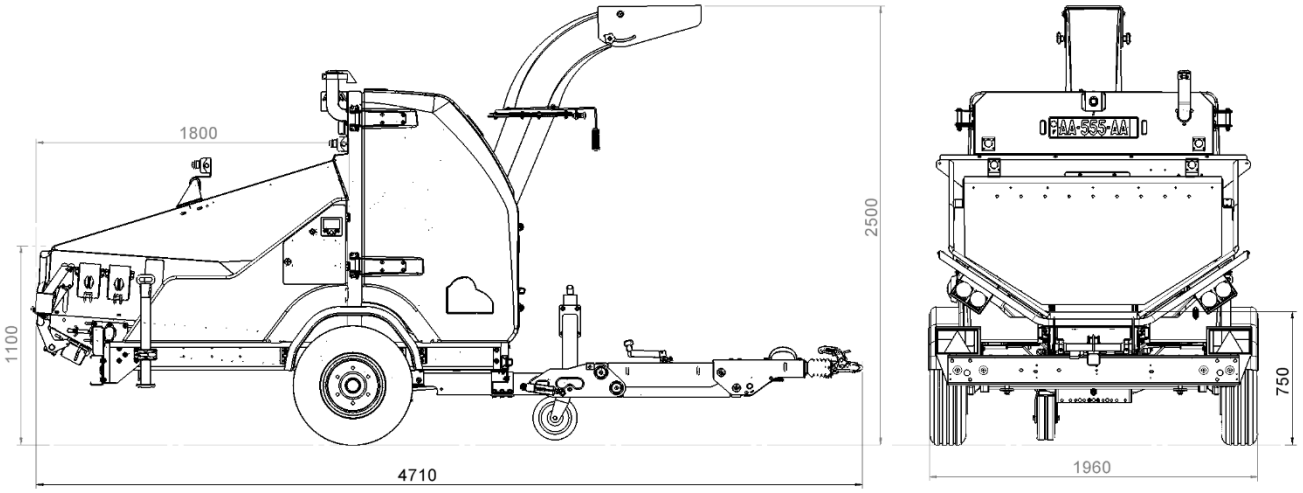
S: Maximum permitted vertical load on the coupling, in N

Power: in kW



Technical data

	GS/COBRA D
Capacity: Hourly	210 mm
output: Length:	45 m³/h
Width:	4.70 m
Height:	2.00 m
Weight:	2.50 m
Number of hammers:	2105 kg
Number of blades:	16
Rotor diameter: Rotor	8
weight: Rotor width:	560 mm
Motor power: Motor	270 kg
speed: Rotor speed:	560 mm
Anti-jamming:	55 kW
Hydraulic power supply:	2600 rpm
Hydraulic capacity:	2000 rpm
Hydraulic pressure:	YES
Road axle:	YES
Number of wheels: Tyre	28 L
size: Tyre pressure:	120 bar
CO2 reduction system	YES
	2
	215R14C
	4.5 bar
	Optional



The shredder produces a guaranteed sound power level in accordance with Directive 2000/14/EC, estimated at:

Sound [dB]	Sound pressure level [dB(A)]
126	124

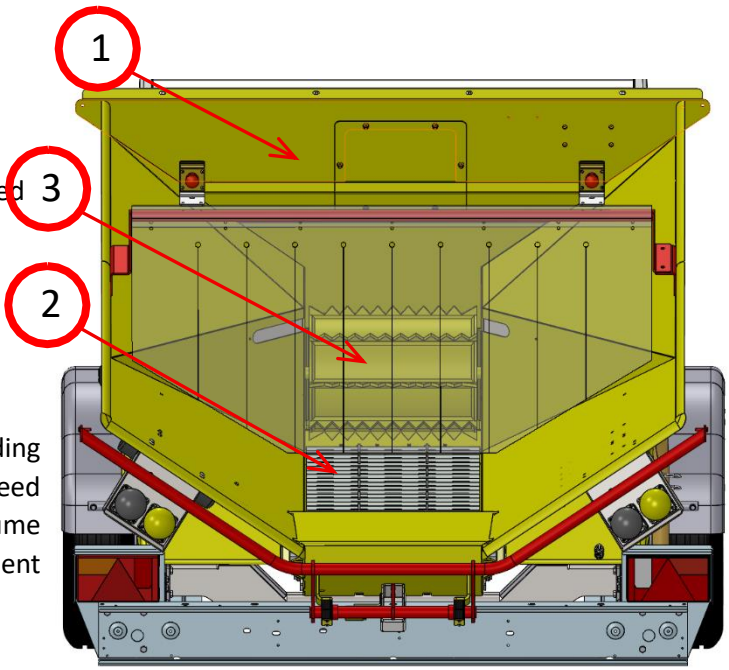


Composition and functions

Composition

A. The chassis.

The shredder's chassis serves as a support for the various components of the GS/COBRA D. It allows the machine to be moved independently.



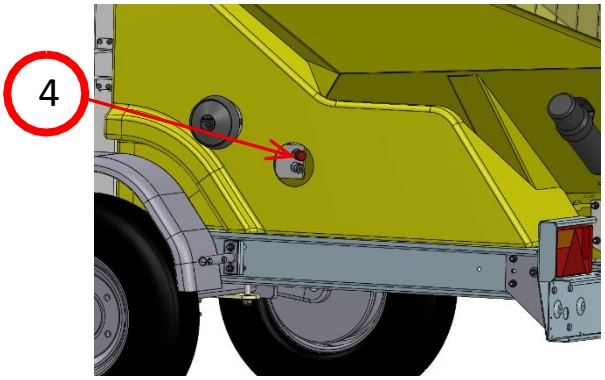
B. The grinding unit.

It consists of a feed hopper (1), a metal conveyor belt (2), a feed roller (3) fitted with serrated bars, and a rotor that grinds the material.

<u>Conveyor belt and feed roller:</u>

They convey the material at a constant speed towards the grinding rotor. An anti-blocking system stops them when the rotor speed drops too low (blockage in the grinding chamber); they resume rotation automatically once the rotor has regained sufficient speed to grind properly.

They can be operated in both directions (forward and reverse) using the yellow and black control buttons located on the sides of the hopper.

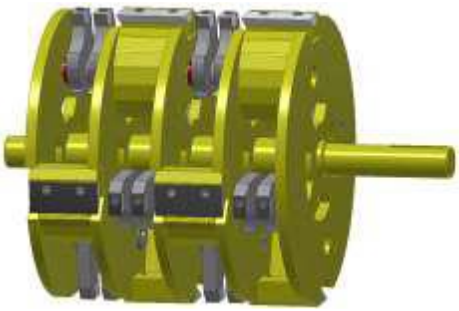


Their rotation speed can be adjusted using the dial (4) located in the rear left cover, depending on the diameter of the material to be shredded

<u>Grinding rotor:</u>

The centrepiece of the machine, this grinds the material fed by the feed roller. It starts rotating when the motor accelerates and runs continuously.

Its speed is fixed.



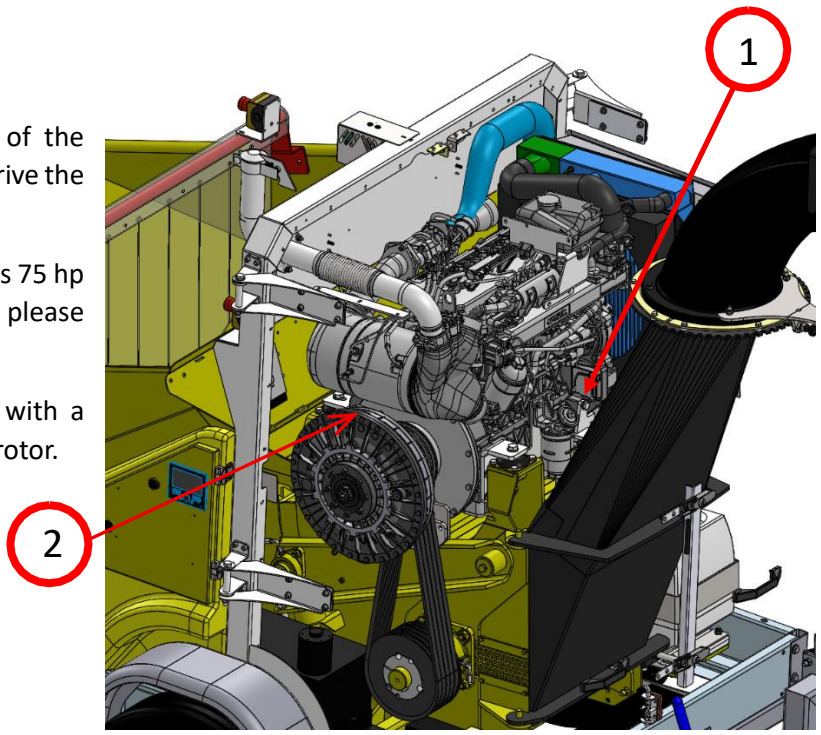
C. The motor and its transmission.

The internal combustion engine is located on top of the grinding chamber; it provides the power required to drive the rotor and the oil pump (1) of the hydraulic system.

The engine is a four-cylinder Kohler model. It produces 75 hp at 2,600 rpm. For further information on this engine, please refer to the manufacturer's manual.

The output shaft is fitted with a hydraulic coupler with a pulley (2) driving five belts which rotate the grinding rotor.

Model	Power	Speed
GS/COBRA D	55.4 kW	2600 rpm



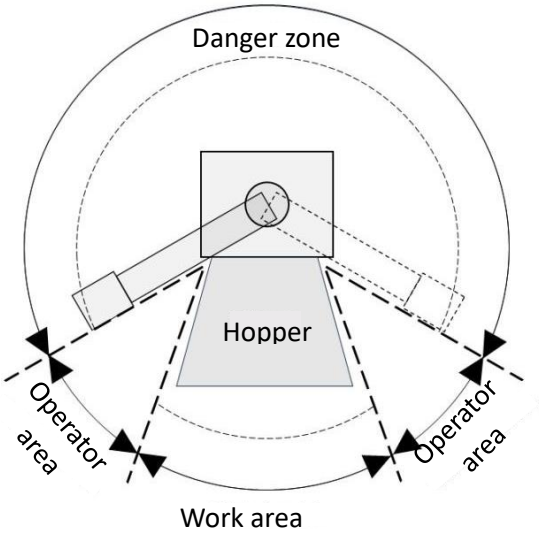
D. The chimney.

This allows chips to be removed; its upper section can be swivelled horizontally through 180°. Its hood is adjustable in vertical angle.

Note:

Wood chip residues may be ejected when the shredder is started up.

Two electrical safety devices stop the motor and prevent it from starting if the engine cover or the chute is opened to access the cutting rotor



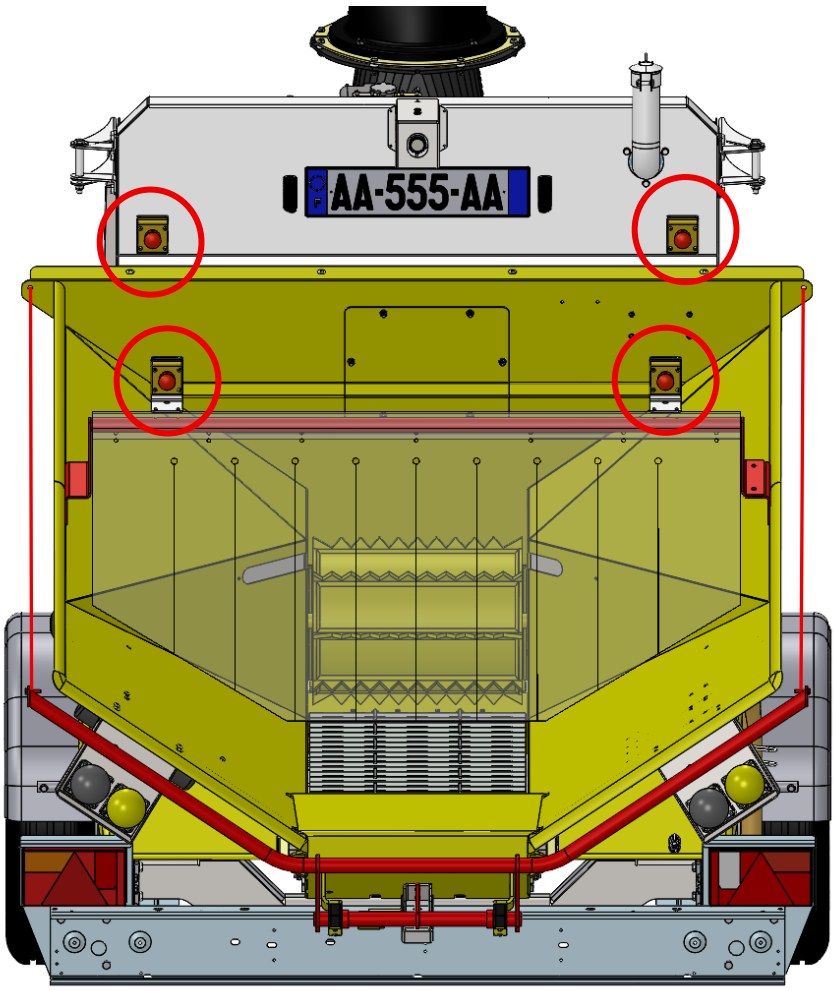
E. The covers.

A combined engine and machine cover protects the machine's moving parts, allowing the user to work in complete safety.

F. Emergency stop buttons

The machine also has four emergency stop buttons positioned on either side of the machine.

When activated, these emergency stops instantly halt the machine, stopping both the feed roller and the conveyor belt, as well as the shredding components.



For your safety, in the event of damage to the red side cables or the emergency stop buttons, please refer to the parts diagram or contact the spare parts department to order the parts.

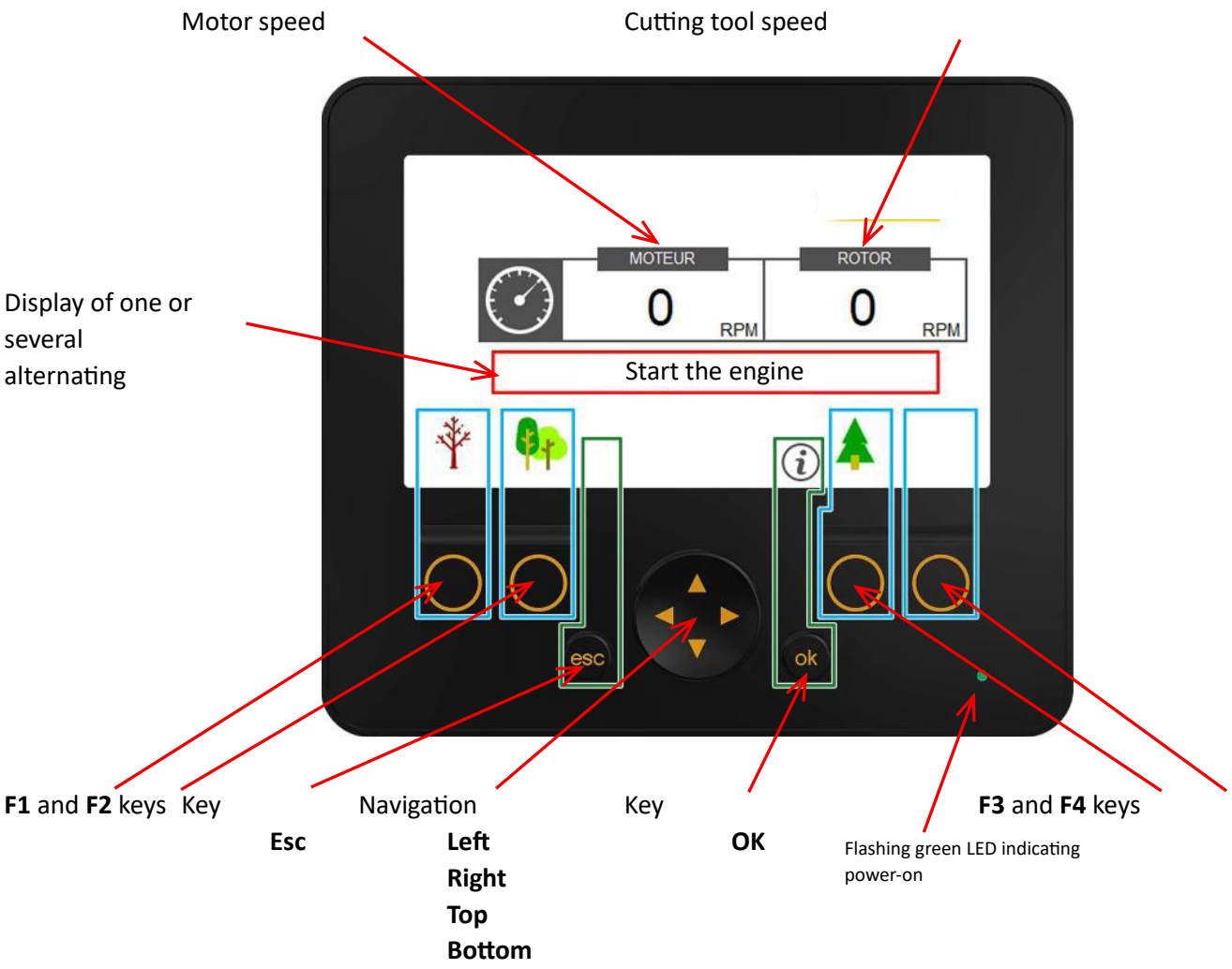
TS-COCKPIT Instruction Manual



Available functions

1. Permanent display of engine speed
2. Permanent display of cutting tool speed
3. Display of daily hours
4. Flashing green LED indicating power is on
5. Reverse rotation of the feed roller to release the cutting tool when the NoStress is in operation
6. Different NoStress operating ranges depending on the type of wood to be shredded
7. Service management: engine and battery maintenance intervals
8. Belt slip protection (ideal for hire)
9. Engine shut-off and anti-start safety if bonnet or chimney is open
10. Fault memory
11. 5 languages available: French, German, English, Spanish, Dutch
12. Control panel (technical diagnostics or fault detection)

Description of the main screen



It is strictly forbidden to alter the factory settings of the TS.COCKPIT.

Any modification to the safety features or programming carried out outside our factory is the sole responsibility of the person who made these changes.

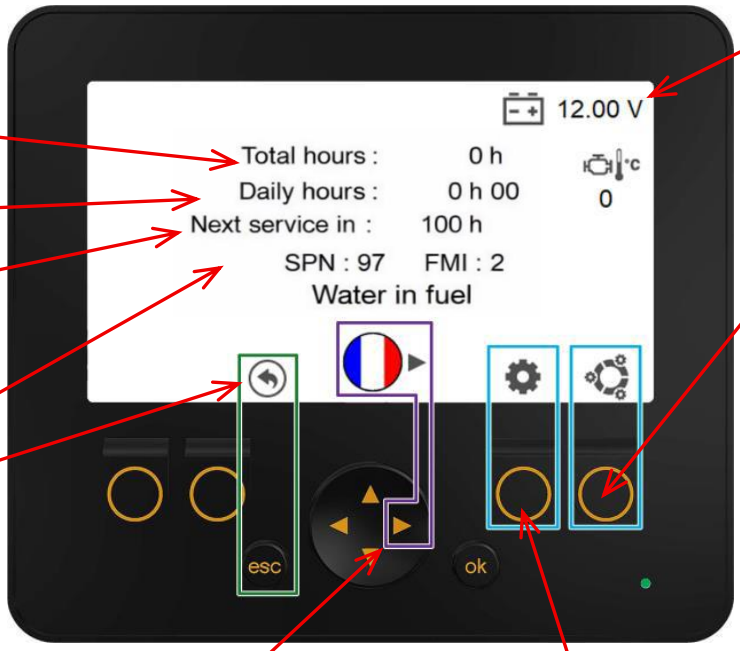
The values given on the following pages are for guidance only

Description of indicator lights and symbols

	Shredding range 1
	Shredding range 2
	Shredding range 3
	Selected function
	Return to previous screen
	Access to main screen
	Fault history
	Machine and engine controls status
	Reset daily counter
	Validate engine oil drain
	Action validation
	Action validation

	Work light *(optional)*
	Battery voltage
	Preheat before starting
	Flashing: maintenance required Fixed: fault (engine temperature high...,
	Red light: fault requiring machine shutdown (oil pressure too low, max temperature reached, low battery voltage, slip sensor, blocked cutting tool at start, ...)
	Engine malfunction

Description of the secondary display



Total hours

Daily hours

Next engine oil change due

Fault code and message

Esc key
Return to the previous screen

Battery voltage

Displays the **'Status'** page for engine controls and data

See below

Right arrow key
Press several times to scroll through the available languages:
French, German, English, Spanish, Dutch

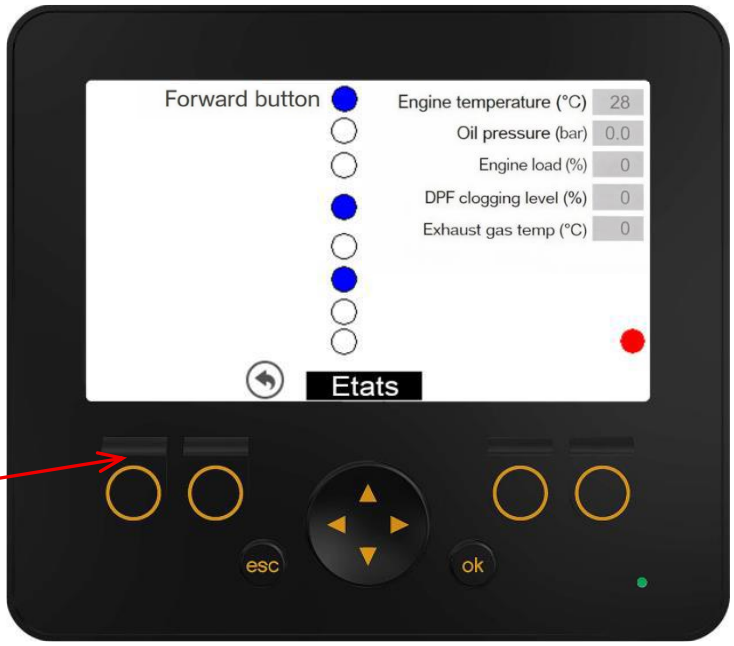
Allows you to access the history of recent faults

(See engine fault codes)

Description of the 'Status' page

Each machine control has an activation indicator light:
◯ = Control not activated
● = Control activated

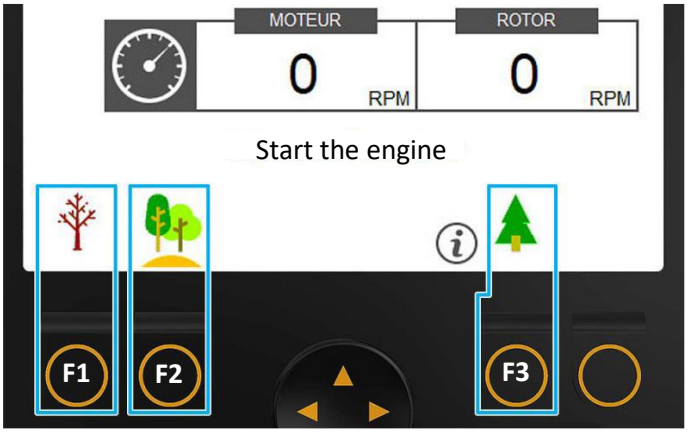
In the example opposite:
-The yellow forward button is held down
-The red STOP lever is held down
-The engine cover is open



<u>Checking the cutting tool sensor signal:</u>
With the ignition on and the cutting tool stopped, the circle is white *(regardless of the position of the indexing pin in front of the sensor)*. When the cutting tool is rotating, the circle turns blue.

If the rotor is stopped, place your finger in front of the sensor and press the **F1** key: the circle turns blue during this time = sensor OK.

Selecting NoStress ranges



The TS-COCKPIT has 3 engine operating ranges with associated NoStress ranges.

Each key has its own icon, which will appear beneath the logo of the selected key. Above, range 2 has been selected.

F1 button: NoStress management for the feed roller uses an extended speed range.

Suitable for shredding medium-sized pruning branches.

F2 key: NoStress management of the feed roller uses a medium speed range.

Suitable for shredding deciduous branches and, occasionally, for shredding conifers and other vegetation.

F3 button: the NoStress control for the feed roller uses a restricted speed range for optimum ventilation.

Suitable for shredding conifers and heavy vegetation thanks to its high-speed engine range for optimum ventilation.

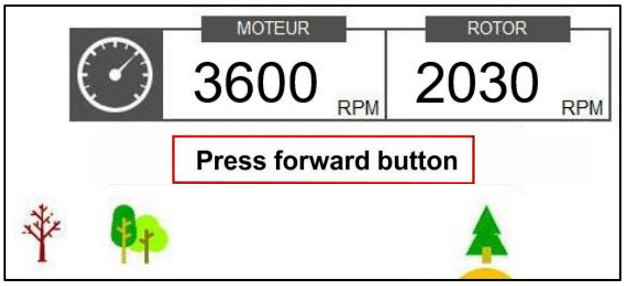
Normal operation and overspeed

The main rotational speed parameter taken into account for controlling the shredder's operation is that of the cutting rotor.

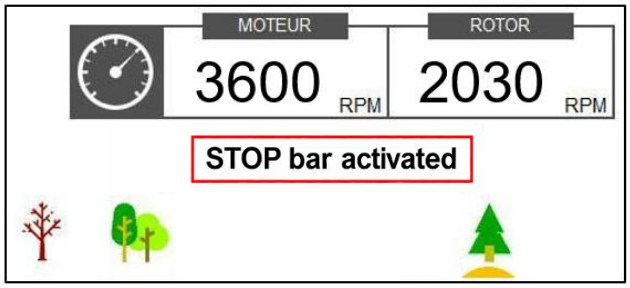
When accelerating the engine, a message

"Press the forward button" appears, indicating that the minimum speed for the feeder's operation has been reached.

You can press the yellow forward feed button.

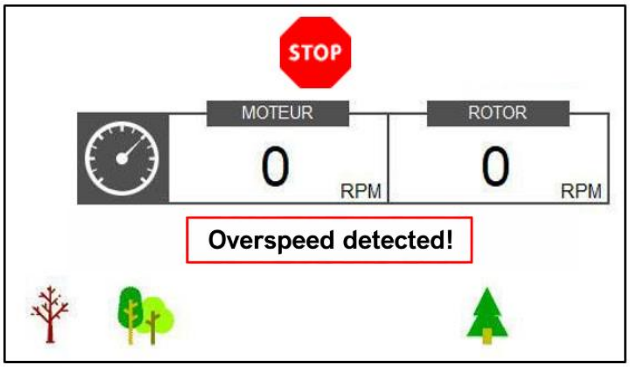


With the feeder running forwards, if you pull the red handrail at the rear of the hopper, the feeder stops and the message **"STOP bar** activated" is displayed.



If the cutting rotor is over-speeding, a **red STOP** icon appears with the message **"Over-speed** detected"; the feed roller stops rotating to prevent use of the machine, and the engine returns to idle.

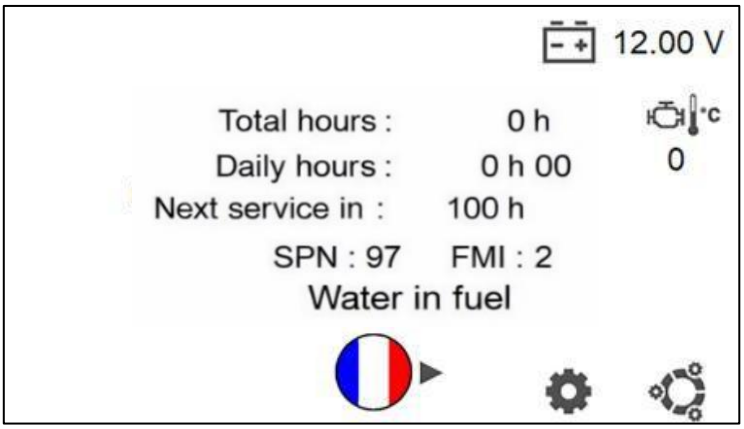
Stop the engine and investigate the cause of the problem.



Access to CUSTOMER (owner) settings. Code 3003



From the main screen, press the OK button (i) to display the secondary screen shown below.



Press the **F1**, **F2** and **OK** buttons simultaneously to display the screen below



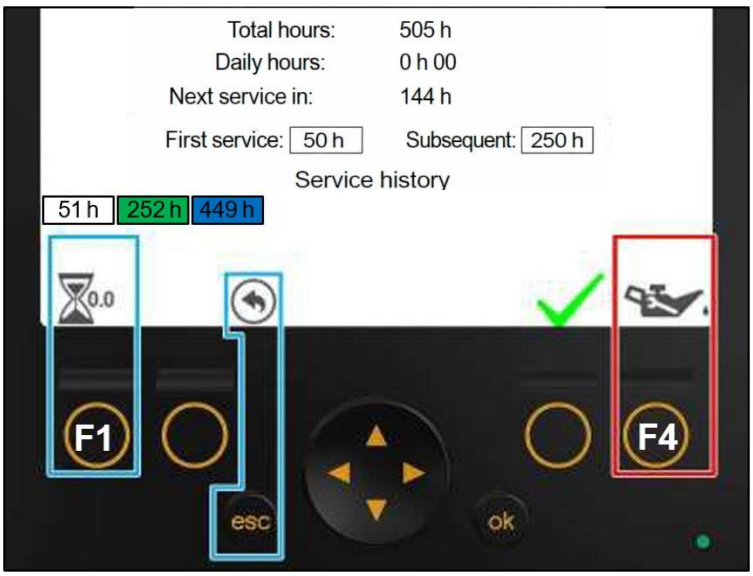


The screen displays the password **0000**. The first digit on a yellow background can be changed using the directional pad.

1) Press the arrow three times ▲ to enter the number **3**
2) Press the arrow three times ▶ to confirm the **two zeros** and move on to the fourth digit
3) Press the arrow three times again to enter the number **3** ▲
4) Confirm the code **3003** by pressing the **OK** button

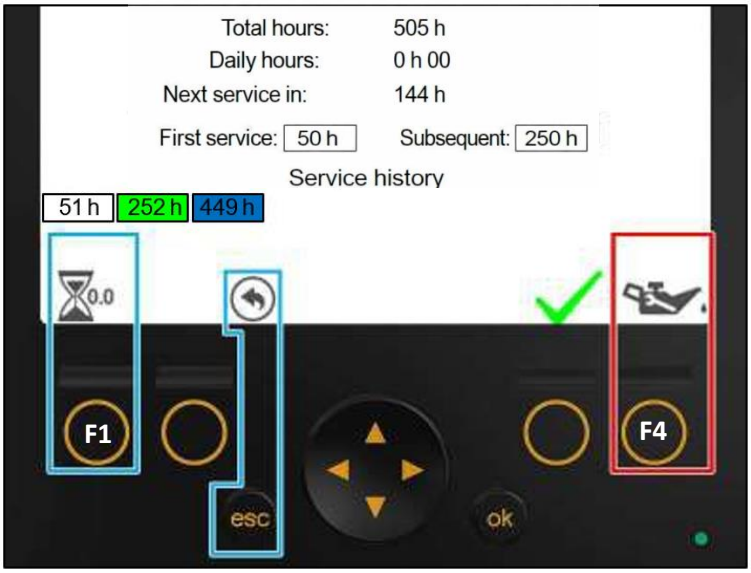
Resetting the daily counter

Press the **F1** key to reset the daily hours.
Press the **Esc** key to exit and return to the main screen.



Confirming engine oil changes

Once the oil change has been carried out, press the **F4** key to confirm the oil change. The time at which it was carried out is added to the table.
Press the **Esc** key to exit and return to the work page.



Blue background: 449 hours of service carried out by the owner

Green background: 252 hours of service carried out by the dealer

White background: 51 hours of service carried out by the manufacturer

NOTE: **15 hours** before the due date, the message **'Schedule oil change'** appears.
When the due date has passed, the background turns orange and the triangle flashes
The message **"Schedule oil change"** appears.
The secondary screen displays **"Oil change overdue by: 5 hours"**

Regeneration

To comply with the new European Stage V emissions standards, the engine is fitted with a DPF (Diesel Particulate Filter), an exhaust system with a particulate filter, whose regeneration is controlled by the engine ECU.

When the soot level in the DPF increases, this requires a 'clean-up' known as regeneration; the engine needs to run at a certain speed for the time required to carry out this maintenance.

There are two ways to do this:

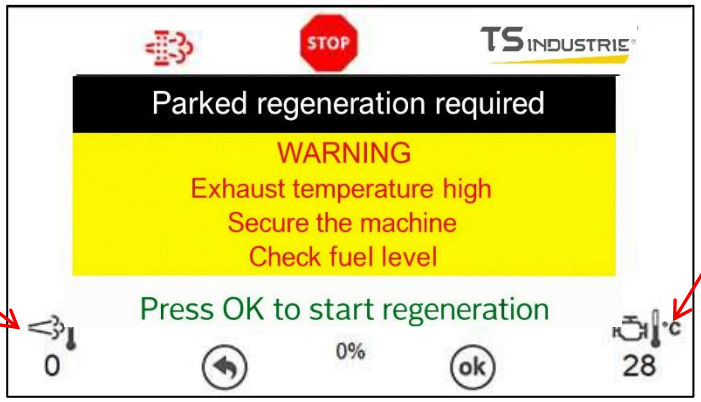
1) Passive regeneration
   'passively' if the machine is used for a sufficiently long time to complete the task.

   The user may notice engine noise, a distinctive smell and black smoke, which are signs that transparent passive regeneration is taking place without a message appearing on the screen.

2) Active regeneration
   in an 'active' manner with a warning on the screen and the feed roller locked. The engine will then rev up and must not be switched off until the 'Regeneration complete' message appears, ~45 to 60 minutes.

   When the DPF requires active regeneration, the information message below appears on the screen.

Exhaust gas temperature



Coolant temperature

Before starting regeneration, check that there is sufficient fuel, and park the machine in a safe and well-ventilated area.

Pressing the Esc key returns you to the working screen.

If the user declines regeneration, the regeneration request will reappear 30 minutes later. In this case:

- the feeder stops

- the engine switches to idle.

If you press the OK button:

- regeneration begins

- the screen displays the regeneration status.

During regeneration, shredding is not possible as the feeder is automatically stopped.

At the end of regeneration, the engine idles and the message ‘Regeneration complete’ appears.

Leave the engine running for 5 minutes before switching off the machine, or press ‘Esc’ to return to the main work screen and resume shredding.

Note: If the user repeatedly refuses to allow regeneration, this may cause premature and irreparable damage to the DPF, requiring its replacement and intervention by the engine manufacturer’s network.

The message “Regeneration service required” will then appear and the following fault codes may appear:

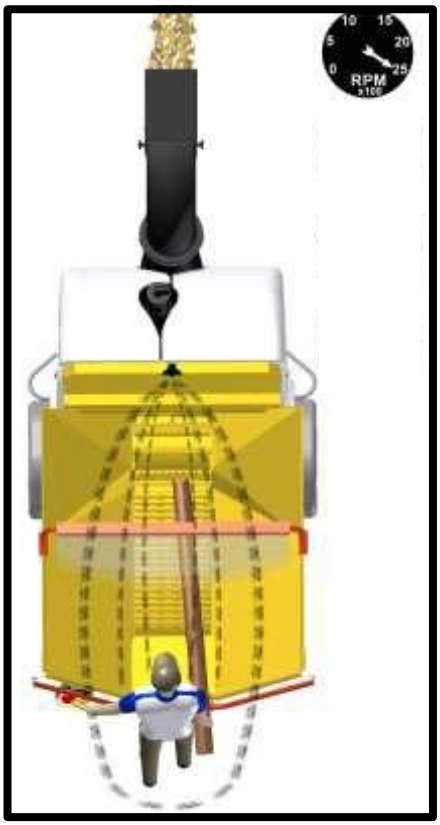
SPN 4781 FMI 15

SPN 4781 FMI 16

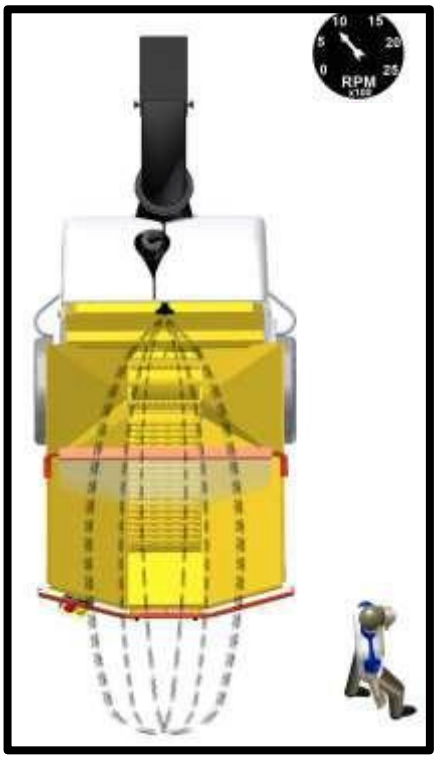
CO2 reduction (optional)

Description and operating principle of the presence sensor





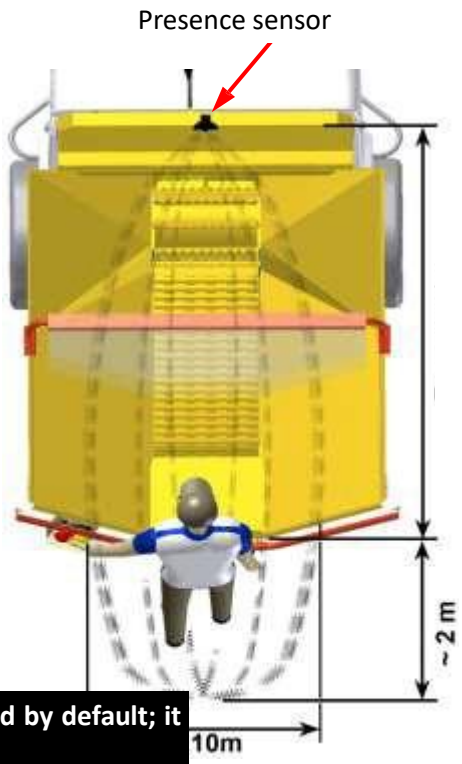
The crusher is a machine that operates continuously at high engine speed, with crushing periods alternating with periods of idle operation of varying lengths depending on the site configuration. Consequently, noise pollution and energy consumption are also always at their maximum.



To avoid these inconveniences and in the interests of environmental protection, whenever the operator leaves the shredder's control panel, after a set time, the presence sensor automatically stops the engine, thereby reducing noise pollution and energy consumption. Simply pressing the illuminated Start & Stop button at the rear of the machine restarts the engine so that it resumes its operating speed.

In addition to the environmental benefits mentioned above, the presence sensor also helps to extend the service life of all the machine's moving parts: engine, transmission, feed roller, feed conveyor, motors and hydraulic system.

Operation



The presence sensor located at the rear of the hood detects the user up to 2m behind the feed hopper and across a width of approximately 1.10m. The area corresponding to the hopper is a dead zone not covered by the sensor.

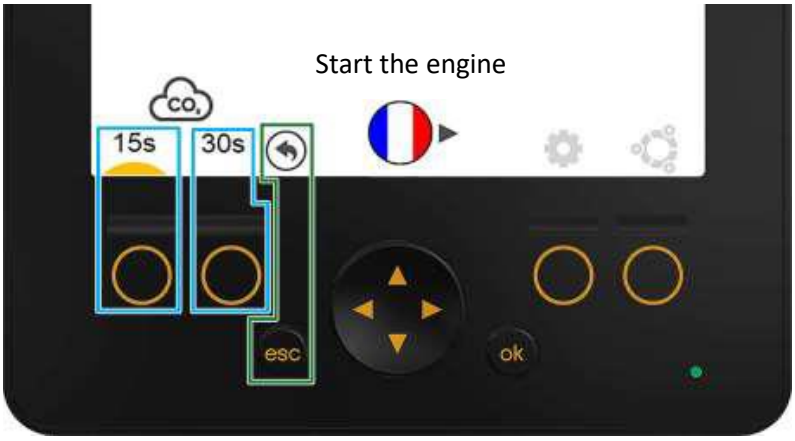
However, any object, even an inert one (such as a wall or vehicle), located less than 2 m behind the shredder will prevent the motor from stopping automatically.

NOTE: For safety reasons, do not alter the position or angle of the sensor; the detection height is set high enough to detect adults but not young children.

On the very first start-up, the presence sensor is not activated by default; it will therefore not stop the motor if no presence is detected.

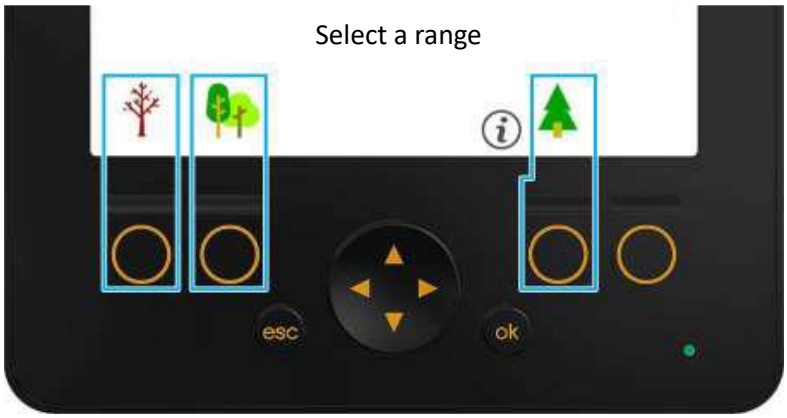
1) After switching on the ignition, from the main screen, press the **F4** key to display the site settings screen, shown below.



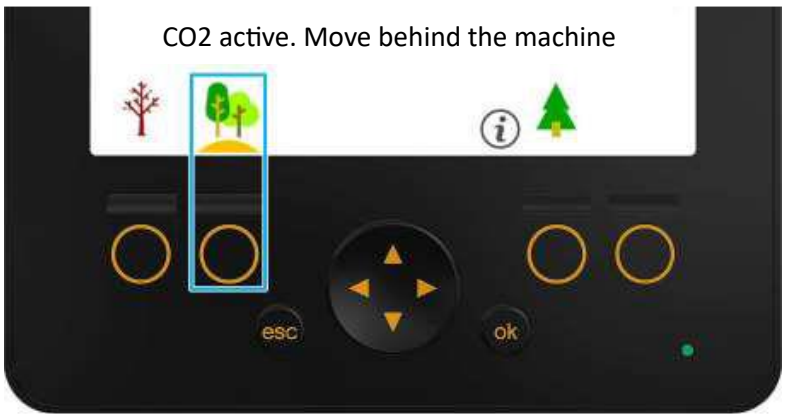


2) Select a delay of 15 or 30 seconds. In the example above, the 15-second delay has been selected as it is highlighted in yellow. (Pressing the button again deselects the CO2 Reduction function

3) Return to the main screen by pressing the Esc key



4) The message ‘Select a range’ is still displayed; now choose the grinding range 1, 2 or 3 that you wish to use by pressing the F1, F2 or F3 key.



5) Above, grinding range 2, highlighted in yellow, has been activated. The message 'CO2 active. Move behind the machine' is then displayed.

6) Stand in the detection zone behind the hopper

7) The engine accelerates to its operating speed; press the yellow push button to activate the feed roller.



8) As long as the user remains in the detection zone, the motor will continue to run at its operating speed.

9) When the user leaves this zone, the motor returns to idle after 15 seconds and the feed roller stops.

10) When the user returns to the detection zone, the motor accelerates again and the feed roller starts rotating automatically.

The delay you have selected *(15 seconds in this example)* will remain active during subsequent restarts until you deactivate the delay.

End-of-shredding function:

If the user has left the detection zone and the delay expires whilst there is still material to be shredded, the feed roller will continue to rotate and the motor will remain at its accelerated speed to finish the job.

Note: this system does not activate for small branches less than 15 to 20 mm in diameter.

Reminder: To use the machine without the presence sensor, deselect the delay on the job site settings screen.

Presence sensor malfunction:

- Never adjust the height of the anti-ejection flap support.
- Do not alter the angle of the sensor bracket.
- Do not leave any branches above the splash guard bracket.
- In the event of **very heavy rain** or **strong winds**.

Operation - Starting up and shutting down

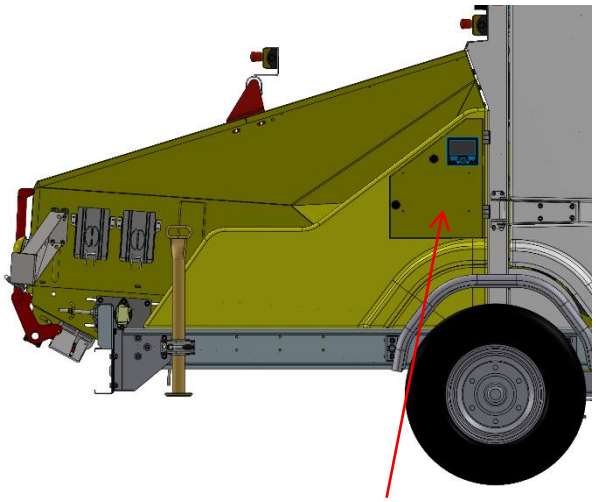
Before each start-up, ensure that the machine is correctly positioned and balanced.

- Machine parallel to the ground

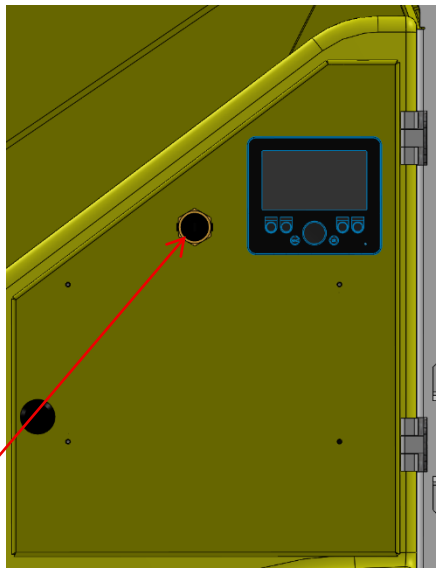
- Minimum distance of 600 mm between the ground and the bottom of the feed hopper

- Prevent the machine from tipping over by deploying the support leg if fitted.

The machine is started or switched off using the ignition key, located on the right-hand side of the machine.



On the GS/COBRA D, it is located here, on the side cover



Turn the key to the right (RUN position) 

to switch on the ignition, activate the 'TS-COCKPIT' display and start the preheating process.

Wait until the orange pre-heating light goes out  (this may or may not come on depending on the outside temperature)

Turn the ignition key to the START position 

. If the engine is cold, it will idle for a few seconds, then switch to high idle until a minimum operating temperature is reached, before returning to normal idle. During high idle, the message **'Low temperature, engine warming** up' remains displayed and it is not possible to select a range.

If the engine needs to perform regeneration, a specific screen is displayed.

See the TS-COCKPIT instruction manual, **page 20.**

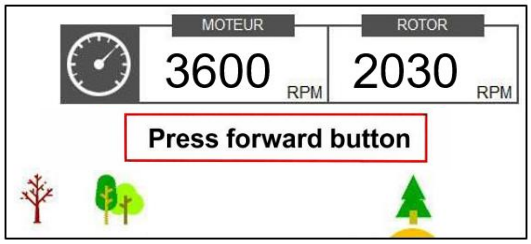
Inserting the equipment and handling

1) Check that the cap at the top of the flue is open

2) On the TS-COCKPIT, select the range  or   at you wish to use.

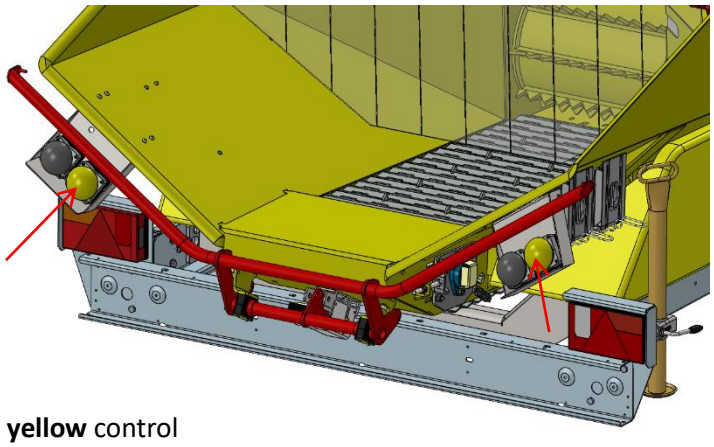
3) The engine accelerates gradually until it reaches its operating speed. Depending on its temperature, the engine accelerates more or less quickly.

(Note: pressing it again returns the engine to idle)



4) Once the engine has reached its operating speed, the message

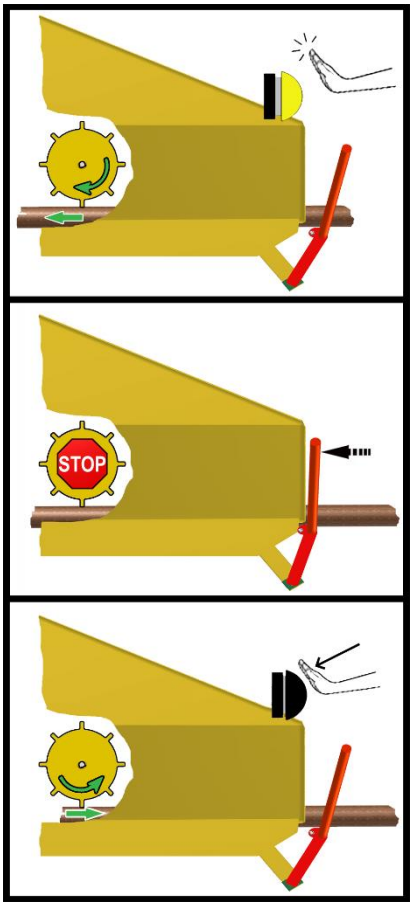
'Press forward button' appears



5) Start the feed roller/conveyor assembly by pressing the **yellow** control button on the branch feed hopper.

6) Start shredding.

The shredder is fitted with a hydraulic distributor with electric controls operated by ‘mushroom’ push-buttons on the rear of the hopper for forward and reverse movement, and a red ‘handrail’ control bar to stop the feed roller/conveyor assembly.



FORWARD CONTROL:

1: To operate the roller in forward motion, the red handrail must be pulled back.

2: Press the yellow push-button once to activate the roller in forward motion.

FEEDER STOP CONTROL:

1: Push the red handrail to stop the feed roller.

REVERSE CONTROL:

1: To operate the roller in reverse, the handrail must be pulled back.

2: Press and hold the black push button.

NOTE: The feeder can be switched directly from forward to reverse without using the red handrail.

INSTRUCTIONS DURING SHREDDING

Ensure the shredder is stable and that the operating staff are properly trained!

Place the feeders at the bottom of the hopper and insert them with the thickest end (branch) into the feed cylinder (cut the wood at an angle at the end).

As soon as the feeders have taken in the material, move to the side as ejections may occur due to irregularities in the branch.

The material fed in is automatically shredded and ejected in the direction (distance) to which the ejection chute has been previously set.

Once the material has been fed in, you should also pay attention to the ejection of branches and readjust the ejection direction if necessary. The ejection distance is controlled by the ejection deflector.

When shredding pruning waste, small logs and dead wood, the formation of projectiles is prevented because the materials are generally fed side by side lengthways into the feed chute.

If the feed stops (blockage due to too much material or forks), press the black reverse control button (the feeder rotates backwards) and the material to be shredded is pushed back. Cut the material into small pieces, saw off the fork and restart the feed.

Caution**:**
Do not touch the hopper whilst the machine is in operation. Never push material into the hopper using a stick or a metal pusher. It is also forbidden to remain in the danger zone! If the wood is dense or hard, it is advisable to reduce the feed roller's rotational speed if the engine speed drops, so that the engine can return to its rated speed.



In the event of a blockage in the discharge chute area, the chute may only be opened once the cutting rotor and drive motor have stopped, and the jammed wood has been cleared.

SLIP function

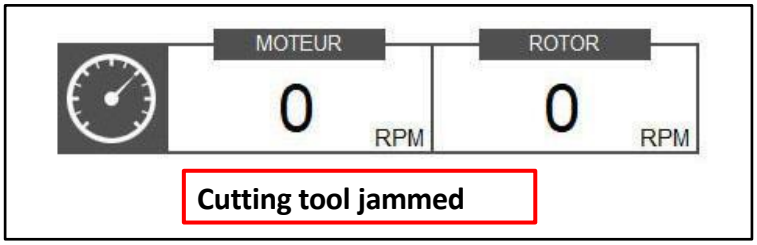
The TS-COCKPIT monitors slippage in the cutting tool's drive system by continuously comparing the speed difference between the motor pulley and the cutting tool pulley. A certain percentage of slippage is tolerated to protect the drive system (belts). If this value is exceeded, the motor is stopped and two different messages may be displayed.

1) **As soon as the cutting tool starts rotating:**

If the message **"Cutting tool blocked"** is displayed

Possible causes of slippage:

- cutting tool blocked by grinding residue remaining in the grinding chamber
- broken belts or faulty transmission.

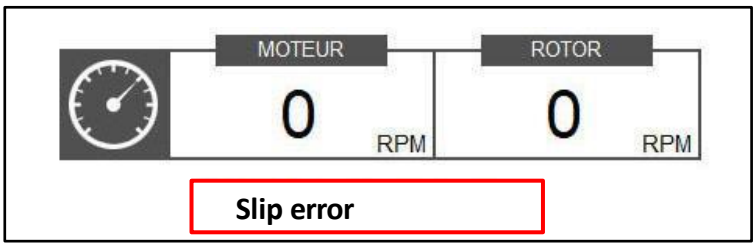


2) **During shredding:**

If the message **'Slip error' appears**

Possible causes of slippage:

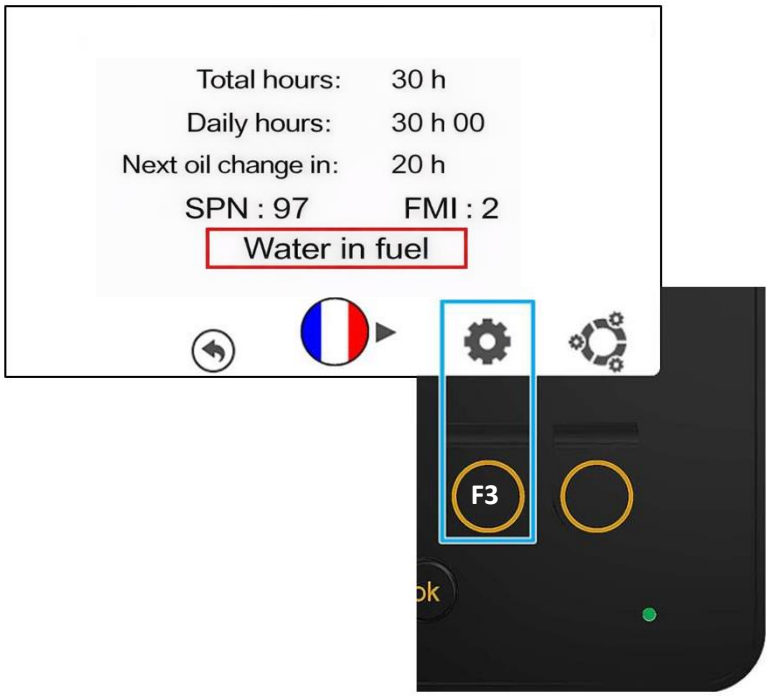
- Cutting tool jammed
- loose or broken belts
- failure or lack of oil in the clutch



SPN/FMI message in the event of a fault

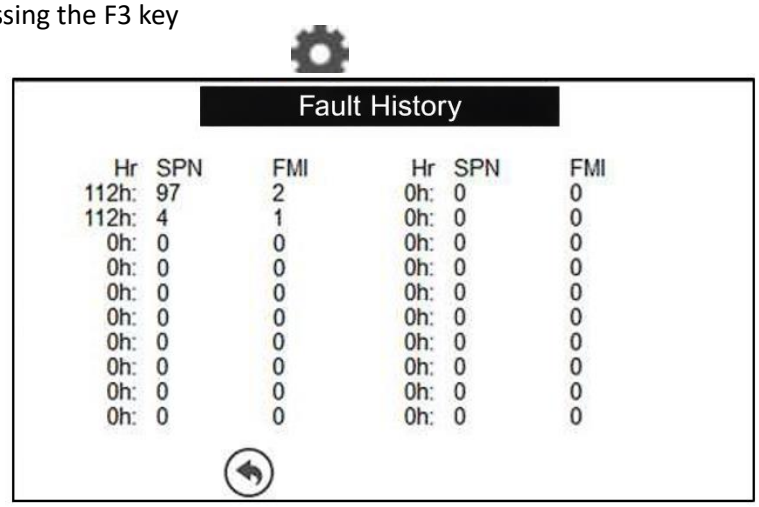
In the event of a fault (machine, motor, inverter, batteries), the display automatically switches to the secondary screen, showing an SPN/FMI code and, where applicable, an explanation of the fault.

If there are several fault codes, they are displayed alternately.



Fault codes are recorded in a log along with the number of engine hours at which they occurred.

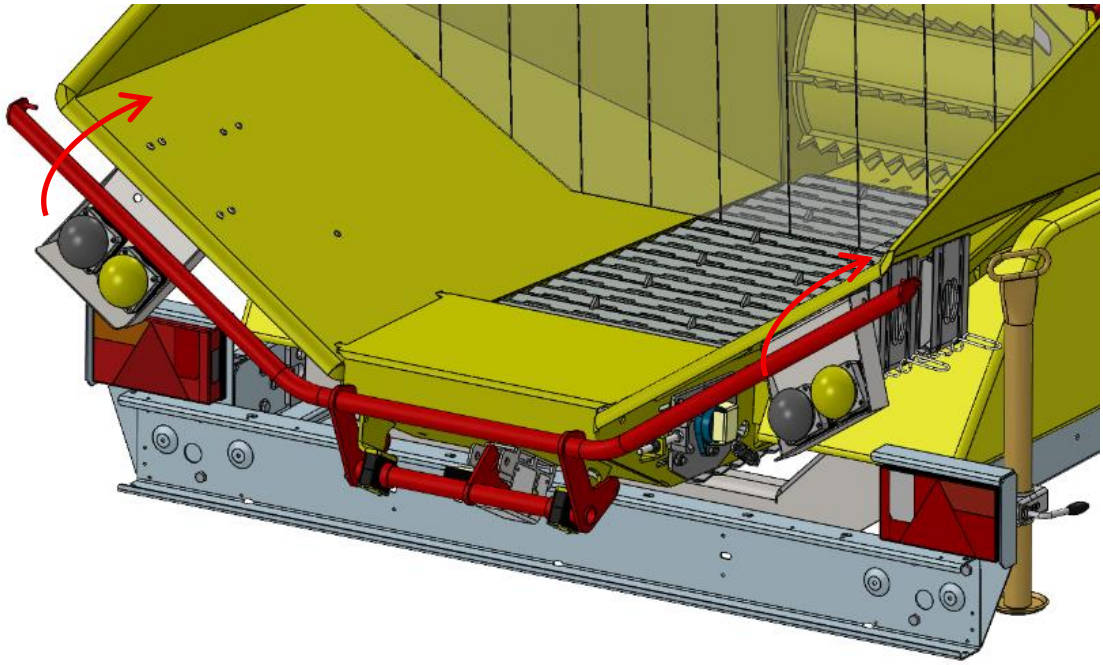
They can be viewed by pressing the F3 key



SHUTDOWN

1) Allow the shredder to run empty for a few minutes to ensure that any material residue in front of the feed roller and within the shredding chamber is completely removed, as this could block the rotor during the next start-up and trigger a slip error message.

2) Push the control lever forwards to stop the feed roller/conveyor assembly



3) Return the engine to idle speed. (Deselect the range on the TS. COCKPIT)

4) Switch off the engine by turning the ignition key to the left, to the STOP position 

(see page 28)

Maintenance and servicing









BIO-LUBRICANTS TO REDUCE THE RISK OF POLLUTION

TS INDUSTRIE shredders are naturally integrated into the sustainable development cycle by virtue of their function: the shredded material produced can be used for composting, mulching or heating.

Forests, parks, construction sites near a lake or watercourse… TS INDUSTRIE shredders are often used in natural environments that pose direct risks to the environment in the event of a leak or accidental loss of hydraulic fluid.

This is why TS INDUSTRIE adopts an eco-responsible approach by equipping its shredders with biodegradable hydraulic lubricants that combine environmental protection with high performance, replacing traditional oils and greases.

In accordance with the Agricultural Framework Act No. 2006-11, drafted and published in the Official Journal on 6 January 2006.

The benefits of bio-lubricants:

- Prevention of environmental pollution
- High biodegradability
- Non-toxic (made from rapeseed and sunflower)
- Renewable
- Very high viscosity index
- Enhanced anti-wear, anti-corrosion and anti-oxidant properties
- Enhanced user safety
- Extended equipment service life
- Low volatility

All machines are tested before leaving the production plant. The hydraulic reservoir is filled with hydraulic oil up to the upper mark on the level indicator upon delivery. After 150 hours of operation, the filter must be changed. Thereafter, replacement is carried out in accordance with the maintenance schedule. The first inspection is an integral part of the warranty conditions.

Only trained personnel are authorised to carry out maintenance and repair work.

The engine manufacturer's operating instructions must be followed for engine maintenance.

The bearings are already lubricated on delivery and the gearbox is filled with oil. It is recommended that a check be carried out before the machine is put into service.

FLUID LEVELS:

1)	Engine oil:	9.8 litres
2)	Fuel:	50 litres
3)	Coolant	10 litres
4)	Hydraulic oil:	28 litres
5)	Feeder gearbox oil:	top up

Recommended lubricants:

1) Grease for the rotor hammers:

You must use a water-resistant, extreme-pressure NLGI 2 grease, *"TS INDUSTRIE BIOPLEX"*

2) Grease for bearings, drive chain and various components:

Use a high-performance, extreme-pressure (EP) SAE multi-purpose grease: *"TS INDUSTRIE BIOPLEX"*

3) Hydraulic oil and hydraulic coupler oil:

Use an oil of grade AFNOR NFE 48603 Types HV iso VG 46 *"MINERVA BIO HYDRO 46"*

4) Engine oil

Use SAE 5W40 grade oil meeting the following standards: API CH4-CG4-CF *"MINERVA POWER LONG WAY 5W-40"*

5) Feeder gearbox oil:

Use SAE 80W90 grade oil meeting the following standards: API GL4/GL5 *"MINERVA PBH EP 80W90"*

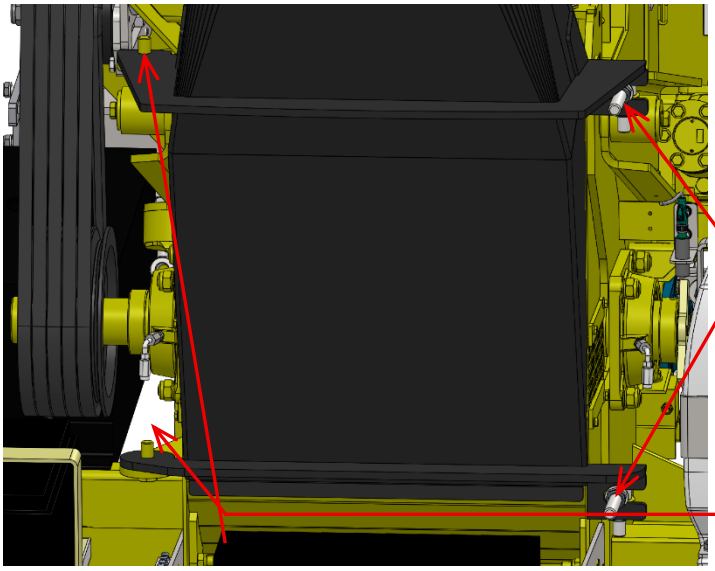
Maintenance intervals

DAILY	daily	every 4 hours	at 50 hours	Every 15 hours	every 50 hours	every 150 hours	every 400 hours	depending on the	annually
Check the engine oil level	■							■	
Check coolant level	■				■				
Check hydraulic oil level	■				■				
Check the hydraulic oil level	■				■				
Check the cleanliness of the air filter	■							■	
Check the battery charge and battery terminals	■								
Check the rotor V-belts	■								
Check the cutting tools: knives, inserts, anvil	■		■						
Check for fluid leaks	■								
Check the condition of the protective flap in the hopper	■								
Check the operation of safety devices (AU, safety bar, etc.)	■								
Check the operation of the feed roller and conveyor belt	■								
Lubricate the rotor hammers				■					
Check the tightness of the 8 fixing bolts on the rotor bearings			■						
Check the tension of the rotor and conveyor belt		■	■						
Test the trailer's lighting	■								
Check tyres: condition/air pressure	■								
Test the inertia device and the coupling mechanism	■							■	
Inspection of axles and brakes	■							■	
Check warning symbols for damage and legibility	■								
Lubricate all lubrication points (earlier if necessary)			■		■				
Check hydraulic hoses and mountings			■		■				
Check the battery cables			■		■				
Replace the hydraulic oil filter and strainer			■			■			
Drain hydraulic oil							■		
Replace hydraulic coupler oil							■		
Replace rotor belts (earlier if necessary)							■		
Safety test									■

Lubrication points



Carry out lubrication and maintenance with the engine switched off and the ignition key removed

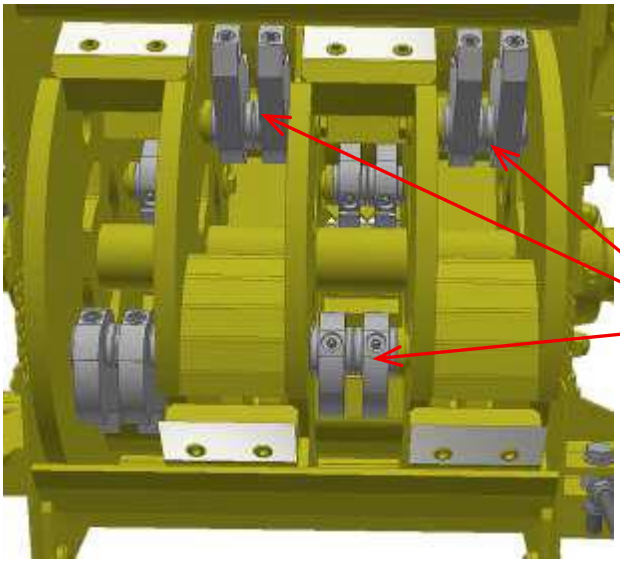


LUBRICATION OF THE HAMMERS:

To access the rotor:

-Loosen the two Nylstop locking nuts

-Open the exhaust chute by pivoting it on its two hinges.



-Clean the grease nipples on the back of the hammers using a small screwdriver or an air gun.

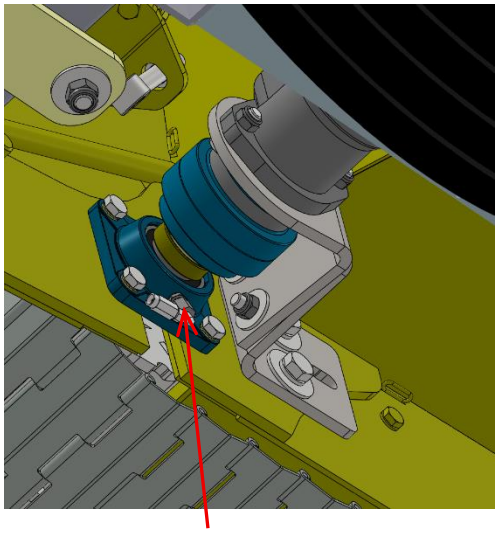
-Grease the 16 hammers

Note: Do not over-lubricate; ~2 pumps per grease nipple are sufficient.

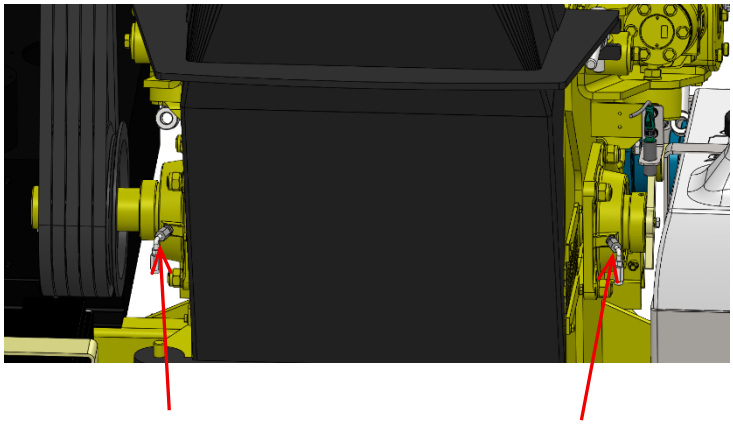
Excessive greasing would cause the excess grease to be flung against the inner wall of the chute as the rotor rotates, resulting in poor flow of the ground material.



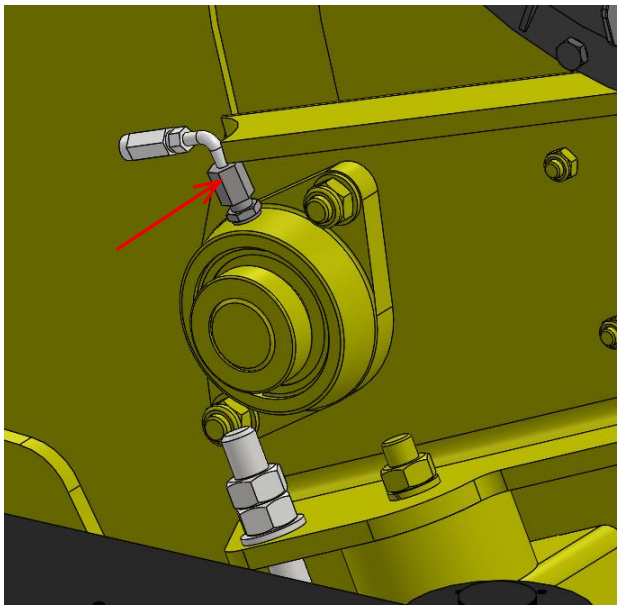
LUBRICATION POINTS



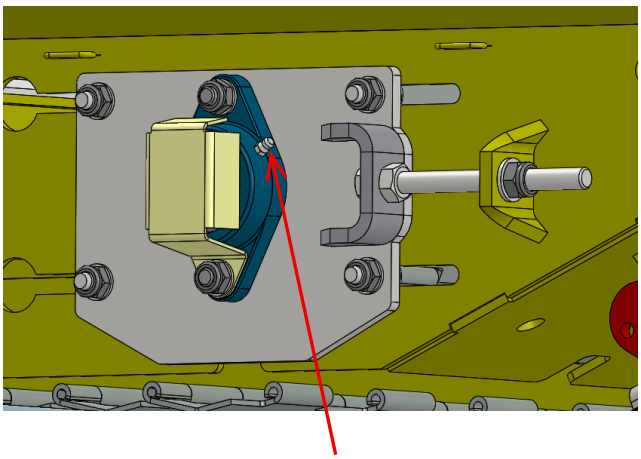
LUBRICATION OF FRONT BELT ROLLER BEARING



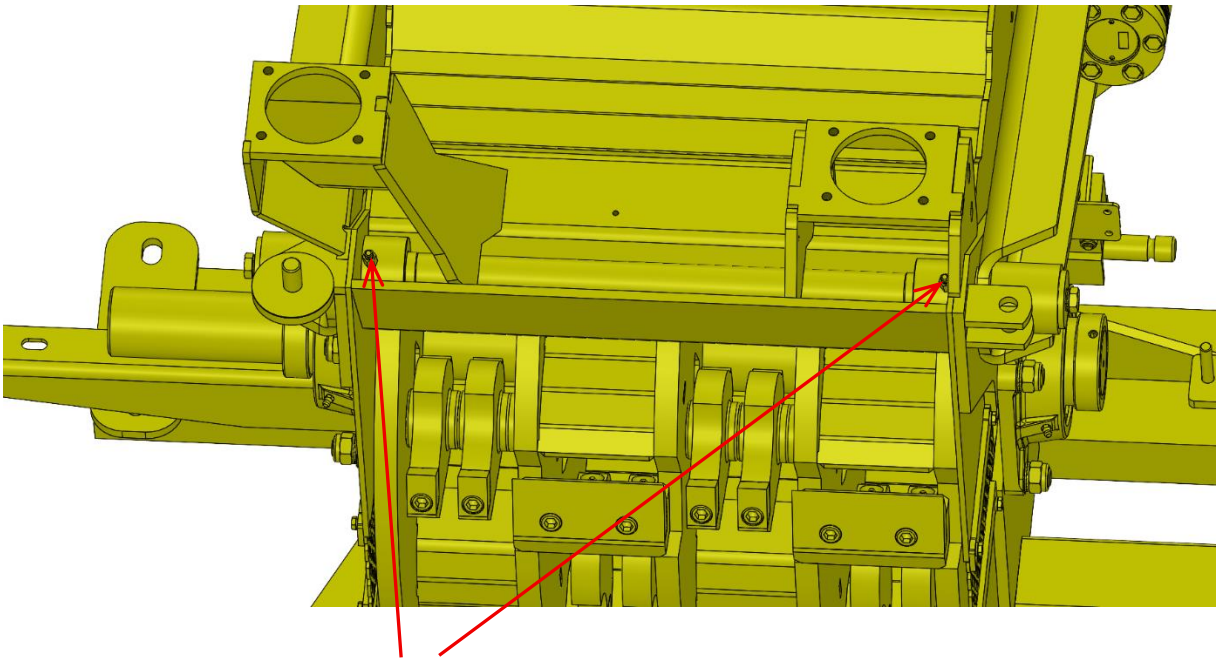
LUBRICATION OF ROTOR BEARINGS



LUBRICATION OF FEED ROLLER BEARING



LUBRICATION OF THE TWO REAR BELT ROLLER BEARINGS

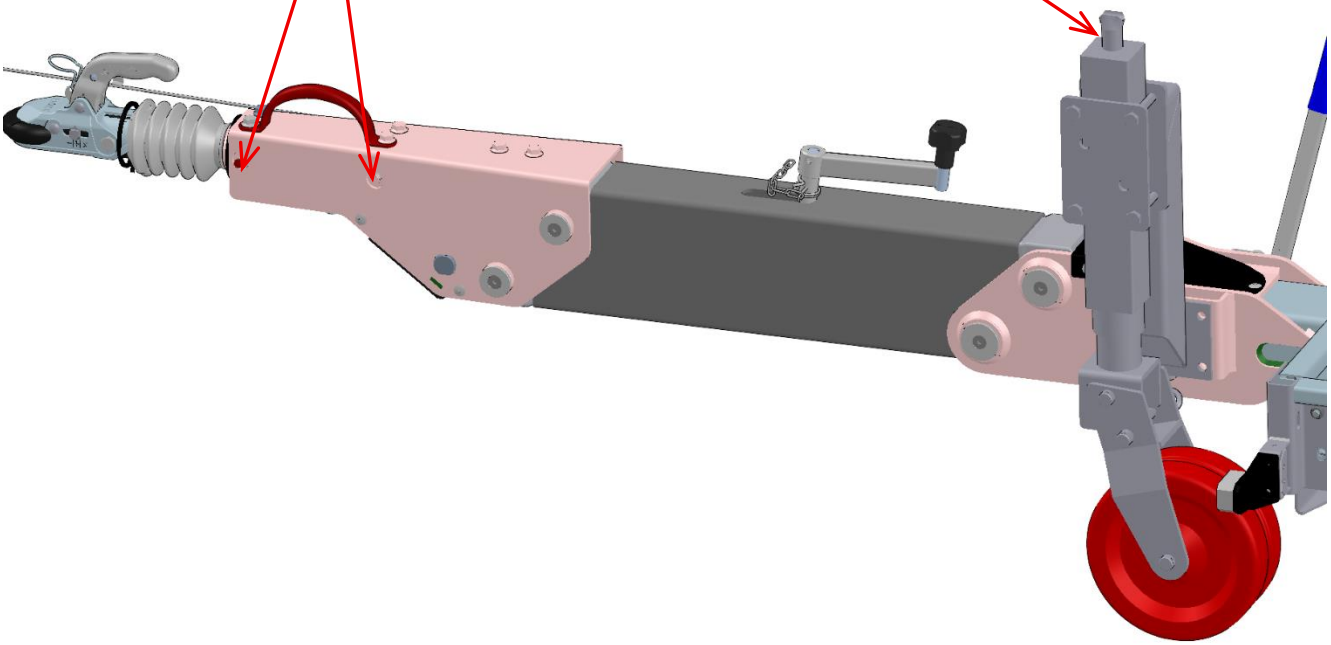


LUBRICATION OF THE HINGE PIN

FEED ARM

DRAWBAR LUBRICATION

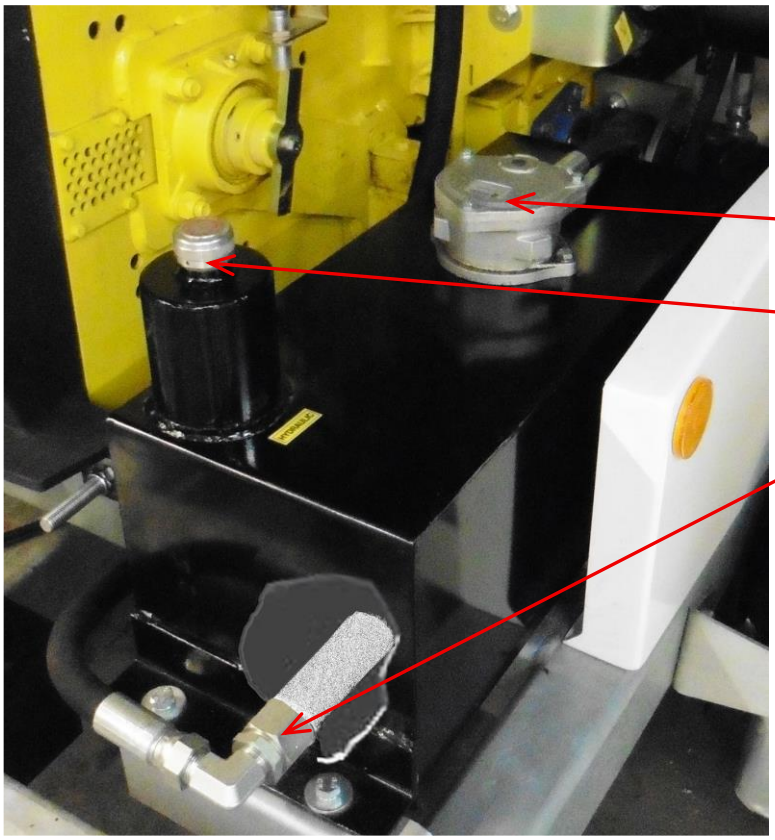
LUBRICATION OF JOCKEY WHEEL



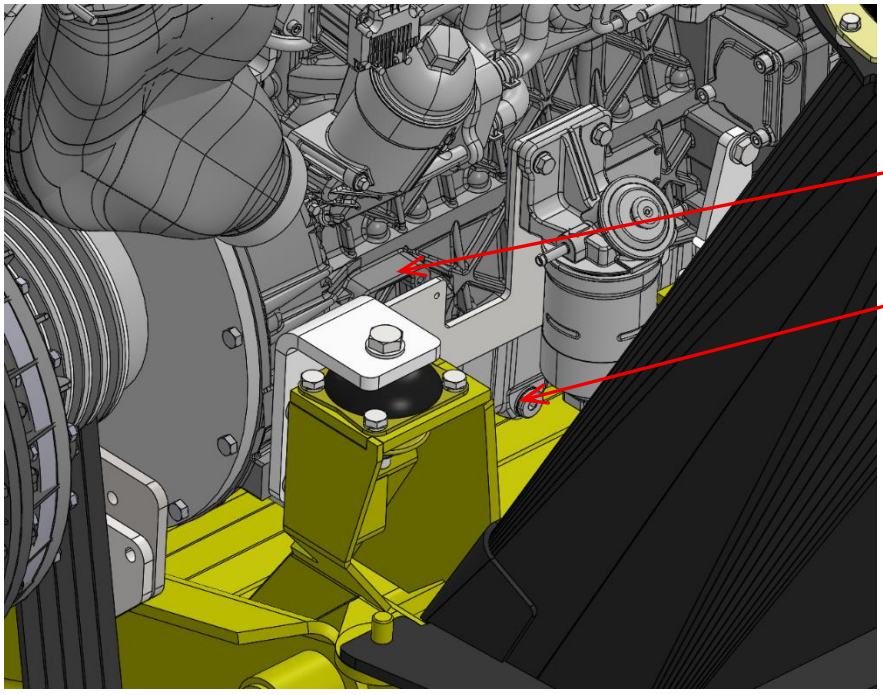
Technical checks

HYDRAULIC OIL LEVEL

The GS/COBRA D has a 28-litre hydraulic oil reservoir comprising:

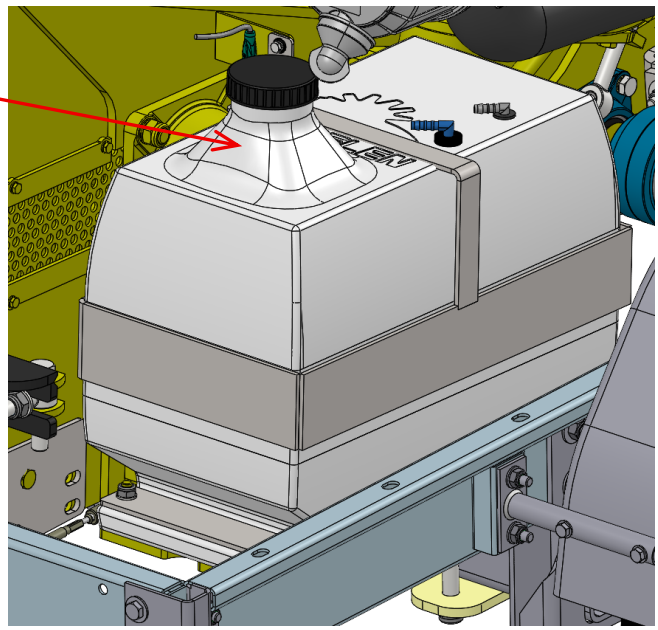


ENGINE OIL LEVEL



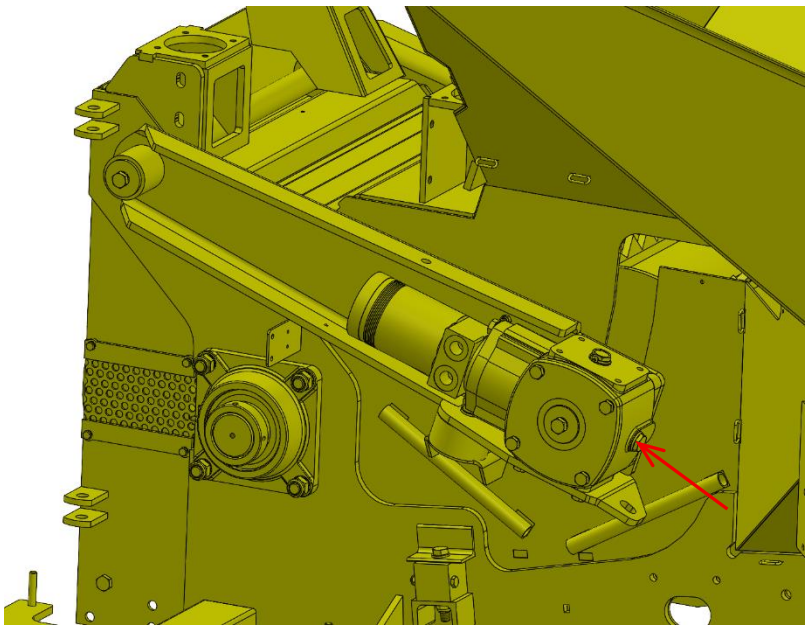
FUEL TANK

Capacity 50 litres

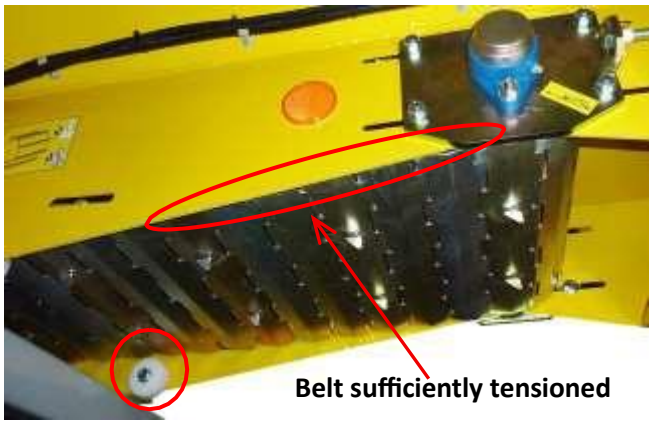


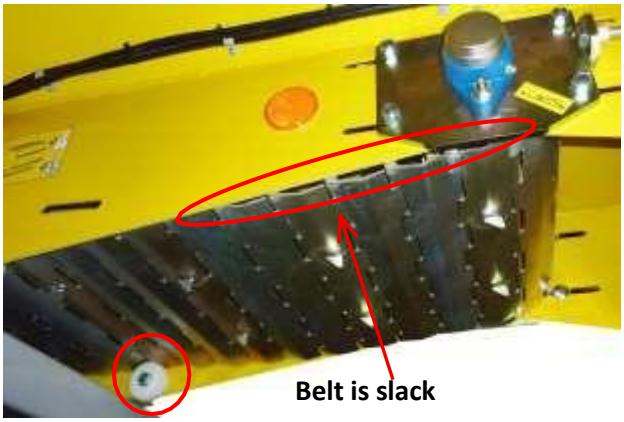
GEARBOX OIL LEVEL (FEED ARM)

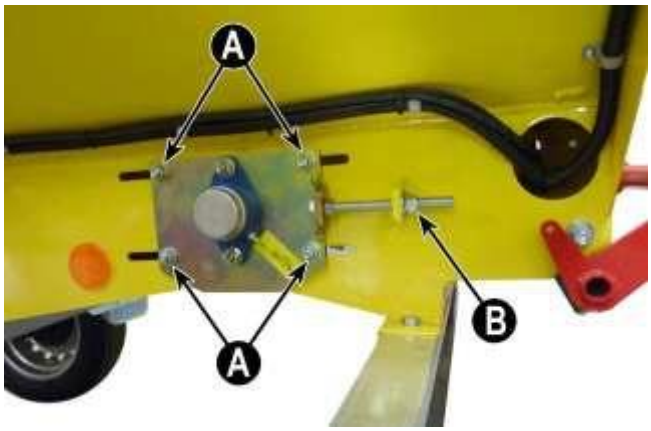
Oil should flow slightly from this opening



CHECKING THE TENSION OF THE METAL BELT







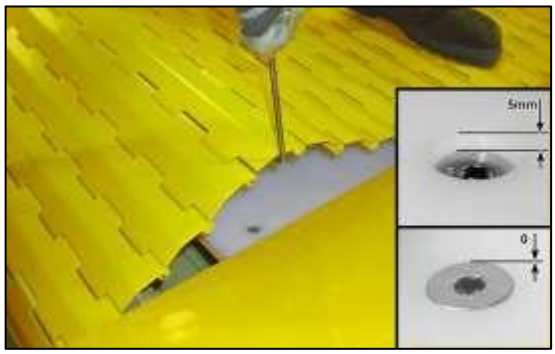


To tension the belt:

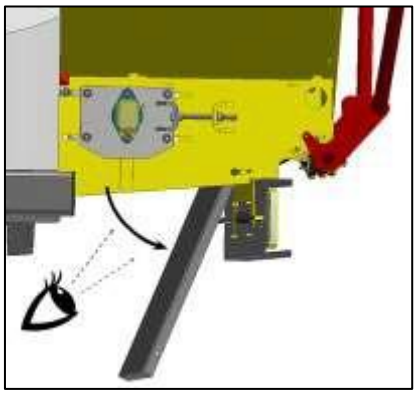
- Loosen the four marked nuts (A) on each side
- Tighten the tensioners (B) simultaneously so that a belt hinge is centred within the maximum tension window (see photo 4)
- Tighten the screws (A)
- After tensioning, rotate the belt several times forwards and backwards to ensure it remains properly aligned.

After the belt has been ‘run in’, check its tension for the first time after 4 hours, then regularly every 50 hours.

CHECKING BELT AND SLIDE PLATE WEAR AND REAR ROLLER CLEANLINESS



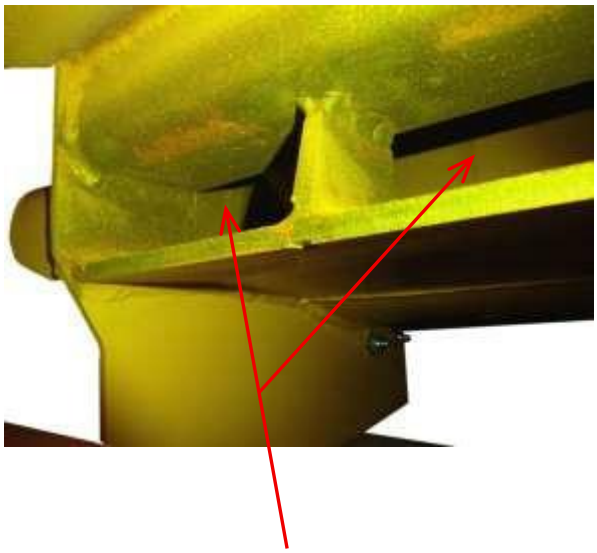




To check for wear on the belt and the self-lubricating polyethylene slide plate, fully loosen the belt, lift it with a hook and check:

- The thickness of the plate above its four fixing screws
- The wear on the belt bars

ROTOR VENTILATION AIR INTAKES

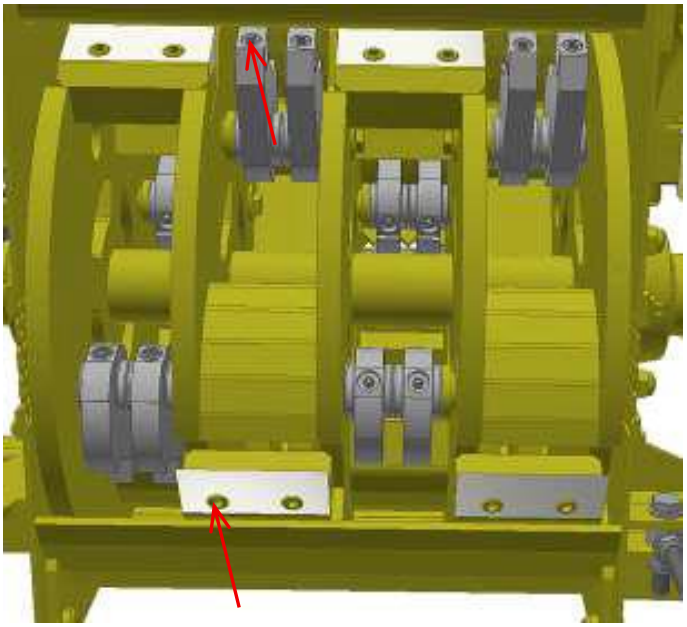




The shredder has an additional air intake beneath the rotor, in addition to the two standard ones on either side, to improve rotor ventilation and optimise the ejection of shredded material through the outlet chute.

Check the cleanliness of the three air inlets regularly to optimise ventilation and the ejection of shredded material.

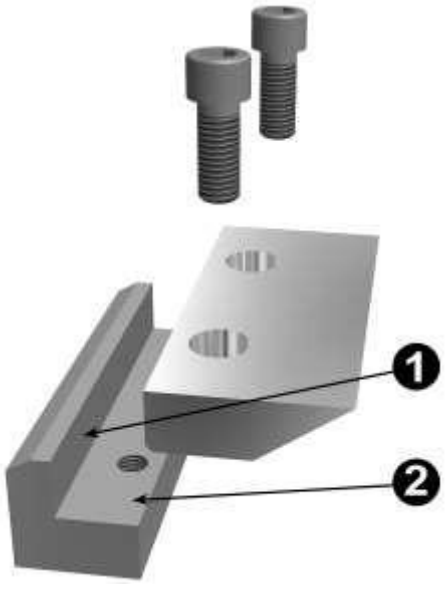
DISASSEMBLY FOR REPLACEMENT OF BLADES AND HAMMER PINS

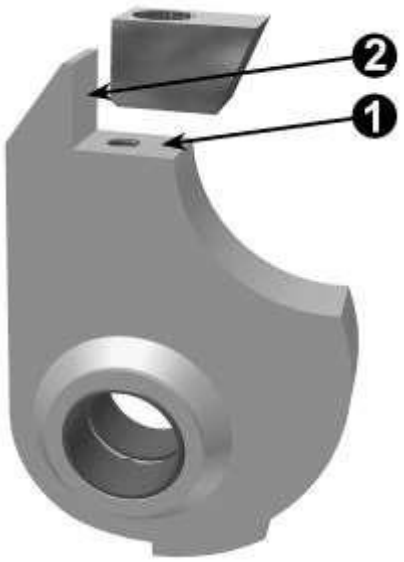


Loosening the blade and hammer screws

Tightening of knife and hammer screws: 157 N.m

- The hexagon socket screws securing the blades and hammer inserts are factory-fitted without threadlocker **at a torque of 157 N.m** (16 M.kg). To remove them, use a suitable spanner in good condition.
- Open the hopper as shown on page 38.
- Remove all screws from the blades and hammers (when reassembling, use only new class 12.9 screws).
- Clean the contact surfaces; seats and heels (1 and 2) of the blades and hammer pads.
- Refitting of sharpened knives of identical weight or new ones.

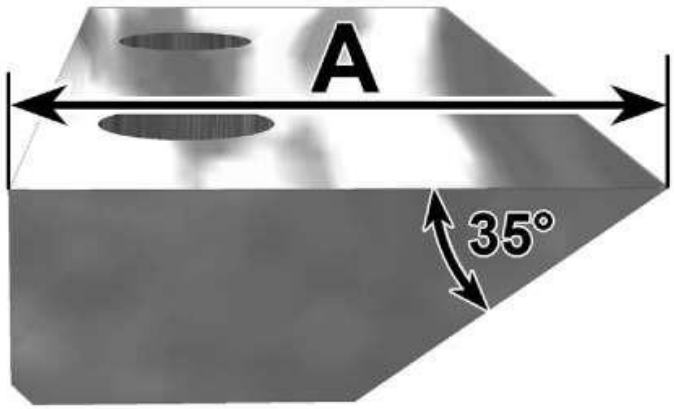




IMPORTANT: Sharpening must be carried out by a professional using a machine specifically designed for this purpose, and not with a grinder.

Also ensure that the 35° cutting edge angle is maintained.

The minimum length A after sharpening must not be less than 50 mm. (The length of a new blade is 60 mm)



Use only the following type of screws: TCHC 12 x 40, grade 12.9

Tighten the class 12.9 screws to a torque of 16 M.kg (157 N.m), ensuring that the blades and inserts are firmly seated against their heels.

Grease the hammer pins (~2 pumps of grease per hammer).

Close the chimney and the covers.

Start the engine and allow it to warm up for a few minutes.

Accelerate to maximum speed to ensure that no abnormal vibrations are affecting the machine’s operation.

DISASSEMBLY FOR INSPECTION OF THE COUNTER-KNIFE

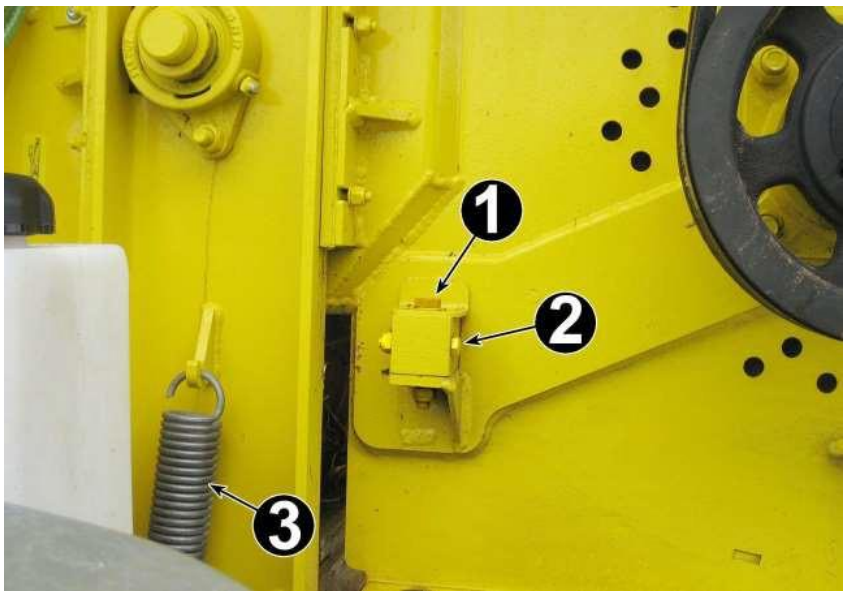
-Remove the two Ø10 retaining bolts (1) at each end of the counter-knife.

-Remove the two Ø8 safety bolts (2)

-Push the counter blade out by sliding it out of its housing on either side.

- If the edge shows signs of wear, remove the counter-blade completely from its housing and refit it by rotating it 90° (a quarter turn) so that a fresh edge faces the blades.

(All four sides of the counter-knife can be used)



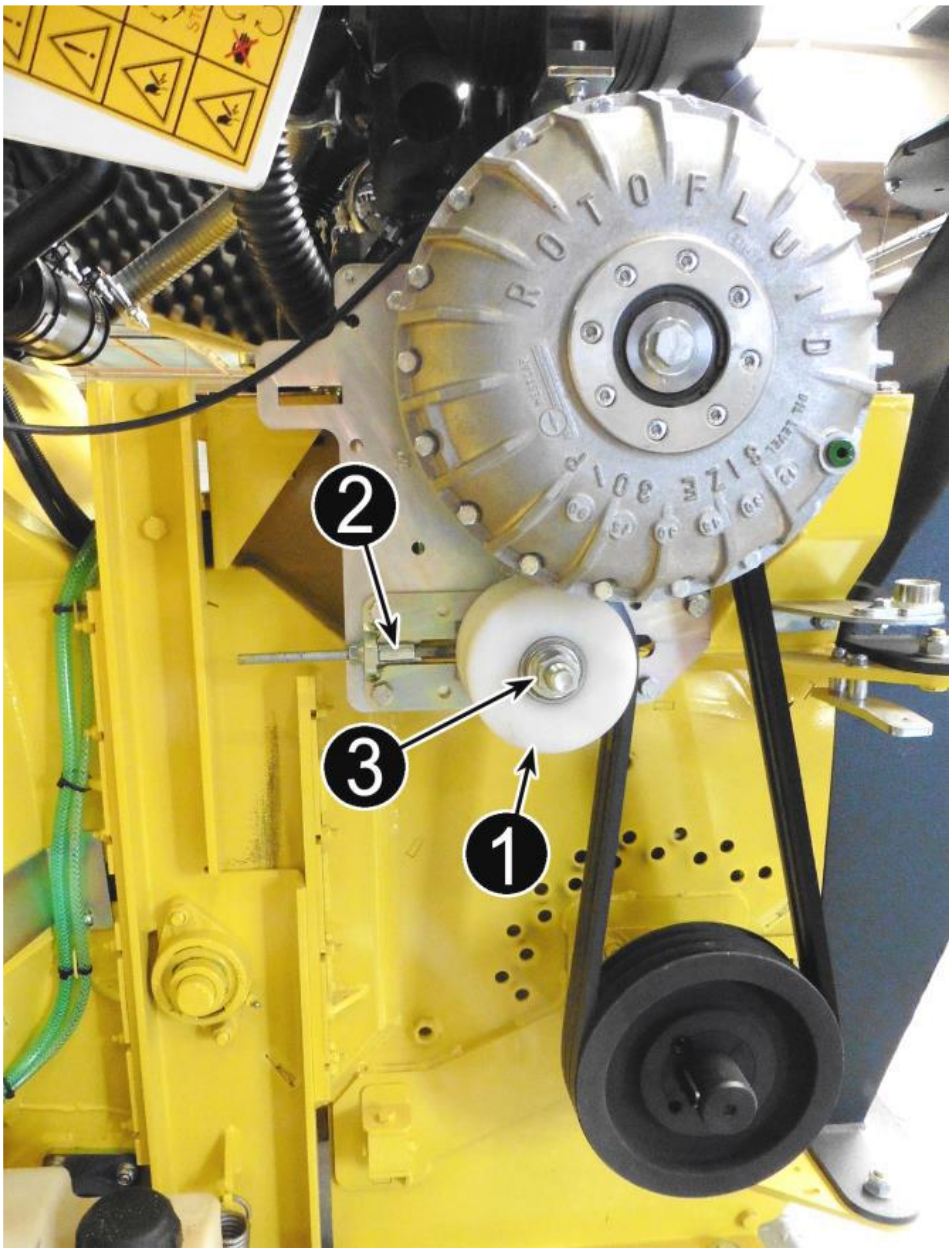
PRESSURE OF THE FEEDER ON THE MATERIAL

The feeder applies pressure to the material via two springs (3) (one on each side)

ADJUSTMENT OF THE ROTOR BELTS

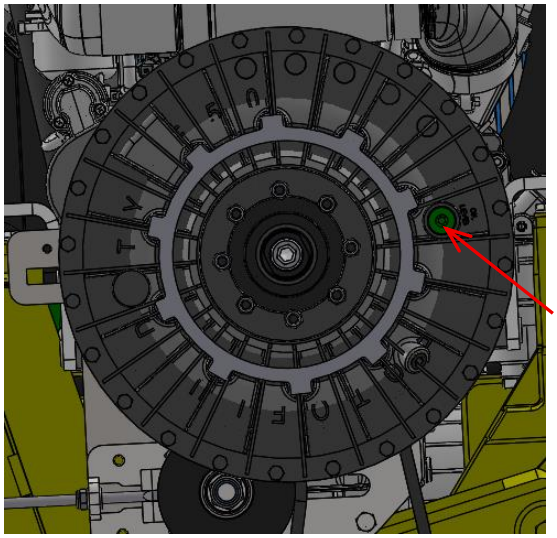
The rotor belts are kept taut at all times by a tensioner pulley.

The belt tension is adjusted by moving the tensioner roller (1) forwards by turning the nut (2), after first loosening the central nut (3) on the roller.



HYDRAULIC CLUTCH

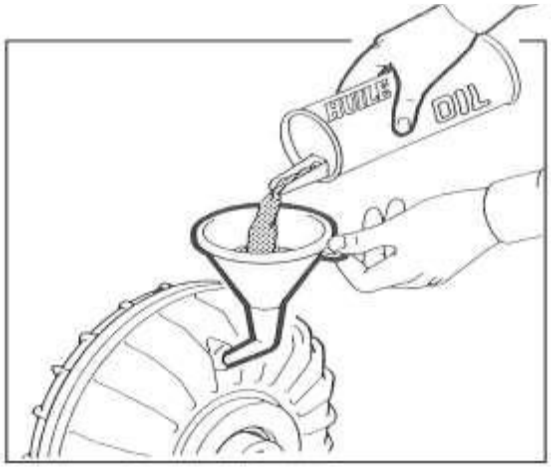
The GS/COBRA D is fitted with a hydraulic coupler which, under normal operating conditions, requires no special maintenance.



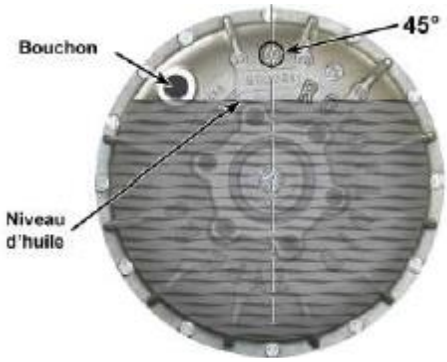
Draining the oil:

Drain the oil via the green plug. (First depressurise the coupler by unscrewing this plug to the top position)

Filling:



Top up the oil (1.14 l) via the pop-off plug or the green fuse plug



Align the 45-degree mark vertically with the coupler's axis. Remove the pop-off plug; if the level is correct, the oil should be level with the hole

If the rotor becomes jammed when the machine is started (for example, due to a branch if the machine was not properly drained after the last shutdown), the oil temperature will rise rapidly.

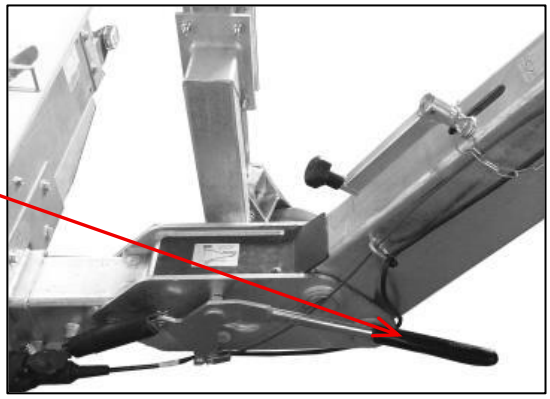
The core of the green fuse plug is designed to melt at a temperature above 180°C.

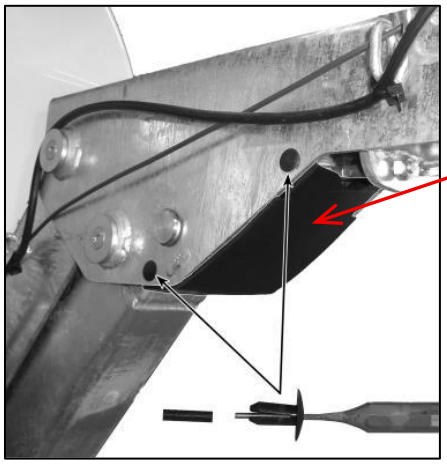
The oil will be expelled from the coupler.

To prevent this problem, a SLIP safety device is provided for this purpose.

BRAKE ADJUSTMENT

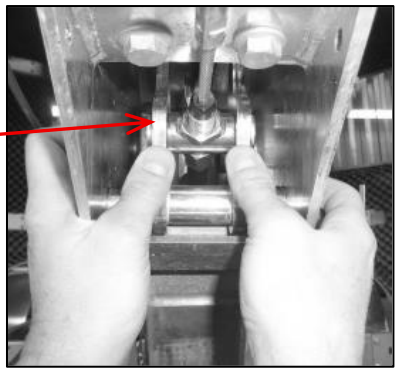
Set the brake lever to the rest position in the lower position

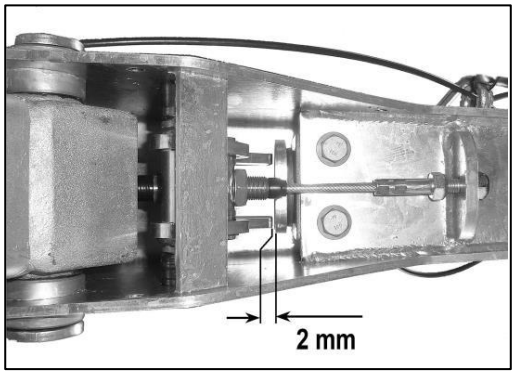




Remove the black plastic cover under the coupling head by removing the plastic rivets after first driving out their pins

Press the double latch and check the play between it and the end of the slide

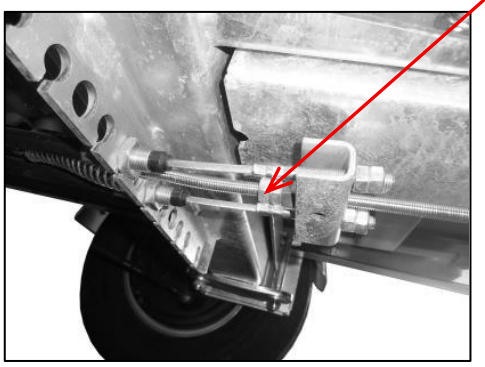


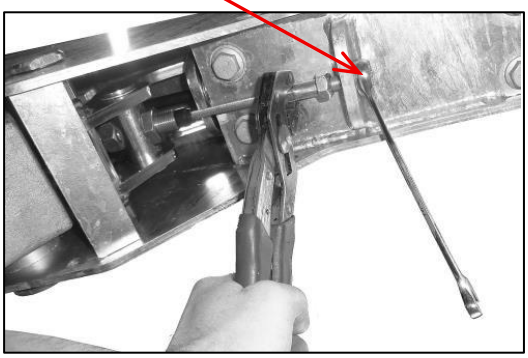


The play should be 1 to 3 mm

Excessive play delays braking and causes jerking

If the play is too great, tighten the nut at the end of the cable. If this is not sufficient, tighten the nut and lock nut at the axle





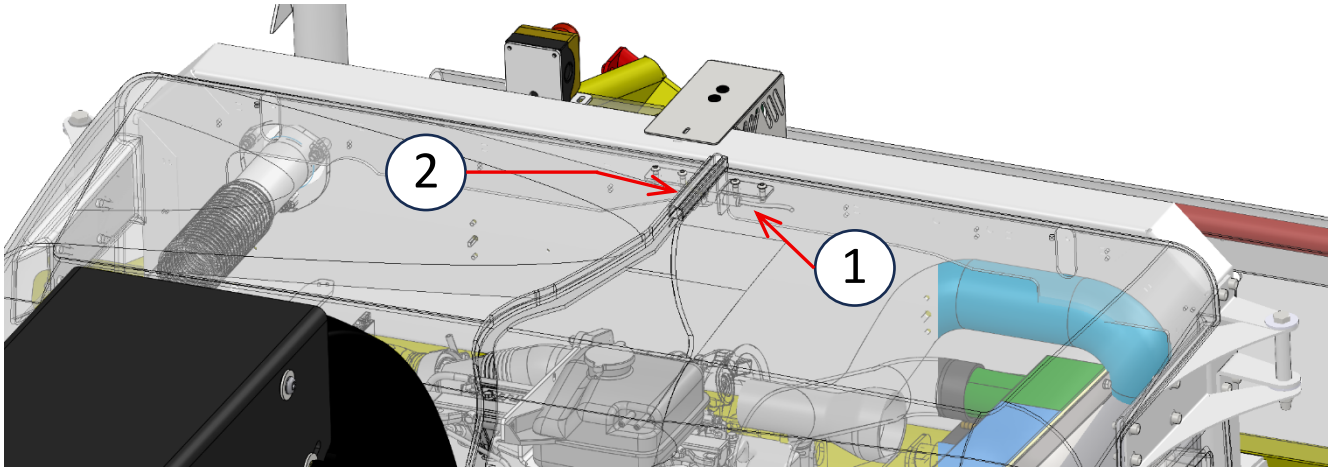
SAFETY COVER AND CHIMNEY

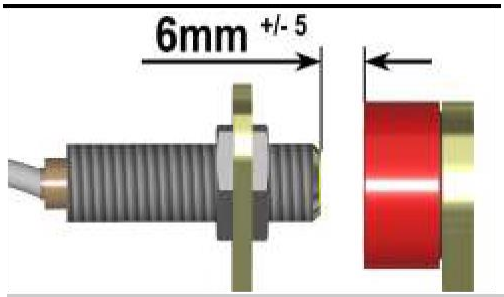
The machine is fitted with a safety device for the opening of the covers

This consists of an inductive sensor (1) mounted on a fixed bracket.

An electrical connection is made when the magnet (2) attached to the other door is brought close.

When the chimney is opened, the safety devices stop the motor.



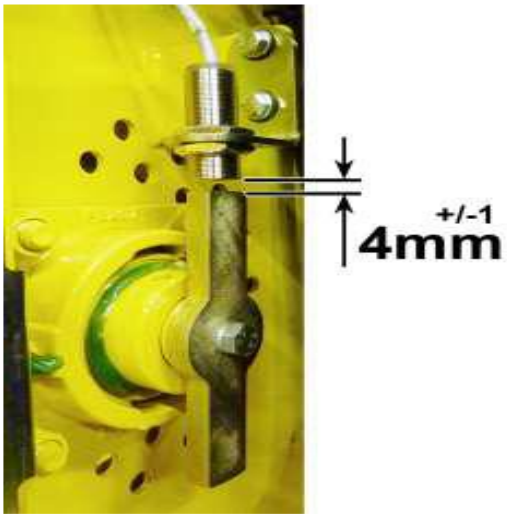


There must be no physical contact between the sensor and its magnet. However, ensure there is a gap of 6 mm +/-5 mm between the two

INDUCTIVE SENSOR

An M18 (Ø18) inductive sensor mounted at the end of the rotor shaft indicates the rotor's rotation to the TS-Cockpit.

The distance between this sensor and the indexing pin fixed opposite it is 4 mm +/-1



⚠

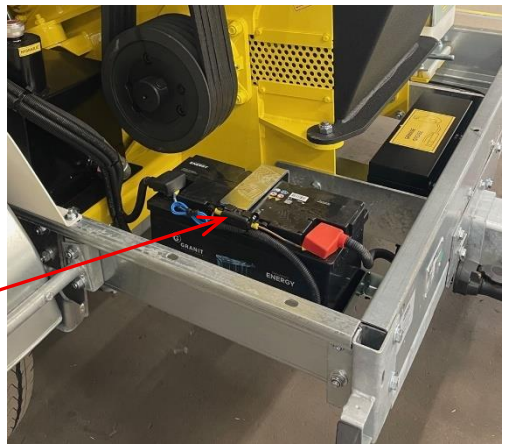
Please note that if the motor starts and stops after a few seconds and displays a **"SLIP ERROR"** message on the TS-COCKPIT,

you must always investigate the cause of the problem:
- Rotor blocked by residue from the previous shredding operation
- Loose or broken belts
- Faulty M18 sensor.

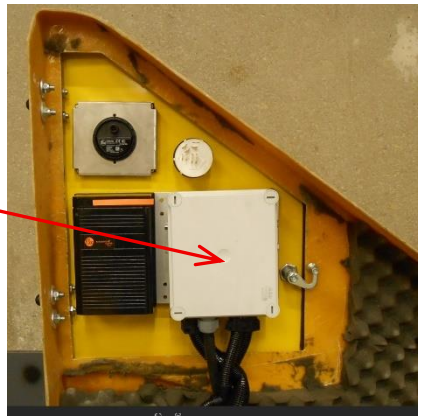
FUSES

A 12-volt, 40A permanent fuse (1) is located in the fuse holder attached to the battery cable.

40A flat fuse

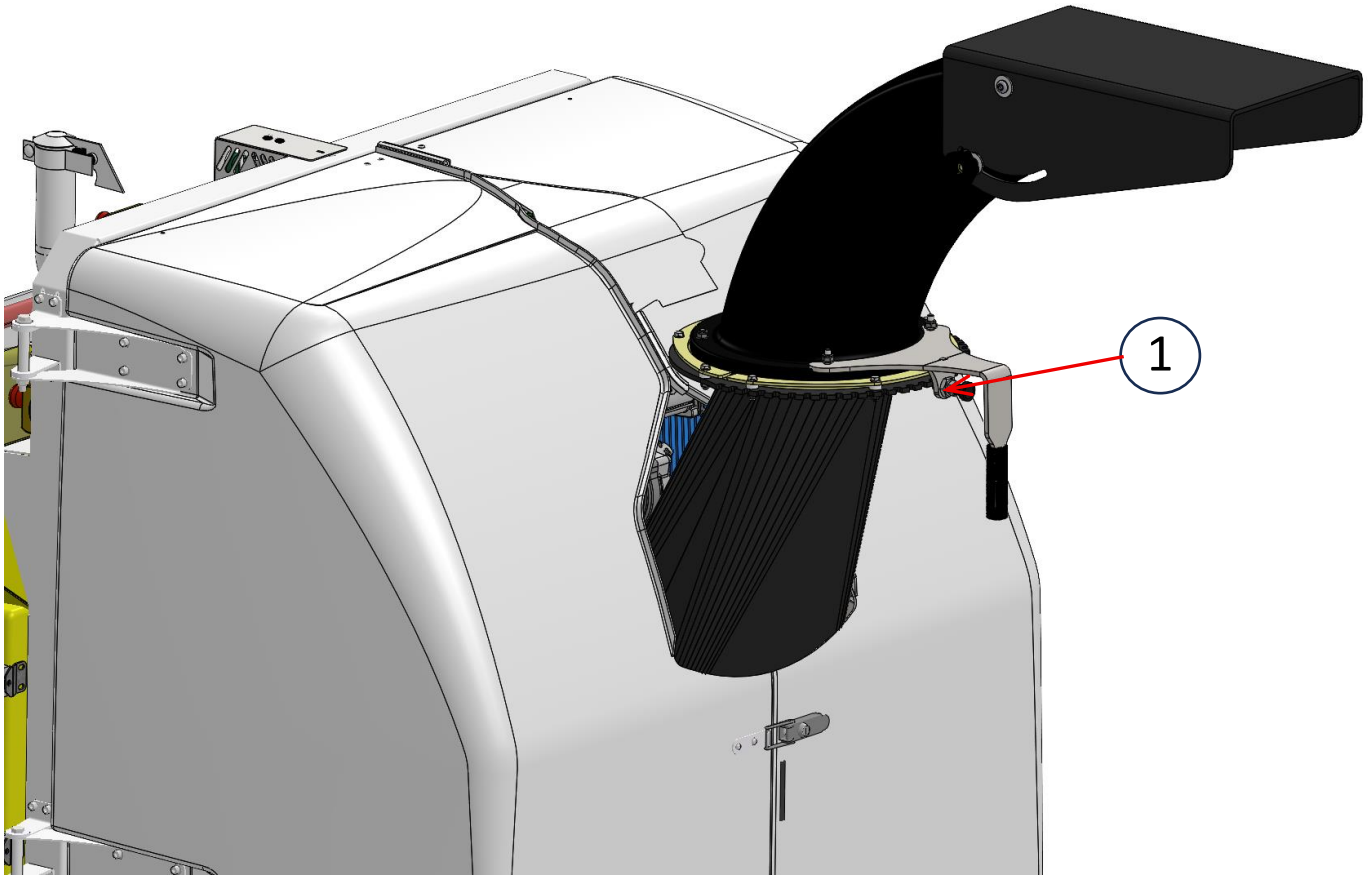



Other fuses are located in the plastic box, fixed inside the door, on the right-hand side of the machine.



EXHAUST DUCT

The upper part of the exhaust flue can be rotated 90° to the left and 90° to the right by releasing the lock (1).



Troubleshooting

PROBLEM	CAUSE	SOLUTION
The engine won't start	-The bonnet or chimney is not properly closed -The bonnet safety sensor is faulty	-Check that the bonnet or chimney is closed -Check the sensor
The engine stops unexpectedly and will not restart	- Punch safety switch engaged - The flue is open - The flue safety sensor is incorrectly adjusted or faulty - 40A fuse blown - The battery is flat - The power cables are damaged - There is no fuel left	-Check that the bonnet or chimney is properly closed -Check this - Charge or replace the battery -Check the electrical circuits - Add fuel
The feeder/conveyor assembly refuses to rotate in forward and reverse	- Feeder speed dial turned all the way in - Faulty hydraulic motor or pump - Insufficient oil in the reservoir	- Loosen the adjustment knob on the control valve -Check or replace the faulty part -Check the oil level
The machine is struggling to shred	-Blunt knives and hammers -Faulty or under-tensioned belts	-Sharpen or replace the blades. Replace the hammer pads -Replace and/or tension the belts
The forward-running feeder does not regulate, even below the TS-Cockpit intervention threshold	-Electrical or hydraulic problem	-Contact your dealer

PROBLEM	CAUSE	SOLUTION
CO2 Reduction, 15-sec. or 30-sec. range activated; the engine does not accelerate automatically when approaching from behind the machine	-Incorrect alignment of the radar beam	-Check that the radar is aimed slightly downwards
	-Interference with the radar beam	-Check that no branches are hanging over the roll bar or that no "screen" is covering the presence detector
	-Radar malfunction	- With the motor stopped and the switch turned on, check the back of the presence detector to ensure that: * the first green LED is lit * the second LED lights up yellow when it detects a person behind the shredder hopper * If the second LED flashes red: contact your dealer

List of SPN/FMI codes Manufacturer

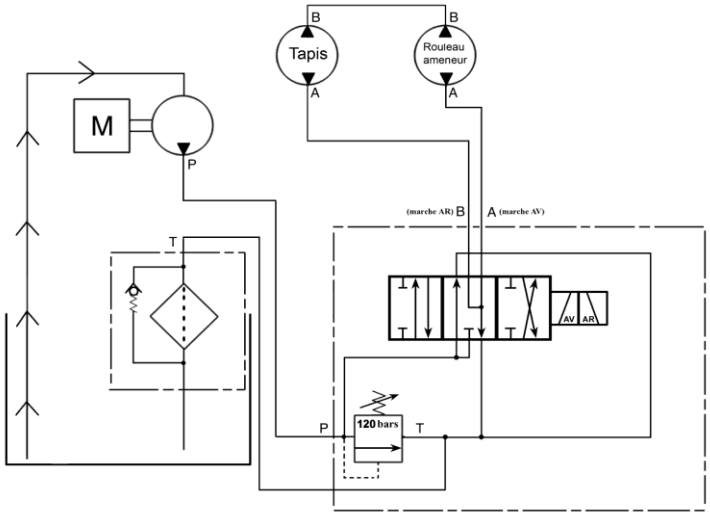
These are displayed on the error code screen. (see page 31)

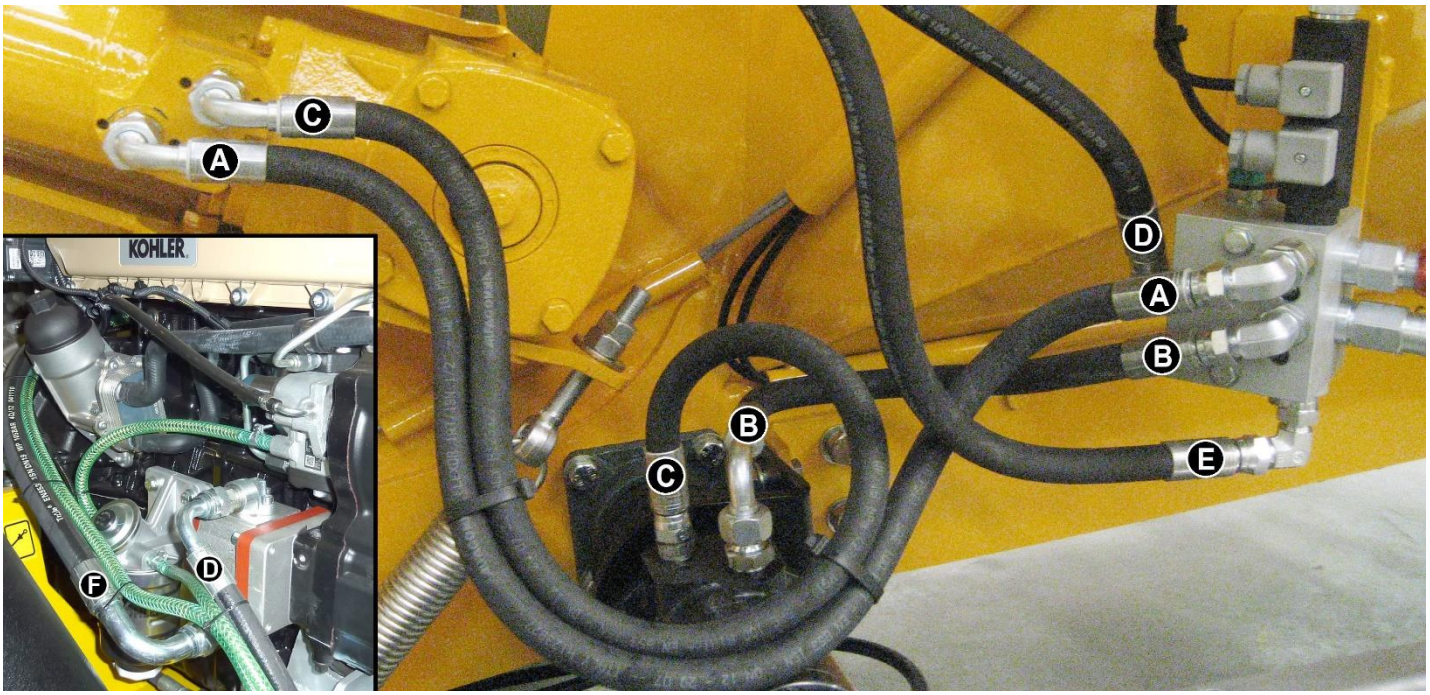
Here is what they mean

SPN	FMI	Fault
901	199	Clutch slip 1st clutch or during chipping
902	199	Rotor blocked at start-up
903	199	Overspeed cutting tool detected
910	199	Controller no longer sees screen
911	199	Screen no longer sees controller, saved a variable to record in controller when it comes back
920	199	Lid open while engine running
921	199	Chimney open while engine running
922	199	ARU (engine kill switch) pressed while engine running
930	199	Vibration sensor exceeded orange limit
931	199	Vibration sensor exceeded red limit
930	199	Vibration sensor exceeded red limit
931	199	Vibration sensor exceeded red limit

Hydraulic diagram

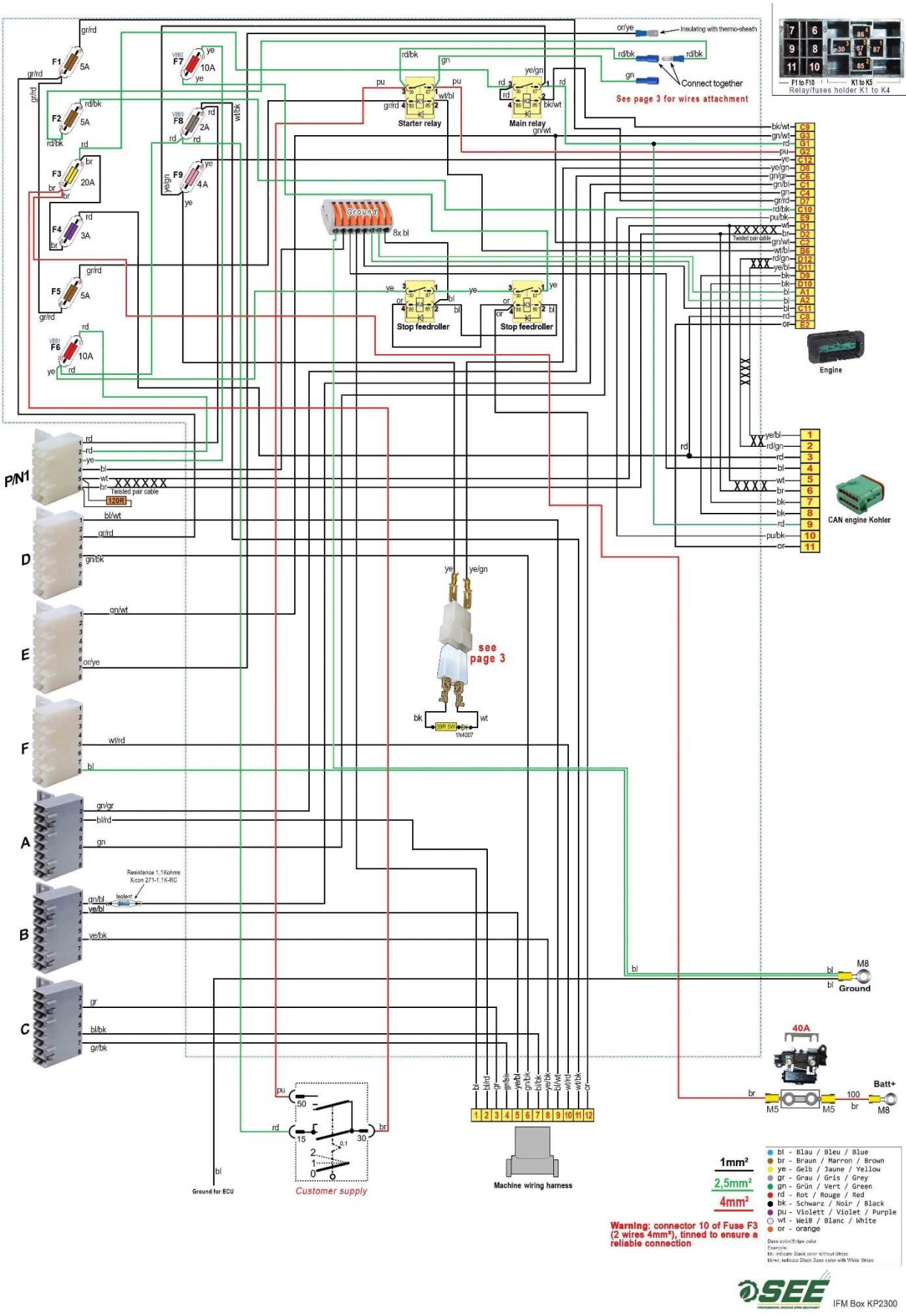
Qté	lg mm	Designation	Reference	Pos.
1	2000	Flexible 3/4 - 3/4 90°	HYDP/0084	**F**
2	850	Flexible 3/8 - 1/2 90°	HYDP/0011	**A - C**
1	500	Flexible 3/8 - 1/2 90°	HYDP/0081	**B**
1	2500	Flexible 1/2 - 1/2 90°	HYDP/0082	**D**
1	1650	Flexible 3/8 - 1/2 90°	HYDP/0083	**E**
1	600	Flexible 7/8 - 3/4	HYDP/0013	vidange

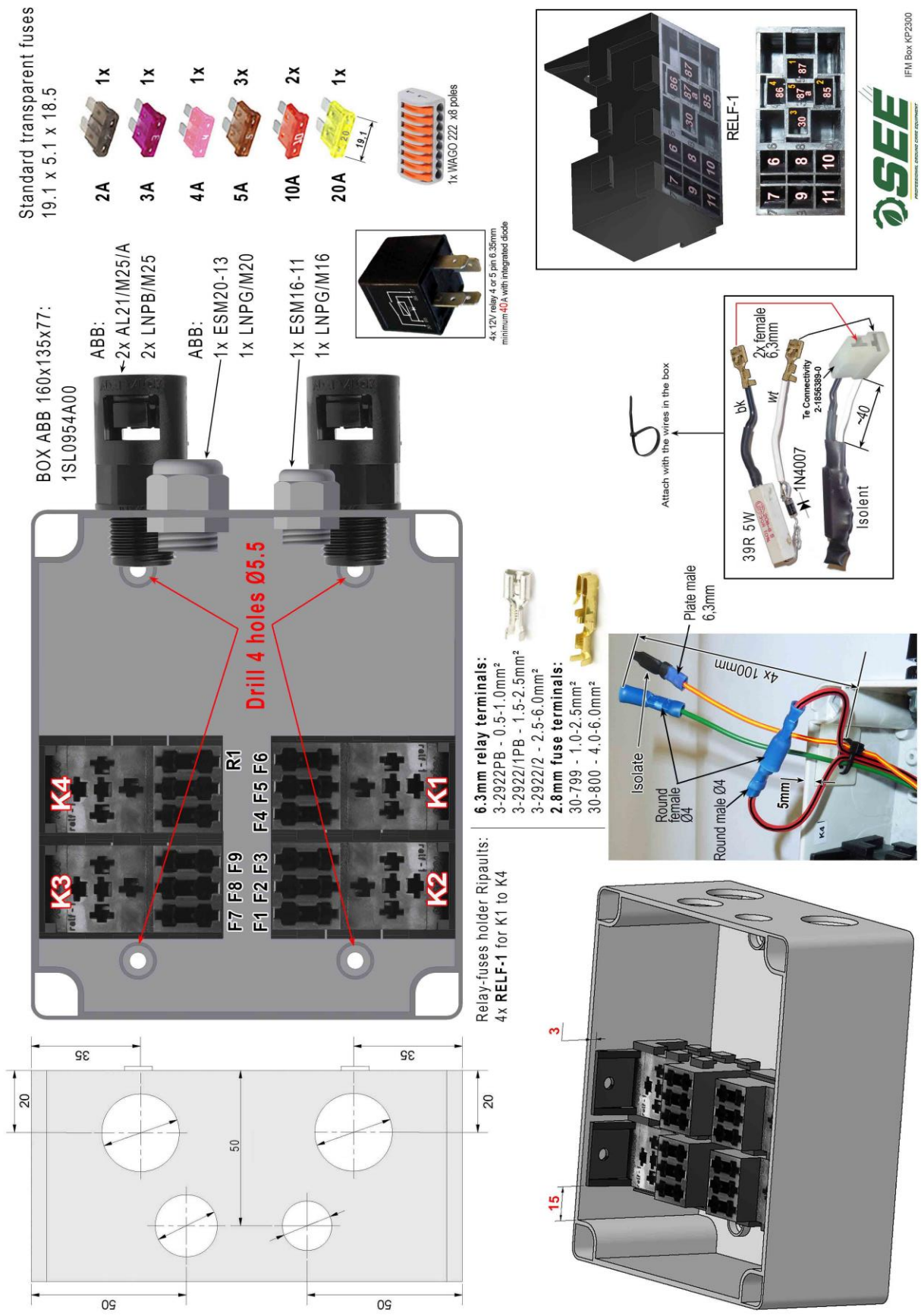


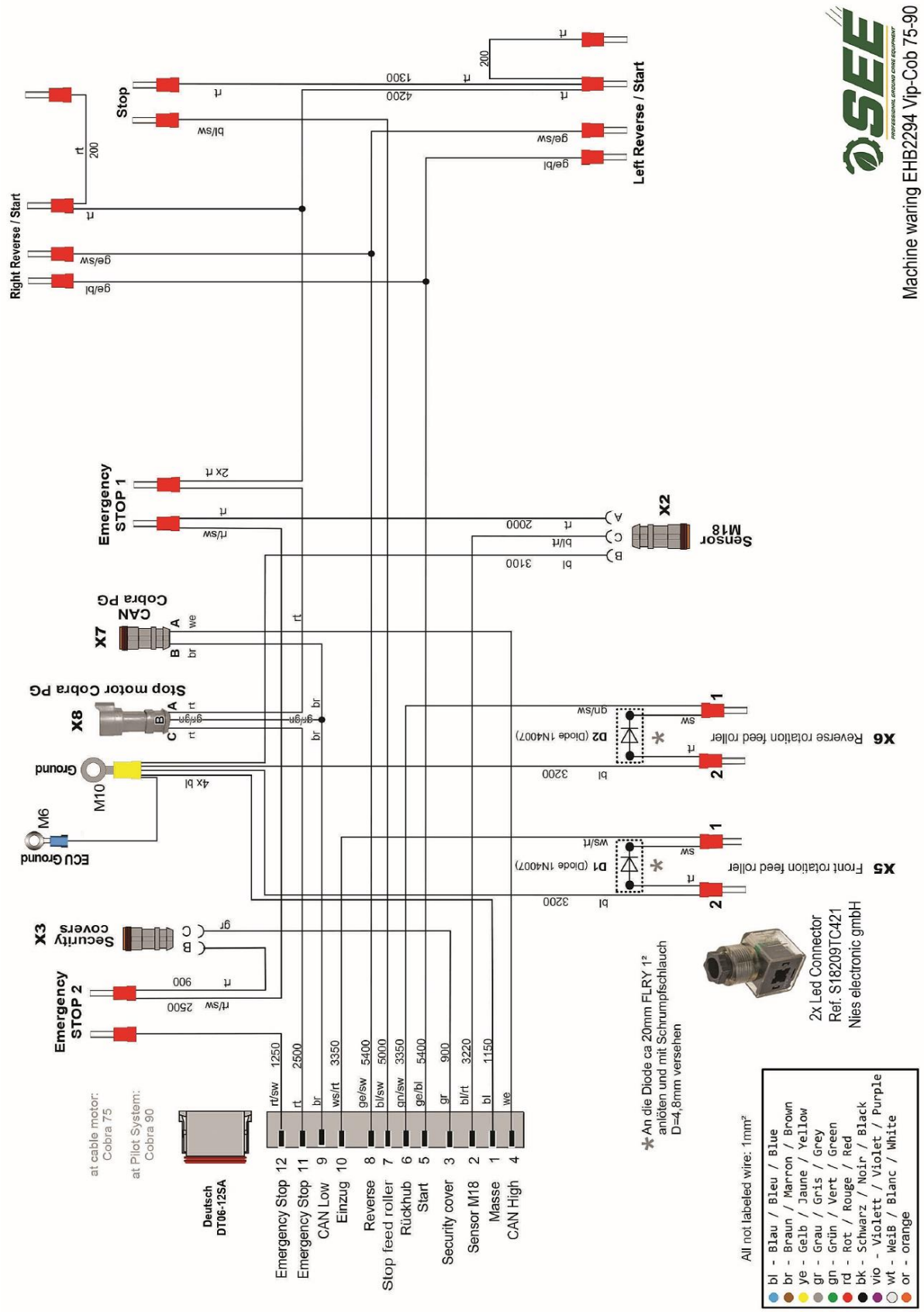


Please consult the exploded view page for full details and part numbers.

Electrical diagrams




Standard transparent fuses
19.1 x 5.1 x 18.5
1x 2A
1x 3A
1x 4A
3x 5A
2x 10A
1x 20A
19.1
1x WAGO 222 x8 poles
BOX ABB 160x135x77:
1SL0954A00
ABB:
2x AL21/M25/A
2x LNPB/M25
ABB:
1x ESM20-13
1x LNPG/M20
1x ESM16-11
1x LNPG/M16
4x 12V relay 4 or 5 pin 6.35mm
minimum 40A with integrated diode
Drill 4 holes Ø5.5
K4
K3
K1
K2
R1
F7 F8 F9
F1 F2 F3
F4 F5 F6
Relay-fuses holder Ripaults:
4x RELF-1 for K1 to K4
6.3mm relay terminals:
3-2922PB - 0.5-1.0mm²
3-2922/1PB - 1.5-2.5mm²
3-2922/2 - 2.5-6.0mm²
2.8mm fuse terminals:
30-799 - 1.0-2.5mm²
30-800 - 4.0-6.0mm²
RELF-1
IFM Box KP2300
Attach with the wires in the box
2x female 6,3mm
bk
wt
Te Connectivity
2-1656389-0
~40
1N4007
39R 5W
Isolent
Plate male 6,3mm
4x 100mm
Isolate
Round female Ø4
Round male Ø4
5mm
35
35
20
20
50
50
50
3
15



Please consult the website dedicated to exploded views for full details and part numbers.

TS Industrie GmbH

Industriering Ost 42

47906 Kempen (Germany)

Tél : +49 2152 / 9934601

kontakt@ts-industrie.de

www.ts-industrie.eu