CO2 Reduction



TECHNICAL INFORMATION

ts-industrie.eu

INDUSTRIE

Original notice

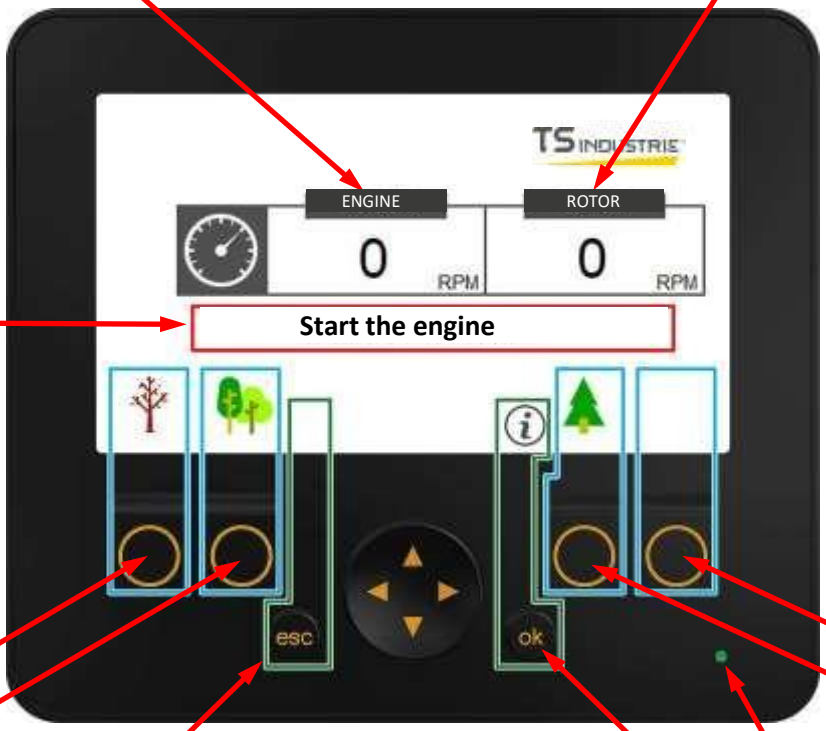


TS.COCKPIT

Available functions

1. Permanent display of the rotation speed of the engine
2. Permanent display of the rotation speed of the cutting tool
3. Display of daily hours
4. Flashing green led indicating power on
5. Reverse stroke roller feeder to release the cutting tool during the NoStress intervention
6. Different NoStress use ranges depending on the type of wood to be ground
7. Service management: engine change intervals
8. Slide belts, clutch or hydraulic coupler safety (ideal for rental)
9. Engine stop and immobilizer safety if the engine hood or chimney is open
10. Memory malfunctions
11. 5 languages available: French, German, English, Spanish, Dutch

Description of the main screen

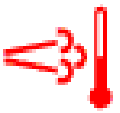


It is strictly forbidden to change the factory settings of the TS.COCKPIT. Any changes to safety or programming outside our factory is under the full responsibility of the person who makes these changes.

The values given in the following pages are given as an indication

Description of lights and symbols

	Range 1 grinding
	Range 2 grinding
	Range 3 grinding
	Selected function
	Return to previous screen
	Access to the next screen
	Defect history
	Machine and motor control status
	Reset daily counter
	Validation of engine oil change
	Validation of the action performed

	CO2 Reduction *(option)*
	Battery charge
	Engine temperature
	Preheating before starting
	Revision to be done. Engine fault (s): water in fuel, feed pump fault, high cooling temperature or other faults sent by the CAN
	Red light: oil pressure too low, maximum cooling temperature reached, low battery voltage, sliding problem or cutting tool blocked at start-up
	Engine malfunction
	Regeneration in progress
	Regeneration needed
	High exhaust gas temperature (during regeneration or not)

Description of the secondary screen

Total hours

Daily hours

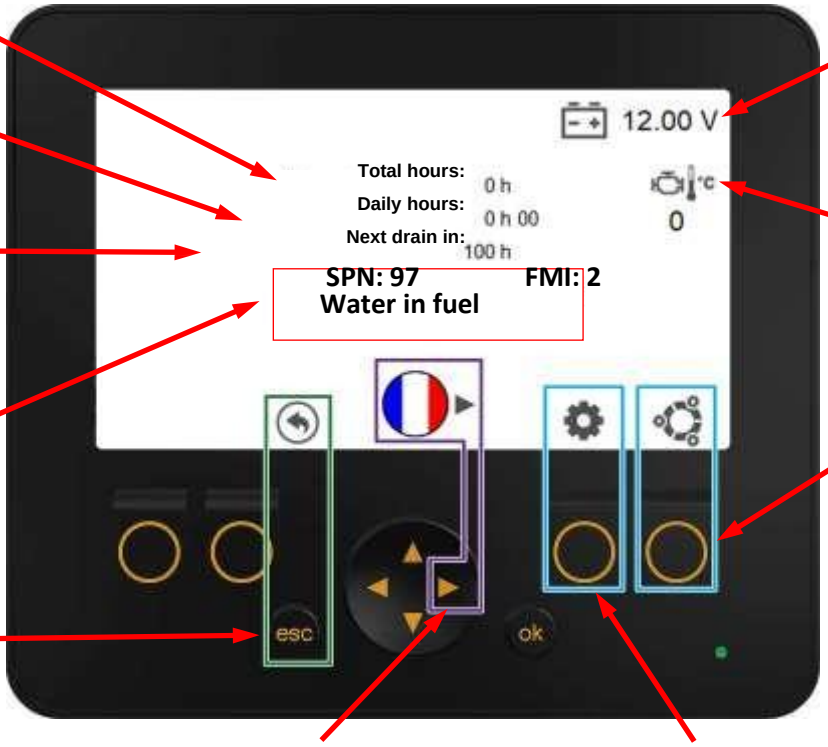
Next engine oil change due date

Code and message **SPN/FMI**

See page 12

ESC key.

Return to the previous screen page



Charging voltage and battery voltage

Engine water T°

Poster page "**State** " engine commands and data

See below

Arrow navigation **Right**

Press multiple times to scroll through the different available languages:

French, German, English, Spanish, Dutch

Provides access to the history of the latest defects

See engine error codes page 12

Description of the page "States"

Each machine command has an activation control light:

○ = Command not activated

● = Command activated

On the example opposite:

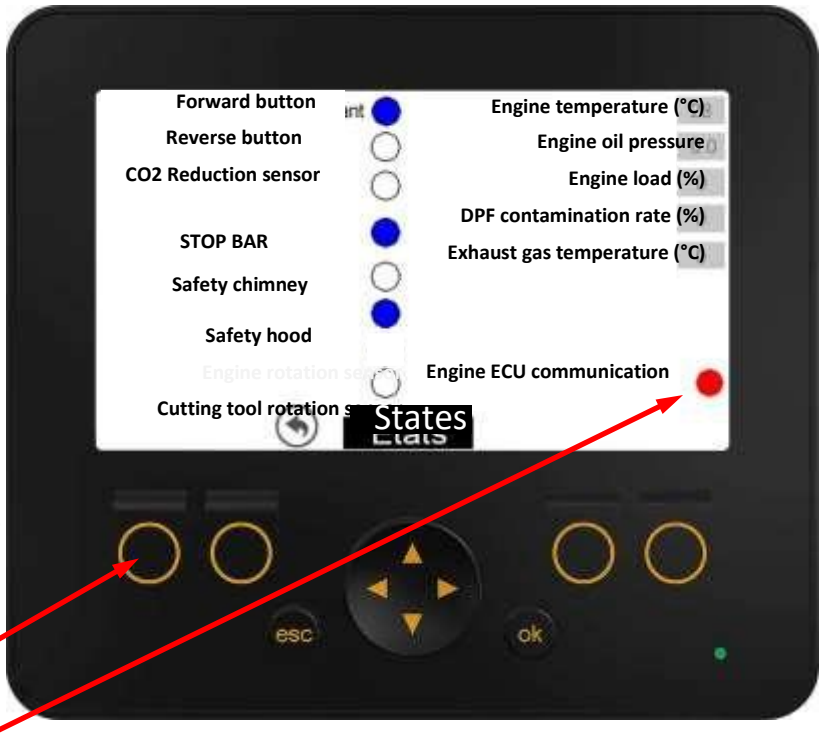
- The Yellow forward button is maintained pressed
- The red STOP bar is maintained pressed
- The engine cover is open

Cutting tool sensor signal check: With the ignition on, the cutting tool stopped, the circle is white *(regardless of the position of the index finger in front of the sensor)*.Cutting tool rotating, the circle turns blue.
If the rotor is stopped, put your finger in front of the sensor, press the **F1 key**: the circle turns blue during this time = sensor OK.

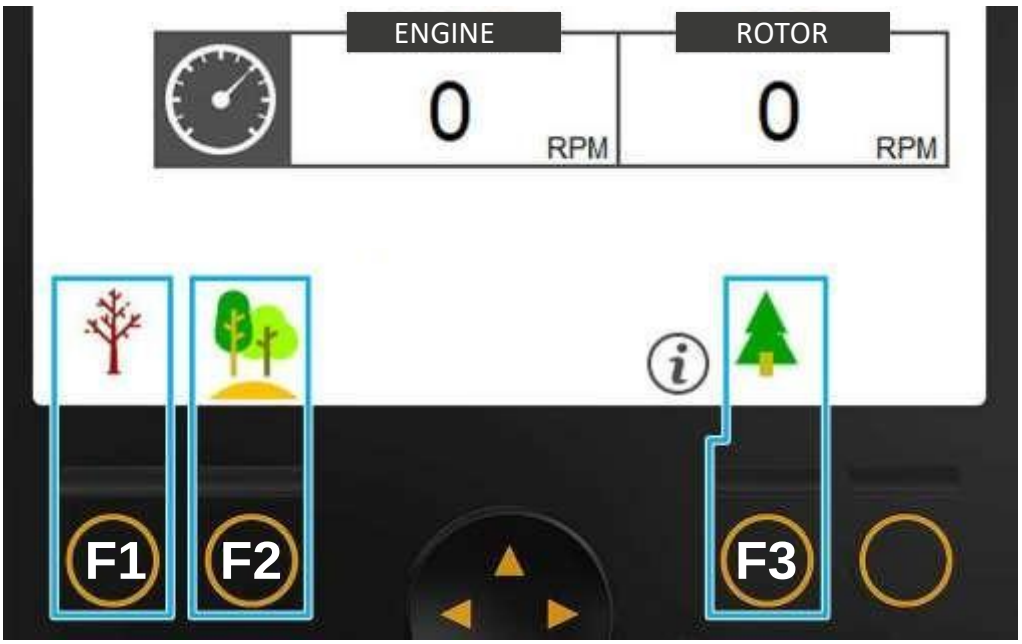
Engine CAN communication indicator:

● = communication OK

● = communication problem



Choice of NoStress ranges



The **TS.COCKPIT** has 3 ranges of engine usage with associated NoStress ranges.

Each key has its pictogram which will be displayed under the logo of the selected key. *Above range 2 has been selected.*

Touch F1 : the engine will stall on a very moderate engine speed, the NoStress management of the feed roller also adapts to this engine speed.

Suitable for grinding medium section pruning branches.

This range greatly promotes fuel economy while considerably reducing noise pollution for the environment.

F2 Key : it is the most suitable usage range for grinding. It defines an average engine speed using the maximum torque of the engine as well as a NoStress range of its own.

Suitable for crushing leafy branches and momentarily for crushing conifers and plants.

This range also promotes, to a lesser extent, fuel economy and noise pollution by maximising the performance of the machine

F3 Key : this range is the "boost" of the machine. It uses the maximum authorized engine speed, using the optimum engine power and the crushed material ejection ventilation, under extreme conditions of use.

Suitable for shredding conifers and heavy plants thanks to its high speed motor range for optimum ventilation.

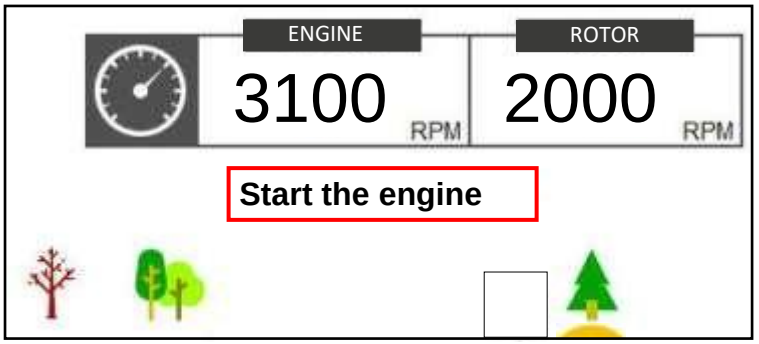
Normal operation and overspeed

The main rotational speed data taken into account for checking the operation of the crusher is that of the cutting rotor.

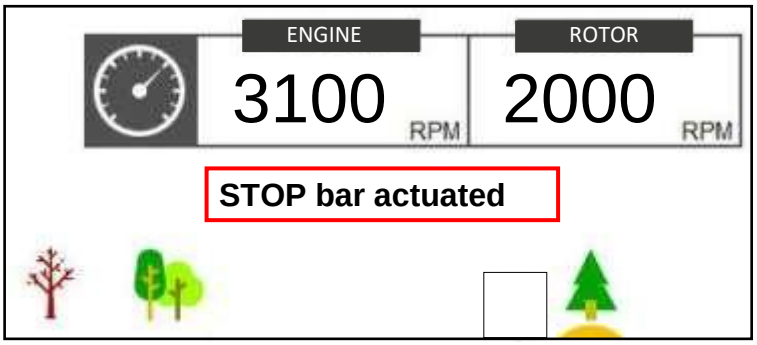
Choose a range, a message "**Press the forward button**" indicates that the minimum operating speed for the feeder is reached.

You can **press the yellow button** on the front gear feeder.



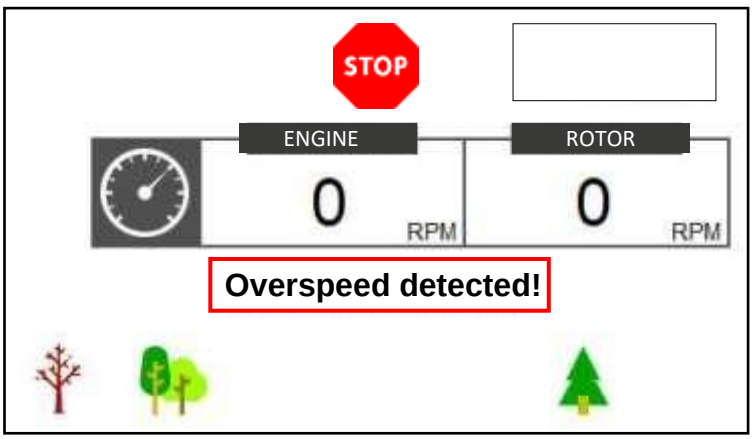


Feeder forward in rotation, if you actuate the red handrail at the rear of the hopper, the feeder stops and the message "**STOP bar actuated**" is displayed.



In the event of the cutting rotor overspeed, a **red STOP** icon is displayed with the message "**Overspeed detected**", the rotation of the feed roller is stopped to prevent use of the machine and the engine returns to idle.

Stop the engine and look for the cause of the problem.



SLIDING Function

The **TS.COCKPIT** controls the slippage ("skating") of the cutting tool transmission system by continuously comparing the speed difference of the motor pulley with the cutting tool pulley. A % of slippage is tolerated to protect the transmission (belts, centrifugal clutch or hydraulic coupler). If this value is exceeded the heat engine is stopped and two different parameters can be displayed.

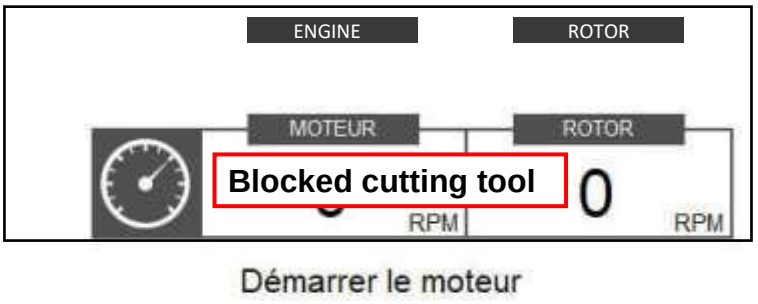
1) As soon as the cutting tool is rotated:

If the message "**Blocked cutting tool** "

Different possible causes of slippage:

- cutting tool blocked by grinding residues remaining in the grinding cell

- broken belts or faulty transmission



2) During grinding:

If the message "**Slippage error** "

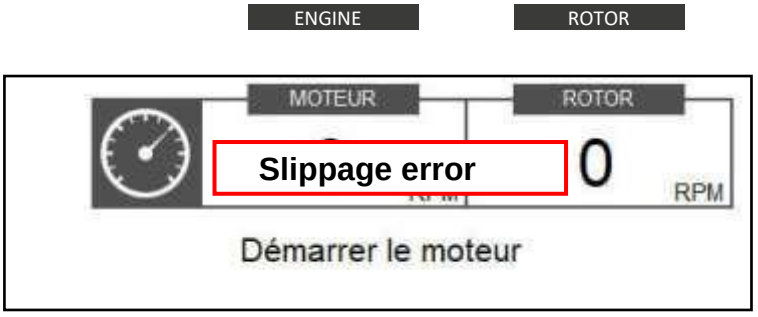
Different possible causes of slippage:

- blocked cutting tool

- relaxed or broken straps

- if hydraulic coupler: failure or lack of oil in the coupler

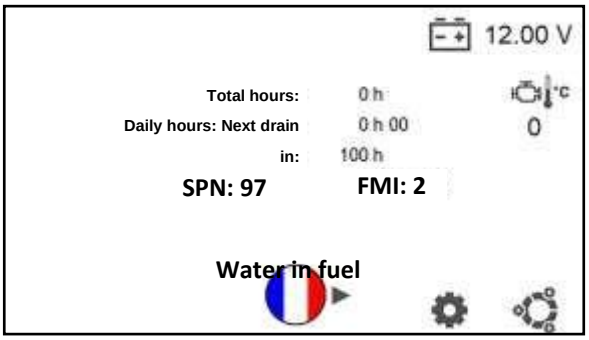
- if centrifugal clutch: worn "Ferrodo" linings



Access to CLIENT (owner) settings. Code 3003

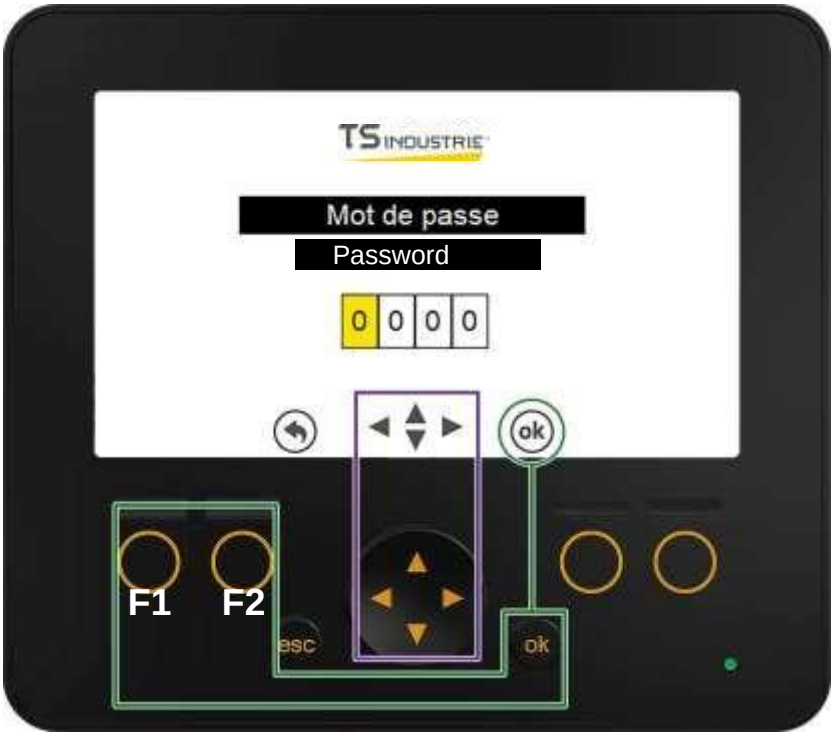
From the main screen, press the **OK** (i) to display the secondary screen, below.





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





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

1) Press the arrow 3 times ▲ to enter the figure **3**

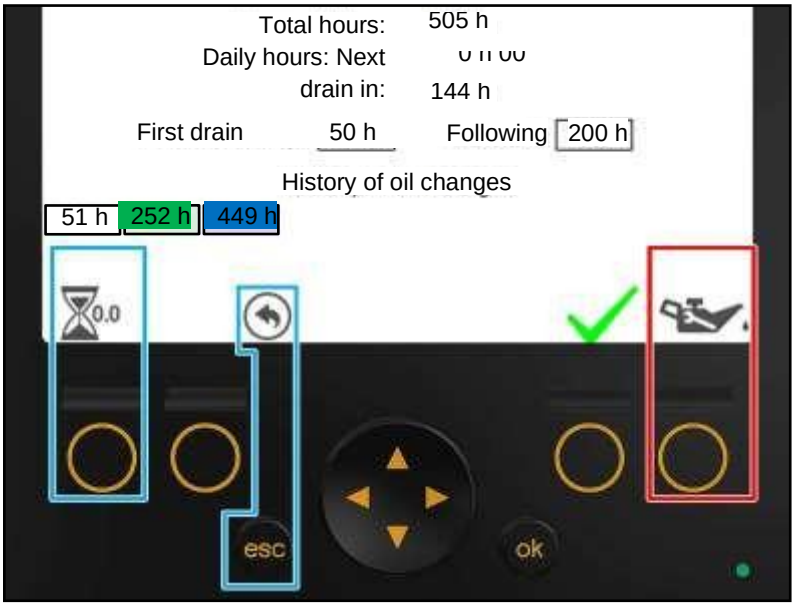
2) Press the arrow 3 times ▶ to validate **the two zeros** and reach the 4th digit

3) Press the arrow 3 times again ▲ to enter the figure **3**

4) Validate the code **3003** pressing the **OK** key

Daily counter reset

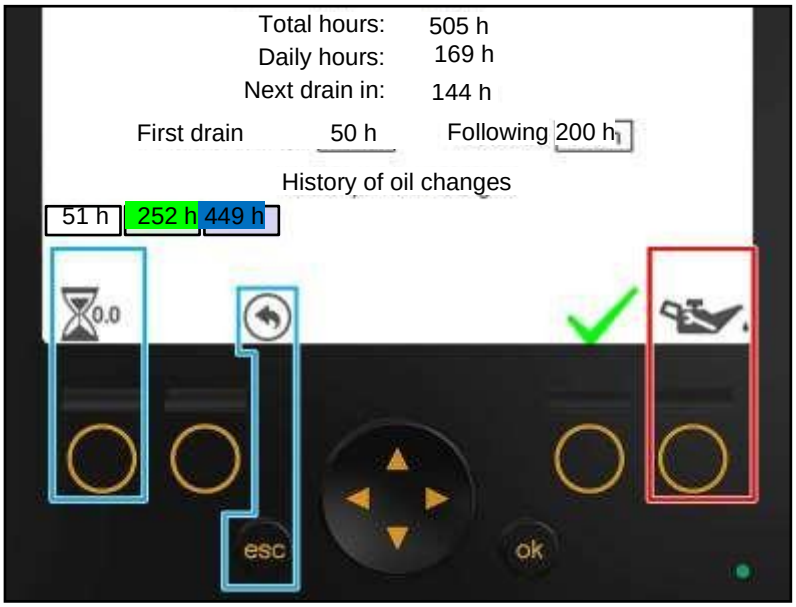
Press the **hourglass** key to reset the daily hours to zero. Press the **ESC key** to exit and return to the main screen.



Validation of engine oil changes

Drain done, press the **burette** key to validate the draining. The time at which the emptying was done is added to the table.

Press the **ESC key** to exit and return to the working page.



Blue background 449 h : drainage done by the owner

Green background: 252 h : drainage done by the dealer

White background : 51 h : draining done by the factory

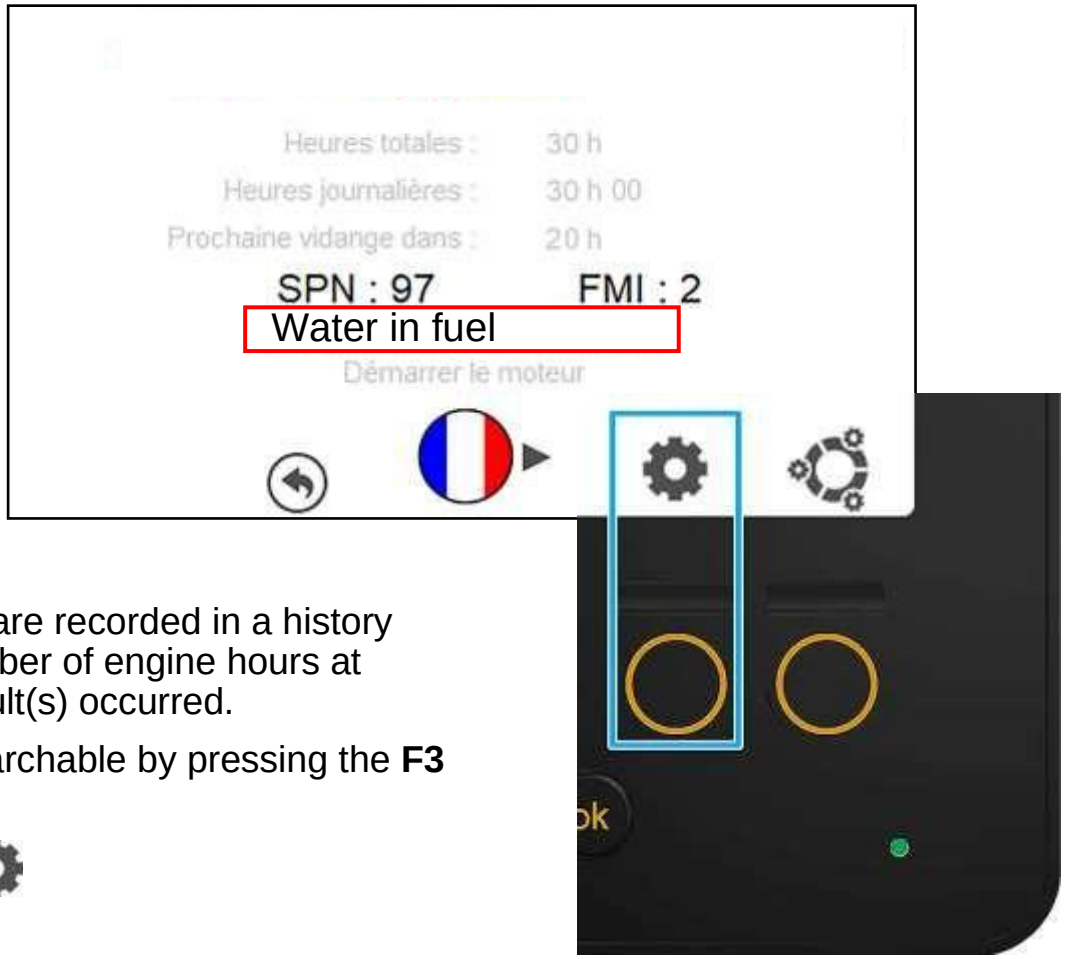
NOTE: **15h** before the deadline, the message "**Plan an oil change** " appears. When the deadline is exceeded, the background is orange, the triangle flashes the message "**Plan an oil change** » appears.

The secondary screen displays "**Late emptying of**: 5 h »

SPN/FMI message if engine fault

With the SPN/FMI code, the screen automatically displays the secondary screen, indicating the SPN/FMI code, and possibly the explanation of the defect.

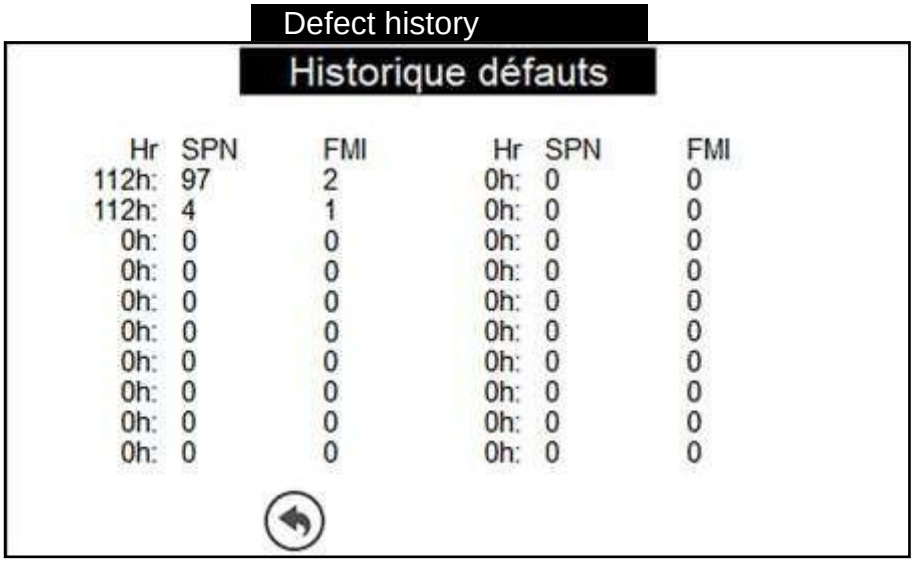
If multiple fault codes are present, they are displayed alternately.



Fault codes are recorded in a history with the number of engine hours at which the fault(s) occurred.

They are searchable by pressing the **F3** key





Regeneration

To meet the new European **STAGE V** emission standards, the engine is equipped with a DPF, exhaust with particulate filter, whose regeneration is controlled by the engine ECU.

When the soot level in the DPF requires a "cleaning" called regeneration, the engine needs to run at a certain speed during the time it takes to perform this maintenance.

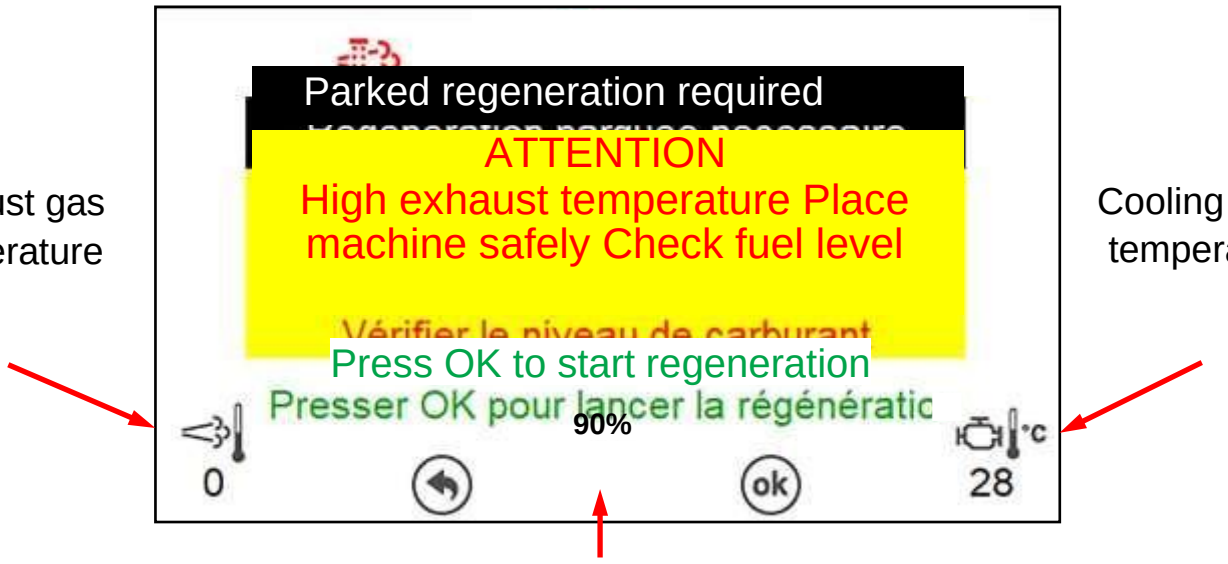
This can be done in 2 ways:

1) "**passive**" manner if the machine is used for a long enough time to complete the task.

A particular engine noise and odour as well as black smoke can be perceived by the user, a sign of a transparent passive regeneration that is underway without a message display on the screen.

2) "**active**" manner with on-screen warning and locking of the feed roller. **The engine will then start at high speed and should not be stopped before the appearance of the end of task message "Regeneration complete", ~ 45 to 60 minutes**.

When the DPF needs active regeneration, the information message below is displayed on the screen.



Before starting the regeneration, check that there is sufficient fuel, and place the machine in a secure and sufficiently ventilated place.

If you press the **ESC key**, return to the working screen.

The regeneration request will reappear in **30 minutes** in cases it was refused. In this case, the feeder stops and the engine goes to idle.

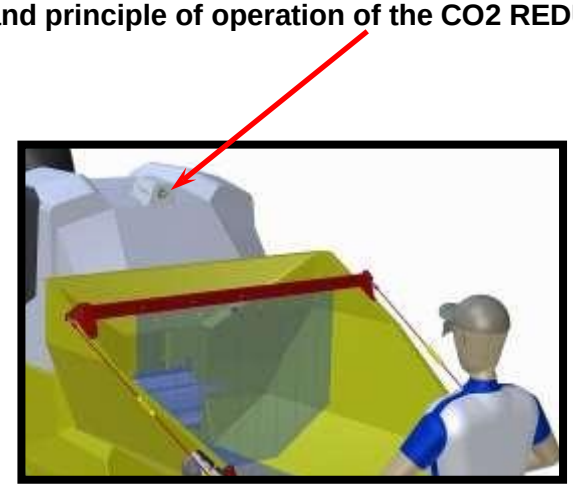
If you press the **OK** key, regeneration begins. The screen shows the state of regeneration.

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

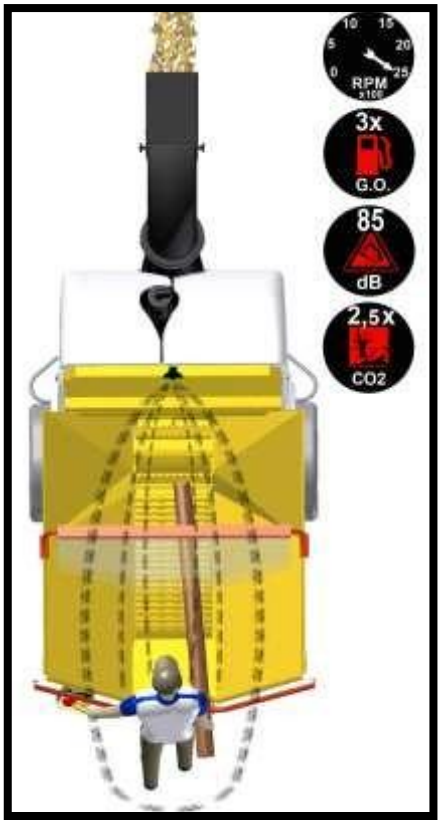
At the end of the regeneration, the engine goes to idle and the message "**Regeneration completed** " appears. **Allow the motor to run for 5 minutes before turning off the machine**, or press the "**ESC" key** to return to the main working page and resume grinding.

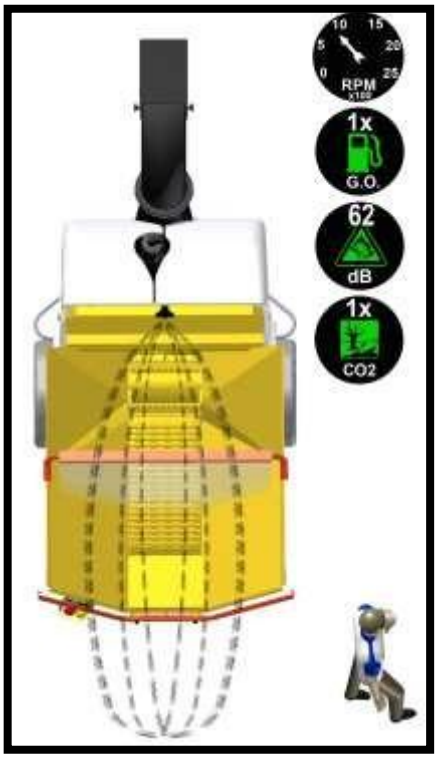
Note: In the event of repeated refusal of regeneration by the user, this can prematurely and irreparably damage the DPF, requiring its replacement and intervention from the engine network. Message **"Regeneration service required** " then appears and the default code **SPN 4781 FMI 15** or **SPN 4781 FMI 16** may appear.

Description and principle of operation of the CO2 REDUCTION system



The grinder is a machine that operates continuously at an accelerated engine speed, and whose grinding periods alternate with periods of passive empty operation of varying lengths depending on the configuration of the sites. Noise pollution, fuel consumption and CO2 gas release are therefore also always at their maximum.





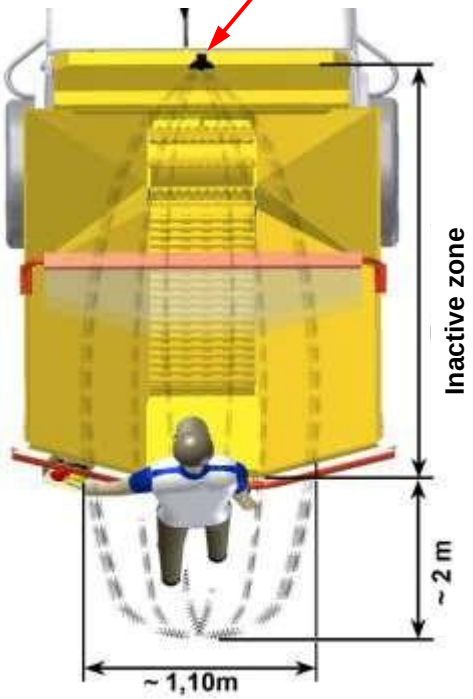
In order to avoid these inconveniences and for the sake of preserving the environment, each time the user leaves the shredder's workstation, after a determined time, the CO2 REDUCTION system automatically returns the engine to idle, thus considerably reducing all these nuisances. As soon as the CO2 REDUCTION radar detects the user approaching the hopper in order to introduce branches, the engine resumes its working speed. In this same period of time, the feed roller which had stopped during the idle speed, returns to rotation in two seconds to resume the grinding process.

In addition to the environmental advantages mentioned above, the CO2 REDUCTION system also makes it possible to increase the longevity of all the moving parts of the machine: motor, transmission, feed roller, feed belt, motors and hydraulic circuit.

CO2 Reduction *(option)*

Manipulation

Presence detector



The presence detector on the back of the cover detects the user up to 2m behind the loading hopper and over a width of about 1.10 m. The zone corresponding to the hopper is a dead zone not supported by the detector, any object located in this zone will not trigger the acceleration of the motor or the rotation of the conveyor belt/feed roller.

On the other hand, any object, even inert (wall or vehicle for example), located less than 2m behind the grinder, will trigger the automatic acceleration of the motor.

NOTE: ***For the sake of safety, do not change the positioning and inclination of the detector, the target height is provided in order to detect adults and not young children.***

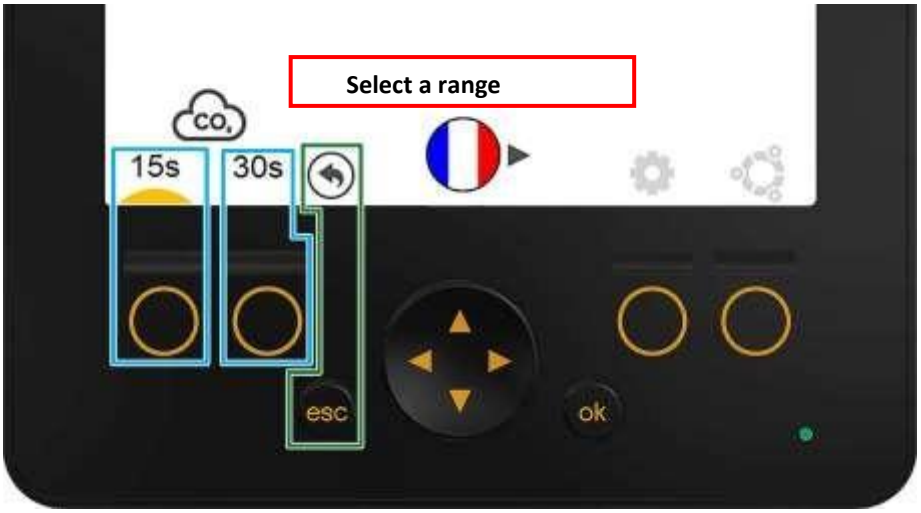
At the very first start-up, the CO2 Reduction mode is not activated by default, so it will not accelerate automatically if you are in the detection zone of the presence sensor.

1) After starting the machine, engine idling, from the main screen, press the **OK** key (*i*) to display the secondary screen, below.



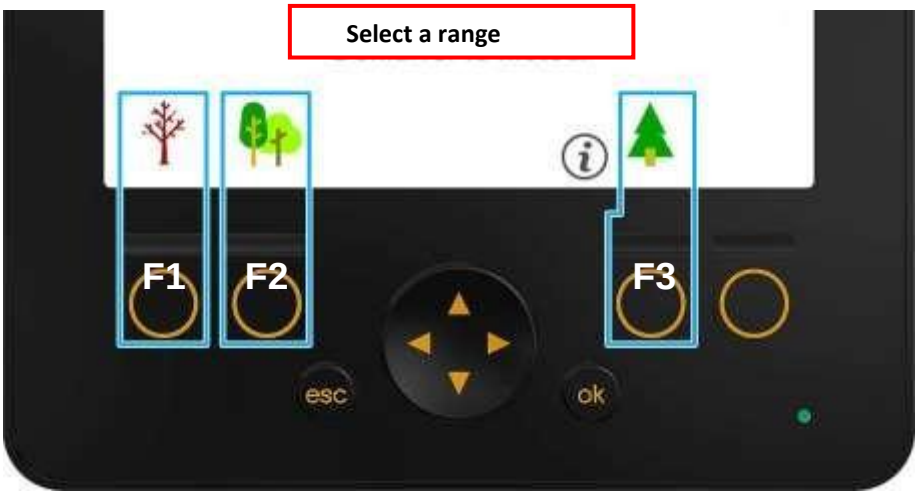


then →

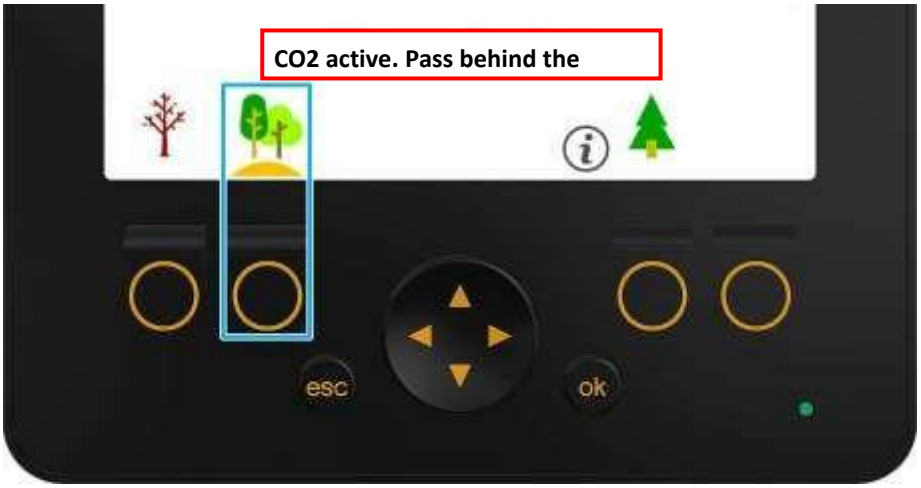


2) Select a **delay of 15** or **30 seconds**. Here above, the time delay of 15 sec. has been selected because it is underlined in yellow. (Re-pressing the key deselects the CO2 Reduction function)

3) Return to the main screen by pressing the **ESC key**.



4) The message "**Select a range** " is always displayed to choose the **grinding range 1**, **2** or **3** which you want to use by selecting the **F1**, **F2** or **F3** keys.



5) Above **grinding range 2** highlighted in yellow has been activated, the message is "**CO2 active". Go behind the machine** " is then displayed.

then →

6) Present yourself in the detection area behind the hopper

7) The engine accelerates to its working speed, press the yellow push button to activate the rotation of the feed roller.



8) As long as the user is present in the detection area, the engine remains at its working speed.

9) When it leaves this area, the engine returns to idle at the end of the **15** seconds and the feed roller stops.

10) When the user returns to the detection area, the motor reactivates and the feed roller rotates again automatically.

The time delay you selected *(15 seconds in this example)* will remain operational during subsequent engine restarts as long as you have not deselected the timeout.

Grinding end function:

If the user has left the detection zone and the time delay comes to an end while there is still material to be crushed, the feed roller will continue to run and the motor will remain at its accelerated speed to finish the work.

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

Reminder: To use the machine without the CO2 Reduction, deselect the timer on the secondary screen.

Disturbance of the presence detector:

- Never change the height of the anti-reject flap holder.
- Do not change the inclination of the detector mount.
- Do not allow branches to "sleep" above the flap holder.
- In the case of **very heavy rain** or **strong wind**.

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