Gremo
1250F/1450F

Instruction manual

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1 Introduction

1.1 Introduction

For you to get the most out of your Gremo machine as an owner or an operator, it is very important that you maintain and handle the machine correctly.

It is also very important that you familiarise yourself with the performance and the restrictions of the machine.

It is especially important that the owner, the operator and those who service the machine are familiar with the contents of this Instruction Manual and study it thoroughly before starting and driving, or before any preventive maintenance work is done.

The responsibility for start, driving and service belongs to the persons performing these steps! Please make yourself well familiar with the controls and instructions before the machine is used. It is too late to start looking in the Instruction Manual when an accident has already happened.

NOTICE

In order to find out about manual updates, it is important to inform Gremo AB of any change of address or owner.

1.2 About the documentation kit

1.2.1 About the Instruction Manual

The Instruction Manual contains important information about your new Gremo machine, about operating the machine, safety when working and the machine's daily checks. In addition, it offers many valuable tips that facilitate your daily work.

Incorrect use of the machine may result in personal injury and product or property damage. For this reason, read the instructions carefully before operating the machine for the first time.

The Instruction Manual should always be accessible in the machine. If it disappears, a new one must be ordered immediately from the manufacturer.

⚠ CAUTION

Never operate a machine without an instruction manual.

Refer to your supervisor or the manufacturer if there is anything in the text that you do not understand or if you cannot find what you are looking for.

1.2.2 About the service and maintenance manual

The service and maintenance manual provided with your machine describes service points and measures that are important to follow and carry out in order for your new machine to work smoothly in the future.

1.2.3 About the spare parts catalogue

The spare parts catalogue provided with your machine helps you to easily identify the right spare part. This unique catalogue is also available online.

1.2.4 About the workshop manual

A workshop manual describing in detail extensive repair measures as well as containing wiring and hydraulic diagrams for the machine is available for purchase.

The workshop manual can be ordered from your service dealer or from Gremo AB.

1.2.5 Ordering documentation

Documentation can be ordered from your service dealer or from Gremo AB.

Always specify the machine number and publication number when ordering. The publication number is printed on the lower right-hand corner of the cover.

1.3 Presentation Gremo 1250F/1450F

1.3.1 General description of the machine

Fig. 1 Gremo 1250F/1450F

Gremo 1250F/1450F

- is a robust and versatile 12 to 14 tonne forwarder that easily navigates all types of terrain. The forwarder is designed and adapted for forwarding timber, the weight of which does not exceed the machine's maximum load capacity, from felling site in the forest to the roadside stacking area.
- is driven by a Cummins QSB 6-cylinder, turbo-charged 6.7 litre diesel engine with intercooler and common rail fuel system that complies with stage 3B environmental requirements and is approved for running on environmentally-friendly fossil-free diesel that complies with the requirements in EN 15940, e.g. HVO diesel.
- is fitted with Gre-VT, a continual and variable hydrostatic transmission with 2 speeds that are controlled by GreControl. Full traction (18.4 tonnes) is available from the start whatever program is run.
- has electric/hydraulic brakes. Four multi-disc brakes in oil bath in the front and rear differentials.
- has a load-sensing hydraulic system with hydraulically-driven variable fan with reversing option to blow out the coolers controlled by GreControl; the oil is cleaned by a return filter and a microfilter.
- has a 24 volt electrical system with dual 145 Ah batteries.

1.4 Intended area of use

The machine must only be used for what it has been designed and adapted for, i.e. forwarding forest raw materials, the weight of which does not exceed the machine's maximum load capacity, from felling site in the forest to the roadside stacking area. All other use is prohibited.

It is not permitted to rebuild or modify the machine without Gremo's approval.

It is not permitted to operate the machine on public roads if it has not been adapted to comply with national road safety rules.

1.4.1 Improper use

Do not under any circumstances use the machine for anything it is not designed for, e.g.

The crane

- should never be used to lift loads greater than it was designed to lift.
- should never be used to tow or push objects.
- should never be used to lift people.

The machine

- should never be used for anything other than it has been designed for i.e. loading and unloading timber.
- should never be used if any safety feature is out of order, e.g. if any safety sensor is disconnected.
- should never be used if a window is broken or with the door open.
- should never be loaded with weights greater than it was designed to handle.
- should never be parked on a slope, but must always be parked on level ground to prevent the machine rolling away or capsizing.

1.4.2 Prohibited operation

It is prohibited to operate the machine if:

- Protection and warning equipment is out of order or disconnected.
- If brakes or steering system are faulty.

- If there are any unauthorised people or vehicles within the machine's operating area.

1.5 Operator requirements

- The machine can only be operated by operators with permission from work supervisors and the necessary knowledge.
- National laws and regulations relating to driving licences, operator certificates, etc. must be complied with at all times.
- Operators must be aware of and follow all local safety rules.
- Operators must follow the manufacturer's instructions.
- Operators must read and understand the machine's warning and information signs, as well as understand and be able to use the machine's protection and warning equipment.

1.6 Safety regulations

Each country has its own national and local safety regulations, and it is the responsibility of both the owner and the operator to know and follow these regulations. If the recommendations in this Instruction Manual differ from the national and local safety regulations, then the national and local safety regulations take precedence over the recommendations in this Instruction Manual.

During the design and testing of the machine, a great deal of effort has been made to make the machine safe and efficient. These efforts may be completely wasted if the safety and maintenance regulations are not followed. Accidents are usually caused by humans, not by the machine. A well-maintained machine and a safety-aware owner/operator is a profitable and safe combination.

A Gremo machine meets the requirements of the Machinery Directive and the harmonised standards, plus national requirements and provisions.

1.7 Warning symbols and information about risks

The following warning symbols and signal words are used throughout this manual and on stickers on the machine:

NOTICE

Read this important information carefully.

If a number of risks occur simultaneously, this Instruction Manual shows the signal word **(DANGER, WARNING, CAUTION)** corresponding to the greatest risk.

NOTE! indicates that attention should be given to anything concerning safety of the surroundings or the machine or other important information that may facilitate understanding or performance of a particular task.

You can prevent accidents by reading these paragraphs with special care and always following the instructions. Remember that your safety and the safety of others may be affected. It is also the responsibility of the operator to ensure that all warning stickers are in place on the machine and are readable.

DANGER

Informs of a very serious hazard which, if not avoided, may be fatal or cause serious bodily harm

WARNING

Informs of a very hazard which, if not avoided, may be fatal or cause serious bodily harm.

CAUTION

Informs of a minor hazard which, if not avoided, may cause minor bodily harm.

1.8 Construction of the machine

NOTICE

This Instruction Manual is designed to be valid in several market areas and for most factory-installed equipment. Please ignore the paragraphs which are not valid for your machine. We reserve the right to change and improve the design whenever we find it necessary, without undertaking to implement these changes on products which have already been delivered. We also reserve the right to change data and instructions for maintenance, service, environment and safety without further notice.

1.9 Definitions

In this Instruction Manual, the concepts of ‘front’, ‘rear’, ‘right’ and ‘left’ on the machine are defined according to the principal direction of travel on roads, i.e. the direction the machine travels when it is steered using the steering wheel.

Example: the serial number of the machine is punched on the frame in the front end of the machine, to the right of the engine compartment.

1.10 Environment

The interplay between human beings, machines and the environment can be influenced, and is becoming increasingly important. We have paid attention to this during the design of the machine and the writing of this manual, which has a section relating to this subject. By following these instructions when you drive and maintain your machine, you will show consideration for humans, animals and nature in your environment.

1.11 Location of type plates and serial numbers

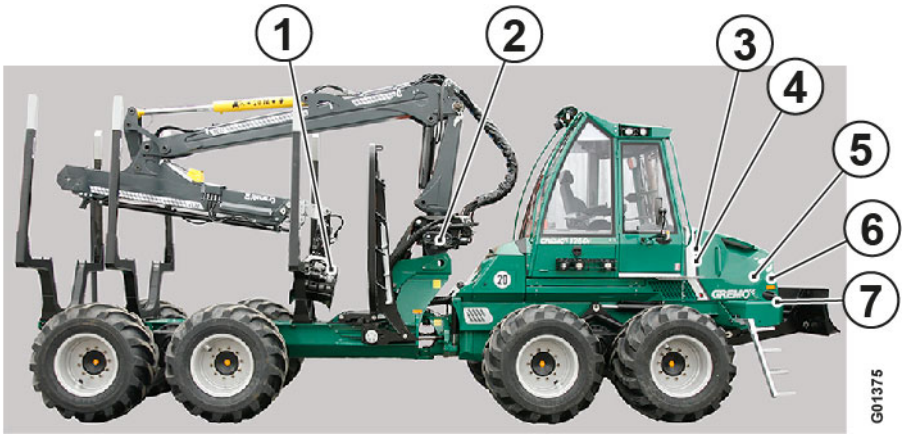


Fig. 2 Type plates and serial numbers

1. Type plate for the grapple
2. Type plate for the crane
3. Type plate for the cab
4. Type plate for the machine
5. Type plate for the diesel engine (on the rocker cover)
6. Type plate for the climate system on the right hand side of the radiator
7. The machine's serial number is punched on the front of the right-hand branch deflector.

1.11.1 Serial number

Fig. 3 Serial number

The machine's serial number is punched on the top of the front of the right-hand branch deflector.

1.11.2 Type plate for the machine

The following details are shown on the machine's type plate:

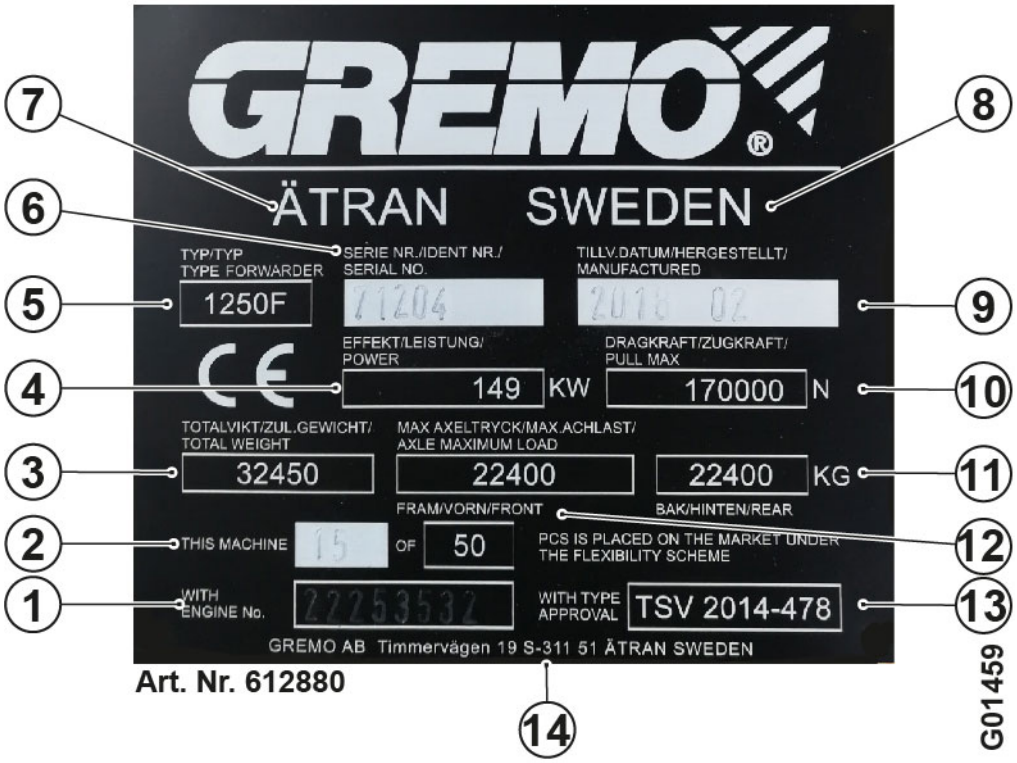


Fig. 4 Type plate for the machine

1. Diesel engine's serial number
2. Machine no. XX of XX
3. Machine's total weight
4. Diesel engine's power in KW
5. Machine model
6. Machine's serial number
7. Place of manufacture
8. Country of manufacture
9. Year and month of manufacture
10. Machine's traction in N
11. Maximum axle load, rear bogie in kg
12. Maximum axle load, front bogie in kg
13. Type approval according to:
14. Manufacturer's address

1.11.3 Type plate for the cab

The following details are shown on the cab's type plate:

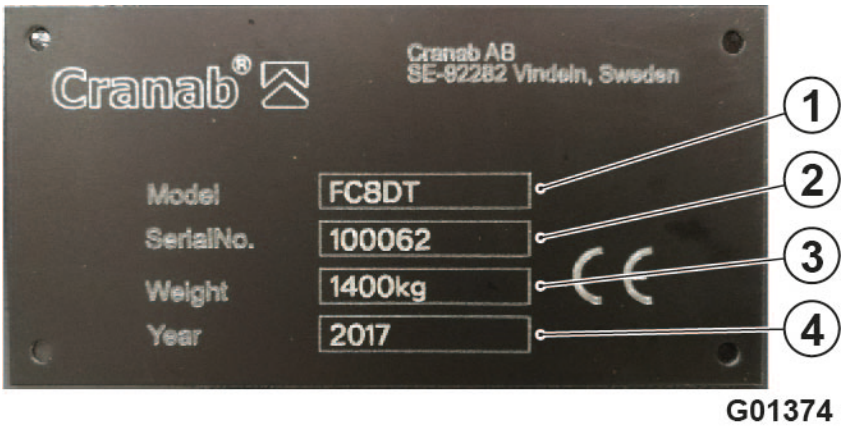
Art. Nr. 612877

Fig. 5 Type plate for the cab

1. Approved according to:
2. Model/Type
3. Serial no.
4. Year of manufacture
5. Weight

1.11.4 Example of crane type plate

The following details are shown on the crane's type plate:



G01374

Fig. 6 Type plate for the crane

1. Model/Type
2. Serial no.
3. Weight
4. Year of manufacture

1.11.5 Example of grapple type plate

The following details are shown on the grapple's type plate:

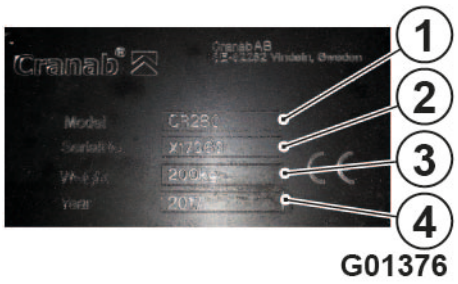


Fig. 7 Type plate for the grapple

1. Model
2. Serial no.
3. Weight
4. Year of manufacture

1.11.6 Type plate for the diesel engine

The machine’s chassis number (engine type and number are normally connected to the chassis number) must be stated when ordering spare parts.

If the engine's type plate is not legible, the engine's serial number can also be read from the engine block on top of the lubricating oil cooler housing.

The injection pump is itemised from Gremo AB.

The following details are shown on the engine's type plate:

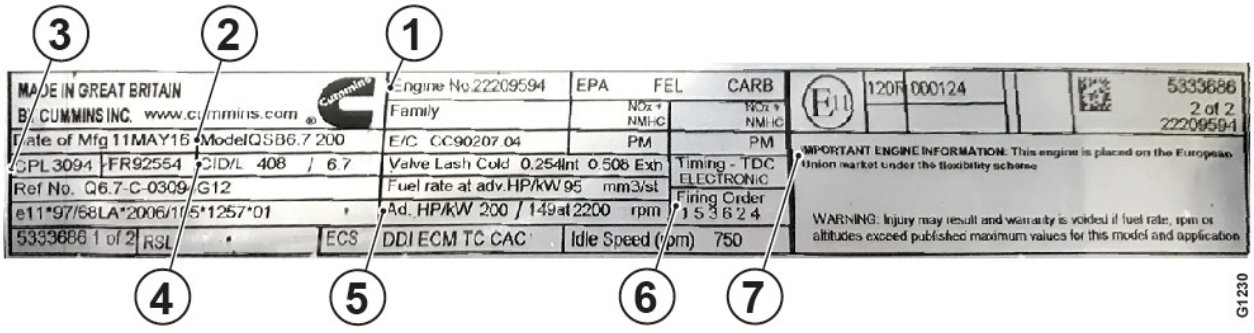


Fig. 8 Type plate for the diesel engine

1. Engine serial number
2. Engine type
3. CPL number
4. Valve clearance tolerances
5. Power output data
6. Ignition sequence
7. Important information

2 Safety regulations

2.1 General

Operators, mechanics and supervisors are obliged to study and follow the safety regulations and advice given in this chapter.

The machine is equipped with signs, and you should make yourself familiar with the meaning and location of these signs. Make sure that the signs are readable and replace any damaged signs.

Furthermore you shall always follow the laws, statutes or other national regulations concerning traffic safety and occupational safety. Local traffic rules and local workplace regulations must always be followed.

WARNING

The cab is not intended for passenger transport, which is why it lacks a seat and seat belt for passengers. There is a risk of fatal accident for passengers!

WARNING

The bogie lift can be used as a lifting aid during service and repairs, but always prop up the machine.

WARNING

When you lift or prop up the machine or parts of the machine, make sure that the equipment you use is intended for this purpose, is appropriately dimensioned, and cannot slip or tip over!

WARNING

Risk of serious crushing injury or fatal accident!

Always switch off the engine before releasing the cab to tip it up.

Never go under a tipped-up cab unless it is propped up.

Ensure that the cab is propped up if you need to go under it!

WARNING

Do not leave the cab without first placing the grapple/ crane safely on the ground or in the loading platform.

WARNING

During all work on the machine, remember the risk of slipping. You should always use a safety helmet, safety goggles, gloves, safety boots, breathing protection and other necessary protective equipment when required.

CAUTION

Never leave the machine unattended with the engine running or the ignition on.

Never leave the machine unattended with the ignition key in the ignition lock.

CAUTION

Never operate the machine with loose tools, binders, etc. in the cab, as these items may injure you if the machine tips over or brakes suddenly.

Secure them properly.

CAUTION

During servicing, the engine and main power switch must always be turned off. In some cases this also applies to fire extinguishing and other electronic equipment.

CAUTION

The manufacturer is not responsible for alterations to the electrical system of the machine, if these do not correspond to the original state. The function of the machine's safety system can be affected.

CAUTION

The machine may be operated and repaired only by personnel who have undergone training approved by the supplier.

NOTICE

For your mobile phone and other portable communication equipment you should always use externally mounted aerials in order to prevent interference with the computers of the machine.

NOTICE

Never use the main power switch to turn off the machine as this can cause damage to the machine!

NOTICE

Off-road driving requires a lot of experience before you master the machine. Because of this, you should take it easy until you are familiar with the limitations of the machine.

NOTICE

Always bear in mind the danger of fire, and keep the machine clean. Check the fire extinguishing equipment as in the instructions.

2.2 Clothing

To prevent clothes getting caught or stuck, clothing should be intact and tight fitting. Do not use loose garments such as ties or scarves because they can get caught in levers and rotating or protruding parts.

Do not wear jewellery as it can conduct electricity or get stuck in moving parts.

Long hair should be tied back properly as it can easily get caught in moving parts. Be careful when working with welders or open flames as hair is flammable.

Always wear gloves, safety footwear, safety goggles, a safety helmet, ear defenders and other necessary safety equipment when required.

2.3 Seat belt

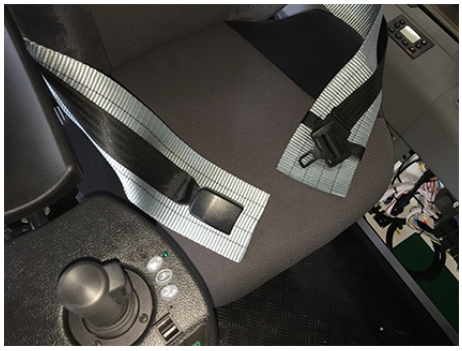


Fig. 9 Seat belt

Always use the seat belt.

Replace a damaged or worn seat belt immediately. Order from you nearest Gremo service dealer or from Gremo AB using spare part number 92900100.

Before you start operating the machine, check that there is no one standing close to it. Risk distance 20 m.

Never drive with an open door. The operator’s cab is not a safety cab if the door is open.

2.4 Emergency stop

Fig. 10 External emergency stop

Fig. 11 Cab emergency stop

Check the emergency stop function daily. The emergency stop is the red switch with the yellow plate.

The external emergency stop is located on the right-hand ascent into the machine, and the cab emergency stop is on the left-hand 'B' column. When you push the emergency stop, the diesel engine stops and the brakes are applied.

2.5 Emergency exit

Fig. 12 Handle side window

The left-hand side window acts as the emergency exit. To open the window, grip the latch handle and turn it upwards until the latch is released. The window can now be opened outwards.

⚠ CAUTION

Note that the side window must always be unlocked when the machine is operating, to ensure that the operator can be rescued from outside if the machine tips over.

Fig. 13 Opened side window

2.6 Emergency alarm

Emergency alarm equipment, e.g. mobile phone or other portable communication equipment, must be available. When you work outside the machine, always take your mobile phone or other means of communication with you.

2.7 Articulated joint lock

NOTICE

The articulated joint lock and the brakes are released when the machine starts pulling at about 1,000 rpm. If the crane is slewed at this time, the machine may tip unexpectedly.

The articulated joint lock consists of two hydraulic cylinders which are automatically blocked and lock the mid-section when the machine is stopped. The articulated

joint lock is released when you ”rev” with the accelerator pedal. For settings, see GreControl in the User Manual.

2.8 Boarding the machine

Fig. 14 Ascent

Use the ladder, and hold on to the handle on the bonnet, the handle on the cab column and the door handle.

⚠ CAUTION

Risk of slipping – steps, platforms and chains can be very slippery in cold weather conditions!

⚠ CAUTION

Always descend the ladder facing the machine. This way you can see and grip the handles. Never jump from the machine.

2.9 Inspection of parking brake

The parking brake is a safety detail and its working order should be checked.

- Place the fully-loaded machine on a slight slope, 10-12 degrees, or a climb of 2 m per 10 m with free rolling movement with no obstacles.
- Stop the machine.
- Engage parking brake.
- Switch off the engine.
- The machine should now be standing completely still without rolling.
- Start the engine and turn the machine around. Repeat the procedure with the machine facing in the other direction.

2.9.1 Manual release of parking brake

WARNING

Before starting the work of manually releasing the parking brake, ensure that the machine's wheels are locked to prevent it from rolling.

NOTICE

If the parking brake does not release, it may be necessary to manually release it to move the machine.

1. Parking brake cylinder

   The machine's parking brake can be manually released if a pressure drop in the hydraulic system prevents hydraulic release.

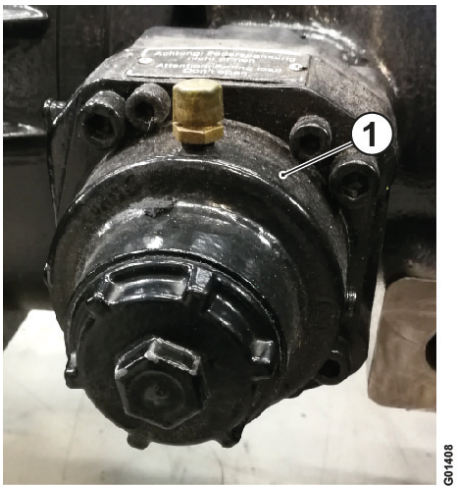


Fig. 15

2. Remove the cover plate (2).

   The parking brake (1) is released using a threaded stud (3) and washer/counter-locking nut (4) found in the cover plate (2).

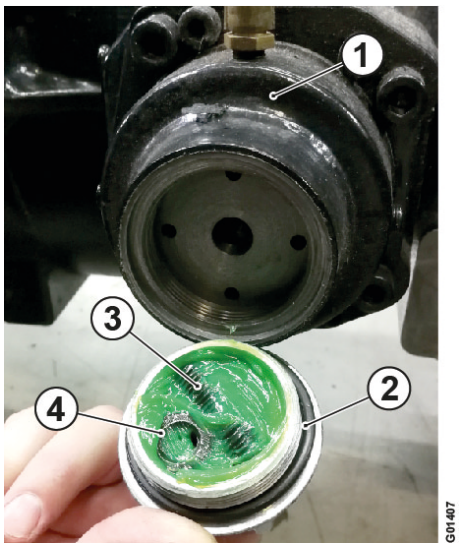


Fig. 16

3. Screw the threaded stud (3) all the way in through the hole in the brake cylinder and tighten until it stops.

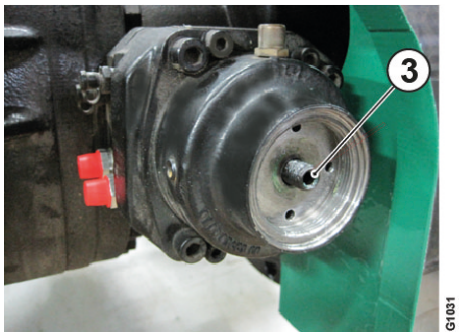


Fig. 17

4. Fit the washer and counter-locking nut (4) and tighten the nut to release the spring force in the brake cylinder.

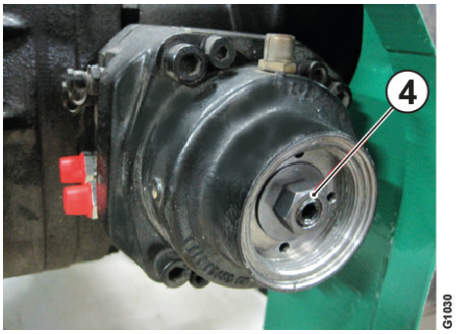


Fig. 18

5. Repeat for all four brake cylinders to release the parking brake.

Reset the parking brakes by loosening and removing the counter-locking nuts, washers and threaded studs again, and put them back in the cover plate.

2.10 Driving

The working speed is set between 1,200-1,500 rpm in the Control System GreControl/IQAN monitor.

As soon as you start to use the crane levers the working speed is activated, and when you release the crane levers the revs reduce to an increased idle after the time delay selected in GreControl. This occurs when the seat is facing backwards towards the crane/gate.

Driving on public roads

When driving on public roads with other traffic, the steering wheel must always be used, and the terrain driving function must be turned off.

Driving speed

A Gremo 1050F is designed to manage a maximum load of 10,500 kg, even on difficult terrain. Off-road driving causes large dynamic forces on the machine. The machine's own weight, plus the load, increases the stress in its construction if driven carelessly over difficult terrain. By driving gently, with feeling and understanding, you can avoid costly repairs and downtime.

Uphill

When driving uphill, the centre of gravity of the payload is shifted backwards, exerting a lifting force on the front carriage. If the machine is angled severely in this situation, it can tip over..

Downhill

The load's centre of gravity is moved forward when driving down a slope, and exerts a pushing force on the engine. If the machine is angled severely in this situation, it can tip over..

Fig. 19 Overload

NOTICE

Never load over the top of the gate!

Overloading leads to worse stability, and during downhill driving the timber may slide over the gate and damage the machine.

2.11 Crane operation

Read the instructions carefully before you operate the crane for the first time. See the *supplier's documentation*.

There is a considerable risk of accidents if you start without being sufficiently familiar with the design, function and use of the crane. Ensure that you follow the applicable laws and regulations and that you have full view of the whole working area.

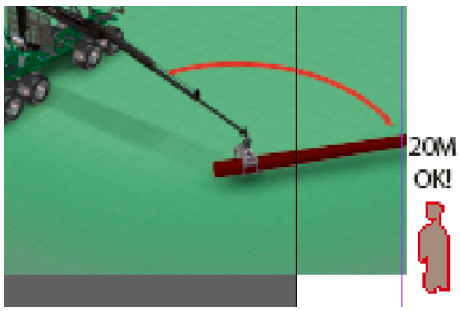


Fig. 20 Crane danger area

DANGER

Standing under the crane may cause danger to life!

Ensure that there are no unauthorised persons within the working area of the crane.

A risk distance of at least 20 m must be observed!

DANGER

Never work underneath electric power lines.

There is a large risk that the crane touches the power lines, and this may cause a fatal accident!

A risk distance of at least 10 m must be observed!

DANGER

If the machine comes in contact with overhead power lines. Remain in your seat and call for assistance!

Danger!

Remain in your seat. Wait for assistance!

Fig. 21 lifting people with crane

DANGER

Never use the crane to lift people. Risk of injury or fatal accident!

NOTICE

Do not move the vehicle when the crane is carrying a load, or when the crane boom is slewed laterally.

NOTICE

Observe the lifting capacity limits on the load sign. Never overload.

NOTICE

Never run the hydraulic cylinders towards the end stops at full speed!

Risk of damage to the machine

NOTICE

The articulated joint lock and the brakes are released when the machine starts pulling at about 1,000 rpm. If the crane is slewed at this time, the machine may tip unexpectedly.

NOTICE

During transportation the crane should be put on the load, strapped to the timber. Observe all safety precautions, as there may be power or telephone lines at unexpectedly low heights.

NOTICE

Use the reach to pull the timber towards you, and then lift.

NOTICE

It is prohibited to use the crane for towing timber or other items.

Fig. 22 Parking the crane

2.12 Parking/storage

- For safety reasons, park the machine on a level surface when it is not to be used.
- Let the machine idle for a minute or so before turning off the engine.
- The ladder is folded down when the switch for the parking brake is put into parking mode.
- Stop the engine.
- Turn off the main power supply.
- Lock the machine!!

Before leaving the machine, always ensure that:

- The machine is parked on a flat surface and not on a slope.
- The parking brake is engaged.
- The machine is completely still without using the hydraulics to do so.
- The engine is turned off.
- The main power switch is turned off.
- The machine is locked and the keys are removed from the machine.

⚠ WARNING

For safety reasons, do not park the machine on a slope. There is the risk that the machine will start to move or tip over.

2.13 Trailer transport

DANGER

Major demands are placed on lifting and transport equipment, e.g. lifting chains, hooks, etc.

Danger!

Check the equipment and its capacity, the lifting straps on the machine and the lashing points on the transport vehicle and machine.

DANGER

Overloading of lifting equipment.

Danger!

Lifting equipment must be dimensioned to handle the load. Never walk underneath a suspended load.

- Place the machine centred sideways on the loading platform.
- Affix the machine at the 8 fixing eyelets.
- To lock the mid-section, turn and lock the red stop heels in the mid-section.
- Lock the door.
- Check the height and width of the loaded machine; see the Technical Data chapter in the Instruction Manual.

2.14 Service

Read through the Instruction Manual, note the machine's warning decals and check the purchasing contract before carrying out any servicing. During the guarantee period, all servicing and repairs must be carried out by personnel approved by Gremo AB.

Rebuilding and/or modifying the machine (mechanically or electrically) is done at your own risk, and Gremo takes no responsibility for the consequences.

Be aware that the safety system may become disabled!

It is the rebuilder's responsibility by law to document and perform a risk assessment on the design (the whole machine with the modifications).

In respect of welding (see 2.18 *Welding Repairs*, page 32), Gremo should be contacted if any welding is being considered. Welding can considerably worsen the machine's abilities and lifespan.

At the slightest uncertainty in conjunction with a repair, it is better to contact Gremo/service provider prior to any repairs being carried out.

⚠ WARNING

Risk of serious crushing injury or fatal accident!

Always switch off the engine before releasing the cab to tip it up.

Never go under a tipped-up cab unless it is propped up.

Ensure that the cab is propped up if you need to go under it!

⚠ WARNING

The bogie lift can be used as a lifting aid during service and repairs, but always prop up the machine.

⚠ WARNING

When you lift or prop up the machine or parts of the machine, make sure that the equipment you use is intended for this purpose, is appropriately dimensioned, and cannot slip or tip over!

WARNING

You are not allowed to service the machine unless you have the correct knowledge to do the work.

CAUTION

Avoid breathing in exhaust gases! The exhaust gases contain, inter alia, carcinogenic substances, aldehydes (which irritate the mucus membranes) and carbon monoxide (which causes headaches and tiredness, and blocks the ability of red blood cells to take up oxygen).

CAUTION

During servicing, the engine and main power switch must always be turned off. In some cases this also applies to fire extinguishing and other electronic equipment.

CAUTION

High oil pressure in the hydraulic system!

Ensure that the hydraulic system is depressurised for service and repairs.

CAUTION

High pressure remains in the accumulators!

When working with brake system: Leave the machine with the ignition on and pump the foot brake until the brake pressure has dropped to zero.

Take great caution when loosening hoses!

CAUTION

The exhaust pipes are very hot and can cause serious burns!

CAUTION

When you are about to change the engine oil, hydraulic oil or transmission oil: remember that the oil may be hot and can cause burns. Avoid contact with skin and note that oil vapours can cause irritation to airways.

⚠ CAUTION

Servicing which is not done correctly can present risks.

Ensure that you have sufficient knowledge, the right information, the right tools and the right equipment in order to carry out the servicing correctly.

Repair or replace broken tools or broken equipment.

NOTICE

When draining oil or fuel you must take measures to avoid spillage. Oil which is dumped freely will cause damage to the environment and may also cause fire. Waste oils and fluids should always be disposed of as hazardous waste at designated waste facilities or handled by an authorised company.

NOTICE

In case of hose breakage: connect the vacuum pump (additional equipment) so that unnecessary oil does not leak out!

NOTICE

Always use Gremo original spare parts.

2.15 Oil leaks

If you cannot rectify the oil leakage yourself, please contact an authorised service dealer or Gremo AB immediately.

2.16 Oils

⚠ CAUTION

All work where you may get into contact with oil involves a risk of skin trouble, e.g. eczema. The risk is greatest in the case of hydraulic oils, but there is also a risk with other types of oil.

Careful hygiene is therefore always of great importance!

- Use protective gloves!

  Wash your hands before putting the gloves on. Protective lotion on your hands will simplify later cleaning.
- Avoid contact with oil, especially hot oil.

  If your skin has been in contact with oil, wash immediately with soap and water, or with a suitable washing lotion and water.
- Don’t keep oil-drenched rags in your pockets.
- Replace oil-stained clothes with clean ones.
- Always keep an extra overall easily accessible, not in the machine where it may easily become dirty.
- Cuts and small wounds should be treated immediately
- Avoid breathing oil fumes!
- Wash your hands and arms at every meal break, or as often as possible!

NOTICE

Oil drums standing outdoors collect water in the lid, and this water can run down into the oil.

Water-damaged oil results in machine breakdown.

Store oil drums lying horizontally under a roof.

2.17 Batteries

A Gremo can be equipped with wet cell or dry cell batteries. When a dry cell battery is depleted, a diode will illuminate red on the screen, or not illuminate at all. Wet cell batteries must be checked so that the fluid level is above the cells. Depleted batteries must be disposed of as hazardous waste.

When start-up help is required, use corresponding series-connected 24 V batteries and connect them over both batteries' poles: one battery's + pole and the other battery's - pole or earth.

Do not use a start booster. The maximum permitted voltage in the system is 28 V.

Charge the batteries using a battery charger designed for a 24 V system.

2.18 Welding Repairs

NOTICE

Prior to beginning any welding, read this chapter carefully!

- Turn off the main power switch.
- Disconnect the earth cable between the battery and the frame.
- Disconnect the generator's plus cables.
- Disconnect the fire extinguishing system's central unit by removing main fuse F57.
- Fit the safety screw in the fire extinguisher tank.
- Connect the ground terminal of the welding equipment as close as possible to the welding location.
- Disconnect all computer cables when welding is taking place near the cab. Engine control, air conditioning system, DASA, GreControl, radio etc.

After any welding, ensure that you reset all the necessary items correctly before restarting the machine.

⚠ CAUTION

Heated paint emits poisonous fumes which are dangerous to inhale. Always remove all paint from the welding location!

NOTICE

Never carry out any welding repairs on frames, articulated joint or crane without first contacting an authorised service dealer or the service department at Gremo AB.

NOTICE

Always bear in mind the danger of fire. Always keep a hand-held fire extinguisher within reach!

NOTICE

Remember that welding close to the fire extinguishing system's detector coil may cause it to burn off and release the contents of the fire extinguisher tank! In order to ensure that the fire extinguisher tank is not accidentally deployed, fit the safety screw. See *Other equipment and optional equipment; Fire extinguishing system in the Instruction Manual*.

2.19 If by accident the machine tips over

WARNING

Hold on and don't jump from the machine while it is moving!

You may get crushed! The cab is the safest place. It is designed to protect you.

CAUTION

Never operate the machine with loose tools, binders, etc. in the cab, as these items may injure you if the machine tips over or brakes suddenly.

Secure them properly.

NOTICE

Switch off the engine immediately if the machine capsizes. It may seize, or suck in water.

⚠ CAUTION

If the machine is equipped with wet cell batteries, there is a risk of corrosive acid leaking from the battery if the machine tips.

If the machine has tipped over onto one side, you should immediately let a Gremo-authorised workshop check the operator's cab. The protection provided by the cab is impaired if the cab becomes distorted.

2.20 In the event of fire

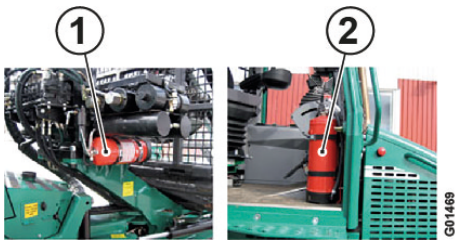


Fig. 23 Hand-held fire extinguisher

1. Hand-held fire extinguisher on crane tower
2. Hand-held fire extinguisher in cab

attempt to drive away from dry areas where there is most scrub.

Then proceed as follows:

1. Stop the machine's engine using the emergency stop, turn off the ignition or engage the parking brake.
2. Leave the machine.
3. If necessary, put out the fire up with the two handheld fire extinguishers, one in the cab and one on the left-hand side of the crane.

WARNING

In the event of fire!

Avoid inhaling the combustion gases since they may be toxic

NOTICE

If the fire extinguishing system is triggered or the hand-held fire extinguisher is used.

As soon as possible, try to wash the machine with the high pressure washer and an alkaline cleaning agent. The extinguishing agent contains a salt solution which corrodes the engine parts and the cleaning agent removes the binding agent in the extinguishing foam.

If the fire alarm sounds or flashes without you thinking there may be a fire, or if you suspect smoke: stay calm.

Do not engage the parking brake, but evacuate the machine and localise the situation before you initiate the emergency stop on the right-hand side of the tractor at the rear edge of the engine compartment.

For more information, see 13.3 *Fire extinguishing system*, page 176.

NOTICE

Contact an authorised Gremo service workshop, or a service workshop authorised by Fogmaker International AB, for refilling and inspection of the fire extinguishing system.

NOTICE

Always bear in mind the danger of fire, and keep the machine clean. Check the fire extinguishing equipment as in the instructions.

2.21 Warning signs

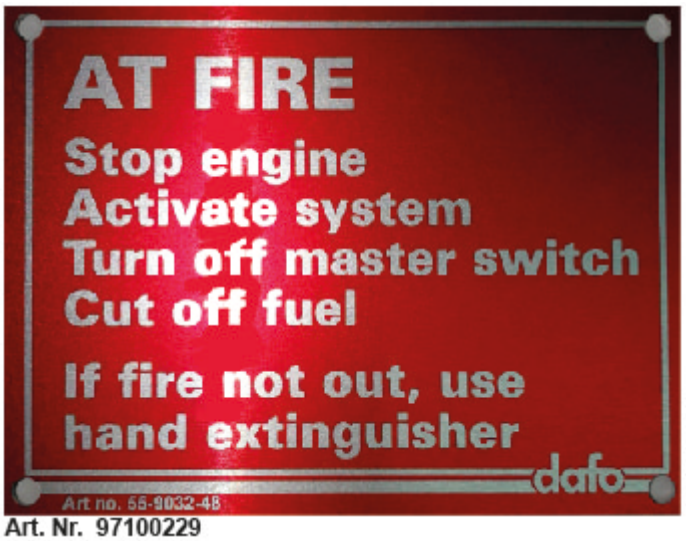
⚠ CAUTION

Ensure that warning and information signs on the machine and its components are always visible and readable. Clean dirty signs and replace signs that are damaged, are unclear or painted over.

New signs can be ordered from your service dealer or Gremo AB.

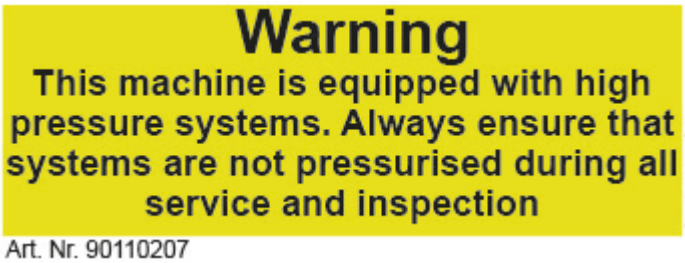
2.21.1 In the cab

Fig. 24 The following warnings signs can be found on the right inside the cab door:



Art. Nr. 97100229

Fig. 25 Warning sign in the event of fire



Art. Nr. 90110207

Fig. 26 Warning sign for high pressure

Art. Nr. 604530

Fig. 27 Operator information for Fogmaker extinguishing system

Fig. 28 Operator information hand-held fire extinguisher

2.21.2 On the machine

Fig. 29 The following warning signs for crushing injuries can be found on the right and left sides of the machine:

Fig. 30 Warning sign for crushing injuries, moving gate

Fig. 31 Warning sign for crushing injuries, moving mid-section

Fig. 32 Protective cover for controlling cab tilt

The following warning signs can be found on the protective cover for controlling cab tilt on the left side of the machine:

Art. Nr. 90110207

Fig. 33 Warning sign for crushing injuries under cab

2.21.3 In the engine compartment

The following warning signs can be found in the engine compartment:

Fig. 34 Engine compartment, left side

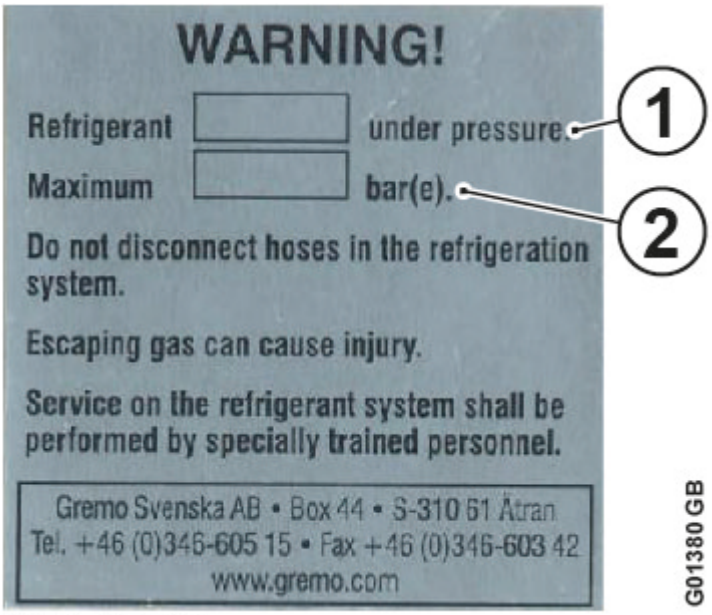
1. Warning for rotating objects
2. Warning sign for crushing injuries under cab

Fig. 35 Engine compartment, right side

1. Warning for rotating objects
2. Warning for air conditioning system

Art. Nr. 90110207

Fig. 36 Warning for rotating objects



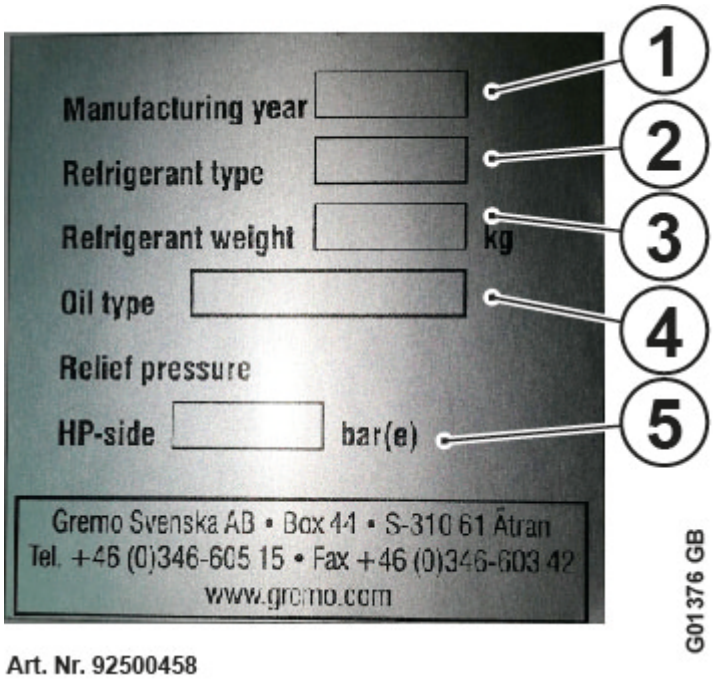
Art. Nr. 92500457

Fig. 37 Warning for air conditioning system

1. Type of refrigerant
2. Max. pressure

NOTICE

Special authorisation is required by the person refilling the refrigerant in the air conditioning system (observe national and local regulations).



Art. Nr. 92500458

Fig. 38 Information sign for air conditioning system

1. Year of manufacture
2. Type of refrigerant
3. Amount of refrigerant
4. Type of oil
5. Pressure in bar

2.21.4 On the crane

The following warning signs can be found on the crane:

Fig. 39 Crane danger area

Fig. 40 Permitted load (example)

2.22 Recovery and towing

Fig. 41 Machine's towing eyes

1. Towing eye, front
2. Towing eye, rear

As the gearbox is not lubricated during towing, the towing speed must not exceed 5 km/h and the towing distance must not exceed 10 km.

If the machine is unable to move by its own power or winch, then it must be salvaged.

Attach the wire or the rope to the appropriate towing eye and pull carefully.

DANGER

All towing or winching with cables entails danger to life. If the wire breaks or the hook slips while you winch, it will result in a whiplash effect. The cable may lash at an angle or backwards along its entire length!

Risk distance 100 m.

WARNING

There is a large risk of personal injury if substandard towing equipment or incorrect methods are used during recovery/towing. Therefore, always ensure you use towing equipment that can cope with the forces that arise and plan the recovery/towing thoroughly before commencing.

WARNING

If the machine has tipped over onto one side, you should immediately let a Gremo-authorised workshop check the operator’s cab. The cab is your best protection, but the protective effect is decreased by a distorted cab.

NOTICE

Don’t attach the pulling cable/rope to the operator’s cab if the machine has capsized! The cab might become distorted!

If the machine has capsized, pull it up using wires/straps attached to the anti-skid chains, bogie cases or bunks.

NOTICE

If the engine has been submerged in water, an authorised service dealer or the Gremo AB service department must be contacted before the engine is started.

NOTICE

In order for towing to take place, the brakes must first be disengaged, see 2.9.1 *Manual release of parking brake*, page 21, and the hydrostatic motor disassembled, see 2.22.1 *Disassembling the hydrostatic motor*, page 46.

NOTICE

You should use the remaining traction of the machine by carefully letting the machine pull, with a reduced setting on the speed potentiometer. Otherwise the brakes will not be released, which results in unnecessary loads on the towing eyes and wire.

2.22.1 Disassembling the hydrostatic motor

WARNING

Before starting the work of removing the hydrostatic motor, ensure that the machine's wheels are locked to prevent it from rolling.

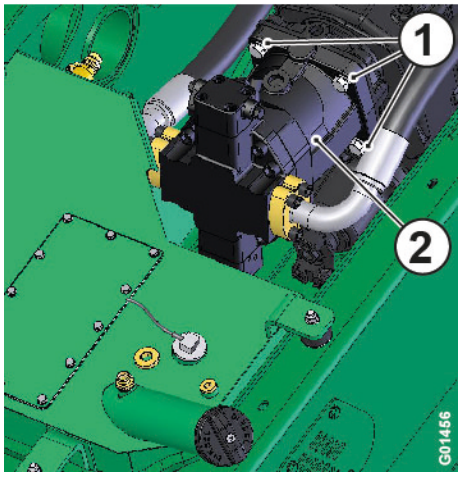


Fig. 42 Hydrostatic motor

1. Remove the screws holding the hydrostatic motor in place on the gearbox.
2. Pull the hydrostatic motor out of the gearbox so that the shaft is not in contact with the sleeve.
3. Fix the hydrostatic motor so that it is not damaged during towing.

NOTICE

The hydrostatic motor must be turned slightly to move it past the diesel tank when it is pulled out.

2.23 Winch

DANGER

The winch (optional equipment) is not approved for suspended loads. If a load is hoisted, e.g. by means of a pulley, it is dangerous to stand under the load.

DANGER

All towing or winching with cables entails danger to life. If the wire breaks or the hook slips while you winch, it will result in a whiplash effect. The cable may lash at an angle or backwards along its entire length!

Risk distance 100 m.

2.24 Engine and cab heater

WARNING

The heater must not be used in enclosed spaces such as garages, workshops, etc. unless the exhaust manifold of the heater is connected to an exhaust removal system.

WARNING

The heater must not be used at petrol stations or other places where the use of open fire is prohibited.

CAUTION

Risk of fire!

Ensure that you keep the heater and its exhaust system clean, this also applies to the whole machine.

2.25 Anti-skid chains

When putting on anti-skid chains on wheels which have been raised with the bogie lift, never walk under the machine without first having palleted up the wheel, as there is a risk of the machine sinking.

2.26 Bogie tracks

⚠ CAUTION

Observe the fitting instructions from the track manufacturer.

Remember the risk of getting your fingers or hands jammed.

⚠ WARNING

The bogie lift can be used as a lifting aid during service and repairs, but always prop up the machine.

2.27 Risk of strain-related injury

In order to avoid that shoulders and neck are exposed to strain during long working periods, you should regularly take micro breaks (a few seconds) and normal breaks (a few minutes). Change of tasks is another possibility to reduce the risk of strain-related injury.

2.28 Noise

The A-weighted sound pressure level at the working location does not exceed 70 dB(A). The reading is based on measurements taken in conjunction with the type approval of Gremo 1050F/1450F. Meets requirements as per VVFS 2003:17 (max 80 dBA in cab).

3 Environment and environmental considerations during off-road operations

3.1 General

Our global environment is strongly affected by the world's increasing level of industrialisation. Nature, animals and humans are exposed daily to high risks when handling chemicals in various forms.

There are still no non-toxic chemicals such as oils and refrigerants on the market. Therefore, anyone handling, servicing or repairing machines must use the tools and methods necessary to protect the environment in an environmentally responsible manner.

No machine system is environmentally-friendly over time without proper maintenance. It is of the utmost importance to follow the safety and environment instructions that can be found in this manual. Also carefully observe the maintenance instructions available and be careful to follow the service intervals. A well-maintained machine uses less fuel and rarely breaks down, which leads to less pollution and better productivity for the owner.

You can help to protect our environment by complying with the following simple rules:

3.1.1 Cleaning

When cleaning the machine you should only use prepared wash areas with oil separators. Avoid using detergents that are hazardous to the environment.

3.1.2 Recycling

Carefully planned recycling of the machine is the basis for correctly ending its life cycle and being able to reuse materials in new products. According to our calculations, more than 90% of the machine's weight is recyclable.

3.1.3 Hazardous waste

Components such as batteries, oils and other chemicals, as well as other items that may be hazardous waste, should be disposed of in an environmentally-safe manner.

Discarded batteries contain substances that are harmful to health and the environment and must therefore be handled in an environmentally-safe manner and in accordance with national regulations.

3.1.4 Oils and fluids

Oils dumped on the ground will cause damage to the environment and may also cause fire. Measures must therefore be taken to avoid spillage when emptying and draining oils or fuel.

Waste oils and fluids should always be taken care of by an authorised company.

Be aware of leaks of oil and other fluids! Repair any leaks immediately.

3.1.5 Air conditioning system

The refrigerant in the cab's air conditioning system accelerates the greenhouse effect if released into the open air. All service work on the air conditioning system requires special training. Authority certification is also required in many countries to carry out such work. When the air conditioning system is scrapped, the refrigerant must be treated by a certified company.

3.1.6 Declarations

The machine does not contain asbestos.

The machine's batteries and wiring contain lead.

R134a refrigerant is used if the machine is equipped with an AC system.

3.2 Environmental considerations during off-road operations

3.2.1 Tips and advice for off-road operations

There are many ways to influence the impact off-road operations can have on the environment. Good planning is a basic requirement toward reducing the environmental impact of forwarding operations, as well as other forestry measures. Development of both small and large scale working methods and new technical solutions can help reduce the environmental impact of operating in forests.

How to conduct off-road operations:

1. **In planning your route, pay attention to ground, water, ancient monuments and other cultural monuments.**
2. **Do not operate in waterways, on the edge of lakes, in water springs or wetlands. Avoid operating directly in conservation areas and do not drive windblown and dead trees.**
3. **Reduce ground damage near waterways by:**
   - Operating as far away from the water as possible.
   - Reinforce the ground where operation is necessary and where there may be a risk of damage.
   - Take advantage of the crane's reach and pile the timber away from waterways. This is also the case when it comes to cultural and ancient monuments.
4. **Crossing waterways and dikes:** Avoid operating over waterways if possible. Consider whether extending the road and building a permanent bridge over the waterway might be a good idea.

   Waterways: If a crossing is unavoidable, this should be done at the most appropriate crossing point using technical aids (portable bridges, timber mats, wooden bridges or similar depending on the size and nature of the waterway), preferably without the machine coming into contact with water. The bridge entry and exit ground is protected, for instance, by timber mats, corduroy bridges and branches. Laying timber and branches in waterways should not be the first option when it comes to technical aids.

   Functional dike systems (does not apply to straightened parts of natural waterways, as these are part of the natural waterway): The easiest way to avoid damage is, for example, to use portable bridges. It is important that the edges are stable or reinforced to avoid damage that causes sludge release. Timber is only used in exceptional cases to construct a crossing over ditches and it must always be removed afterwards to avoid clogging the waterway. Damage to dike

systems is prevented to protect downstream waterways and maintain the dike's working order. Technical aids are left in place if possible (if they do not block the waterway) or are available to allow future crossing if needed.

5. **Drive around wet and marshy areas, dead peat bogs and conservation areas:** Forwarding operations should take place at a distance that prevents wheel ruts which might affect the water conditions or damage the roots of trees in the conservation area. If there is a need to cross bogs and conservation areas, the ground should be reinforced with timber and branches, or it is best to travel the ground when it is frozen.
6. **Felling in productive peat bogs:** The ground structure and basic conditions place high demands on planning and technology. Forwarding operations are planned so that the inward and outward flow of water is not affected by avoiding crossings over swampy areas, natural waterways and dikes as much as possible. Necessary crossings are carried out according to point 4 above. Basic tracks and access roads are protected and reinforced with timber and/or branches. If possible, use machines with lower ground pressure. There are also band tracks and tyres adapted for peat bog conditions. If possible, felling should be carried out when the ground is frozen.
7. **Forest residues and tree stumps are only harvested to the extent that prevents serious ground damage:** Do not harvest tree stumps in basic tracks.

Source: www.skogsindustrierna.org

4 Instruments and controls

4.1 Cab overview

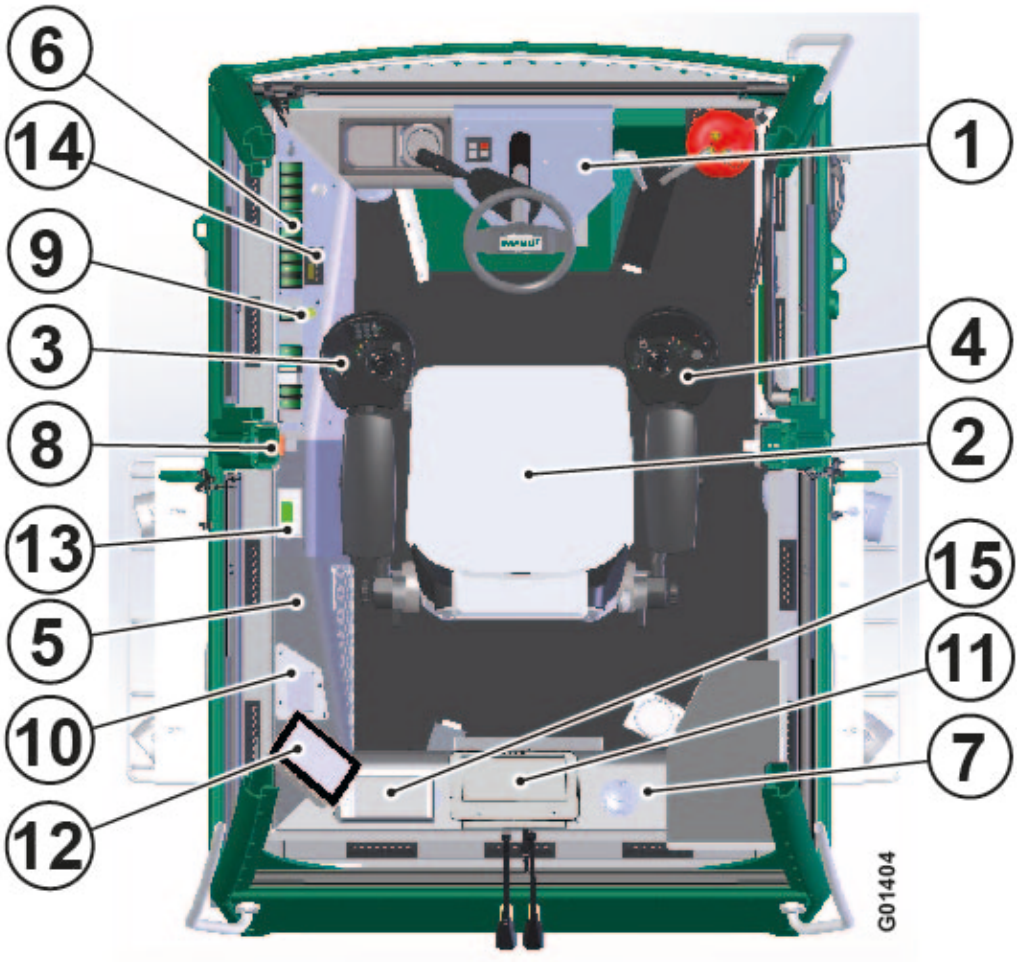


Fig. 43 Cab overview

1. Steering wheel panel
2. Operator’s seat
3. Left armrest panel
4. Right armrest panel
5. Side panel
6. Switches on side panel
7. Rear panel
8. Emergency stop
9. GreControl warning
10. Fire extinguishing system's central unit
11. Computer (optional equipment)
12. Display for control system
13. Control panel for climate system
14. Timer for the diesel heater
15. Display for vision camera

4.2 Functions at the steering wheel panel

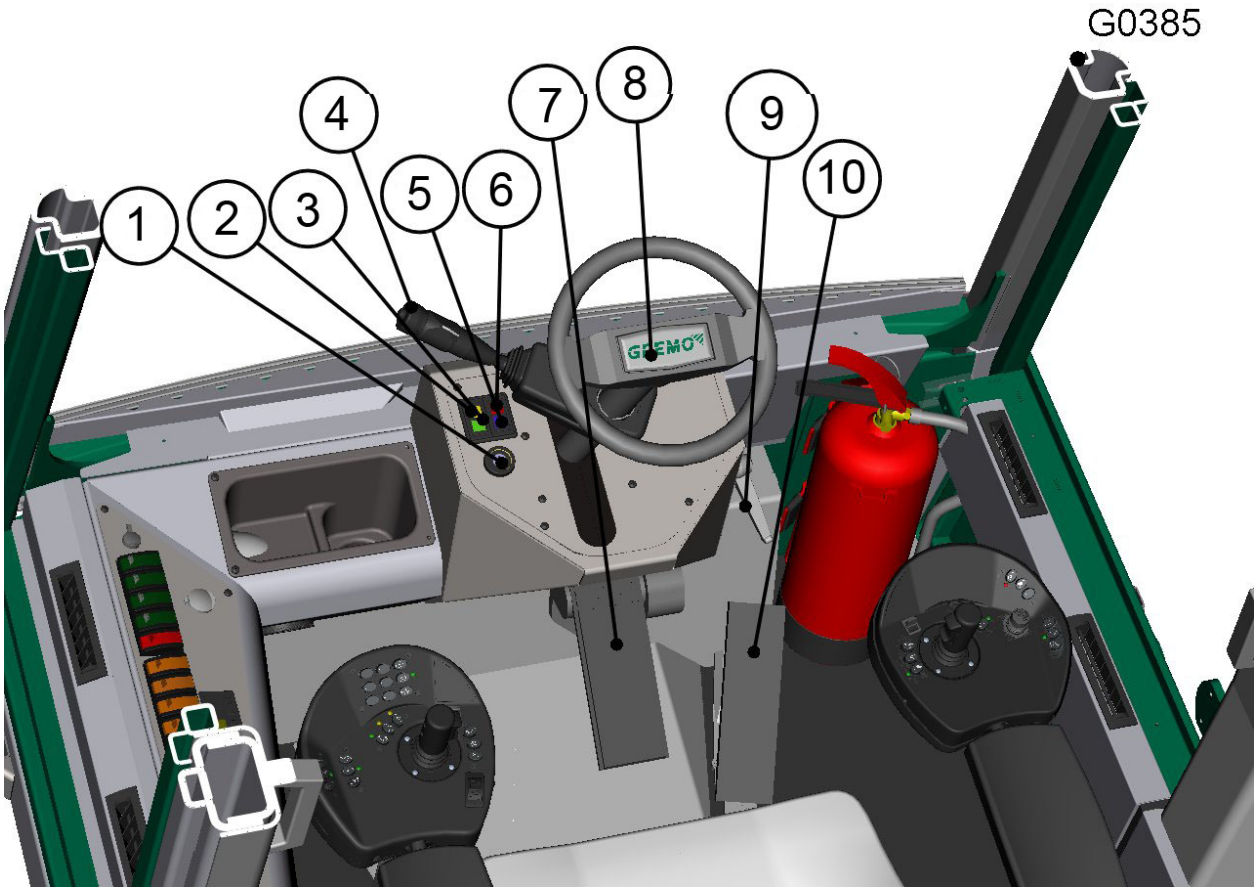


Fig. 44 Steering wheel panel

1. Ignition lock
2. Indicator lamp, off-road steering (yellow light when off-road steering is enabled)
3. Indicator lamp, indicators
4. Indicator switch, horn, full/dipped beam, front window wipers, front window intermittent wiper
5. Indicator lamp, full beam
6. Indicator lamp, charging
7. Brake pedal
8. Steering wheel
9. Latch for steering wheel inclination
10. Drive pedal (see also rear drive pedal)

4.3 Functions on the side panel

1. Driving lights (centre position: parking)
2. Hazard warning lights
3. Food heater
4. Off-road steering mode (activate function on the right armrest panel)
5. Main power switch (30 seconds delay when switching off)
6. Working lights roof, front
7. Working lights roof, sides
8. Timer for the diesel heater
9. Working lights: low sidelight
10. Working lights roof rear
11. Working lights: rear ramp
12. Interior light and removable lamp (outside) (the lamp is stored in the front left side hatch of the cab)
13. GreControl warning light (comes on when GreControl indicates a warning)
14. Computer (operational follow-up and GIS) (optional equipment)
15. Wiper left side window (optional equipment)
16. Wiper right side window (optional equipment)
17. Wiper, rear window (front window) (centre position: interval wiper)
18. Power socket 24 V
19. Power socket 12 V (cigarette lighter socket)
20. Extra switches
21. Extra switches
22. Extra switches
23. Extra switches
24. Extra switches

Fig. 45 Side panel

4.4 Left arm rest panel functions

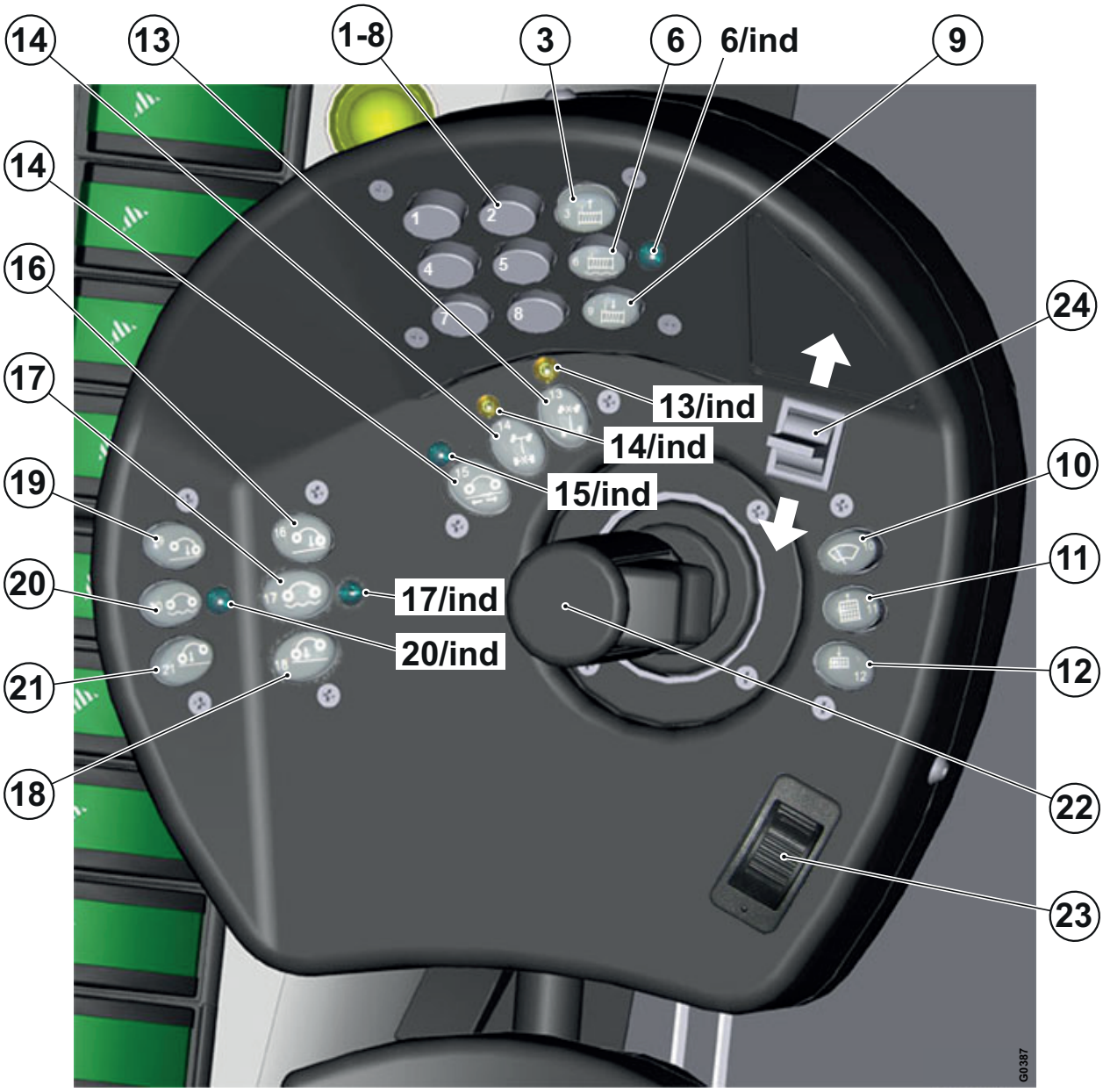
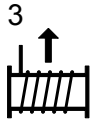
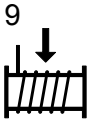
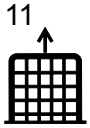
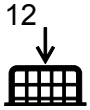


Fig. 46 Left armrest panel

ID	Function	Comments
1–2 4–5 7–8	Extra buttons	
3 	Winch out	

ID	Function	Comments
6 	Winch disconnection	
6/Ind	Green LED	Comes on when winch is disconnected
9 	Winch in	
10 	Windshield wiper, instantaneous	
11 	Gate upright, tall	
12 	Gate folded, low	
13 	Differential lock, front axle	The differential lock is activated when the button is pushed for a short period (0.6 sec.). The function is deactivated by a new short push on the button.
13/Ind	Yellow LED	Comes on when the differential lock (front axle) is engaged.
14 	Differential lock, rear axle	The differential lock is activated when the button is pushed for a short period (0.6 sec.). The function is deactivated by a new short push on the button.
14/Ind	Yellow LED	Comes on when the differential lock (rear axle) is engaged.
15 	Shift bogie; left-right/ parallel	Shifts between the two modes by pushing the button for 1.5 seconds. 0) Mode: Bogie; left-right: Buttons 16, 17 and 18 operate the bogie on your right side[1], while buttons 19, 20 and 21 operate the bogie on your left side[1] 1) Mode: Bogie; parallel: Buttons 16, 17 and 18 operate both the right and left bogies simultaneously.
15/Ind	Green LED	Comes on when Mode: Bogie parallel is active (1)

1. Irrespective of which way the seat is facing

ID	Function	Comments
16 	Bogie lift	Front bogie wheel on your right side[1] moves downwards.
17 	Bogie lift Float mode/ activation	Float mode is activated on the bogie on your right side or on both bogies if LED 15 comes on.
17/Ind	Green LED	When the lamp comes on, the bogie lift on your right side[1], or both sides, are activated. The float mode is disabled when it is off.
18 	Bogie lift	The rear wheel on your right side[1] moves downwards.
19 	Bogie lift	The front wheel on your left side[1] moves downwards.
20 	Bogie lift Float mode/ activation	Activates float mode function on left bogie[1].
20/Ind	Green LED	When the lamp comes on, the bogie lift on your left side[1] is activated.
21 	Bogie lift	The rear wheel on your left side[1] moves downwards
22	Left Crane Controls	Controls the crane.
23	Speed potentiometer	Affects the machine's speed and pulling power.
24	Direction selector (switch)	Three settings: 'forward'-'neutral'-'rear'. The machine moves in the direction where the selector points, independently of how the operator's seat is positioned. If the machine is started in the forward or reverse setting, the direction selector must be placed in neutral before the machine can be moved.

4.5 Functions on the right armrest panel

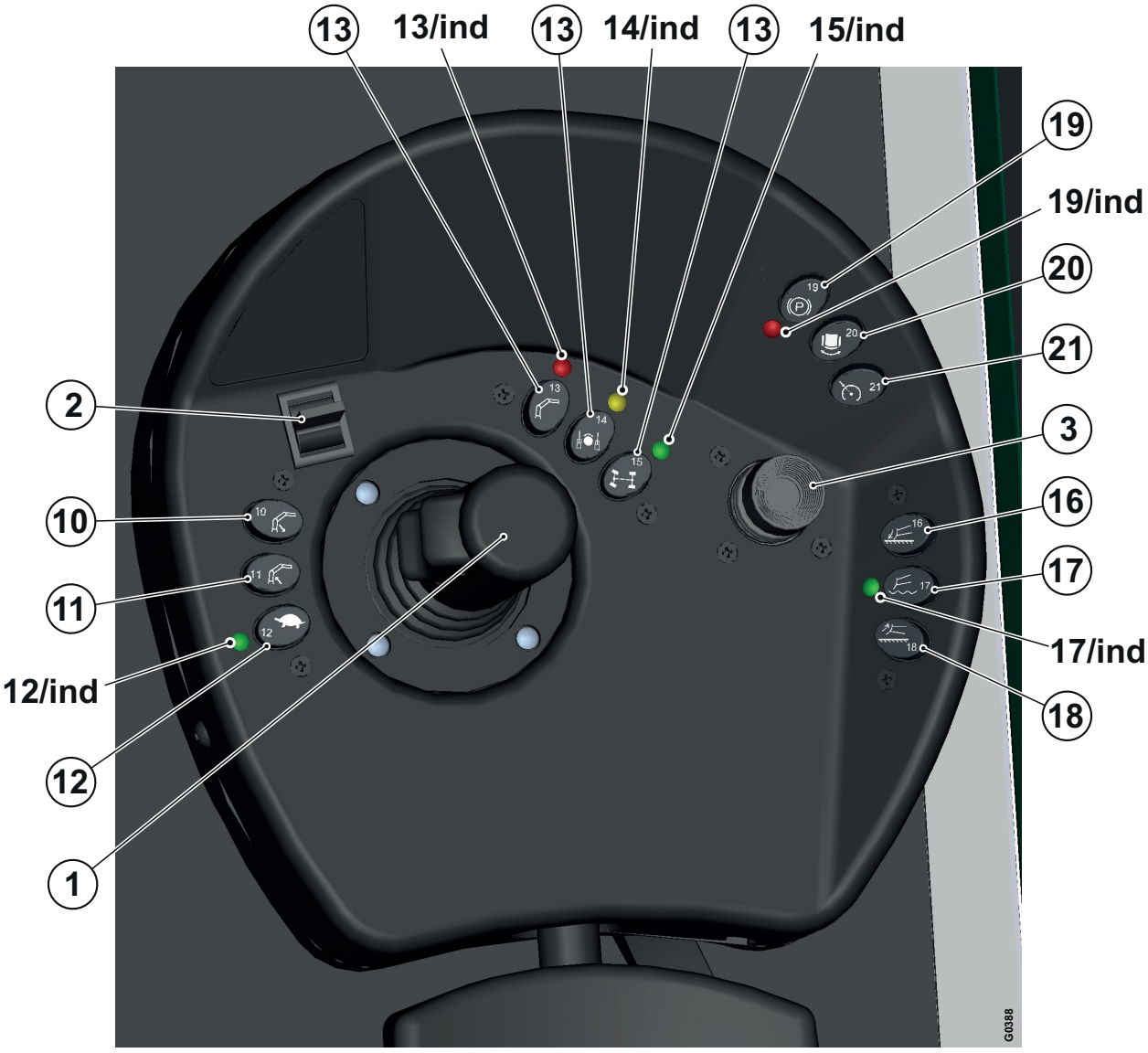


Fig. 47 Functions on the right armrest panel

ID	Function	Comments
1	Right Crane Controls	Controls the crane.
2	Gear Selector	The Gear Selector has two positions: - towards you = 1st gear - away from you = 2nd gear.
3	Off-road steering lever	Regulated in side, left and right swings.
10 	Crane tilt down	

ID	Function	Comments
11 	Crane tilt up	
12 	Normal speed/off-road speed	Shifts between normal and off-road speed at the touch of a button. See 5.14.7 *Example: Pedal filter*, page 114 for setting percentage of transmission power in off-road position. Activated by a short push.
12 Ind	Green LED	Comes on when Off-road speed is selected (button 12).
13 	Crane operation, seat facing forward	When this function is activated, with a long (1.5 sec) press of the button, the crane can also be operated with the seat facing forward.
13 ind	Red LED	Comes on when ”crane operation seat facing forward” is activated.
14 	Articulated joint lock Open/locked	The articulated joint lock is activated with the press-hold function whilst the machine is in motion. It is deactivated by releasing the button. The second function is activated when the machine is at a standstill and the operator gives a brief press, then the articulated joint lock opens. For example, when unloading.
14 Ind	Yellow LED	The light comes on when the articulated joint lock is active, while the machine is being driven forward/in reverse
15 	Wagon drive	Wagon drive is activated with a long (2 secs) press.
15/Ind	Green LED	The lamp lights up when the wagon drive is activated.
16 	Blade down	
17 	Float mode Dozer blade active	
17/Ind	Green LED	Comes on when float mode dozer blade active is activated (button 17).
18 	Blade up	
19 	Parking brake	Activate the parking brake when the machine is turned off. The button also controls the ladder and the fire extinguishing system.

ID	Function	Comments
		By activating the parking brake the fire extinguishing system is set to fully automatic.
19/Ind	Red LED	Comes on when the parking brake is activated (button 19).
20 	Seat brake	
21 	Cruise control	The function is started with a long press (2 secs) and the speed is locked with a short press. The next time a short press is given, a new speed is saved. The act of braking or accelerating cancels the speed lock. Deactivation is done through a further long press (2 secs).

4.6 Crane control levers

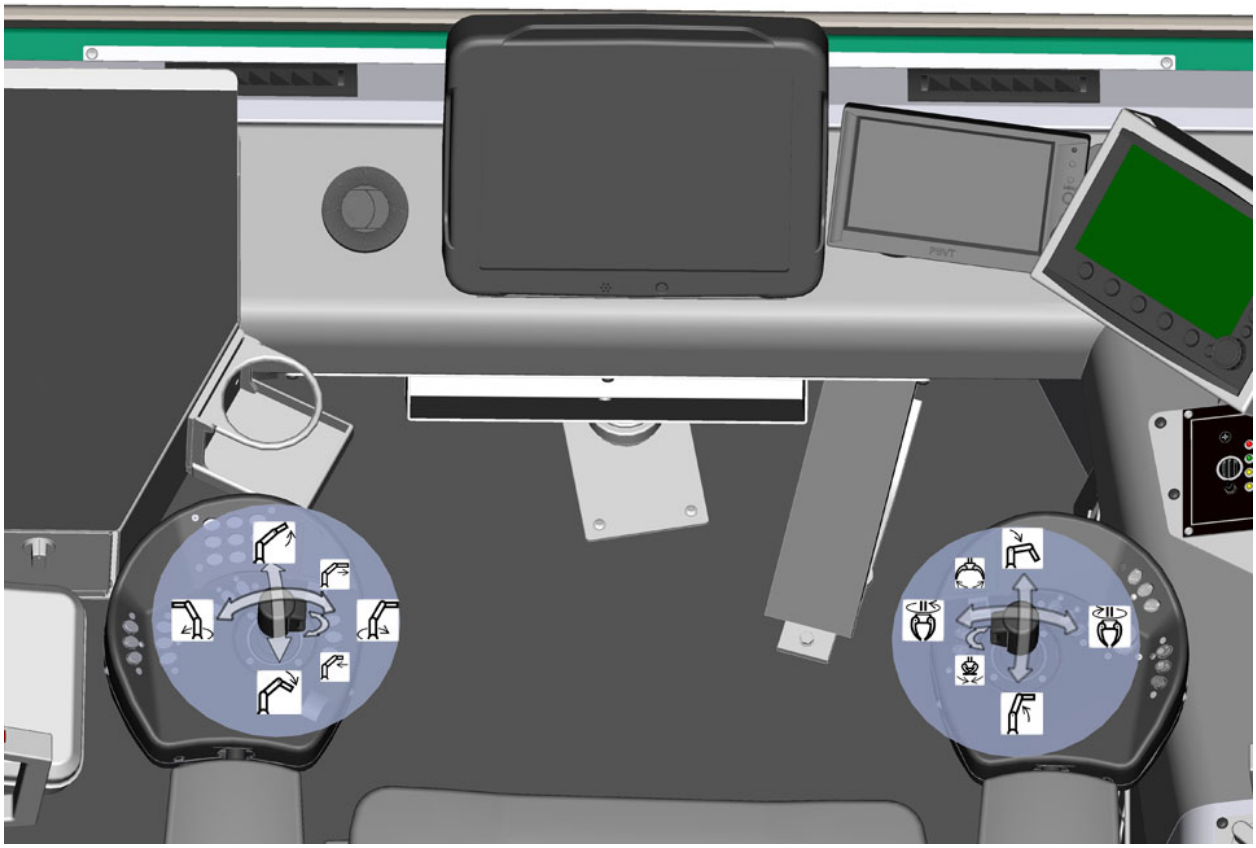
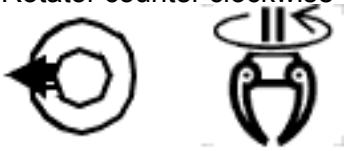
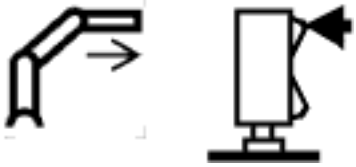
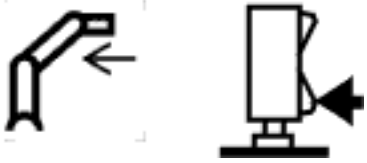


Fig. 48 Crane control levers

Crane control levers affecting crane

When the seat is facing rearward (toward the crane, i.e. not in the normal direction of travel) the crane is operated

by lever 22 (on the left armrest panel) and by lever 1 (on the right armrest panel) as above. The crane can also be operated via the crane controls in the same way when the seat is facing forward (facing the steering wheel, i.e. in the normal direction of travel) if button ”Crane operation seat facing forward” (13 on the right armrest panel) is activated.

Function/Left lever	Right lever/Function
Outer boom out 	Lifting boom down 
Outer boom in 	Lifting boom up 
Slewing counter clockwise 	Rotator counter clockwise 
Slewing clockwise 	Rotator clockwise 
Boom extension out 	Grapple open 
Boom extension in 	Grapple close 

4.7 Functions at the rear panel

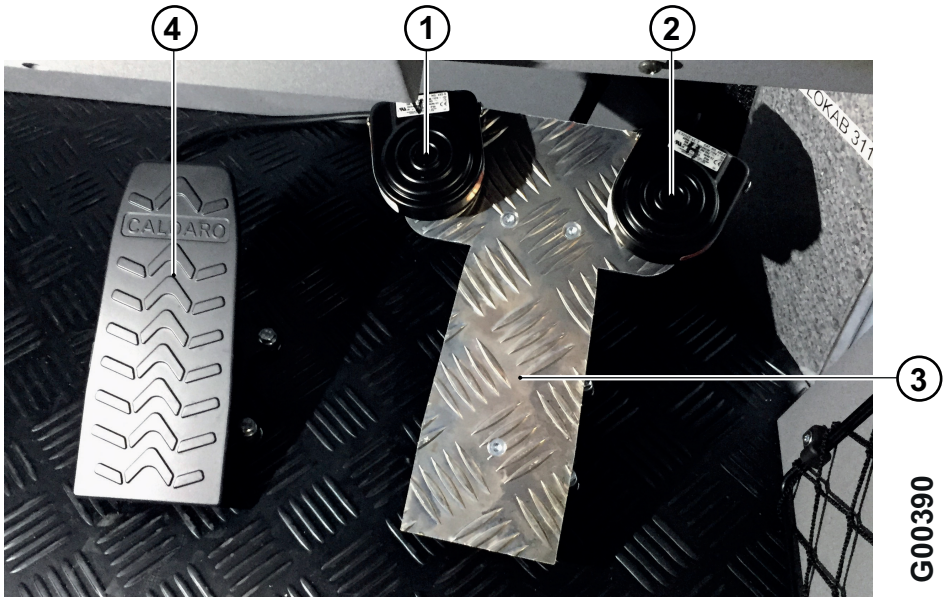


Fig. 49 Functions at the rear panel

ID	Function	Comments
1	Forward pedal	Selects driving direction forward, when the drive direction selector (on the left armrest panel) is in neutral.
2	Back pedal	Selects driving direction reverse, when the drive direction selector (on the left armrest panel) is in neutral.
3	Drive pedal	The drive pedal acts on both the steering system's operational revs and the machine's driving speed in the following way: • if the crane controls are not activated, the drive pedal functions like a regular accelerator pedal. • if the crane controls are being used, the preset operating revs are active (e.g. 1300 rpm): when the Drive pedal is activated, it operates like a speed control. In this mode, it interacts with the speed potentiometer (on the left armrest panel) in such a way that the machine's maximum speed corresponds to the set value on the speed potentiometer. If the Drive pedal is pressed even further, not only will speed increase, so too will engine revs.
4	Brake pedal	

4.8 Functions on the control panel of the air conditioning system

Fig. 50 Control panel for air conditioning system

ID	Function	Comments
1	Temperature	The temperature is set with these keys and the controlled range is between 16°C and 28°C. If the lower key is set to the coldest position, then the temperature will be set to a minimum and the heat valve will be closed. If the upper key is set to the warmest position, the temperature will be set to a maximum and the heat valve will be open.
2	Fan speed	Fan speed is set with these keys.
3	AUTO	
4	AC - ON/OFF	Activates/switches off the air conditioning compressor.
5	Air circulation	Selection of outside air or recirculation. Use the recirculation mode only for rapid heating and cooling.
6	Maximum defrost	This button activates and deactivates Maximum defrost. Push the button once to activate, defrost will then be run automatically for 5 minutes or until the button is pushed again to deactivate. Maximum defrost automatically activates full fan speed, maximum heat and the cooling compressor.

4.9 Fire extinguishing system: Central unit

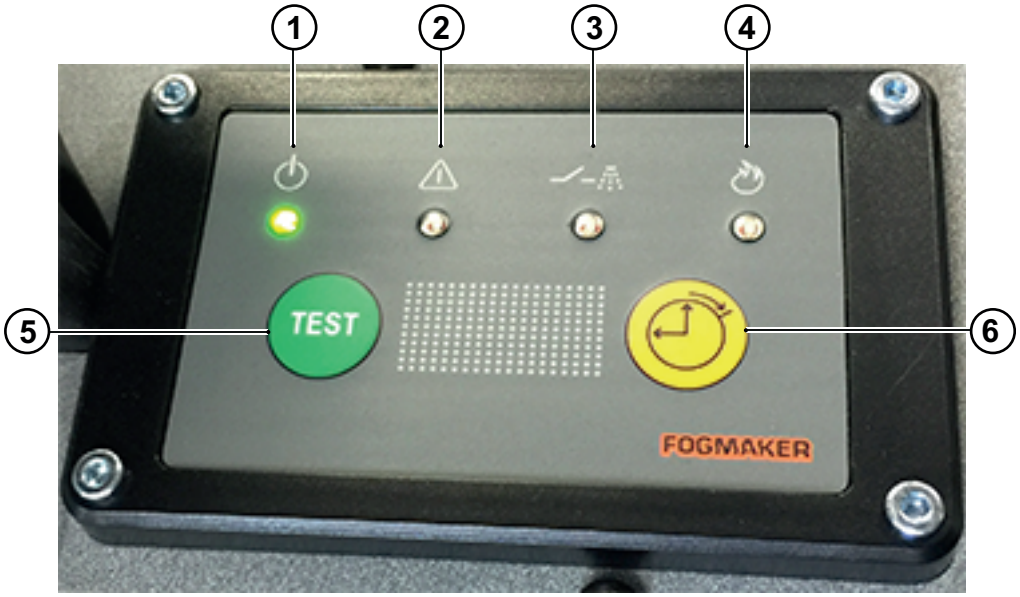


Fig. 51 Fire extinguishing system: Central unit

ID	Function
1	Green LED for operation indication, indicates that the alarm panel is supplied with power.
2	Yellow LED. Comes on when the pressure in the extinguisher tank (pressure <80 bar) or detector cylinder (pressure <14 bar) is too low. If the diode comes on, check the pressure in the fire extinguisher tank.
3	Yellow LED, comes on if the system is semi-automatic and is off when the system is fully automatic. The extinguisher will not be triggered in this case until the operator carries out an active step, for example, switches off the ignition, gets up out of the chair or engages the parking brake.
4	Red LED, indicates a fire in the engine compartment (pressure switches 1 and 2 have opened). The extinguisher will be triggered if the system is fully automatic.
5	FUNCTION TEST: Press the button marked "TEST". All four lights should come on and the built-in buzzer should beep. If any external alarms are connected, these will also be activated. The alternating relay is NOT activated.
6	Engine shutdown delay button. The button can be used repeatedly, but is not enabled if delayed engine shutdown is not connected.

5 User manual for GreControl control system

5.1 Introduction

This user manual describes the functions in GreControl. The description may be different to the version in the current machine and Gremo reserves the right to make changes without prior notification.

5.2 Unit structure

The control system has a main unit with a colour screen. From here the settings are made and the current information is displayed. To enter data, there are a number of buttons grouped as follows:

Fig. 52 GreControl, main unit

	Function buttons
	Menu selection buttons
	Menu Used to enter the main menu to carry out basic system settings.
	Home Back to the main window
	Back Used to return to the previous page
	Confirm Used to confirm the current value
	Close Used to close the current page

5.2.1 Language settings

The unit can be set for several different languages. Set the language as follows:

- Press  to select the main menu.
- Press *Settings*.
- Press *Language*.
- Select the desired language.
- Use  to return to the previous page or  to return to the main window.

The language can be changed at any time.

5.2.2 Setting the date

Dates are set as follows:

- Press  to select the main menu.
- Press *Settings*.
- Press *Date/time*.
- Then press *Date*.
- Set the correct year by pressing + or - and then confirm by pressing  .
- Set the correct month by pressing + or - and then confirm by pressing  .
- Set the correct date by pressing + or - and then confirm by pressing  .
- Press  to return to the previous page, or  to return to the main window.

Note that time can also be set in the same menu

5.2.3 Setting the time

Time is set in the following way:

- Press  to select the main menu.
- Press *Settings*.
- Press *Date/time*.
- Then press *Time*.

- Set the correct hour by pressing + or - and then confirm by pressing  .
- Set the correct minute by pressing + or - and then confirm by pressing  .
- Press  to return to the previous page, or  to return to the main window.

Note that dates can also be set in the same menu.

5.3 Main window

The main window consists mainly of three areas;

- The upper area with indicator lamps
- The centre area with instrumentation
- The lower area with menu selections

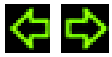
5.3.1 Indicator lamps

Fig. 53 GreControl, indicator lamps

Fig. 54 GreControl, indicator lamps

The indicator lamps in the main window show the following from left to right:

- Pre-heating  is shown during active pre-heating
- Current allowable transmission percentage
- Date and time
- Differential indication  left = rear and right = front
- Direction

   indicates in which direction the machine's direction lever is set. If the machine is in neutral,  will be displayed.
- Gear Guard

   indicates that the high or low gear is engaged.

   indicates that no gear is engaged.
- Cruise control

   is shown when cruise control is available.
- Engine lamps

  Yellow  = warning and red  = stop.
- All-wheel drive

   is shown when all-wheel drive is activated.
- Gears

Low gear is indicated by and high gear is indicated by . If the adjustable off-road mode is activated, a green line is shown under the symbol. The percentage is the current maximum value

- Bogie lift

  Normally the bogie lift is in float mode which is indicated with the green bogie symbol . When the bogie is locked, a red bogie symbol is shown in the display. One for each side

- Articulated joint lock

  When the articulated joint lock is activated, a red padlock is displayed. An open green padlock is shown if the articulated joint lock is disconnected.

- Parking brake

  A red is displayed when the parking brake is engaged.

5.3.2 Instrumentation

The centre area of the main window displays instrumentation for the following from left to right:

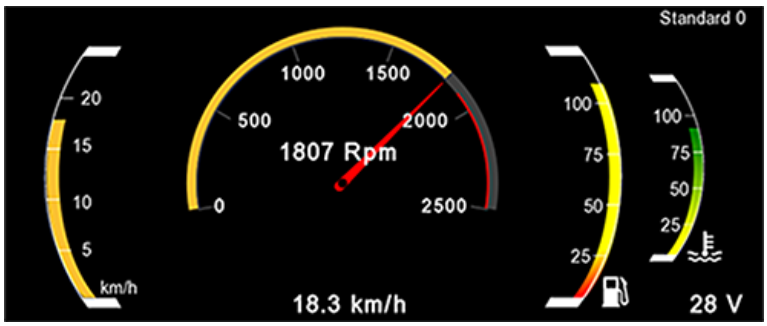


Fig. 55 GreControl, instrument in main window

- The current speed (kph) of the machine.
- Current diesel engine speed (rpm).

NOTICE

The red line indicates the rpm limitation of the engine when the hydraulics are below 15 degrees.

- Tank fuel volume where the red area indicates a low fuel level in tank.

NOTICE

The fuel volume display may fluctuate depending on the inclination of the machine.

- Current temperature of the diesel engine on a relative scale.
- Current operator, name and number.
- Battery voltage.

Other symbols in the main window

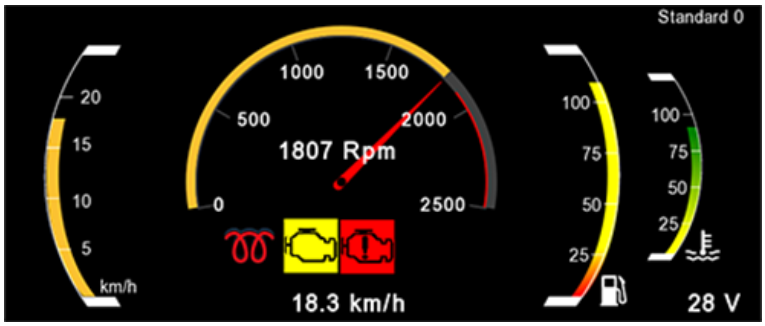


Fig. 56 GreControl, other symbols

- Active pre-heating
- Engine alarm warning
- Serious engine alarm

5.3.3 Menu selection

There are a number of sub-pages to the main window. There are several different ways to access a sub-page and the same information is available, in some cases, on multiple pages. This manual presents one main way to access each of the windows.

The following selections can be made in the main window:

	Engine (Diesel engine, temperature, pressure, hours, etc.), see 5.4 *Engine window*, page 75.
	Transmission (hydrostatic pump, hydraulic motor, gearbox, etc.), see 5.5 *Transmission window*, page 78.

	Hydraulics (Current values for working hydraulics), see 5.6 *Hydraulics window*, page 80	
	Levers, pedals and potentiometer See 5.7 *Levers window*, page 82.	
	Tank levels/Filter See 5.8 *Tank level window*, page 87.	
	Temperatures and pressure See 5.9 *Temperature and pressure window*, page 89.	
	Crane Crane settings, see 5.10 *Crane setting*, page 91.	
	Cab suspension See 5.11 *Cab suspension*, page 93	
	Fuel consumption. See 5.12 *Fuel consumption window*, page 95.	
	Menu window See 5.13 *Menu window*, page 98. • Operation monitoring • Machine service. • Fuel consumption. • Fan control • Brakes • Service code • Intermittent wipers	• Operator options • Crane • Steering • Bogie • Machine settings • Working speed • Pin login • Options
	Main menu for system settings See 5.14 *System settings window*, page 106.	

5.4 Engine window

The engine window can be accessed by pressing  in the main window.

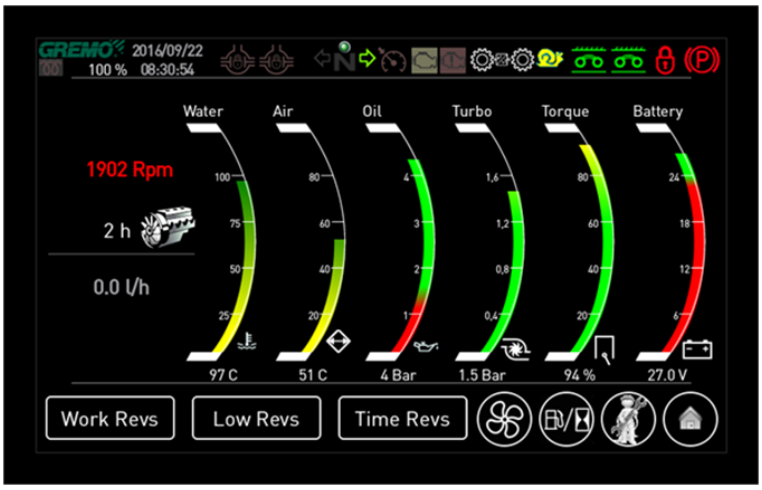


Fig. 57 GreControl, engine window

The window for the engine displays from left to right:

- The current speed (rpm) of the diesel engine
- Engine's operation time in hours
- Current fuel consumption in litres/hour
- Engine temperature in degrees Celsius
- Intercooler temperature in degrees Celsius
- Oil pressure for the diesel engine in bar
- Turbo pressure in bar
- Torque socket in percentage
- Battery voltage in volts

The following menu selections can be made from the engine window:

Work Revs	**Working speed** Setting the working speed. This is set using + or - and confirmed using ✓.
Low Revs	**Low speed** Setting increased reverse idle speed. This is set using + or - and confirmed using ✓.
Time Revs	**Working speed time**

	Setting of the time that the engine runs at working speed from when the levers are released until the engine runs at idle speed again. This is set using + or - and confirmed using  .
	Radiator fan. Opens the window for the cooling fan, see 5.4.1 *Fan control window*, page 76.
	Fuel consumption. See 5.12 *Fuel consumption window*, page 95.
	Machine service. See 5.13.2 *Machine service window*, page 99
	Back to main window

5.4.1 Fan control window

The fan control window is accessed by pressing  in the main window followed by  .

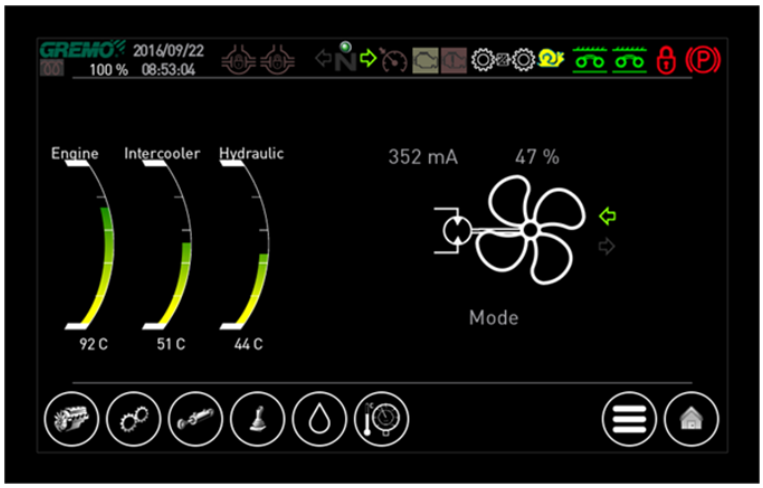


Fig. 58 GreControl, fan control window

The fan control window displays from left to right:

- Water temperature in engine
- Air temperature in Intercooler

- Oil temperature in hydraulic tank
- Existing current out to fan valve (inverted)
- Current fan power as %
- Current air direction through the radiator
- The fan mode can be changed by service personnel only

From the fan control window, a number of menu selections can be made, see5.3.3 *Menu selection*, page 73.

5.5 Transmission window

The transmission window is accessed by pressing  in the main window.

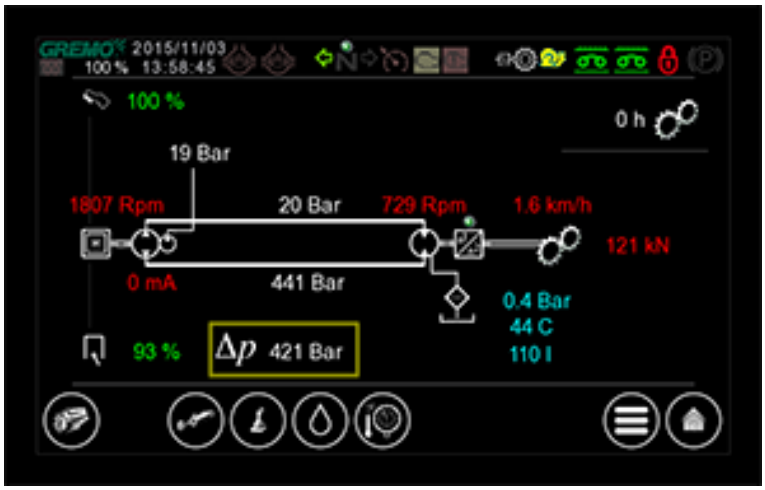


Fig. 59 GreControl, transmission window

The transmission window displays from left to right:

- Pedal value in percentage
- The speed in the hydrostatic pump in rpm
- Output control to the hydrostatic pump in milliamperes
- Torque socket in percentage
- Supply pressure in bar
- Pressure in hydrostatic circuit
- Delta pressure in the hydrostatic circuit
- The hydraulic motor’s speed in rpm
- Gear guard indicator
- The current speed (kph) of the machine
- Transmission filter housing pressure in Bar
- Oil temperature in the hydraulics tank in degrees Celsius
- Oil volume in hydraulics tank in litres
- Transmission’s operation time in hours
- Traction in kilonewtons

The following menu selections can be made from the transmission window

	Engine See 5.4 *Engine window*, page 75.
	Hydraulics See 5.6 *Hydraulics window*, page 80.
	Levers, pedals and potentiometer See 5.7 *Levers window*, page 82.
	Tank levels/Filter See 5.8 *Tank level window*, page 87.
	Temperatures and pressure See 5.9 *Temperature and pressure window*, page 89.
	Main menu for system settings See 5.14 *System settings window*, page 106.
	Back to main window

5.6 Hydraulics window

The hydraulics window is accessed by pressing  in the main window.

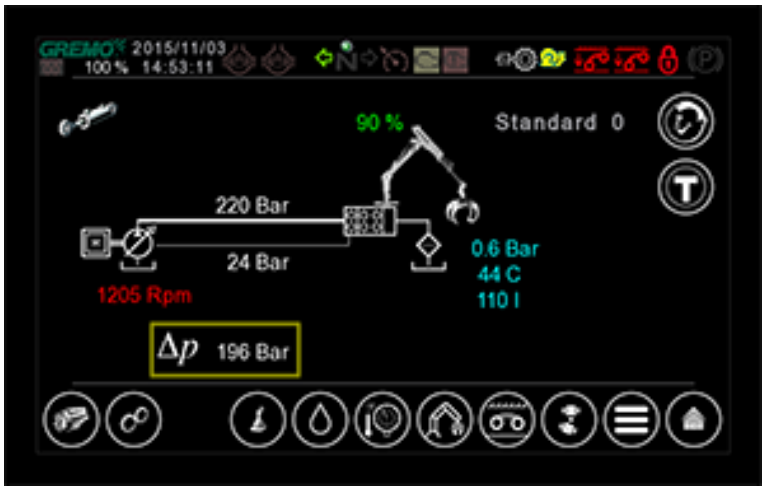


Fig. 60 GreControl, hydraulics window

The hydraulics window shows, from left to right:

- The speed in the hydraulic pump in rpm
- Pump pressure in bar
- Load signal pressure in bar
- Delta pressure in bar
- Crane speed in percentage of maximum current
- Working hydraulic filter housing pressure in Bar
- Oil temperature in the hydraulics tank in degrees Celsius
- Oil volume in hydraulics tank in litres
- Operator name
- Operator number

The following menu selections can be made from the hydraulics window:

	Engine See 5.4 *Engine window*, page 75.
	Transmission See 5.5 *Transmission window*, page 78.
	Levers, pedals and potentiometer See 5.7 *Levers window*, page 82.

	Tank levels/Filter See 5.8 *Tank level window*, page 87.
	Temperatures and pressure See 5.9 *Temperature and pressure window*, page 89.
	Crane Opens the page for crane settings, see 5.10 *Crane setting*, page 91.
	Bogie Opens the page for bogie settings
	Steering Opens the page for off-road steering settings
	Main menu for system settings
	Back to main window
	Change of operator Changing to another operator, as each operator can have individual settings. Operator 0 is the default operator set at the factory. Select there-fore an operator other than 0 to carry out any personal settings. Set the correct operator by pressing + or - and then confirm by pressing  .
	Name or edit name of operator. Enter the desired name and press ENTER.

5.7 Levers window

The levers window is accessed by pressing  in the main window.

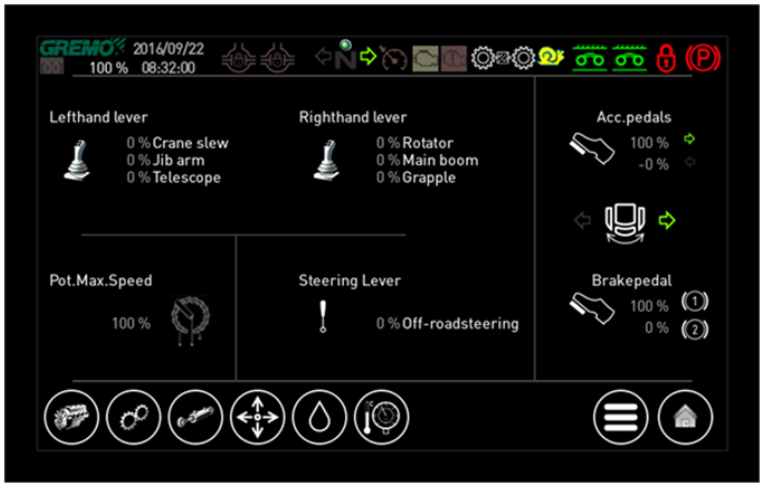


Fig. 61 GreControl, levers window

The levers window displays from left to right:

- Left-hand lever

  Crane slew is 0 in neutral position, -100 at full reach to the left and 100 at full reach to the right outer boom is 0 in neutral position, -100 at full outward reach and 100 at full inward reach Boom is 0 in neutral position, -100 at full inward reach and 100 at full outward reach
- Max. potentiometer speed 0-100 %
- Right-hand lever

  Rotator is 0 in neutral position, -100 at full reach to the right and 100 at full reach to the left Main boom is 0 in neutral position, -100 at full downward reach and 100 at full upward reach Grapple is 0 in neutral position, -100 at full reach closed and 100 at full reach open.
- Control level, off-road steering Shows 0 in neutral position, -100 at full reach to the right and 100 at full reach to the left
- Gas pedal, front and back 0-100% and 0-100% also shows the pedal safety switch
- Seat position shows the active seat switch
- Brake pedal, front with two sensors, 100-0% and 0-100%

The following menu selections can be made from the levers window:

	Engine See 5.4 *Engine window*, page 75.
	Transmission See 5.5 *Transmission window*, page 78.
	Hydraulics See 5.6 *Hydraulics window*, page 80.
	Calibrate Levers Opens the window for lever calibration, see 5.7 *Levers window*, page 82.
	Tank levels/Filter See 5.8 *Tank level window*, page 87.
	Temperatures and pressure See 5.9 *Temperature and pressure window*, page 89.
	Main menu for system settings See 5.14 *System settings window*, page 106.
	Back to main window

5.7.1 Calibrate levers

The window for lever calibration is accessed by pressing  in the levers window.

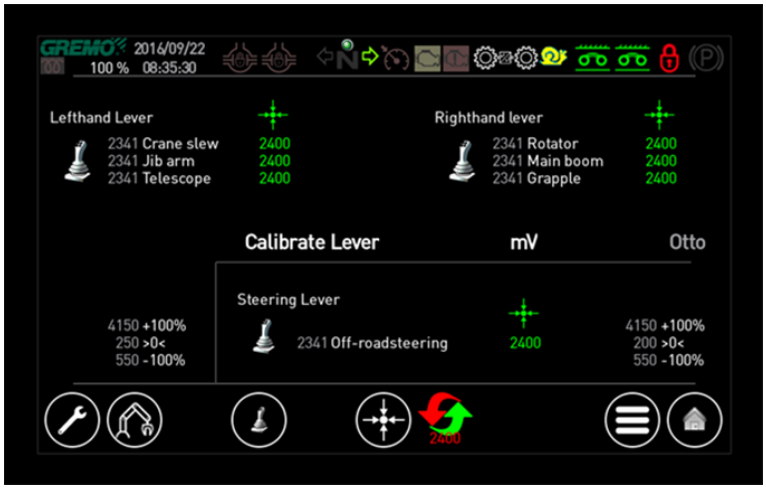


Fig. 62 GreControl, calibrate levers

The Calibrate lever window displays:

- Current voltage value from the respective lever function
- Midpoint of each lever function, green numbers
- Selected Sakae or Otto lever model
- mV when levers operate at +100%
- Deadband at the midpoint +mV
- mV when levers operate at -100%

The following menu selections can be made from the Calibrate lever window:

	Settings Parameter settings for: Lever's Min, Max, Midpoint and deadband
	Crane Parameter settings for the crane and gate, see 5.10 *Crane setting*, page 91.
	Levers, pedals and potentiometer See 5.7 *Levers window*, page 82.
	Calibrate Midpoint Sets the current value as the Midpoint for each function
	Reset Midpoint Sets 2,400 mV as the Midpoint for each function (press for 0.5 seconds).

	Main menu for system settings See 5.14 *System settings window*, page 106.
	Back to main window

5.7.2 Lever settings

The lever settings window can be accessed by pressing  from Calibrate levers.

Fig. 63 GreControl, lever settings

The following is adjusted in the lever settings window:

- Model, Deadband, Max and Min for crane levers
- Deadband, Max and Min for control levers

5.8 Tank level window

The tank level window is accessed by pressing  in the main window.

Fig. 64 GreControl, tank level window

The following tank levels, in litres, are shown from left to right:

- Diesel volume
- Oil volume in hydraulics tank
- Temperature in the hydraulic tank
- Discharge pressure in return filter for hydraulics
- Discharge pressure in return filter for transmission

The following menu selections can be made from the tank level window:

	Engine (diesel engine, temperature, pressure, hours, etc.) See 5.4 *Engine window*, page 75.
	Transmission (hydrostatic pump, hydraulic motor, gearbox, etc.) See 5.5 *Transmission window*, page 78.
	Hydraulics (Current values for working hydraulics) See 5.6 *Hydraulics window*, page 80.
	Levers, pedals and potentiometer See 5.7 *Levers window*, page 82.

	Temperatures and pressure See 5.9 *Temperature and pressure window*, page 89.
	Main menu for system settings See 5.14 *System settings window*, page 106.
	Back to main window

5.9 Temperature and pressure window

The temperature and pressure window can be accessed by pressing  in the main window.

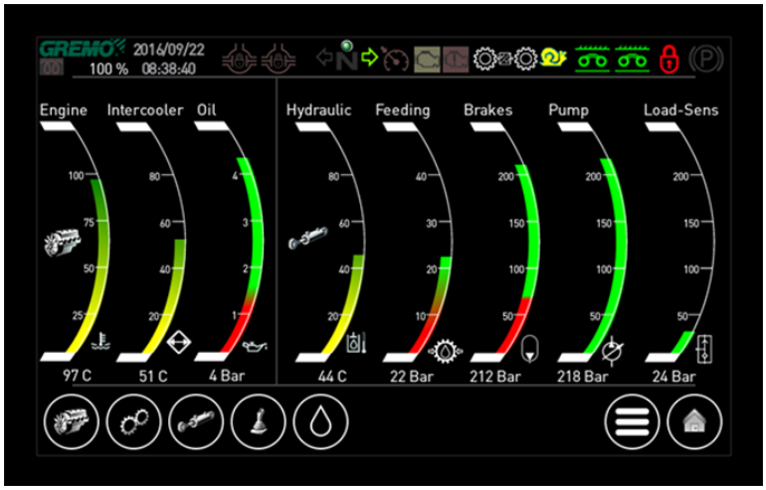


Fig. 65 GreControl, temperature and pressure window

The temperature and pressure window displays the following temperatures in Celsius and pressure in bar from left to right:

- Engine temperature
- Intercooler temperature
- Oil pressure in engine
- Oil temperature in hydraulics tank
- Feeding oil pressure for hydrostat
- Accumulated brake pressure
- Pump pressure
- Load signal pressure

The following menu selections can be made from the temperature and pressure window:

	Engine (diesel engine, temperature, pressure, hours, etc.) See 5.4 *Engine window*, page 75.
	Transmission (hydrostatic pump, hydraulic motor, gearbox, etc.) See 5.5 *Transmission window*, page 78.
	Hydraulics (Current values for working hydraulics) See 5.6 *Hydraulics window*, page 80.

	Levers, pedals and potentiometer See 5.7 *Levers window*, page 82.
	Tank levels/Filter See 5.8 *Tank level window*, page 87
	Main menu for system settings See 5.14 *System settings window*, page 106.
	Back to main window

5.10 Crane setting

The crane setting window can be accessed by pressing  in the main window.

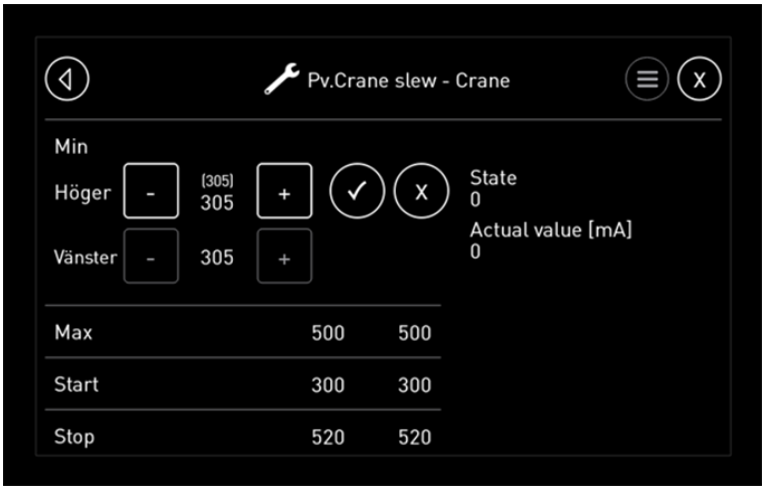


Fig. 66 GreControl, crane slew settings

Select the function to change values for, followed by its direction if required. Crane slew has been selected in the above example, followed by right min. current. Change with + and - and confirm with  .

The value can be changed until it has been confirmed with  .

In the settings menu you can reset the values to the factory settings using  followed by *Reset*.

The  button in the top right corner can be used to return to the main window.

The  button can be used to return to the previous page.

There are four setting values to choose from for a function:

- Min

  Current at the lowest output control in milliamperes, the minimum function speed, is set to put the function just at the start position but does not move.

- Max

  Current at maximum output control in milliamperes, maximum function speed, is set so full lever extension corresponds to the desired maximum speed.

- Start

  Length of the start ramp in milliseconds. How gentle the function starts.

- Stop

  Length of the stop ramp in milliseconds How gentle the function stops.

For each function, it must be possible to change values within a given area to protect the components used when steering

5.11 Cab suspension

The cab suspension window can be accessed by pressing  in the main window and then **Cab suspension** once in the settings window.

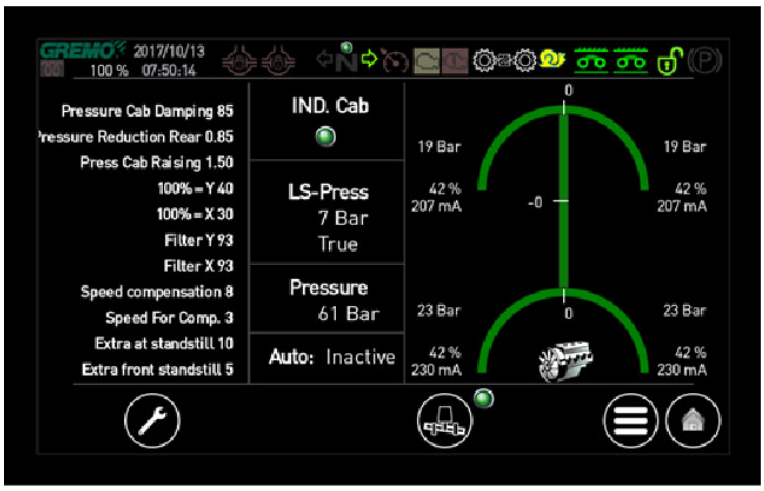


Fig. 67 GreControl, cab suspension settings

The cab suspension window displays from left to right:

Parameters:

- **Pressure Cab suspension (85)** sets value to make cylinders work between min. and max., a greater value = higher pressure
- **Pressure reduction Rear (0.85)** should differ approx.: 4-5 bar from the rear and front cylinders
- **Pressure Cab Height increase (1.50)** when machine starts, the cab is raised using a pressure that is 1.5 times higher
- **100% = Y (40)** At an inclination of 40% the relevant side gives 100% pressure to the cylinders to compensate for the additional weight there, a vector of 0=0%, 40=100%
- **100% = Y (30)** at this side tilt the system produces 100% in the cylinders in question
- **Filter Y (93)** Filter value for tilt sensor Y
- **Filter X (93)** Filter value for tilt sensor X
- **Speed compensation (8)** percentage pressure increase at variable speed
- **Speed for Comp. (3)** compensation speed
- **Extra** percentage pressure increase **at standstill (10)**
- **Extra front standstill (5)** increases front pressure for 3 seconds to compensate for extra loads

Reconnection:

- **IND.Cab,** indicates when the cab is locked at the rear, cab suspension is inactive if the cab is not locked

- **LS Pressure,** shows current LS pressure, status of LS output from cab suspension
- **Pressure,** shows current pressure in cab suspension block
- **Auto:** shows status of cab suspensions auto setting, changed in parameter settings ”Cab Auto setting”

Display graphics:

The larger display window shows: The machine's tilt on a Y and X axis, theoretical pressure in each cylinder, percentage output control and output control in mA

A number of menu selections can be made from the cab suspension window:

	Settings Parameter settings for: Cab suspension's settable parameters
	Cab suspension On/off indicated by  when active, this function is also available in the main window.

See function in 5.3.3 *Menu selection*, page 73 for other menu selections.

5.12 Fuel consumption window

The fuel consumption window is accessed by pressing in the main window.

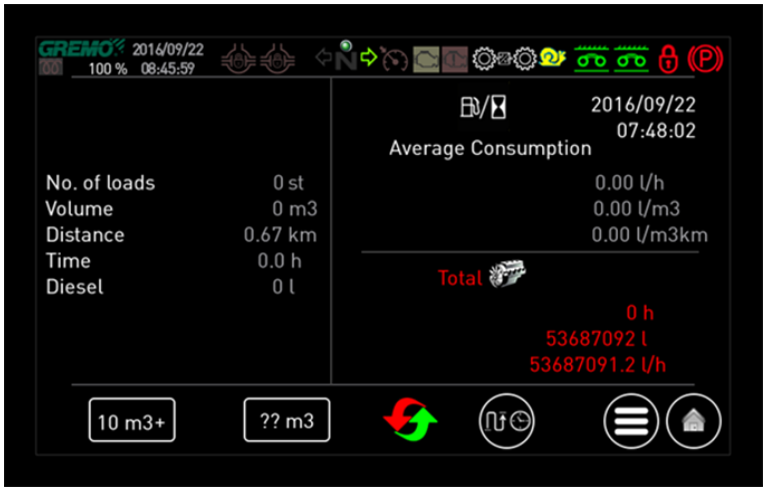


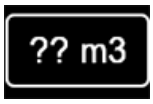
Fig. 68 GreControl, fuel consumption window

The fuel consumption window displays from left to right:

- Total: No. of loads, volume, distance, time, diesel
- Average consumption: litres per hour/cubic metre/cubic kilometre

  Memorised date and time from the latest resetting
- Total: engine time, diesel volume, litres/hour, These values will not be reset!

The following menu selections can be made from the fuel consumption window:

	Add a load and set volume.
	Setting for changing volume.
	Reset the values and lock a new time and date. Red fuel figures from the engine must never be reset!
	Operation monitoring Open the window for trip and time measurement

	See 5.12.1 *Operation monitoring window*, page 96.
	Main menu for system settings See 5.14 *System settings window*, page 106.
	Back to main window.

5.12.1 Operation monitoring window

The trip meter and operation monitoring window are accessed by pressing  in the main window followed by  in the fuel consumption window.

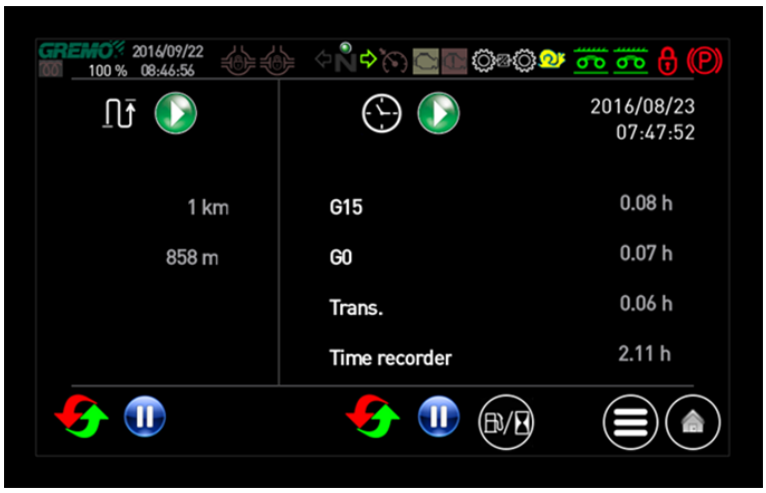


Fig. 69 GreControl, operation monitoring window

The trip meter and operation monitoring window displays from left to right:

- Trip meter

  Distance travelled shown as kilometres and metres when the trip meter is activated

- Operation monitoring

  Memorised date and time from the latest resetting

  Number of hours machine has run according to G15 time

  Number of hours machine has run according to G0 time

  Number of hours the transmission has been in operation

  Number of hours the engine has run above 1,000 rpm

The following menu selections can be made from the trip meter and operation monitoring window:

	Reset the trip meter.
 	Start and pause the trip meter. When the trip meter is activated, it is marked with a green indicator above this button and with a blue indicator when in pause mode.
	Reset operation monitoring and lock a new time and date.
 	Start and pause time measurements for operation monitoring. When operation monitoring is activated, it is marked with a green indicator above this button and with a blue indicator when in pause mode.
	Fuel consumption. See 5.12 *Fuel consumption window*, page 95.
	Main menu for system settings See 5.14 *System settings window*, page 106.
	Back to main window.

5.13 Menu window

The menu window can be accessed by pressing in the main window.

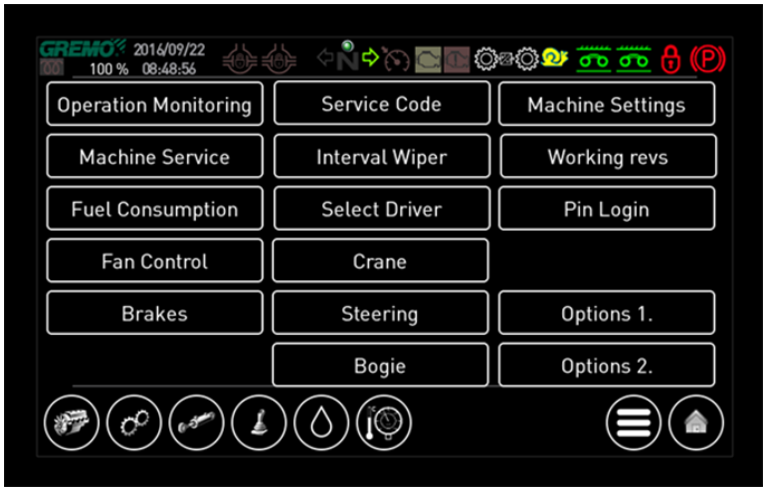


Fig. 70 GreControl, menu window

The following menu selections can be made from the menu window, in addition to the menu selection buttons at the bottom:

- Operation monitoring — Opens the page for Operation monitoring
- Machine service — Opens the page for Machine service
- Fuel consumption — Opens the page for Fuel consumption
- Fan control — Opens the page for Fan control
- Brakes — Opens the page for Brake monitoring
- Service Code — Opens the page for Service code
- Intermittent wipers — Opens the page for configuring the intermittent wipers
- Select operator — Opens the page to configure operators
- Crane — Opens the page to configure the crane
- Steering — Opens the page to configure the steering
- Bogie — Opens the page to configure the bogie
- Machine Settings — Opens the page to configure the machine
- Working speed — Opens the page to configure the working speed
- Pin Login — Opens a window for pin login
- Options 1 — Opens the page for any options
- Options 2 — Opens the page for any options

5.13.1 System information window

The system information window can be accessed by pressing  in the main window followed by  .

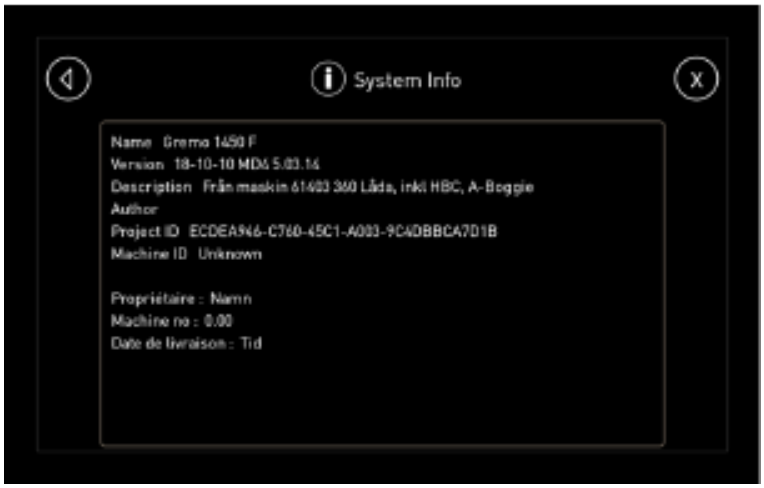


Fig. 71 GreControl, system information window

The window for system information displays, from left to right:

- Project name
- Project version
- Machine number
- Owner
- Delivery date
- Cycle time
- Cycle usage
- Memory usage

A number of menu selections can be made from the system information window, see 5.3.3 *Menu selection*, page 73.

5.13.2 Machine service window

The machine service window can be accessed by pressing  in the main window followed by *Machine Service* in the menu window.

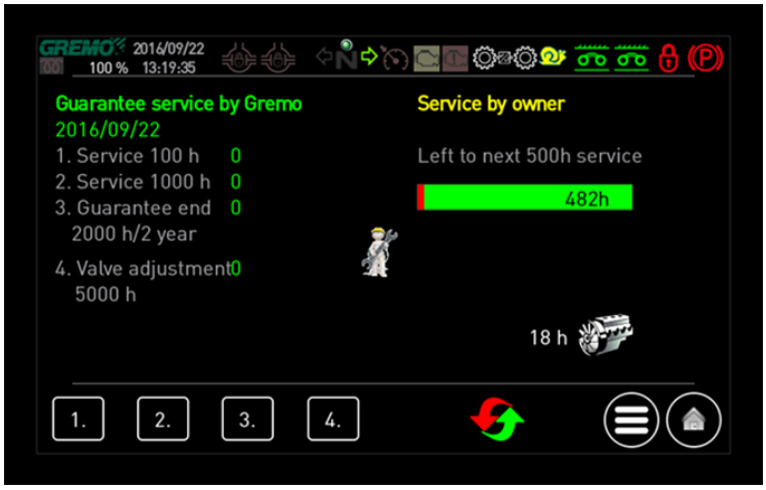


Fig. 72 GreControl, machine service window

After each Guarantee Service the Service Dealer provides a receipt. Iqan memorises dates and blocks further alarms for the current service.

The machine service window displays from left to right:

- Date for Guarantee start
- Service 100 h, date stored when serviced
- Service 1,000 h, date stored when serviced
- Service 2,000 h/2 years, date stored when serviced
- Valve adjustment 5,000 h, date stored when serviced
- Bar graph with 500 h countdown, owner service, reset with  (Press for 1 sec)
- Current operation time

The following menu selections can be made from the machine service window:

	Used by Service Dealers.
	Resetting of Service 500 h (Press for 1 sec)
	Return to previous page.
	Main menu for system settings. see 5.14 *System settings window*, page 106.

Service code window

The following page is displayed whenever the ignition is switched on, after a guarantee service (100 h, 1,000 h, 2,000 h/2 year) is reached, and the correct service code is entered.

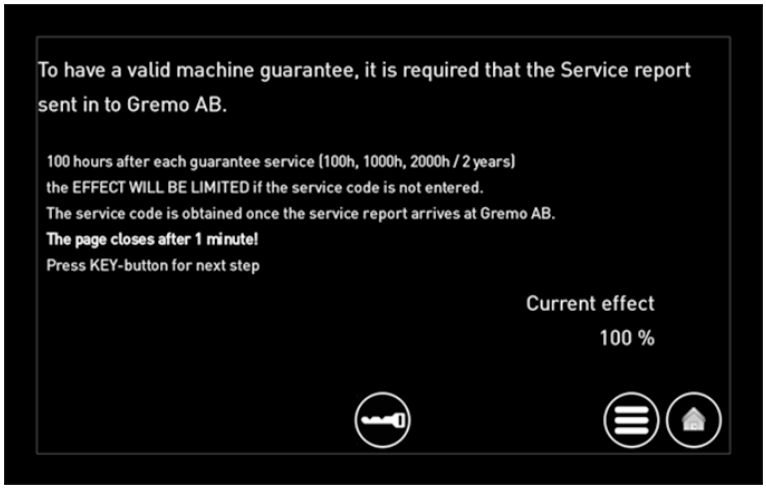


Fig. 73 GreControl, service code window

The page closes automatically after 1 minute, or press  .

To enter the service code, press  and the next page will open.

Service code info

The following is an instruction how to inactivate the service limit.

Fig. 74 GreControl, service code info

Pin code input window

Press  and the pin code window opens.

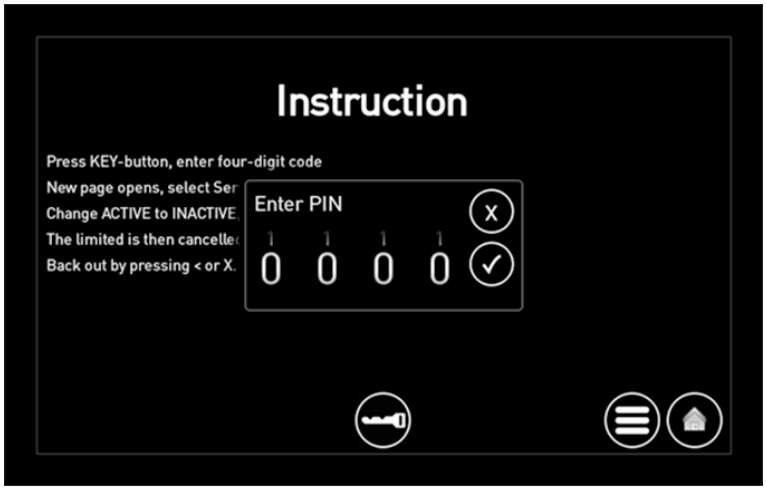


Fig. 75 GreControl, pin code input window

Hover over the number, move your finger up or down to increase or decrease the value. When all the digits in the PIN code have been entered, press  to confirm.  cancels and closes the pin code window.

Limitation inactivation

Fig. 76 GreControl, Limitation activation

Press *Service limitation*.

Fig. 77 GreControl, Limitation activation

Press *Inactive*.

Fig. 78 GreControl, Limitation activation

The limitation is now lifted! Press or .

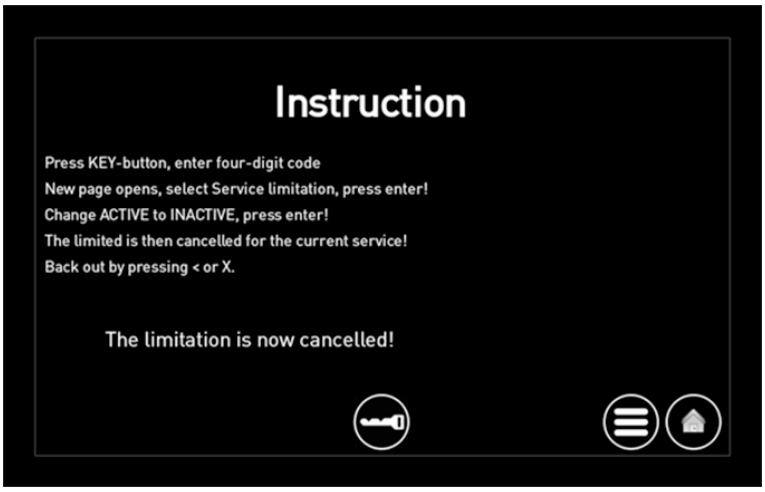


Fig. 79 GreControl, Limitation activation

Return to the required page using or .

Reminders for service

The reminders are shown when the following amount of time is left to service:

- **Service 100 h** 70, 50, 30, 10, <=1
- **Service 500 h** 40, 20, 10, <=1 (not at 1,000 h and 2,000 h)
- **Service 1,000 h** 200, 150, 100, 50, <=1
- **Service 200 h** 200, 150, 100, 50, <=1 / **2 year**, 14d, 11d, 8d, 5d, <=1d
- **Valve adjustment 5,000 h** 200, 100, 50, <=8

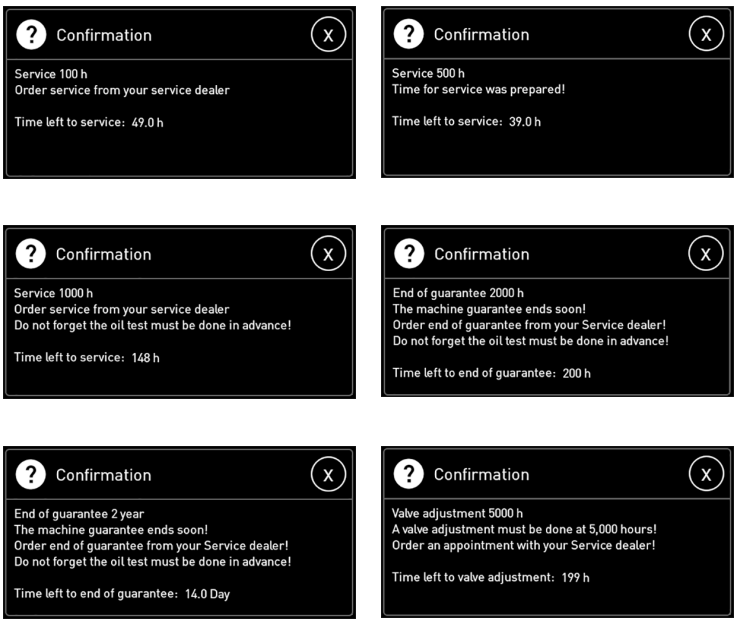


Fig. 80 GreControl, reminder service

A long button press is required to activate the following palette functions:

- Bogie toggle, press for 1.5 sec
- Crane front, press for 1.5 sec
- Wagon drive, press for 2 sec.
- Cruise control, press for 2 sec to access the cruise control followed by a short press to lock the speed.
- Differential, press for 0.6 sec to lock the hold function, release with a short button press.

5.13.3 Brake monitoring window

The brake monitoring window can be accessed by pressing  in the main window followed by *Brakes*.

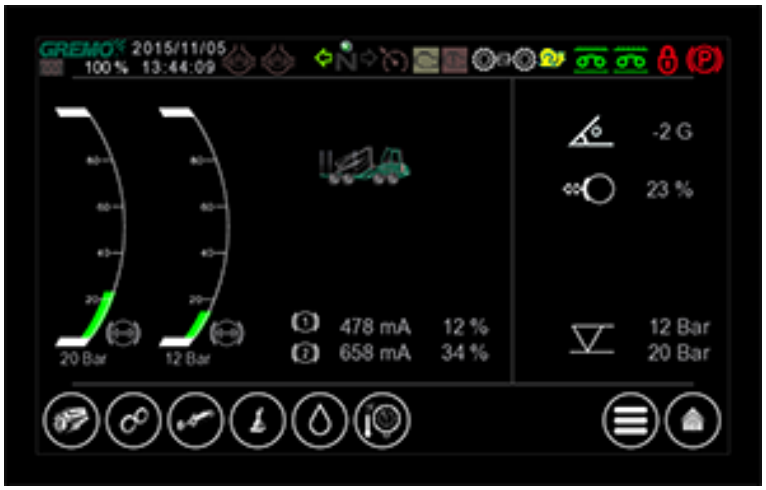


Fig. 81 GreControl, brake monitoring window

The brake monitoring window displays from left to right:

- Current brake pressure in rear axle
- Current brake pressure in front axle
- Power and braking force in each axle
- Machine slope in longitudinal direction
- Total current braking force as a percentage
- Average pressure in each axle

From the brake monitoring window a number of menu selections can be made, see 5.3.3 *Menu selection*, page 73.

5.14 System settings window

The system settings window can be accessed by pressing  in the main window.

Fig. 82 GreControl, system settings window

The following menu selections can be made from the system settings window:

	**System information** Information on the system and connected units.
	**Measurements** Voltage inputs Digital input signals Frequency inputs Current outputs Digital outputs CAN motor CAN levers in CAN digital in CAN digital out Can Dasa

	**Adjust** Crane Bogie Steering Machine settings Working speed Interval time Operator Follow-up
	**Setting** Display settings Setting the date, see 5.2.2 *Setting the date*, page 69. Setting the time, see 5.2.3 *Setting the time*, page 69. Setting the language, see 5.2.1 *Language settings*, page 69.

5.14.1 Selection and unit input

In general, the following applies to navigation and input in the system settings windows.

Fig. 83 GreControl, selection and unit input

Drag and drop the menus using your finger, click on the desired menu. Select the value you want to change and change it using + and - and confirm with  .

The value can be changed until it has been confirmed with  .

In the settings menu you can reset the values to the factory settings using  .

The  button in the top right corner can be used to return to the main window.

The  button can be used to return to the previous page.

5.14.2 Measurements

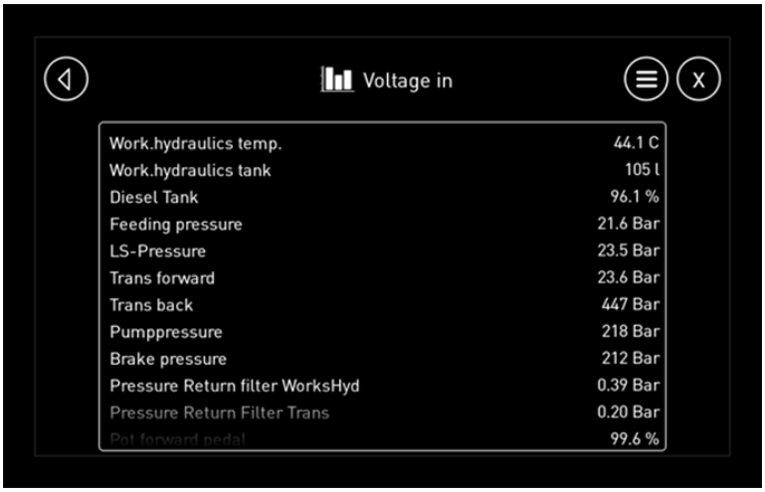


Fig. 84 , GreControl, measurements

The measurement values are shown in the list window. The entire list does not always fit in the window. To reach the rows outside the list window: place your finger on the screen and drag upwards.

5.14.3 Current setting

Fig. 85 GreControl, current setting

Select the function to change values for, followed by its direction if required. Crane slew has been selected in the above example, followed by right min. current.

Change with **+** and **-** confirm with ✓.

The value can be changed until it has been confirmed with X.

The values in the window can be reset to the factory settings using ☰ followed by **Reset**.

The X button in the top right corner can be used to return to the main window.

The ◁ button can be used to return to the previous page.

There are four setting values to choose from for a function:

- **Min**

  Current at the lowest output control in milliamperes, the minimum function speed, is set to put the function just at the start position but does not move.

- **Max**

  Current at maximum output control in milliamperes, maximum function speed, is set so full lever extension corresponds to the desired maximum speed.

- **Start**

  Length of the start ramp in milliseconds. How gentle the function starts.

- **Stop**

  Length of the stop ramp in milliseconds How gentle the function stops.

For each function, it must be possible to change values within a given area to protect the components used when steering.

NOTICE

Note that operator 0 is the default operator set at the factory.

Select an operator other than 0 to carry out any personal settings.

5.14.4 Copy operator settings

Fig. 86 GreControl, copy operator settings

The function groups with this symbol [...] can be copied.

There are five operators in addition to Operator 0 which is the default operator set at the factory.

First activate the operator to copy to, see the change of operator section under Hydraulics window.

Go to Adjust and select for instance Crane pressure [...], then select **Copy mode** and click on the operator to be copied and confirm with [✓].

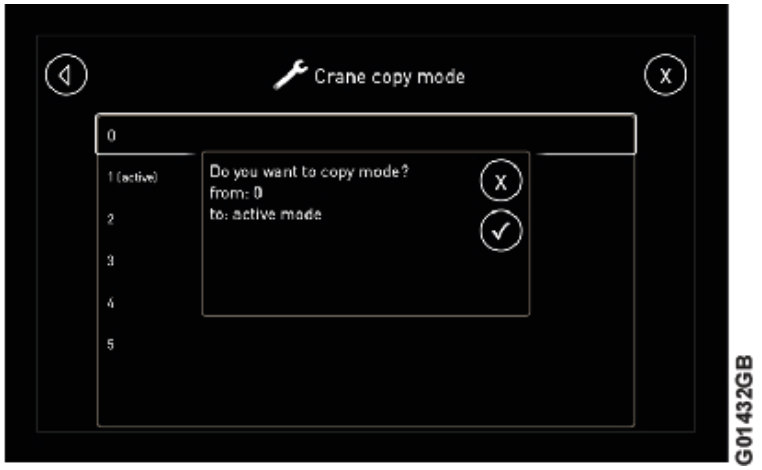


Fig. 87 GreControl, copy operator settings

5.14.5 Machine settings

Machine settings are settings the operator can alter to adapt the machine to individual requirements.

The following menu selections can be made from the machine settings window:

Select Drive mode	Settings: see 5.14.6 *Example: Select drive mode*, page 113. • High power • Normal • Economic
Pedal Filter	Settings: see 5.14.7 *Example: Pedal filter*, page 114. • 0 to 98%, active area approx.: 90-98%
Activate front camera	Settings: Activates camera image rotation • 0 = of • 1 = on
Activate Dasa	Settings: Activate communication with Dasa operation monitoring • 0 = of • 1 = on

Activate back warning	Settings: Activate once to provide back warning • 0 = of • 1 = on
Select articulated joint lock type	Settings: Define which function the articulated joint lock button on the palette has. • Lock when under pressure • Alternate off/on
Level Low mode	Settings: Specifies the percentage of the transmission current allowed when the low mode button is active. • 0 to 100%
Select working speed	Settings: Indicates the selected working speed • Standard • Constant speed
Select Off-road steering	Settings: Activate rotator lever for off-road steering in forward chair position. • Standard • Rotator lever Front • Pedal • Rotation + Pedal
Interval cooler fan	Settings: Specifies how often the cooling fan must reverse for cleaning. • 15 min., 30 min., 45 min., 60 min. or off

Engine temperature - Fan	Settings: Specify the engine temperatures between which the cooling fan gives 10-100% • 91°C - 97°C Standard • 87°C - 95°C • 85°C - 91°C
End % Main boom damper	Settings: Specifies how many percent of max. current is allowed when the boom damper sensor is active. • 0 to 100%

5.14.6 Example: Select drive mode

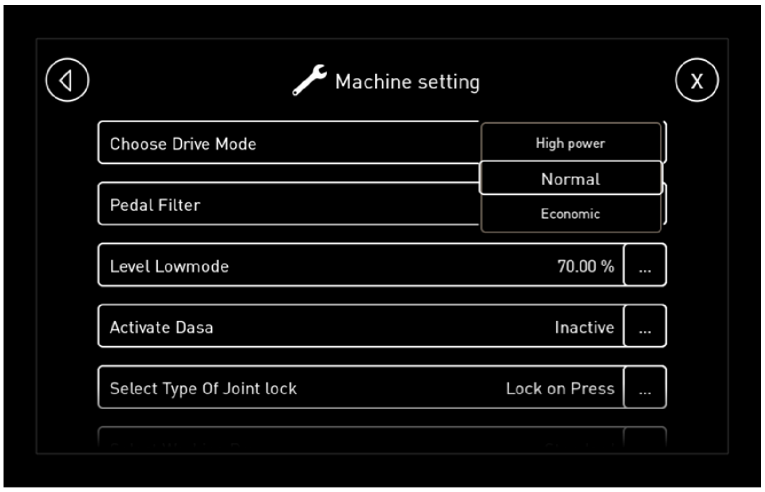


Fig. 88 GreControl, example of select drive mode

Select Drive mode by tapping on the text *Select Drive Mode* on the screen. Three options will be shown, click on the desired option.

- High power = more pressure on engine and steeper ramps.
- Normal = normal.
- Economic = less pressure on engine and slower ramps.

If you want to reset factory settings, press ... at the far right of the row and select *Reset*.

5.14.7 Example: Pedal filter

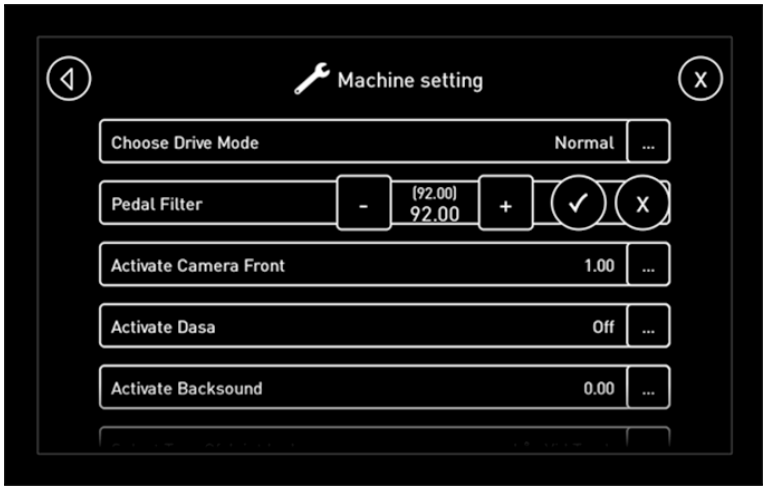


Fig. 89 GreControl, example pedal filter

Pedal filter is a start/stop ramp on the drive pedals and can be set at low gear or high gear. To switch gears you have to exit the menu and change the gear, and then return to the menu again.

90% = little or no ramp.

98% = steep ramp.

6 Driving instructions

6.1 Before you operate the machine

NOTICE

Read and learn the following before you operate the machine!

Thoroughly read and understand the safety instructions.

6.1.1 Boarding and descent

Always use the ladder and hold on to the handle on the bonnet, on the front side of the cab column and the inner side of the door.

⚠ CAUTION

Risk of slipping – steps, platforms and chains can be very slippery in cold weather conditions!

⚠ CAUTION

Always descend the ladder facing the machine. This way you can see and grip the handles. Never jump from the machine.

Emergency stop

The emergency stop is the red power switch on the left hand B column in the cab. When you push the emergency stop, the diesel engine stops and the brakes are applied.

Fig. 90 Emergency stop in the cab

Emergency exit

Fig. 91 Latch handle, emergency exit

The left-hand side window acts as the emergency exit. To open the window, grip the latch handle and turn it upwards until the latch is released. The window can now be opened outwards.

Note that the side window always must be unlocked when the machine is operating, this to ensure that the operator can be rescued from outside in case the machine tips over or sinks through ice.

6.2 Check before start

NOTICE

Each time you prepare to operate the machine it is important to perform certain checks. Make this a habit and follow the same routine each time. You will find that you need to do less maintenance and you also get a safer machine.

1. Walk around the machine and check that there are no visible oil leaks. Also look under the machine and on the inside of the wheels.
2. Check the engine oil level.

Fig. 92 Engine oil dipstick

3. Check the coolant level.

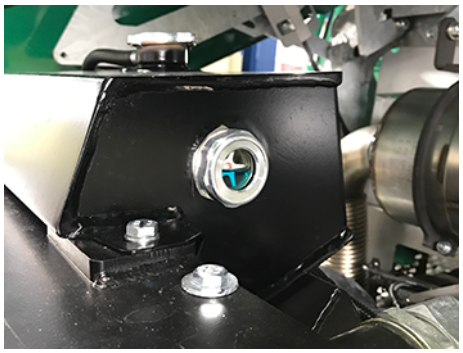


Fig. 93 Expansion tank sight glass

4. Check hydraulic oil level

Fig. 94 Hydraulic tank sight glass

5. Check tyres and wheel nuts.

6. Check that the hose for the crankcase ventilation is fully open and free of dirt, ice and snow.

   During cold winter conditions, there is considerable risk of ice formation in the venting hose.

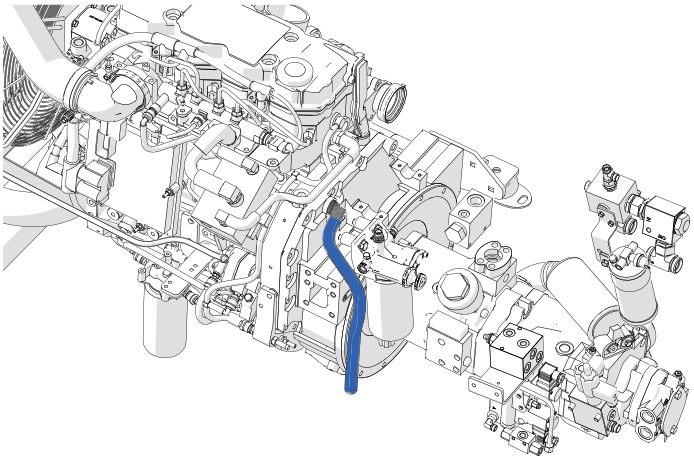


Fig. 95 Crankcase ventilation

7. Check that the two emergency stop buttons are protruding (both inside the cab and outside).

Fig. 96 Emergency stop in the cab

8. Activate the main power switch (1).

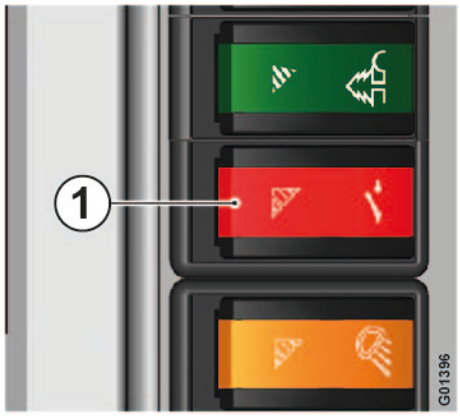


Fig. 97 Main power switch

9. Turn the ignition key to ignition position (first position) and wait for the control system to start.

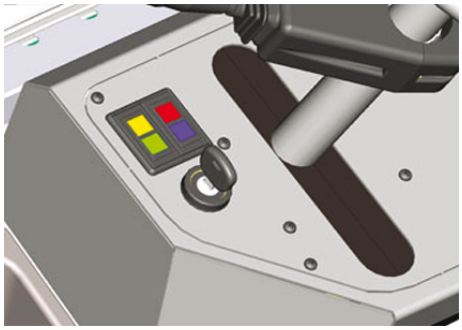


Fig. 98 Ignition key

10. Check the fuel level and the hydraulic oil level via the control system.

Fig. 99 Tank volume window

11. Put the driving direction selector in neutral.

Fig. 100 Driving direction selector

12. Start the engine, see 6.3 *Starting the engine*, page 120.
13. Check the brakes, see 6.4 *Brake test*, page 121

6.3 Starting the engine

NOTICE

When starting the engine!

Turn the ignition key to the first position. Before starting the engine, wait until the control system has started up and blocked the work pump during the start sequence.

Turn the ignition key to the ignition position (first position) and wait a few seconds for the control system to start.

Turn the ignition key to the start position (the second position) to start the engine, let it run idle a few minutes and check all pressure values in the control system's screen.

In cold weather, preheating of the injected air starts automatically.

Release the parking brake and check that the ladder is automatically retracted before you try to move the machine.

NOTICE

To spare the turbo while the oil is still cold you should avoid racing the engine.

NOTICE

Perform a brake test! See 6.4 *Brake test*, page 121.

When this has been done the machine is ready for work.

6.3.1 If the machine doesn’t start

Check that:

- the two emergency stop buttons are pulled out (both inside the cab and outside).
- the main power switch is activated
- the batteries maintain the correct voltage.
- there is fuel in the fuel tanks.
- there are no active error codes.
- all fuses are intact.

Contact a service dealer if none of the above solves the issue.

6.4 Brake test

Perform a brake test as follows:

1. Select driving direction and switch to 1st gear.
2. Press the foot brake pedal, see 4.2 *Functions at the steering wheel panel*, page 54.
3. Raise the revs to ca. 1500 rpm.
4. The machine should now stand motionless or ‘creep’ forward very slowly, and you should sense a distinct brake effect. Otherwise, please contact an authorised service dealer or Gremo AB.
5. Checking the parking brake, see 2.9 *Inspection of parking brake*, page 20.

6.5 Steering

Fig. 101 Off-road steering

Fig. 102 Off-road mode

As a default the machine is equipped with a control lever for off-road steering (1) on the right armrest panel, see 4.5 *Functions on the right armrest panel*, page 59. This function is activated with the switch Off-road mode (steering) On/Off (2) on the side panel, see 4.3 *Functions on the side panel*, page 55.

NOTICE

The off-road steering switches direction automatically when the operator's seat is turned around.

Steering with the steering wheel operates via an Orbitrol valve and gives a relaxed and responsive steering, which may be hard to achieve using the off-road steering lever.

NOTICE

By law, the steering wheel must be used when driving on public roads and the off-road steering function must be turned off.

6.6 Brakes

Fig. 103 Parking brake

The brakes consist of four packages of discs built in on each side of the differentials. The disc brakes are designed to work as parking- and emergency brakes also.

The brakes are activated in any of the following ways.

Via the parking brake circuit, that is to say::

- With the parking brake button (1) on the right armrest panel, see 4.5 *Functions on the right armrest panel*, page 59. The indicator light (2) and a red symbol in GreControl come on, see 5.3.1 *Indicator lamps*, page 71 when the parking brake is activated.
- Automatically when emergency stop is pressed.
- Automatically if the diesel engine stops

Via the wheel brakes/operation brake circuit, that is to say:

- Automatically when the Forward pedal and Reverse pedal are released (during operation with or without constant revs), see 4.7 *Functions at the rear panel*, page 63.

- Automatically when the Drive pedal, see 4.7 *Functions at the rear panel*, page 63 or Drive pedal, see 4.2 *Functions at the steering wheel panel*, page 54 is released (during operation with or without constant revs).
- With foot brake pedal under the steering wheel panel (beside the door), see 4.2 *Functions at the steering wheel panel*, page 54.
- With the emergency brake (rear panel), see 4.7 *Functions at the rear panel*, page 63.

If the parking brake is active when you select forward/ backward direction, a buzzer is sounding. It's impossible to move the machine with the parking brake active.

When you stop the machine, the brakes of all wheels will be activated together with the articulated joint lock. This to increase safety!

The brakes and the articulated joint lock are automatically released when the engine revs above 1,000 rpm and the Forward Pedal, Backward Pedal, see 4.7 *Functions at the rear panel*, page 63 or direction selector on the left armrest panel, see 4.4 *Left arm rest panel functions*, page 56 is activated and the Drive pedal, see 4.2 *Functions at the steering wheel panel*, page 54 and 4.7 *Functions at the rear panel*, page 63 is pressed.

⚠ WARNING

For safety reasons, do not park the machine on a slope. There is the risk that the machine will start to move or tip over.

NOTICE

Perform repeat tests on the handbrake, by placing the loaded machine on a slope with free rolling movement. See 2.9 *Inspection of parking brake*, page 20.

6.7 If the parking brake does not release

See 2.9.1 *Manual release of parking brake*, page 21.

6.8 All-wheel drive

Fig. 104 All-wheel drive switch

The machine is equipped with a disengageable wagon drive. Operation takes places via an all-wheel drive switch on the right armrest panel, and the button must be held down for 2 seconds to activate wagon drive. The indicator lamp for all-wheel drive on the right armrest panel, see 4.5 *Functions on the right armrest panel*, page 59, will light up in green when wagon drive is activated. The all-wheel drive symbol is also shown in the upper part of GreControl's main window, see 5.3.1 *Indicator lamps*, page 71.

Engagement/disengagement may be simplified if you turn the machine until the indicator lamp is switched on/off. Engagement and disengagement is allowed while the machine is moving but avoid this if the machine is pulling heavily.

6.9 Speed potentiometer

Fig. 105 Speed/torque potentiometer

The Speed Potentiometer (1) is located on the left armrest panel, see 4.4 *Left arm rest panel functions*, page 56.

The Speed Potentiometer affects the angle of the hydrostatic pump, which in turn affects the speed and traction. You will get maximum traction when the Speed Potentiometer is adjusted to make the machine move slowly. Changes to the Speed Potentiometer setting can be done while the machine is operating with a heavy load.

6.10 Drive pedal

The drive pedals (front, see 4.2 *Functions at the steering wheel panel*, page 54) and rear (see 4.7 *Functions at the rear panel*, page 63) affect both the control system's operating revs and the machine's driving speed in the following way:

- if the crane controls are not activated, the drive pedal functions like a regular accelerator pedal.
- if the crane controls are being used, the preset operating revs are active (e.g. 1300 rpm): when the Drive pedal is activated, it operates like a speed control. In this mode, it interacts with the speed potentiometer, see 4.4 *Left arm rest panel functions*, page 56, in such a way that the machine's maximum speed corresponds to the set value on the speed potentiometer. If the Drive pedal is pressed even further, not only will speed increase, so too will engine revs.

6.11 Direction selector

6.11.1 General

Fig. 106 Controls, direction selector

You can select the driving direction in two ways:

- with the direction selector on the left armrest panel (1).
- with the two pedals (2) and (3).

NOTICE

Here the direction ‘forward’ means the principal travelling direction of the machine on a public road when steered with the steering wheel, see 1.9 *Definitions*, page 8.

6.11.2 Direction Pedals

The pedals (2 forward and 3 backward) act as direction pedals.

6.11.3 Selecting the travelling direction

You can select the travelling direction in two ways:

1. By moving the direction selector (1) forwards or backwards.
2. By pressing one of the two Direction Pedals (2) or (3) you also press the Drive Pedal (4). The operator’s foot must always rest on the selected pedal in order for the machine to move.

The direction pedals (2) and (3) have a double function together with the direction selector (1) on the left armrest panel. You will feel yourself which way of operation you will prefer.

NOTICE

The direction selector (1) on the armrest panel must be in ‘neutral’ position in order for the direction pedals to work

NOTICE

If you start the engine with the direction selector (1) in position ‘Forward’ or ‘Backward’ the machine will not move. In order to move the machine, you must first put the direction selector in position ‘Neutral’ and then select the travelling direction.

6.12 Gear selection

The machine's gearbox is a mechanical dropbox with one low speed register (1) for off-road transport and one high speed register (2) for road transport.

6.12.1 Gear selection

Fig. 107 Controls, gears

The gear selector on the right armrest panel has two positions:

1. Gear selector **reverse** = 1st gear
2. Gear selector **forward** = 2nd gear

Gear selection using the gear selector can be up/down when in transport independent of speed and load. But the control system prevents shifting until the machine is stopped. The brake system must be activated.

In the main window’s top edge of GreControl is a diode depicted. For a green light, the gear engages and a red light warns the controller that the gear not has been engaged, so turn the machine slightly with the off-road steering lever.

6.13 Working speed

With the value set to zero, the drive pedal functions like a regular accelerator pedal. Working speed (1,200-1,500 rpm) is enabled as soon as the crane controls are used.

For safety reasons, working speed is deactivated when the levers are not active and the chair is turned towards the door or forwards (normal position).

For working speed settings, see 5.4 *Engine window*, page 75.

6.14 Differential locks

Fig. 108 Controls, differential lock

The differential locks are operated with the buttons (1) and (2) on the left armrest panel. The button (1) controls the differential lock on the front carriage (front axle) and the button (2) controls the differential lock on the rear carriage (rear axle). The front and rear differential locks are operated independently and give a complete locking of the differentials while the buttons are pushed.

The indicator lamps (3) and (4) are yellow when the differential locks are engaged.

In the middle of GreControl's main window, a symbol indicating when the differential locks are engaged is also displayed, see 5.3.2 *Instrumentation*, page 72.

Activation of the differential locks can be done while the machine moves without pulling heavily, but we recommend that you stop first.

WARNING

The differential locks must not be activated or de-activated while the machine is turning!

WARNING

Never operate the differential locks when a wheel is skidding! You could damage the differentials!

NOTICE

The use of the differential locks means that a wheel or a bogie may suddenly get the complete traction force if this wheel or bogie suddenly gets a hold while the other wheels are skidding. Therefore you should use the differential locks with sound judgement, especially if you have fitted bogie tracks.

You will spare the machine if you activate the front and rear differential locks simultaneously and, if possible, avoid steering the machine while the differential locks are active. Also try to keep low engine revs. It spares the transmission and gives better traction

6.15 Warnings from the control system

The control system supervises, warns and senses how the transmission works, controls the diesel engine and adjusts the transmission at gear shift. The system warns with a buzzer and a warning lamp if a fault occurs, and also shows the fault on the display. If a main page is shown on the display, then there will be a textual explanation of the fault, otherwise a warning symbol in the right corner of the display.

NOTICE

The control system will not automatically shut down the machine.

6.16 Off-road operation

6.16.1 General

Off-road operation requires a lot of experience before you fully master the machine. Be patient until you have learned the limits of the machine. Always use a seat belt!

Also remember that you work with the machine in an environment where the best overall result is achieved by paying attention to the fauna.

These are the most important points in the Swedish Forestry Act:

- Do not make clearings that are too large.
- Leave any obstacles undisturbed.
- Avoid damaging key biotopes and valuable cultural environments.
- Be especially careful when a felling job affects areas with rare plants and animals.
- Preserve foliage in coniferous forests during the entire growth period.
- Leave the protection zones required for water, obstacles, agricultural land and construction.
- Always leave a number of older trees in the clearing, ideally in groups.
- Plan clearing and transportation so that there is little or no damage to ground and water.
- Plan forestry access tracks so that there is minimal damage to nature and the cultural environment.

6.16.2 Before driving

Remove the indicators and rear mirrors as well as the rear ramp with the Slow Vehicle sign.

Acquaint yourself with the terrain and plan the most effective driving. Be alert for slopes, sunken areas or other unexpected occurrences. Plan whether tyre chains or tracks need to be used.

Engage the all-wheel drive. The all-wheel drive can be engaged and disengaged while the machine is moving but this is only allowed if the machine moves easily, i.e. without the engine pulling. Survey the terrain in order to decide whether to use anti-skid chains or bogie tracks.

6.16.3 Anti-skid

A machine with normal width 260 cm (600-wheel) or 276 cm (700-wheel) can be fitted on all eight wheels with any type of anti-skid chain available on the market. If the machine is narrower, use smaller anti-skid chains. Contact Gremo AB.

Always observe the fitting instructions from the manufacturer. Remember that loose ends must be secured using shackles! On machines equipped with bogie lift, the bogie lift can be used to aid the fitting of the anti-skid chains on the front carriage.

⚠ WARNING

When you fit anti-skid chains to wheels raised with the bogie lift, there is a severe danger if the machine starts sinking during the work. Never stay under the machine when you tie the anti-skid chains together!

6.16.4 Bogie tracks

Certain types of bogie tracks do not fit depending on the shape of the track or the design of the tyre. Contact the track supplier or Gremo AB.

⚠ CAUTION

Observe the fitting instructions from the track manufacturer and remember the risk of getting you fingers or hands jammed!

Fig. 109 Bogie tracks

6.16.5 Spacer blocks

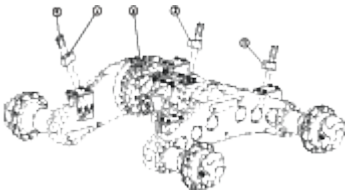


Fig. 110 Bogie stop band, installation instructions

When bogie tracks are used, you should also fit the spacer blocks which restrict the up and down movements of the bogie. The spacer blocks (1) and Allen bolts M12 x 80 (2) have been delivered with the machine.

Do as follows:

- Align the spacer blocks correctly: the wide end of the spacer block should point forwards for the frontal block (3) and rearwards for the rear block (4).
- The chamfer of the spacer block (5) must be next to the weld (6).
- Fit the Allen bolts and tighten them with a 10 mm Allen key (7).

6.16.6 Driving speed

The machine is designed to cope with a maximum payload even on very difficult ground. Off-road driving causes large dynamic forces on the machine. This means that the weight of the machine together with the weight of the payload will increase as a result of the movements. The dynamic forces may cause considerable impact on the machine frame and the articulated joint, e.g. when the machine moves over an obstacle.

You can avoid this by driving gently and with sound judgement. To drive fast is one thing, to keep the right speed is a different one!

When driving with a payload the crane should be put down on the load and the grapple should be secured. This way you lower the centre of gravity, and spares the rotator and the vibration damper. When driving with an empty machine we recommend that the grapple is placed down at the front bunk.

6.16.7 Uphill

Always drive straight forward uphill and avoid hilly slopes!

⚠ CAUTION

When driving uphill, the centre of gravity of the payload is shifted backwards, exerting a lifting force on the front carriage. If the machine is angled severely in this situation, it can tip over..

Fig. 111 Driving uphill

The machine handles very steep slopes uphill. How steep is a question of traction and size of payload. Use the first gear if you are climbing a steep slope. Turn down the Speed Potentiometer setting enough to keep the diesel engine at high revs without being overstressed. Always use anti-skid chains if the ground is steep, soft, wet or slippery. It's important to ensure the grip of the wheels!

When driving empty or loading uphill it's an advantage to turn the machine around and reverse uphill. Then you will utilise the larger weight of the front carriage and the engine, as this now is positioned at the lower end and thus presses the wheels down creating better grip.

NOTICE

The engine can cope with a 41° slope. If the engine has no oil, it will move into idle mode.

6.16.8 Downhill

Always drive straight down and avoid hilly slopes!

⚠ CAUTION

The load's centre of gravity is moved forward when driving down a slope, and exerts a pushing force on the engine. If the machine in this situation is sharply angled then it may tip over.

NOTICE

The engine can cope with a 47° slope. If the engine has no oil, it will move into idle mode.

Fig. 112 Driving downhill

Always use anti-skid chains if the ground is steep, soft, wet or slippery. It's important to ensure the grip of the wheels! When driving steeply downhill it's important to use first gear and to turn down the Speed Potentiometer setting to low speed and to keep the diesel engine at relatively high revs. This is the best way to utilise the braking power of the hydrostatic transmission.

Use the foot brake if the revs of the diesel engine increase sharply, and don't release the Drive pedal during braking.

Avoid braking in a way which causes the wheels to lock! Locked wheels means decreased grip.

6.16.9 Hilly slopes

Always avoid driving and working on hilly slopes. It you still must do this, then be extremely careful! There is a large risk of the machine tipping over! Also remember that the risk of the machine tipping over is larger with a load or when the machine is in an angled position. The larger the load or angle, the larger the risk. You can use the crane for balancing.

If you capsize, remain where you are and do not leave the cab, see 2.19 *If by accident the machine tips over*, page 33.

6.16.10 Obstacles

Adjust your speed in order to make the passing of the obstacle as soft as possible, without the machine bumping or swaying unnecessarily. Remember that passing over obstacles, cavities and depressions means slopes. High payloads mean high centre of gravity and thus a large risk of the machine tipping over! Singular high obstacles which

give large slopes can be passed with the crane slewed uphill.

6.16.11 Soft ground

Soft ground requires experience and care.

The machine is by default equipped with tyres with rounded shoulders to avoid cutting root fibres in the ground.

If you need to turn, then you should do so with as large a turning radius as possible. If a wheel makes a rut, then stop immediately and check whether you can continue or have to reverse. The safest way is almost always to first unload the timber and then to reverse.

If the rear carriage has at least some grip left, then the traction will increase if the load is partially left on the carriage.

If the machine is equipped with bogie lift then this may be used to lock the bogies when driving forwards, to prevent the wheels from getting stuck in holes. Normally you should operate with the bogies in float mode

6.17 Loading and unloading

6.17.1 Crane operation

Fig. 113 Controls, crane operation, seat facing forward

The control system which controls the crane is automatically switched on when you turn the operator's seat backwards, in this position you can use all crane functions.

For safety reasons the crane control levers do not affect the crane when the operator's seat is turned towards the cab door.

When the seat is facing straight forward, you can usually only lower the crane's lifting arm for safety reasons; other crane functions are not available in this situation.

With the ""Crane driving seat facing forward" button (button 13 on the right armrest panel) it is possible to over-ride the control system and obtain full crane function even with the seat facing straight ahead; the crane function is cancelled as soon as the seat is turned.

The crane hydraulic system operates more smoothly if you use operating revs of 1,200-1,500 rpm, see 4.6 *Crane control levers*, page 61.

6.17.2 If the crane does not work

Check that:

- the machine starts, otherwise see 6.3.1 *If the machine doesn't start*, page 121.
- there are no active error codes.
- the chair is turned backwards and the sensor for this is not working.
- there is hydraulic oil in the hydraulic system.
- there are no broken hoses.

Contact a service dealer if none of the above solves the issue.

6.17.3 Loading / unloading

Loading of timber and pulpwood in various lengths should be carried out with the hydraulic gate in Timber-position (folded down). Loading of pulpwood in 3-metre lengths should be carried out with the hydraulic gate in Pulpwood-position (folded up). This way you will get the best possible longitudinal stability.

Fig. 114 Loading over the top of the gate

The gate is operated via the two buttons (gate upright, high and gate folded, low) on the left armrest panel. See 4.4 *Left arm rest panel functions*, page 56.

Do not drive with the crane hanging freely, instead place it on the loading platform.

NOTICE

Never load over the top of the gate!

Overloading leads to worse stability, and during downhill driving the timber may slide over the gate and damage the machine.

NOTICE

Never try to knock the logs level against the gate, it is not intended for this purpose!

It's easier to turn the machine, reverse it uphill and then load it. The timber will slide against the gate more easily.

When loading timber it might be easier to start loading at the bottom end of the bunks with the gate in Pulpwood-position. When the bottom is covered, you then fold the gate into Timber-position.

NOTICE

Due to the large loading area it's easy to exceed the maximum load capacity of the machine when loading timber and pulpwood in various lengths. The warranty will not cover damages caused by overloading.

Loading and unloading can be done while the machine is moving.

Remember that in normal cases, the articulated joint lock is released when the machine starts to move, resulting in inferior stability if the crane is slewed. Releasing the throttle locks the articulated joint lock straight away.

By avoiding loading while the machine is rolling in difficult terrain and moving the machine with timber suspended from the grapple, you decrease the risk of accidents as well as strain on the chassis.

6.18 Working underneath electric power lines

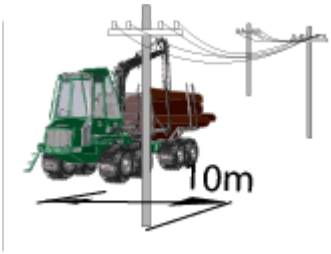


Fig. 115 Working underneath electric power lines

DANGER

Never work underneath electric power lines.

There is a large risk that the crane touches the power lines, and this may cause a fatal accident!

A risk distance of at least 10 m must be observed!

DANGER

If the machine comes in contact with overhead power lines. Remain in your seat and call for assistance!

Danger!

Remain in your seat. Wait for assistance!

6.19 Road transport

6.19.1 Before starting

Fig. 116 Indicators and rear mirrors

Fig. 117 Rear light ramp

Fit the indicators and rear mirrors as well as the rear light ramp with the Slow Vehicle sign. Ensure that the driving lights and the indicators are working and that the rear mirrors are adjusted correctly. Check the coolant level and the hydraulic oil level in the hydraulic tank.

Ensure that you have fuel in the tank! Thus you avoid running out of fuel on a public road, and thus avoid becoming a danger to other traffic.

NOTICE

If the weather is hot and dry, you should clean the radiators before the transport. During the transport, especially in hot weather, you should continuously check water and oil temperatures. If the temperature is too high, then the best way to decrease it is to let the machine roll with smallest possible strain. Turn down the Speed Potentiometer but keep relatively high engine revs in order to keep the fan and the water pump working properly.

The control system adjusts the diesel engine to run at exactly the revs required to keep the selected speed. The smaller rolling resistance, the lower engine revs.

NOTICE

Never use tyre chains or tracks on tarmac roads. You could be liable for any surface damage that occurs.

WARNING

The cab is not intended for passenger transport, which is why it lacks a seat and seat belt for passengers. There is a risk of fatal accident for passengers!

7 Engine

7.1 Engine, identification

7.1.1 Type plates

See 1.11.6 *Type plate for the diesel engine*, page 12.

The machine’s chassis number (engine type and number are normally connected to the chassis number) must be stated when ordering spare parts.

If the engine's type plate is not legible, the engine's serial number can also be read from the engine block on top of the lubricating oil cooler housing.

The injection pump's type plate is attached to the pump and shows the following information:

- Pump serial number
- Cummins part number
- Factory code
- Bosch part number
- Date code

7.1.2 Cylinder numbering

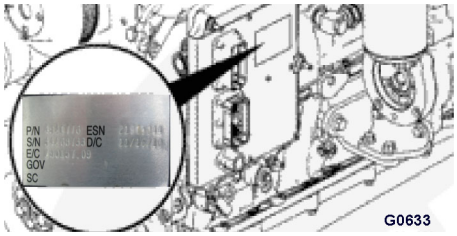


Fig. 118 Cylinder numbering

The cylinders are numbered in sequence from the engine end where the cooling fan and the drive belts are mounted.

Cylinder no. 1 is therefore located closest to the fan, cylinder no. 6 is located closest to the flywheel.

7.2 Engine, component position

7.2.1 General

For additional information, see the workshop manual and the engine supplier's documentation.

7.2.2 Component position, air intake end

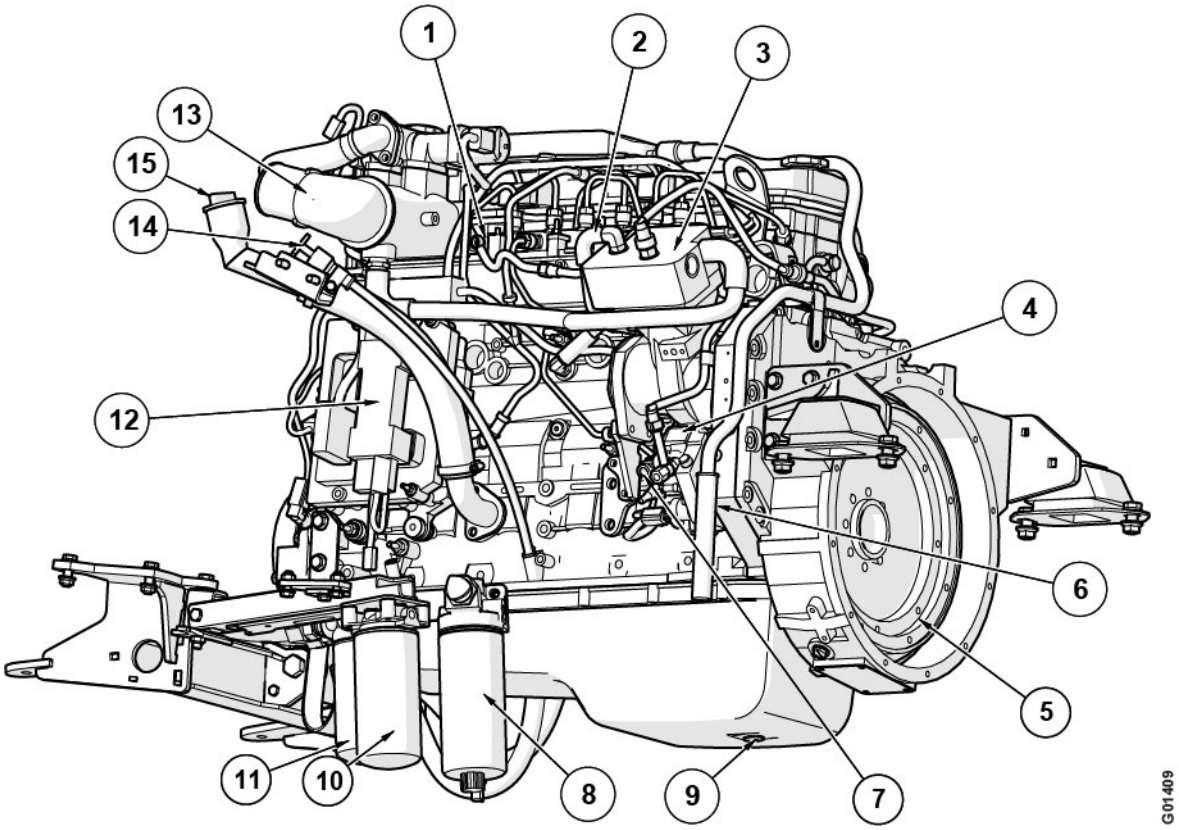


Fig. 119 Component position, air intake end

1. Fuel distributor
2. Coolant pipe for air compressor Flywheel
3. Air compressor
4. Bosch fuel pump
5. Flywheel housing
6. Fuel, return
7. Fuel, intake
8. Fuel filter prefilter
9. Oil sump drain plug
10. Fuel filter Primary
11. Oil filter
12. Electronic control module (ECM)
13. Air intake
14. Dipstick
15. Oil filler cap

7.2.3 Component position, fan side

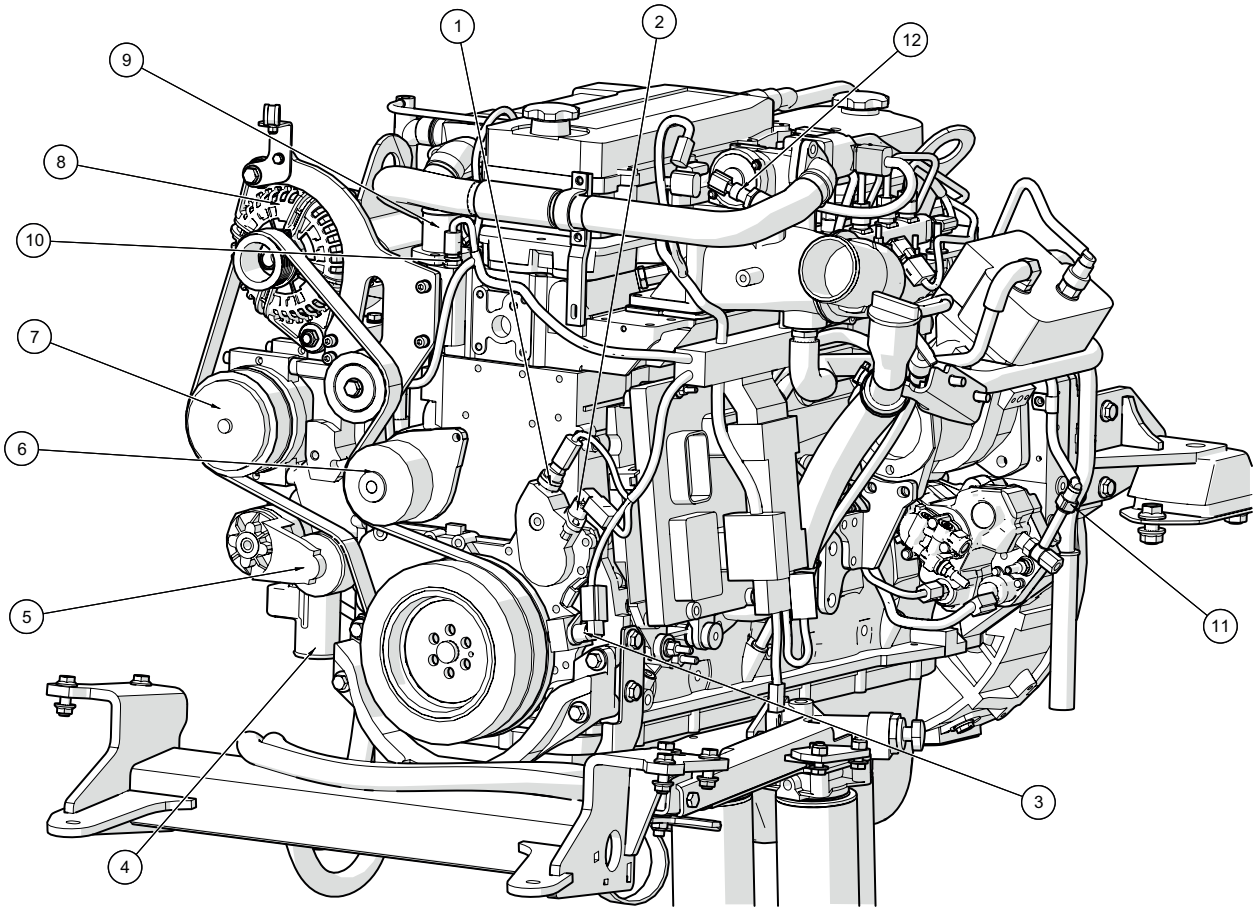


Fig. 120 Component position, fan side

1. Oil pressure contact
2. Engine speed sensor (camshaft)
3. Engine speed sensor (crankshaft)
4. Coolant inlet
5. Drive belt tensioner
6. Coolant pump
7. Coolant compressor, air conditioning system
8. Generator
9. Coolant outlet
10. Coolant temperature sensor
11. Fuel pressure sensor

7.2.4 Component position, flywheel side

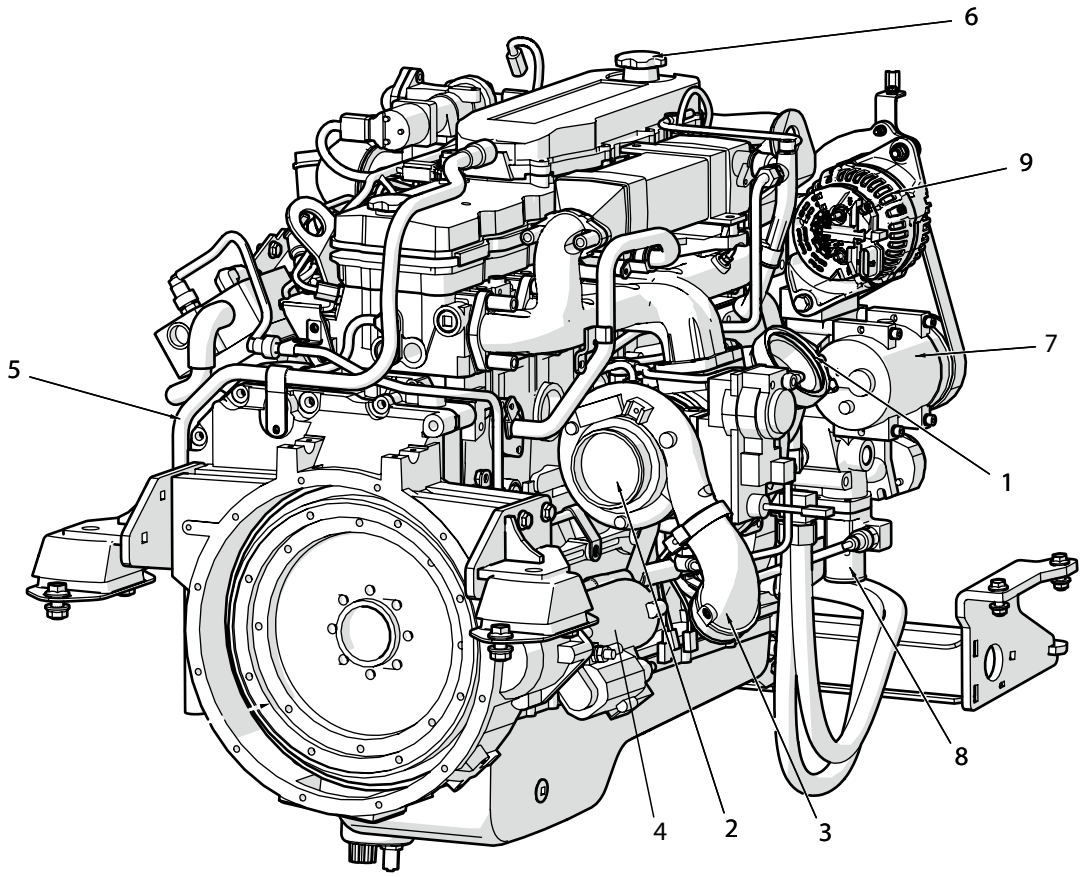


Fig. 121 Component position, flywheel side

1. Turbocharger exhaust outlet
2. Turbocharger air intake
3. Air outlet to intercooler
4. Starter
5. Crankcase ventilation
6. Oil filler cap
7. AC compressor
8. Coolant intake
9. Generator

7.2.5 Component position, top end

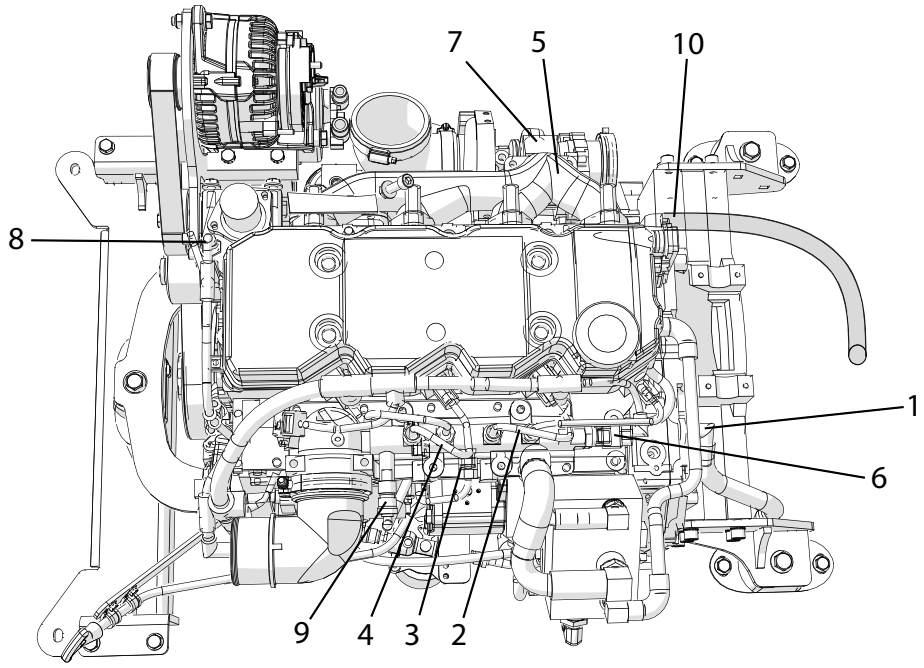


Fig. 122 Component position, top end

1. Crankcase ventilation
2. Fuel distributor
3. High pressure feed lines
4. High pressure fuel pipes
5. Exhaust manifold
6. Pressure sensor, fuel distributor
7. Turbocharger wastegate
8. Coolant temperature sensor
9. Safety valve, fuel distributor
10. Water outlet for water valve/climate system

7.3 Fuel system

7.3.1 General

The fuel system is a Common rail system with a high pressure pump which, via a distributor, provides electrically-controlled diffusers with fuel at a very high pressure.

The fuel pump also circulates the fuel through a fuel filter and primary filter, which is why the tank is fitted with a fuel supply line and a return line.

The prefilter has inbuilt sensors which alert GreControl when draining is required

Service and maintenance intervals for the engine's fuel system are outlined in the service and maintenance manual.

For additional information, see the workshop manual and the engine supplier's documentation.

⚠ CAUTION

The high pressure fuel lines from the fuel pump and the fuel distributor on the engine contain fuel at very high pressure. Never loosen the pipe couplings or similar in the high pressure section of the fuel system, or when carrying out a service or venting the system. Risk of injury or damage to the machine!

7.3.2 Filling fuel

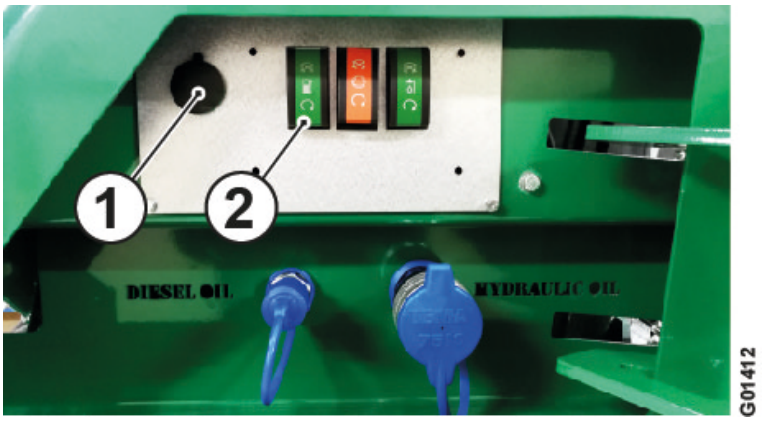


Fig. 123 Filling fuel

There are three options when it comes to refilling fuel:

- The fuel is filled via the filling line on the rear right hand side of the forwarder. Remove the lockable tank cap and fill from a fuel can, for example. The fuel tank cap is vented using a check valve so that the fuel does not run out if the machine capsizes.
- A 24 V outlet (1) is included as standard under the cover to operate an external fuel pump.
- As an optional extra, the machine can be fitted with an automatic fuel pump, see Fig. 123 *Filling fuel*, page 145. Connect the filling hose to the 1/2” quick connection and start the pump by pressing the ON button (2). The tank is fitted with a level monitor which automatically stops the pump. It is also possible to manually stop the pump by pressing the OFF button.

Fig. 124 Starting fuel pump

NOTICE

Ignition has to be activated to be able to use the automatic fuel pump.

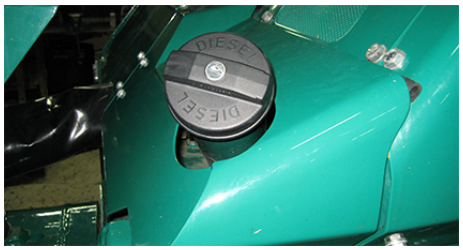


Fig. 125 Fuel filling line

⚠ CAUTION

Fill with fuel with the engine turned off but with the main power switch and ignition on.

Never leave the machine unattended.

7.3.3 Fuel prefilter

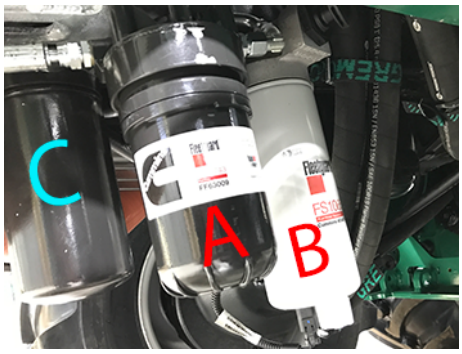


Fig. 126 Position of the fuel prefilter

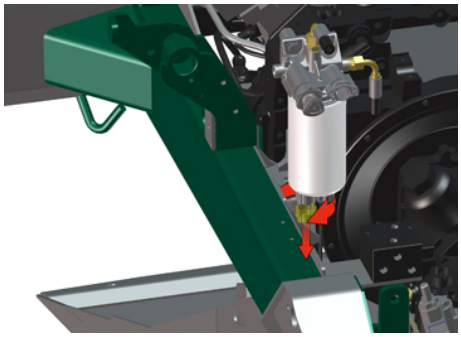


Fig. 127 Draining the fuel prefilter

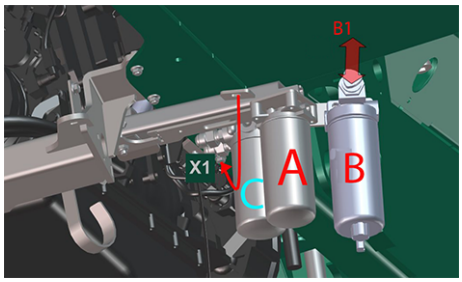


Fig. 128 Pump handle on the fuel prefilter

The fuel prefilter (B) is mounted, as shown in the figure, on the left side of the tractor under the cab.

Draining

GreControl will trigger a warning if there is water in the fuel prefilter!

- Stop the engine!
- Lower the front guard plate.
- Hold a container under the filter.
- Turn the filter 3 or 4 turns.
- Lower the screw about 25 mm and drain off the fuel into the container.
- Allow it to run freely until the fuel looks clean.
- To stop the draining, push up the screw and turn until it comes to a stop.

NOTICE

Do not overtighten the valve in the fuel prefilter as this can damage the threads.

Venting the fuel system

The fuel system is bled using the pump handle B1 on the fuel pre-filter, which is mounted behind the frame on the left side of the engine carriage behind the front guard plate.

Vent the fuel system as follows:

1. Lower the guard plate.
2. Unscrew the pump handle.
3. Use the pump handle to pump for approx. 3 minutes or until you can hear fuel streaming back to the fuel tank, this is indicated by the fuel tank making a weak noise.
4. Try to start the engine.

If the engine doesn't start, repeat step 3 again. If the engine doesn't start at the second attempt, contact your service dealer.

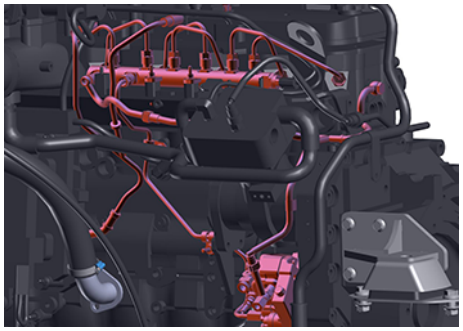


Fig. 129 High pressure section of the fuel system

⚠ CAUTION

The high pressure fuel lines from the fuel pump and the fuel distributor on the engine contain fuel at very high pressure. Never loosen the pipe couplings or similar in the high pressure section of the fuel system, or when carrying out a service or venting the system. Risk of injury or damage to the machine!

NOTICE

Dispose of any waste fuel in compliance with local environmental regulations.

7.3.4 Draining the fuel tank's sediment trap

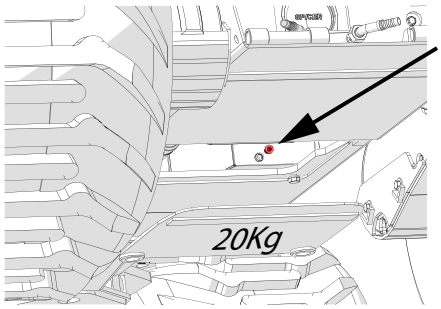


Fig. 130 Fuel tank drain plug

The fuel tank sediment trap must be drained as a part of regular preventative maintenance. The fuel tank's drain plug is located in the bottom of the tank, in the front left-hand corner. Remove the required panels to gain access.

- Place a container under the tank.
- Undo the plug and let the fuel run into the container until it is free from water and dirt.

7.4 Lubrication system

7.4.1 General

Service and maintenance intervals for the engine's lubrication system are outlined in the service and maintenance manual.

For additional information, see the workshop manual and the engine supplier's documentation.

7.4.2 Checking oil level

Fig. 131 Checking oil level

1. Park the machine on a level surface. **Warm engine**: switch off engine, wait 15 minutes and check the oil level. **Cold engine:** check the oil level.
2. Pull out the dipstick.
3. Wipe the dipstick clean with a clean, non-fibrous cloth.
4. Reinsert the dipstick all the way in and pull it out again while turning it.
5. Check the oil level, and if required top up with oil to the H-mark.

If the oil level is just above the L-mark, it should be topped up.

The amount of oil between L and H is around 2 litres.

NOTICE

Never operate the engine with the oil level below the L level or above the H level. Poor engine performance or engine damage may result.

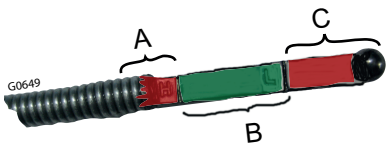


Fig. 132 Oil dipstick

A. Oil level too high

B. Correct engine oil level

C. Oil level too low

7.4.3 Refilling engine oil

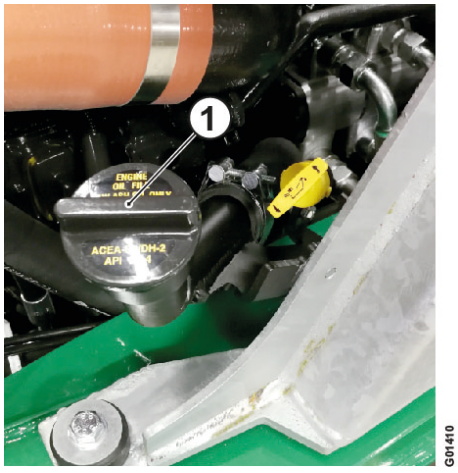


Fig. 133 Refilling engine oil

Pour the oil into the filling opening (1).

Lubricating oils

Quality grades

See the service and maintenance manual for details of recommended oils.

If in doubt contact your service dealer.

7.5 Cooling system

7.5.1 General

Service and maintenance intervals for the cooling system are outlined in the service and maintenance manual.

For additional information, see the workshop manual and the engine supplier's documentation.

⚠ CAUTION

There is an overpressure in the cooling system when the engine is hot. Hot coolant may spurt out and cause burns in the cases of any leaks or when the expansion tank filler cap is opened. Do not remove the cap if the coolant temperature is greater than 50°C. Glycol is harmful to the environment and toxic if swallowed.

7.5.2 Checking the coolant level

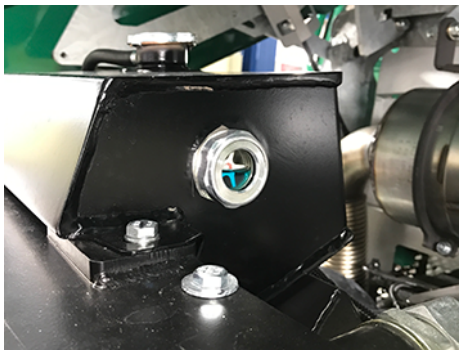


Fig. 134

The system is filled with coolant using the expansion tank. The coolant level is checked in the expansion tank's sight glass; the level should be in the middle of the glass scale.

Top up, if necessary, using the correct blend of water and glycol.

⚠ CAUTION

There is an overpressure in the cooling system when the engine is hot. Hot coolant may spurt out and cause burns in the cases of any leaks or when the expansion tank filler cap is opened. Do not remove the cap if the coolant temperature is greater than 50°C. Glycol is harmful to the environment and toxic if swallowed.

NOTICE

If the coolant level is too low, the engine may be damaged.

7.5.3 Checking the coolant freezing point

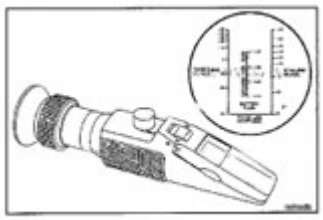


Fig. 135 Checking the coolant freezing point

The coolant freezing point is checked by using a refractometer. Use a mixture of 50% water and 50% antifreeze to keep the engine protected down to -32°C , all the year round!

NOTICE

Too high a concentration or too low glycol content can cause engine damage!

NOTICE

Do not mix ethylene glycol and propylene glycol. If you have the slightest doubt, pour out, clean and refill with a new mixture.

NOTICE

Before draining, the engine must be switched off and the filler cap removed.

7.6 Air filtration system

7.6.1 General

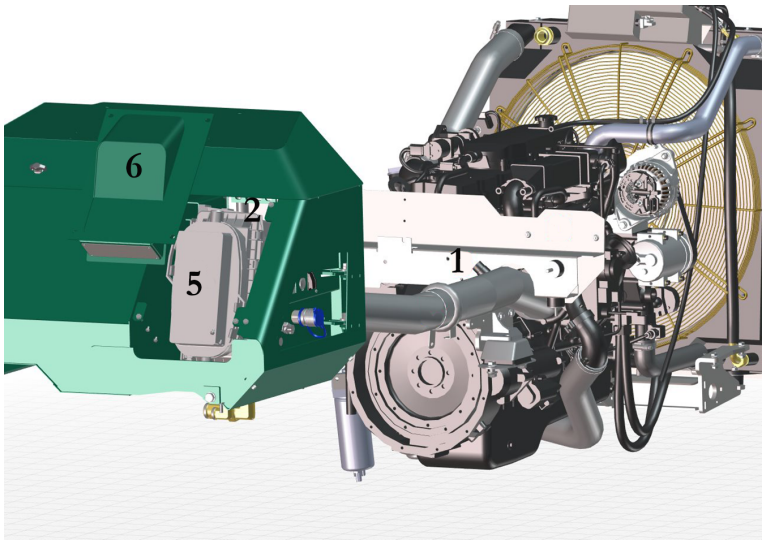


Fig. 136 Air filtration system

1. Air filter indicator
2. Air filter holder
3. Inner air filter, safety filter
4. Outer air filter, filter cartridge
5. Filter cover
6. Intake with grid

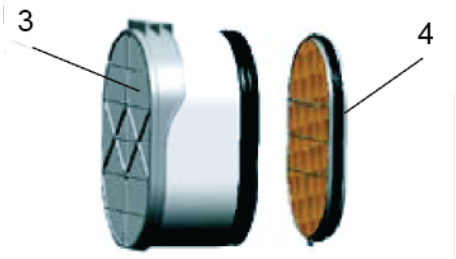


Fig. 137 Air filter

The air filter on all Gremo machines has an air filter indicator which measures the pressure drop in the filter and therefore triggers an alarm in the control system, GreControl.

The air filter must therefore only be replaced when the control system alerts you to do so. When alerted, replace the external or internal filter alternately each time.

NOTICE

In order for the engine to start, the air filter's intake opening must be kept clear of dirt, snow and ice.

7.6.2 Exhaust system with particulate filter

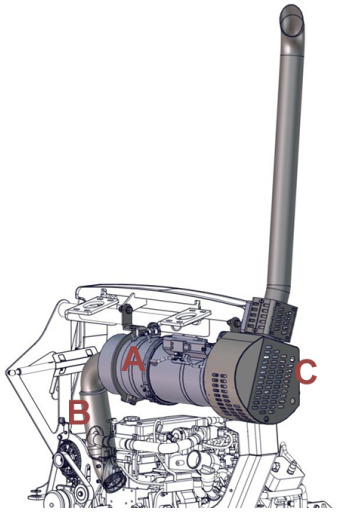


Fig. 138 DPF particulate filter

General

The engine installed in this machine is a 3B engine that complies with the requirements outlined in the 97/68/EG directive concerning exhaust emission limits. This engine is therefore fitted with a DPF (Diesel Particulate Filter).

The filter is made of a ceramic material with small channels with an irregular surface. By restricting the exhaust flow through the exhaust system the pressure is increased and the combustion temperature raised. First and foremost, the soot is burned off faster, and when the remaining soot particles pass through the DPF they are trapped in the filter's surface.

The filter traps: calcium, zinc, sulphur, phosphorous, 60% calcium phosphates and 20% zinc dithiophosphates.

Definitions

We distinguish between four definitions of regeneration:

1. **Passive** regeneration takes place at 300°C in the exhaust gas temperature; it takes place continuously during normal engine operation.
2. **Automatic** regeneration occurs when passive regeneration does not work. The engine then uses a larger volume of fuel to increase the exhaust gas temperature to about 600°C in the working temperature; also takes place automatically every 96 hours.
3. **Manual** stationary regeneration at about 700-800°C takes place after the soot level is too high.

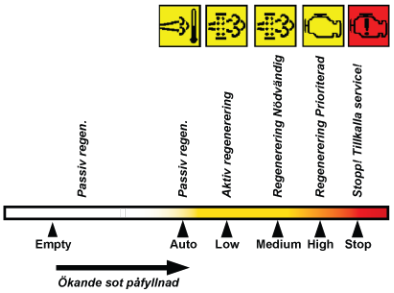


Fig. 139 The regeneration process

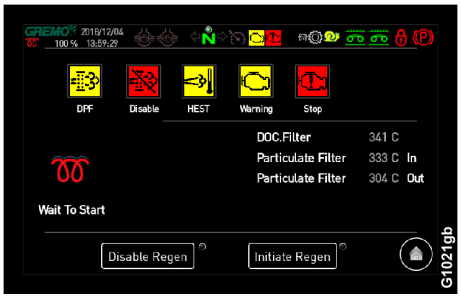


Fig. 140 GreControl

Fig. 141 Stop engine lamp.

4. **Filter cleaning**/replacement after about 3,500 hours or when the soot level is so high a red engine lamp goes on.

Passive regeneration

The passive process takes place continuously during normal engine operation. During harder operation and higher exhaust gas temperatures, the soot particles are burnt more and this extends the time until the next manual regeneration process.

Automatic regeneration

This regeneration process normally occurs every 96 hours or when passive regeneration does not work due to low exhaust temperatures.

Stationary active regeneration

Alarm triggered in Gre-Control when soot particle content in the DPF filter is too high. When the medium DPF symbol flashes, active stationary regeneration should be started. Similarly, when the Check engine lamp is lit when the level of soot is too high.

Pause the regeneration process by pressing **F2**. (Red DPF lamp is lit while the process is paused.) Drive to an area where there is no combustible material around the exhaust pipe. At least 2-5 metres or more depending on the weather. The software now takes over the engine and reduces engine speed to 650 rpm and starts the regeneration process, which takes about 45 minutes. Park the machine by engaging the parking brake but keep the engine running. Do not operate the crane during an ongoing regeneration process. Start the process in Gre-Control by pressing **F4**.

⚠ CAUTION

Major fire hazard! The exhaust system gets very hot, about 800°C, during the particle filter regeneration process.

”Stop Engine Lamp” normally lights up after 3,500 hours or when a red check engine lamp is lit/flashes. The DPF filter must then be replaced. The next time the filter can be cleaned using the correct equipment.

8 Transmission system and gearbox

8.1 General

The gearbox in the Gremo 1250F/1450F is a mechanical dropbox with two speed registers as standard. The gearbox has two gears and develops a variable torque that is easily controlled using the potentiometer on the left armrest panel.

9 Electrical system

9.1 General

The machine is equipped with a 24 V electrical system with negative earth. The system consists of a 110 A AC alternator, two 12 V batteries connected in series, a main switch, various fuse groups, switches and loads such as lights, crane, fire extinguishing equipment etc.

9.2 Batteries

Fig. 142 Batteries in the right branch deflector

The batteries are located in the right branch deflector. The batteries are connected in series to provide a combined voltage of 24 V.

9.3 Activation of main power switch

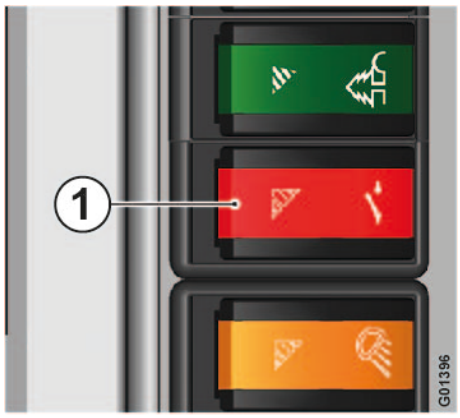


Fig. 143 Main power switch

The power switch (main power switch) is located on the side panel (1) in the cab. With the main power switch activated, the machine is live, when it is turned off (Note: does not apply to emergency stops) the timer relay K10 will maintain power for approx. 60 seconds so that the engine's control unit can reset itself.

The diesel heater can be operated without the main power switch being activated.

Always disconnect the power supply via the main power switch when you leave your machine.

9.4 Component position of fuse groups and relays

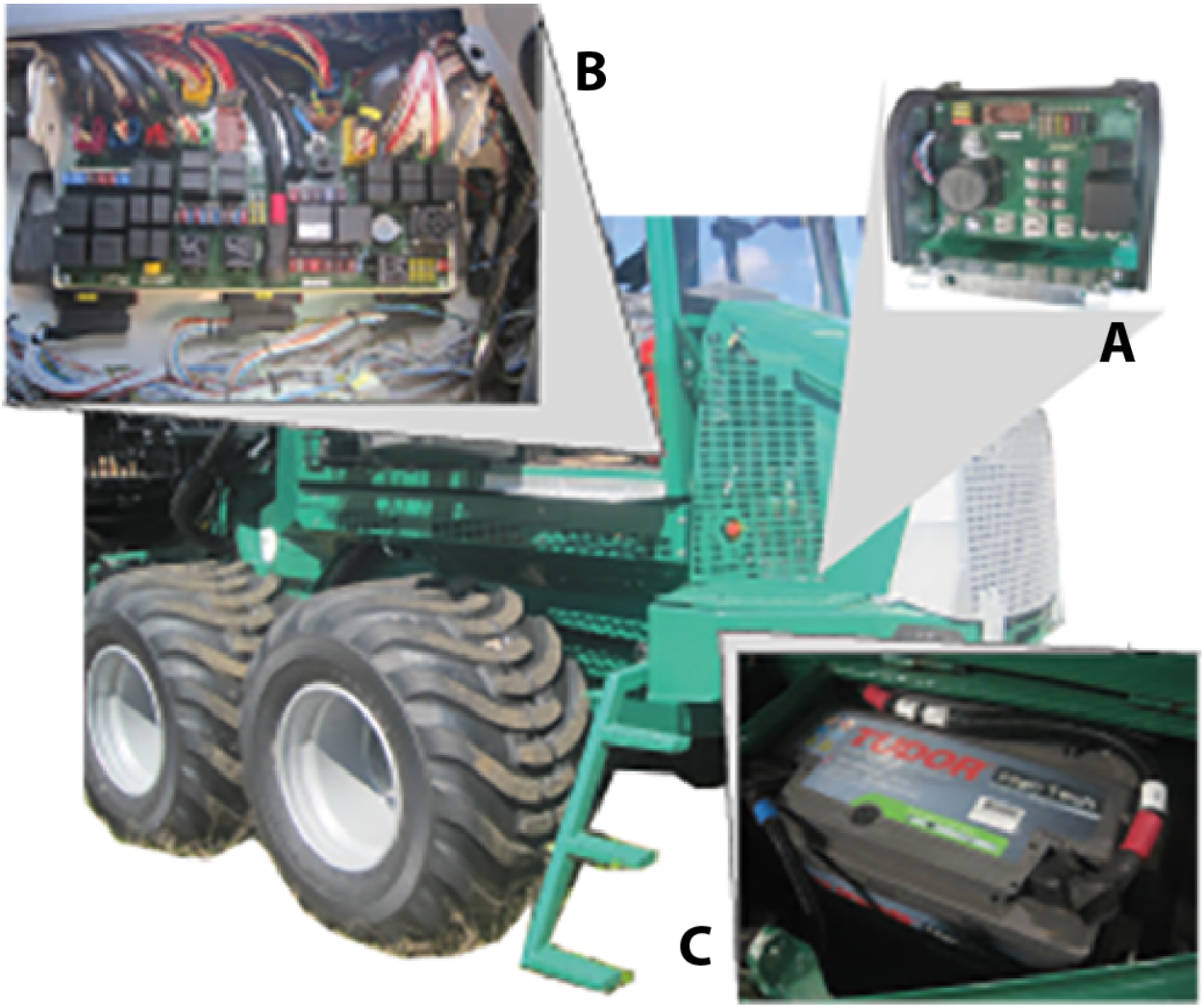


Fig. 144 Position of distribution boxes

Pos.	Location	Fuses	Relay
A	Right engine compartment	F51-F60, F99-F101	K30–31 K60 (at rear)
B	Distribution box, left side of cab	F1 - F50	K1 - K25
C	Batteries in the right branch deflector		

9.4.1

Fuse list, right engine compartment

Fig. 145 Fuse list: right engine compartment

Fuse	Nominal current [A]	Function
F51	40	Main fuse for fuses F12, F24, F46, F49, F50
F52	20	Diesel heater
F53	20	Back-up 00 002
F54	30	Cummins engine
F55	25	Tank pump for hydraulic oil, vacuum pump
F56	25	24 V Outlet, tank pump for diesel
F57	10	Generator battery sensing
F58	30	Cab tilt pump
F59	20	Back-up 00 003
F60	3	Blocking acc. load during start-up

Fuse	Nominal current [A]	Function
F99	100	Main fuse for power relay K31, starter motor
F100	150	Main fuse for power relay K60, pre-heating
F101	150	Main fuse for cab card

9.4.2 Fuse and relay list, distribution box in cab

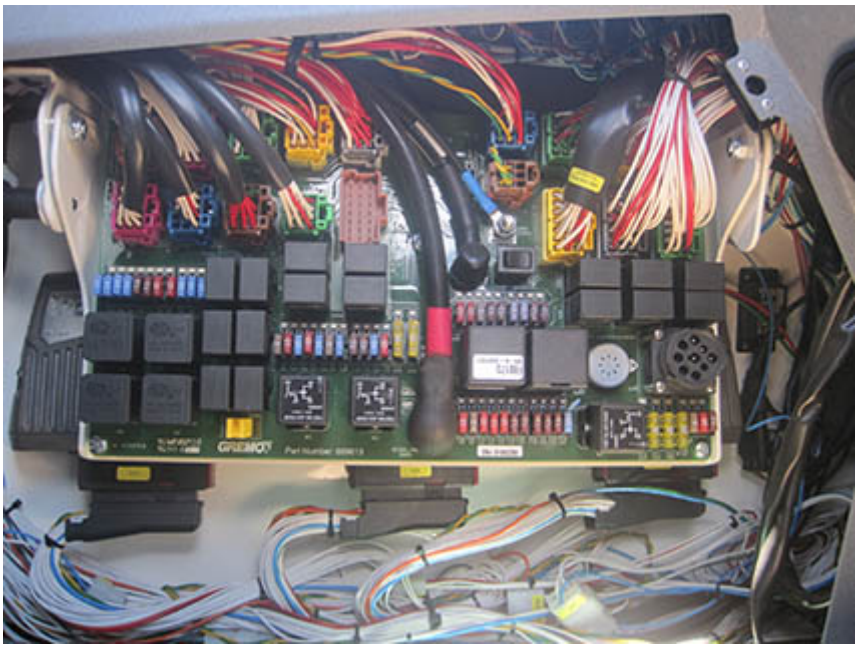


Fig. 146 Distribution box in cab

Fuse	Nominal current [A]	Function
F1	5	Operation of ECU, charge indicator
F2	7.5	Position lights, backlit symbol in switch, working lights
F3	15	Heater fan, water valve
F4	5	Misc. valves, air filter/differential/all-wheel drive indicator, damping
F5	10	Urea level, float mode bogie

Fuse	Nominal current [A]	Function
F6	7.5	Driving lights, main beam
F7	7.5	Driving lights, dipped beam
F8	10	Armrest panels, crane levers, digital keys for IQAN, seat position, pedals, lever control, emergency brake rear
F9	20	IQAN-MD4 Display, XA2–A5
F10	20	IQAN-XA2-A0 Crane
F11	20	IQAN-XA2-A1 Pump
F12	7.5	Hazard warning lights, main power cutout
F13	10	Operation of starting relay, relief relays K1-K3
F14	10	Driving lights F6, F7
F15	7.5	Winch/Gate operation, operator’s seat tilt, interior lighting, mechanic’s lamp
F16	10	Windshield wipers
F17	7.5	Indicators, signal horn, seat heater
F18	7.5	Supply, hydraulic motor sensors, gear guard
F19	15	Dasa Operational follow-up
F20	7.5	Rotating warning light, food heater
F21	20	IQAN-XA2-A2 Brake
F22	10	Radio, 24/12 V converter, phone, 12 V cab socket
F23	7.5	24 V cab socket
F24	7.5	IQAN-MD4, timer for diesel heater, DASA
F25	3	Left position lights
F26	3	Right position lights

Fuse	Nominal current [A]	Function
F27	7.5	Back-up, after ignition lock, tilt sensor
F28	7.5	Back-up, before ignition lock, PC-ECU socket
F29	20	Extra box A8:18, A14:16
F30	15	Working lights roof, front
F31	15	Working lights roof, left side
F32	15	Working lights roof, right side
F33	15	Working lights low, left side
F34	15	Working lights low, right side
F35	10	Working lights roof/cab rear, left side
F36	10	Working lights roof/cab rear, right side
F37	15	Working lights, carriage
F38	15	Working lights, crane
F39	15	Free roof ramp
F40	15	Free roof ramp
F41	15	After ignition on A14:13, 14
F42	10	After ignition on A14:7, 8
F43	5	After ignition on A14:3, 6
F44	10	Before ignition on A14:1, 2
F45	5	Before ignition on A14:4, 5
F46	10	Battery voltage A14:10, 11
F47	15	After ignition on K17:30, A14:18
F48	15	After ignition on K18:30, A14:19

Fuse	Nominal current [A]	Function
F49	5	Fire
F50	10	Heater setting, Climate system

10 General

The machine is equipped with a joint hydraulic system for the hydrostatic transmission (forward drive) and working hydraulics supplying the crane, steering, ladder, differential locks, parking brake and extra equipment, the engagement and disengagement of all-wheel drive with oil. The pumps in this system are located at the rear of the diesel engine.

Service and maintenance intervals for the hydraulic system are outlined in the service and maintenance chapter.

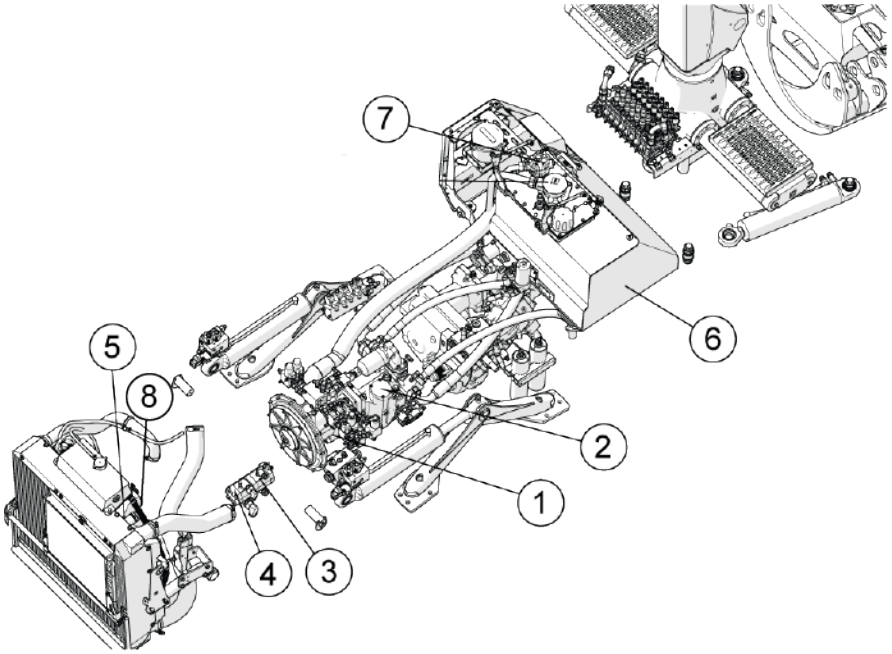


Fig. 147 Hydraulic system "Rexroth", component position

1. Working hydraulics pump
2. Hydrostatic pump
3. Valve bank working hydraulics
4. Cooling fan pump
5. Hydraulic oil cooler
6. Hydraulic tank
7. Return filter
8. Cooling fan engine

10.1 Hydraulic oil level check

Fig. 148 Hydraulic tank level check

The hydraulic oil level is checked either in the sight glass on the hydraulic tank's left side or in GreControl.

The hydraulic oil level is checked either in GreControl or in the sight glass on the rear of the hydraulic tank.

In the sight glass the level should be between the marks. Top up with oil if the level is too low. See the service and maintenance section for volumes and quality, volume specifications and oil recommendations. GreControl triggers an alarm if the hydraulic oil level drops below the factory-set alarm level. (See Chapter 4, Instruments and controls and Engine transmission and crane control system)

NOTICE

When changing the hydraulic oil, the return filter and breather filter should also be replaced at the same time.

Refilling hydraulic oil

NOTICE

When filling up with hydraulic oil, the machine must be on a level surface. Do not mix different types of hydraulic oil; check which type of oil the machine is already using before topping up.

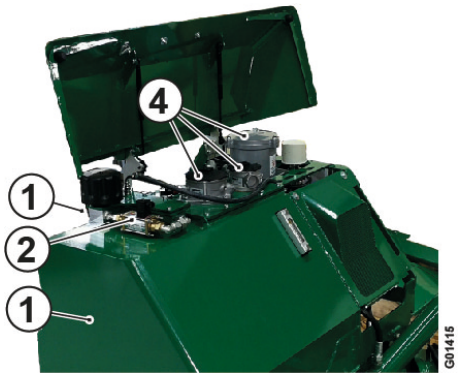


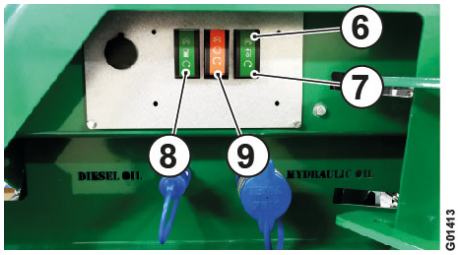
Fig. 149 Refilling hydraulic oil

The hydraulic oil tank (1) is filled using an electric refilling pump (2). By inserting the filling hose (3) in the oil drum with new hydraulic oil, the oil passes through the return filter (4) before it enters the hydraulic tank.

Press the right-hand start button (7) on the control panel (5) to start the refilling pump and when the oil level reaches the maximum level the pump stops. Press (6) to manually stop the pump. The switch (8) controls the diesel filling pump and (9) controls the vacuum pump (OPTION).

NOTICE

New oil in new barrels or cans is seldom clean enough to fulfil the requirements. All filling of hydraulic oils should therefore be done with the electric refilling pump.



NOTICE

Never fill hydraulic oil directly at the cap. Dirty and unfiltered hydraulic oil may cause damage to the machine!

NOTICE

Oil drums standing outdoors collect water in the lid, and this water can run down into the oil.

Water-damaged oil results in machine breakdown.

Store oil drums lying horizontally under a roof.

11 Pressurised air system

11.1 General

The machine is equipped with a pressurised air system that provides air to the operator's seat, and a socket where, for example, the compressed air gun can be connected.

The water-cooled air compressor is directly connected to the diesel engine. The pressurised air tank, which is equipped with automatic draining, is mounted under the diesel tank. The pressurised air outlet is mounted in the left-hand toolbox (branch deflector).

⚠ CAUTION

Wear protective goggles while cleaning, and do not direct the air stream towards any part of the body.

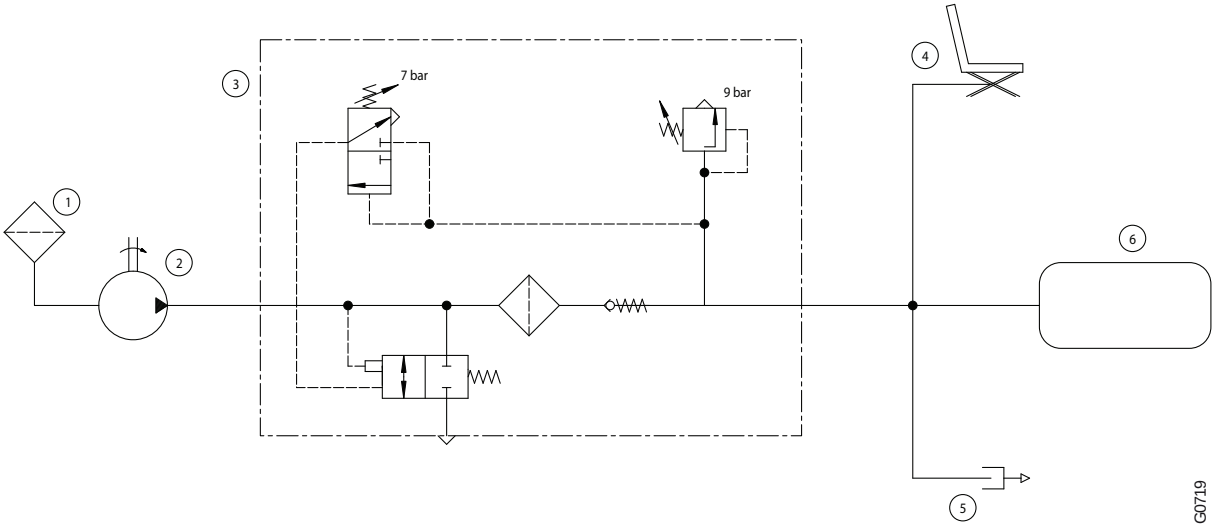


Fig. 150 Pneumatic installation

General

For service and maintenance intervals for the pressurised air system, see Chapter 15: Service and maintenance. For additional information, see the engine supplier's documentation.

pos.	Description	pos.	Description
1	Air filter	4	Pneumatic operator's seat
2	Compressor	5	Quick connection
3	Pressure regulator	6	Accumulator tank

12 Crane

12.1 General

This chapter provides an overview of the crane and how to maintain it. Refer to the crane-specific instruction manual that comes with the machine for more detailed information.

12.2 Washing the crane

NOTICE

When high-pressure washing the crane, the water jet must not be directed towards the connection points of the crane column or the crane base! Risk of water penetration and corrosion damage!

12.3 Periodic checks and maintenance

Perform checks and lubrication at repeated stages during work. In this way you will extend the lifespan and minimise unnecessary downtime of your crane equipment. See the *Service and maintenance manual*.

12.4 Reach for each crane

Crane reach, see 14.13 *Cranes*, page 194.

By turning the carriage outwards, the reach is increased by 0.5 m.

12.5 Lubricating the boom

The boom should be serviced regularly in accordance with the maintenance schedule. See the *Service and maintenance manual*.

12.6 Crane instruction manual

The instruction manual and spare parts catalogue for the crane are delivered separately.

13 Other equipment and optional equipment

13.1 Diesel heater Webasto Thermo 50/90

13.1.1 General

Fig. 151

The heater is connected to the regular heating system of the machine. A separate water pump circulates the coolant through a heat exchanger where the water is heated and then led to the cab and the engine. The cab is heated by the regular heating fan of the machine. The heater works in intervals with a thermostat which first raises the temperature in the engine to approx. 40°C before the fan in the cab starts.

NOTICE

Note that the heater causes a load on the batteries!

NOTICE

When the heater is used as a parking heater it will use up part of the battery capacity. This happens especially in cold weather and when the battery is already heavily strained. Because of this, it is recommended to run the engine for at least the same duration as the heater has been active. Furthermore the battery should be checked and charged if necessary.

Run the heater at least once per week, even during the summer. This will prevent non-circulating fuel from vapourising and leaving coatings which may cause operating problems.

13.1.2 Operating problems

If the heater doesn't start:

1. Check the fuses, see 9 *Electrical system*, page 157. Check also fuse F3 (heater fan, water valve). If this fuse is broken, then the heater will still start and heat the diesel engine, but there will be no hot air in the operator's cab.
2. Check the automatic overheating thermostat.
3. Check that cables and fuel hoses have not come loose.
4. Ensure that the battery has enough capacity.
5. Check the glow plug.
6. Contact your service dealer.

The heater will automatically switch off if the combustion doesn't start during startup or if flame failure occurs during operation. The flame detector will sense this and the heater will attempt to start again. Only if this second attempt fails too, the heater will be switched off.

13.1.3 Error codes Thermo 90

F 01	No start (after 2 starting attempts)
F 02	Flame failure (repeated > 5)
F 03	Voltage too low or too high
F 04	Flame identification comes too early
F 05	Flame monitor, break or short-circuit
F 06	Temperature sensor, break or short-circuit
F 07	Metering pump, break or short-circuit
F 08	Fan motor, break, short-circuit or incorrect speed
F 09	Glow-plug, break or short-circuit
F 10	Overheating
F 11	Circulation pump, break or short-circuit

13.2 Air conditioning system

Fig. 152 Air conditioning, panel

The air conditioning system distributes air as set in the air conditioning panel, see 4.8 *Functions on the control panel of the air conditioning system*, page 64.

The air conditioning system consists of an air conditioner package that contains a heating element and a heat sink, a fan package and a control unit. A water valve opens depending on the hot water setting in the heating element. The AC compressor generates the coolant for the heat sink if (4) is on.

13.2.1 Air conditioning system, components

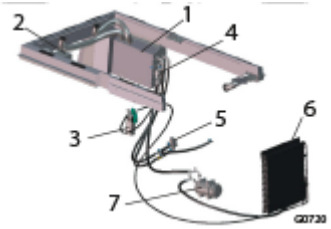


Fig. 153 Air conditioning system, components

1. Complete air conditioning package
2. -
3. Drying filter
4. Block valve
5. Water valve
6. Condenser
7. AC compressor

13.2.2 Troubleshooting the air conditioning system

NOTICE

Special authorisation is required by the person refilling the refrigerant in the air conditioning system (observe national and local regulations).

- The fuses that protect the air conditioning system are F54 and F3, and relay K9 (See section 9.2 and the F3/9 wiring diagram).
- Coolant leakage - Inspect all hoses and pressure test the system (carried out by authorised service workshop authorised to handle R134 gas).
- The water valve is not functioning if the system produces maximum heat.
- Contact a Gremo Service shop to troubleshoot the control unit.

13.3 Fire extinguishing system

13.3.1 How the Fogmaker fire extinguishing system works

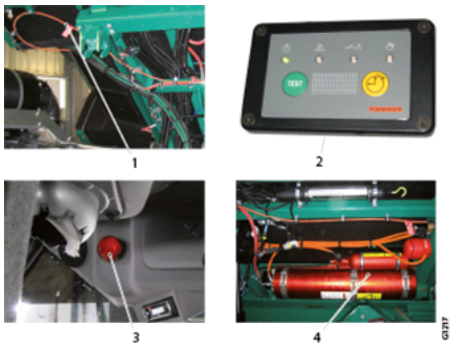


Fig. 154 Fogmaker, fire extinguishing system

1. Detector coil
2. Alarm panel
3. Warning lamp in the cab roof
4. Fire extinguishing container

1. In the event of a fire in the engine compartment, the detector coil will burn off.
2. The system activates both a visible and audible alarm signal in the alarm panel.
3. Flashing warning lamp in the cab roof.
4. The fire extinguisher tank is triggered if the semi-automation is disconnected:
   - by pressing the emergency stop,
   - turning off the machine using the ignition key or
   - by activating the parking brake.
5. The fire extinguisher tank is automatically activated if the fire extinguishing system is in fully automatic mode (i.e. there is power supply to the machine and the parking brake is activated or the machine has no current supply).

13.3.2 Actions in the event of fire

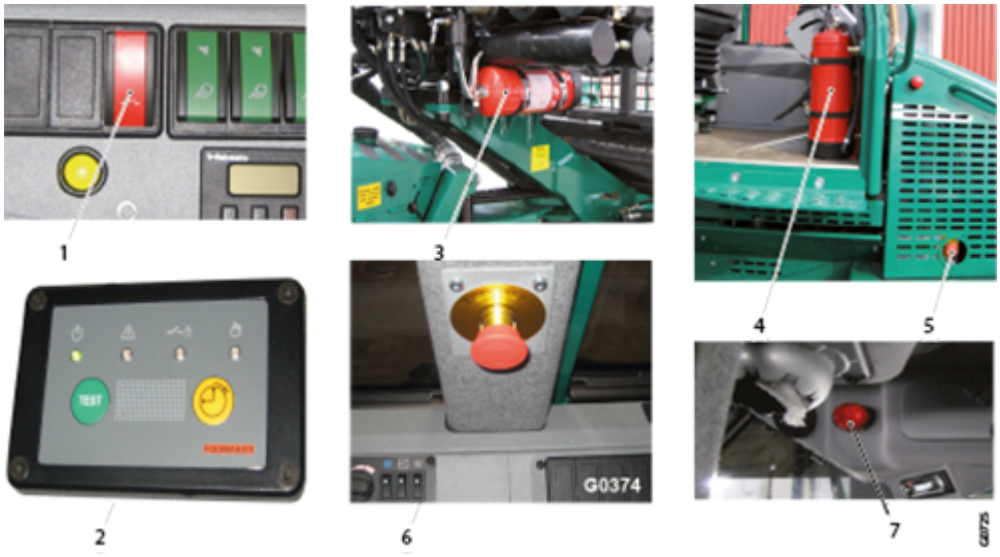


Fig. 155 Actions in the event of fire

- In the event of a fire, the detector coil will burn off and the system will generate both a visible and audible alarm signal (diode + buzzer in the alarm panel (2) and a flashing warning lamp (7) in the cab roof).

- Stop the machine's engine with the emergency stop (5 or 6) or by switching off the ignition (1).
- Be prepared with the handheld fire extinguisher located inside the cab (4) or on the left side of the crane tower (3) to tackle any resurge of the fire.

13.3.3 False alarm, pressure drops below 14 bar but remains above 6 bar

The system activates both a visible and audible alarm signal in the alarm panel but the fire extinguisher tank is not triggered.

Disabling the alarm, fire extinguishing system

- If you have verified that it is a false alarm, the alarm can be disabled.
- Disconnect main fuse F49 in the circuit board for the cab.

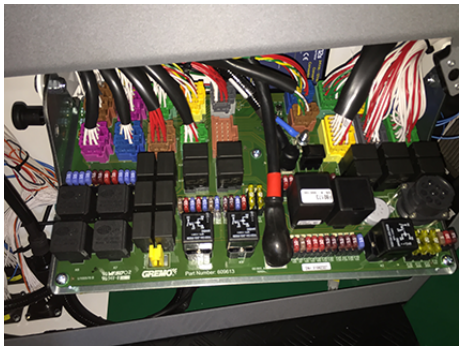


Fig. 156 Cab circuit board

- In order to ensure that the fire extinguisher tank is not accidentally deployed, fit the safety screw.

  The safety screw must be fitted when servicing and transporting pressurised containers. Let the safety screw hang by the wire when it is not inserted.

  Refit main fuse F49 and unscrew the safety screw so that the system becomes operational again.

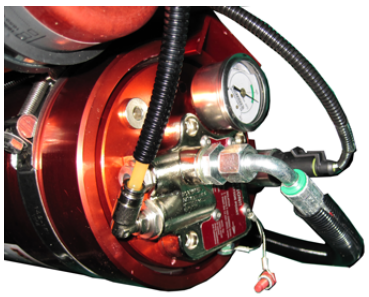


Fig. 157 Fire extinguishing system, safety screw

13.3.4 Actions after the fire

- Check that the fire has been properly extinguished. Use additional extinguishers if necessary.
- Disable main fuse F49 to switch off the alarm.
- Do not start the machine until the cause of the fire has been established and any faults are rectified. You are required to observe and follow the instruction signs on the machine.
- The fire extinguishing system must be inspected once a year by authorised service personnel. Check this with your insurance company.

NOTICE

If the fire extinguishing system is triggered or the hand-held fire extinguisher is used.

As soon as possible, try to wash the machine with the high pressure washer and an alkaline cleaning agent. The extinguishing agent contains a salt solution which corrodes the engine parts and the cleaning agent removes the binding agent in the extinguishing foam.

13.3.5 Component specification

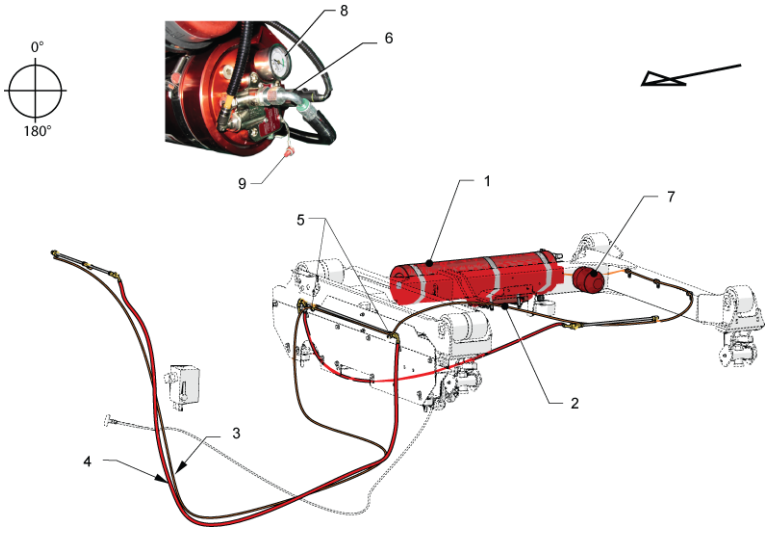


Fig. 158 Fire extinguishing system, component placement

1. Extinguishing container
2. Detector flask
3. Detector loop
4. Fire extinguishing loop
5. Nozzles (9 pcs)
6. Pressure switch
7. Alarm siren
8. Pressure gauge, analogue
9. Safety screw

13.4 Winch

13.4.1 Description and use

DANGER

Risk zone for all winching work is at least 70 m

Never work in the load's area of movement between the load and the winch.

WARNING

Do not disengage the winch when it is under load!

The winch is operated by a hydraulic motor connected to the machine's standard system.

The wire is paid out using the Winch out switch (3) and drawn in with the Winch in switch (9) on the left armrest panel.

The winch can be disengaged using a clutch so that the winch drum can free spool. The clutch is released with a double-action air cylinder operated by the Winch release switch (6) on the left armrest panel.

When the winch spools freely, the green indicator lamp by the Winch freespooling switch comes on, see 4.4 *Left arm rest panel functions*, page 56.

13.5 Cab suspension

As an optional extra, the machine can be fitted with cab suspension to increase operator comfort, see 5.11 *Cab suspension*, page 93.

13.6 Gremo remote control unit

DANGER

The winch (optional equipment) is not approved for suspended loads. If a load is hoisted, e.g. by means of a pulley, it is dangerous to stand under the load.

DANGER

All towing or winching with cables entails danger to life. If the wire breaks or the hook slips while you winch, it will result in a whiplash effect. The cable may lash at an angle or backwards along its entire length!

Risk distance 100 m.

WARNING

The risk zone when using the machine's remote control is 20 metres.

NOTICE

When working remotely, the work area should be cordoned off and signposted: "DANGER: timber winching"

Fig. 159 Radiomatic FSE510 remote control unit

13.6.1 HBC remote control

Enable remote control

1. Turn on the power switch for the rotating warning light on the side panel.

2. Activate it in the **IQAN**display.
3. Pull out the emergency stop on the transmitter.
4. The remote control is now enabled.

Disable remote control

1. Turn off the engine with the transmitter.
2. Deactivate it in the **IQAN**display.
3. Turn off the power switch on the side panel.
4. Press in the emergency stop in the transmitter.

Emergency stop function

The two emergency stop buttons on and in the machine work as normal, and disconnect the main power supply.

The emergency stops in the transmitter are enabled when the power switch on the side panel is on; when pressed the emergency stops disconnect the engine and control system, the machines' main power supply is on to ensure lighting stays on.

Function

When the transmitter is enabled, most functions are blocked in the cab for example, levers, pedals and some critical buttons.

WARNING

Enabled remote control! Deactivate the cab lever in the **IQAN**display.

The chair brake can still be controlled from the cab.

Ladder and parking brake can be controlled from the cab in **winch mode**, it could be difficult otherwise to get out.

If the ladder is lowered, it is folded up when the engine is running and **Machine mode** is selected.

If the ladder is up, it is lowered when the **Stop engine** mode is enabled, the engine stops with a 2 seconds delay.

Display

Press  to open the **HBC Radio activation** window.

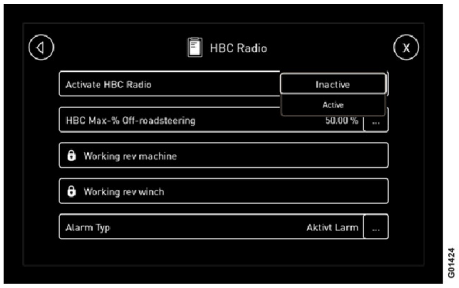


Fig. 160

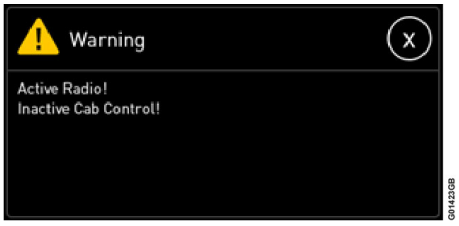


Fig. 161

Press **Active** to activate.

The following warning window is shown when the radio is active.

To activate, first remove the warning, then press, to display the **HBC Radio activation** window. Press **inactive**.

(if the warning is removed, it will appear again after 20 seconds as long as the radio is activated).

Remote control setting

The page is found under **Adjustment**.

The following settings are possible:

- Enable or disable the remote control, the same as from the main page
- Speed for off-roading steering
- Working speed for moving machine
- Working speed for winching

FSE510 transmitter functions

Indicators

(D1) Indicates green/red battery status

(D2) Indicates green when the engine is running

(D3) Indicates red when there is an alarm in the machine

(D2) and (D3) flash when the emergency alarm is enabled

Signal (toot)

(S6) machine signal (toot)

Engine

(S3) DMG + (S5) engine start/stop

Winch

(S4) in winch mode

(S1) winch increase/reduce speed

(S2) winch in/out, if the winch is free to spool it is locked when in/out is enabled

(S3) winch free spooling/locked

Machine

(S4) in machine mode

Machine operation requires additional safety so (S3) DMG must therefore be enabled when moving the machine.

(S1) off-road steering left/right

(S2) operation forward/backward

(S6) AUX + (S1) to increase/decrease the set machine speed

13.6.2 Function matrix

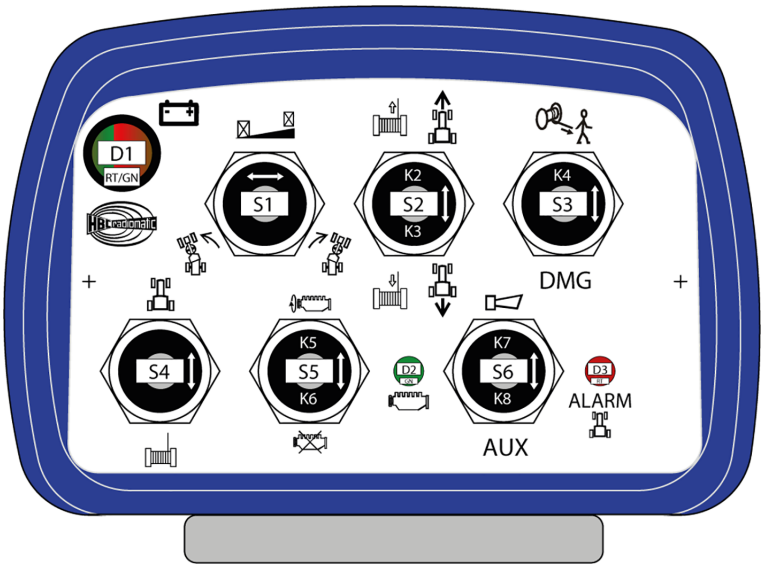


Fig. 162 Remote control unit

A		**Indicators**	**D1**	**D2**	**D3**			
		All modes	Battery status	Engine running	Machine alarm			

B		**Winch**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
	+		Winch increase	Winch out	Winch free	Machine		Signal
	-		Winch reduce	Winch in	DMG	**Winch**		AUX

C		**Winch + DMG**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
	+		Winch increase	Winch out	Winch free	Machine	Start engine	Signal
	-		Winch reduce	Winch in	**DMG**	**Winch**	Stop engine	AUX

D		**Winch + AUX**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
	+		Winch tilt up	Winch out	Winch free	Machine		Signal

	-		Winch tilt down	Winch in	DMG	**Winch**		**AUX**

		Machine	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
E	+					**Ma-chine**		Signal
	-				DMG	Winch		AUX

		Machine + DMG	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
F	+		Ma-chine right	Ma-chine forward		**Ma-chine**	Start engine	Signal
	-		Ma-chine left	Ma-chine back-ward	**DMG**	Winch	Stop engine	AUX

		Machine + AUX	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
G	+		Ma-chine in-crease	Blade down		**Ma-chine**	Start engine	Signal
	-		Ma-chine de-crease	Blade up	DMG	Winch return to reposi-tory	Stop engine	**AUX**

The receiver is activated together with the rotating warning light, the transmitter is then activated by means of  .

When the transmitter is enabled, most functions are blocked in the cab for example, levers, pedals and some critical buttons.

The chair brake can still be controlled from the cab.

The ladder and parking brake can be controlled from the cab in Winch mode, it could be difficult otherwise to get out.

If the ladder is lowered, it is folded up when the engine is running and **Machine mode** is selected.

If the ladder is up, it is lowered when the **Stop engine** mode is activated, the engine stops with a 2 seconds' delay.

13.7 Active bogie

Gremo active bogie balancing is a proprietary computer-controlled bogie balancing function for the best accessibility in hilly terrain.

In addition, the balanced bogie offers responsiveness, excellent operator comfort and more favourable loads on the machine.

13.7.1 Active bogie page

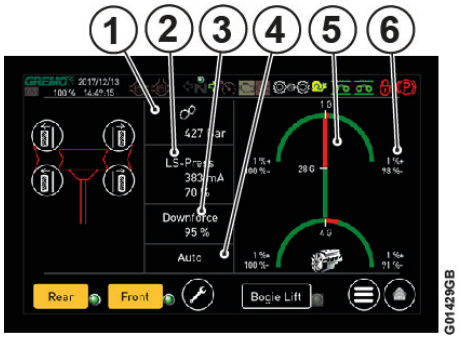


Fig. 163

1. Shows transmission pressure.
2. Shows current in the LS pressure valve and % of relevant maximum value.
3. Shows set value of how much thrust force from a maximum value is transferred to the bogie
4. Shows Manual/Auto.
5. Shows the machine inclination in the Y axis, carriage and tractor in the X axis (seen from above).
6. Shows the current distribution of the active bogie power (seen from above).

Reverse. Disables the carriage's bogie in auto mode, green indication when active.

Forward. Disables the tractor's bogie in auto mode, green indication when active.

. Shortcut to the bogie's settings.

Bogie Lift. Selection of auto or manual bogie, green indication for manual bogie lift (Can also be controlled from the left panel, button no. 5)

Main page

Fig. 164

1. Shortcut to Active bogie page from the first page.
2. Green LED comes on for Active bogie on back axle.
3. Green bogie symbol appears when manual bogie lift is activated otherwise .
4. Green LED comes on for Active bogie on front axle.

13.7.2 Active bogie settings

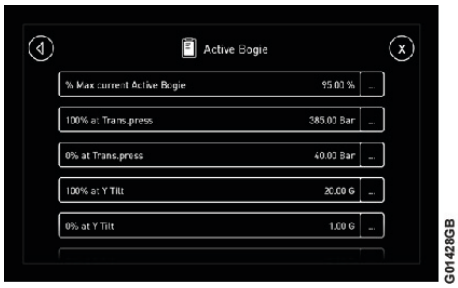


Fig. 165

NOTICE

Certain settings are locked!

%Max. current Active Bogie: The value indicates how much pressure force in % is available (75%).

100% for Transmission Pressure: The value indicates which transmission pressure gives 100% (385 bar).

0% for Transmission Pressure: The value indicates which pressure transmission gives offers 0% (40 bar).

100% at Y tilt: The value specifies which Y tilt gives 100% (20 degrees).

0% at Y tilt: The value specifies which Y tilt gives 0% (1 degree).

0% at X tilt: The value specifies which X tilt gives 0% (40 degrees).

Filter Tilt sensor: The value indicates filtering size on the tilt sensors (94).

Filter Pressure sensor: The value indicates filtering size on the pressure sensors (92).

100% Under Km/h: Below this speed 100% is allowed (3 km/h).

0% Upper Km/h: Above this speed 0% is allowed (6 km/h).

Pv. LS pressure: Proportional pressure actuation, Current output

Pv. Bogie lift Left +: Current output.

Pv. Bogie lift Left -: Current output.

Pv. Bogie lift Right +: Current output.

Pv. Bogie lift Right -: Current output.

Pv. Bogie Rear Left +: Current output.

Pv. Bogie Rear Right -: Current output.

Pv. Bogie Rear Right +: Current output.

Pv. Bogie Rear Left -: Current output.

13.8 Blade

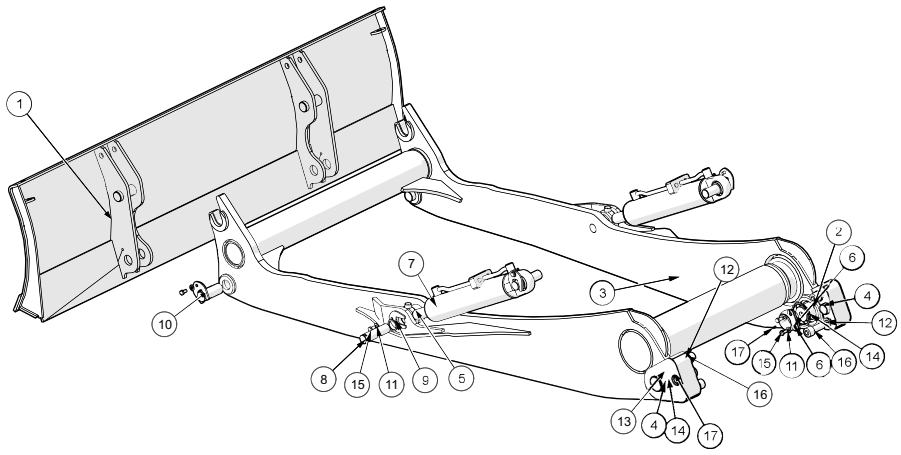


Fig. 166 Dozer blade

1	Removable dozer blade	9	Axle locking
5	Hydraulic cylinder	10	Axle 40x100

The Gremo dozer blade is robust and the right size for the Gremo 1250/1450F forwarder. Operated from the right armrest panel; see section 4.5 Instruments and controls.

14 Technical data

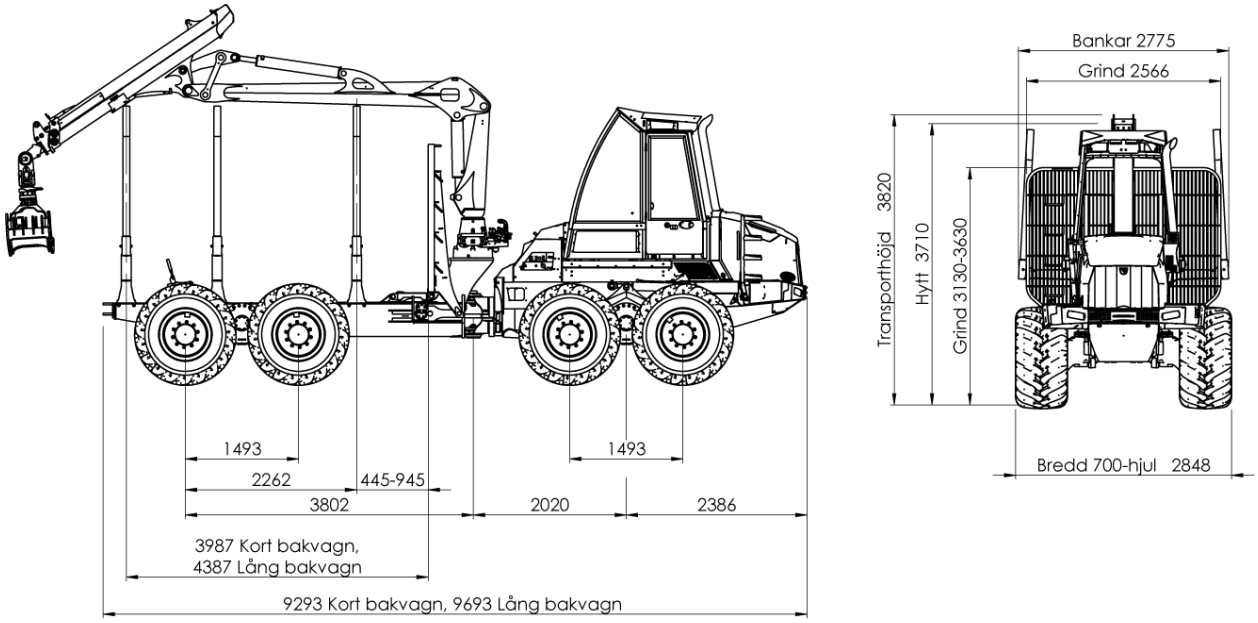


Fig. 167 measurement sketch 1450F

14.1 Dimensions, side view

Combination	A Front carriage	B Rear carriage	C Total
Standard configuration Short front carriage + Short rear carriage (SS)	2460	1832	8,700 mm
Short front carriage + Medium Long rear carriage 400 (SM)	2460	2232	9,100 mm
Long front carriage + Short rear carriage (LS)	3060	1832	9,300 mm
Long front carriage + Medium Long rear carriage 400	3060	2232	9,700 mm
Long front carriage + Long rear carriage 600	3060	2432	9,900 mm

14.2 Dimensions, front view

Width with tyres 600x26.5	2,648 mm
Width with tyres 700x26.5	2,848 mm
Ground clearance	600 mm
Height, highest point of cab	3,710 mm
Height of crane's highest point incl. hoses in transport mode:	3,820 mm

14.3 Weight

Net weight	18,000 kg Standard, depends on equipment
Max. weight	32,500 kg
Max. load capacity	14.5 tonnes
Tractor weight	10,800 kg
Carriage weight	7,200 kg

14.4 Engine

Type	Cummins QSB 6.7. Turbo-charged 6-cylinder diesel engine with intercooler. Common-Rail
Type approval no.	e11*97/68IA*2004/.....
Displacement	6.7 litres
Power	149 KW / 200 hp at 2,200 rpm (speed limited to 1,700 rpm)
Torque	929 Nm at 1,400 rpm
Environmental class	EC step IIIB

Cooling system	Hydraulic variable fan with automatic reverse. Controlled by Grecontrol
Fuel tank	200 litres Electrical refilling pump with automatic stop on the level meter

14.5 Transmission/Axles

Transmission type	2-step manual gearbox Gear 1: approx. 0 - 8.3 km/h Gear 2: about 0 - 25 km/h
Power distribution	Mechanical power distribution to identical gearwheel bogies. Planetary gear on each wheel. Disengageable drive on carriage.
Tractive force	20 kNm as standard, manual gearbox,
Controls	Foot pedals and switch for forward/backward and driving speed..
Differential locks	Electrical manual differential locks, front and rear.
Warning system	Warning system which automatically decreases the revs of the diesel engine and indicates faults with a text message and an audio/light signal in GreControl.
Hydraulic tank	Joint hydraulics tank, separate filters with electrical filling via filter to the transmission section.

14.6 Brake system

Four electro-hydraulically activated multi-disc brakes in oil bath in the front and rear differentials. Braking force 136 kN.

Transmission brake which gives the same braking force as the tractive force.

Emergency brake which affects all disc brakes, automatically engaged when in neutral.

Parking brake engages when pressure falls below 25 bar. Mechanically released when pressurisation occurs.

Meets the requirements as per 76/432 EEC and ISO 11169:1993. Tested according to VVFS 2003:17 of SP 25.02.08 on machine 9533.

14.7 Steering

Type	Steering servo control via hydraulic orbitrol valve plus electrical proportional off-road steering. Meets requirements according to 75/321 EEC.
Steering torque	Max. 42 kNm gross
Steering angle	+/- 45°
Turning radius	6.8 m (5.5 m with front wheel pair raised)

14.8 Electrical system

Type	24 V system, two 12 V batteries connected in series
Capacity	2 x 145 Ah
Generator	110 A
Starter	5.8 kW

14.9 Lights

Driving lights	Full and dipped beam in the front branch deflector, plus extra full beam light in cab ceiling. Rear lights and brakes in rear light ramp plus extra hanging rear light ramp.
Position lights	In the dipped beam lamp and integrated in the rear mirror consoles.
Directional indicator light	In the rear mirror consoles and in the rear light ramps.
Working lights	16 x 35 W Xenon lamps incl. 1 in rear light ramp and 2x2 lamps in low side light unit. 1 crane illumination lamp under the crane's boom.

14.10 Working hydraulics

Type	Load sensing hydraulic system with variable pump and full-flow recycling filter.
Pump displacement (cc)	145 variable
Working pressure	245 bar
Cooling, Filtration	Separate pumps for cooling and fine filtration. Grecontrol controls a hydraulic variable fan with reverse for cleaning the radiator.
Hydraulic tank volume	180 litres
Filling system	Electric refilling pump via filter, automatic stop.

14.11 Load carrier

Type	Three detachable bunks with separate supports. The two rearmost bunks are adjustable. Hydraulically operated folding gate (electrically controlled)
Load area	5.0 m² / 5.3 m²
Load capacity	14.5 tonnes

14.12 Cab

Type	Welded construction with roll profiled A, B and C posts in high-durability steel. Tested and approved as per EN ISO 3449, 8083 and 8084 (ROPS, FOPS, OPS).
Suspension	4 fluid-filled bushings on the underside of the cab. Tilt bar to the right around 60° manual or electric pump.
Operator environment	The cab is sound and heat-insulated. Meets requirements as per 77/311EEG.
Windows	All the windows are made of polycarbonate safety glass.
Emergency exit	Opening side window.

Windshield wipers	Intermittent wiper with parallel drive. Front and rear. Optional extras include side wipers and windscreen washer.
Operator’s seat	Air-sprung electrically-heated operator’s seat with electrical seat brake.
Air conditioning system	ACC heating and climate system.
Other equipment	Radio/CD player with two speakers. Vision camera, front/rear, with colour monitor. sunshade in top of rear window.

14.13 Cranes

14.13.1 Cranab FC12

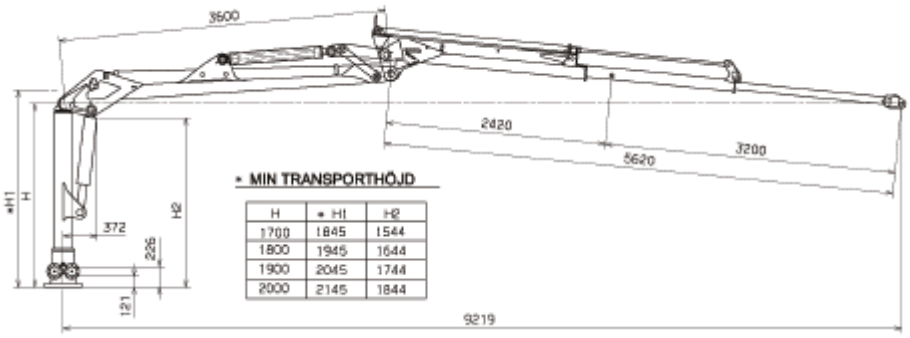


Fig. 168 Cranab FC12

Reach	10 m
Gross lifting torque	120 kNm
Gross slewing torque	28.7 kNm
Slewing angle	370°
Weight excluding grapple and rotator (2 m pillar)	1,765 kg

14.13.2 Winch technical data

Model	Max. pressure	Max. oil volume	Max. traction
6-tonnes winch (short rear carriage)	180 bar	75 l/min.	6 tonnes
8-tonne winch (long rear carriage)	150 bar	60 l/min.	8 tonnes

When used, the cable and cable locks must be checked.

The cable should be discarded when:

- the cable is worn down to more than 10% of its nominal diameter
- when a single wire thread is worn to more than 1/3 of the wire diameter
- the number of wire thread breaks per twisted length exceeds 10
- the cable has a kink in it
- the cable is flattened
- the wires in a strand are broken, bent, or have come loose from the cable
- the cable is damaged by rust, chemical corrosion or other reasons

If the cable is replaced, the new cable must have the same specifications as the discarded one.

The winch must be inspected by the supplier or an expert at the time of sale and at least once per year.

14.14 Gremo's warranty

GREMOS ALLMÄNNA GARANTIÅTAGANDE 13.01

1. GREMO lämnar avtalad köpare garanti, att levererad fabriksny maskin är fri från fel och brister med avseende på konstruktion, material och tillverkning.
Om köparen vidaresäljer eller hyr ut godset gäller garantin endast i den mån GREMO utfärdat särskild skriftlig garantiförbindelse.

2. Garantin gäller för fel eller brister som visar sig inom 24 månader från leveransdagen eller till och med uppnådda 2000 driftstimmar, vilket som först uppnås.

3. För nytt eller i utbyte levererat gods, vilket tillhandahållits av GREMO på grund av i Maskin 03 p. 26 angiven orsak, lämnas garanti endast så lång tid som återstår av den ursprungliga garantitiden.

4. För av GREMO ej tillverkad tillvalsutrustning kan undantag förekomma. Sådana undantag noteras på köpekontraktets framsida, och/eller framgår av orderbekräftelse eller meddelas i separat skrivelse.

5. Garantin omfattar ej:
- felsökningar, justeringar och reparationer som köparen på egen hand kan utföra
- normala förslitningsdetaljer till exempel däck, alla förekommande typer av slang och slangskydd, cylindertätningar, vätskor och filter, kilremmar, kvistverktyg, sågsvärd, lampor, rutor, slirskydd med mera.
- fel understigande 500:- SEK exklusive arbetstid, restid och reseersättning.

6. Garantin gäller inte vid skador som åsamkats godset vid fastkörning, fastfrysning eller bärgning.

7. Garantitiden förlängs inte på grund av stillestånd orsakat av fel eller brist i levererat gods. Ej heller lämnas ersättning för stillestånd i samband med garantireparationer.

8. GREMO är inte skyldig att utge ersättning för personskada eller skada på egendom som ej omfattas av avtalet, ej heller för utebliven vinst, produktionsbortfall, indirekt skada eller annan följdskada.

9. Vid köp av begagnat gods är det köparens plikt att noga undersöka godset. GREMO svarar för godsets beskaffenhet endast i den mån särskild garantiförbindelse utfärdats.

10. GREMO´s ansvar för fel eller brist i varan är helt begränsat till Gremos Garantiansvar enligt vad som ovan angivits. Köparen kan således inte göra gällande något annat ansvar eller andra påföljder än vad som följer av garantierna.

Undertecknad har mottagit ovanstående leverans/garantibestämmelser Maskin 03 och Gremos allmänna garantibestämmelser 13.01och är införstådd med dess innebörd.

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Köpare

Fig. 169

14.15 EC declaration

Tillverkardeklaration

Ätran 2013-06-25

Bilaga 2A Maskin Direktivet 2006/42/EC

Tillverkare:

Gremo AB
Box 44
S-310 61 ÄTRAN
tel: +46 346 60515

Vi försäkrar härmed att Skotaren GREMO 1050F, tillverkningsår 201604 med chassinr 61104 Har följande tekniska data:

Garanterad last på främre axel:	14850 Kg
Garanterad last på främre axel:	14850 Kg
Tomvikt för kpl fordon std utrustad	12600 Kg
Max tillåten totalvikt	22790 Kg
Maxeffekt enligt DIN standard	119 KW
Tankvolym, diesel	120 L
Konstruerad max fart på väg	25 Km/h

a) **Uppfyller de grundläggande säkerhetskraven i maskindirektivet 2006/42/EG**

b) **Uppfyller kraven i särdirektiven:**

2009/63/EG, (ljudnivå enl SMP testprotokoll **5F003152)** (se också Nationell std VVFS 2003:17)
2009/59/EG samt tillämpliga särdirektiv under **2003/37/EG**

c) **Följer och uppfyller de harmoniserade standarderna:**
8082:2003(ROPS, SMP-PM89787/06
8083:1989(FOPS, SMP-PM80569/05 (enl EN-ISO 3449:1992)
8084:2004(OPS, SMP-PM82580/05
11169:1993(Bromssystem) enl SMP testprotokoll SMP-PM-**FX206788**
EN-ISO 14861 Säkerhetskrav på skogsmaskiner
EN ISO 11112 Arbetsstol och EN ISO 6683 Säkerhetsbälte
ISO 10570:2004. Midjestyrlåsning

d) **Uppfyller kraven enl nationella standarder:**
2003:17 Ljudnivå (enl SMP testprotokoll 5F003152)

e) **Följande komponenter är inbyggda och uppfyller isig kraven enl bilaga 2B: 2006/42**

Motor Cummins QSB4,5 Typ godkännande Nr e11*97/68MA *2010/26*1593*01, SerieNo 22174979
Kran Cranab FC8DT SerialNo X15602

Gremo AB Production department

GREMO®