

Document Title: <b>Safety concerns everybody!</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L20B, L20F, L25B, L25F [GB]</b>			

## **Safety concerns everybody!**

Always follow the instructions in the machine's Operator's manual.

The Operator's Manual must be kept in the machine and must always be to hand.

Many hours have been spent in designing and producing the safest and most efficient machine possible. However, all this work is in vain if the person about to perform service on any of our machines does not read the safety instructions or does not bother to follow them: for example, does not refit guards, steps on slippery machine parts instead of using a ladder, grabs onto hoses instead of handrails or uses the wrong tools for the job.

Always use genuine (intended and adapted) spare parts to maintain safe and efficient machine function.

Machines seldom cause accidents. Instead, people do.

Careful service and maintenance, and immediate repair of any defects, are the best guarantee for constant availability and few faults.

**Any person who does not follow the safety instructions and who ignores the warnings in this manual must make sure that their work method is safe. Otherwise, there is a great risk of serious accidents and injuries, perhaps even fatalities.**



### **WARNING SYMBOL**

This symbol is shown at various points throughout the manual. The appearance of it means "Warning, stay alert! Your safety may be involved!"

**Become familiar with the abilities and limits of your machine!**

Document Title: <b>CE-marking, EMC-directive</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L20B, L20F, L25B, L25F [GB]</b>			

## CE-marking, EMC-directive

### CE-marking

(Declaration of Conformity, and CE-marking, only machines marketed within the EU/EEA). This machine is CE-marked. This means that when delivered the machine meets the applicable "Essential Health and Safety Requirements", as stated in EU's so-called Machine Safety Directive, 98/37/EC. Any person who makes changes that affect machine safety is also responsible for the same, and that governing legislation/standards are fulfilled.

As proof that the requirements are met, an **EU Declaration of Conformity**, issued by Volvo CE, is supplied with each separate machine. This EU declaration also covers attachments and equipment manufactured by Volvo CE. The documentation is a valuable document, which should be kept safe and retained for at least 10 years. **The document should always accompany the machine when it is sold.**

If the machine is used for other purposes or with other attachments than described in this manual, safety must be maintained at all times and in each individual case. The person carrying out such action is also responsible for the action which, in some cases, may require a new CE-marking and the issue of a new EU Declaration of Conformity.

### The EU's EMC-directive

The electronic equipment of the machine may in some cases cause interference with other electronic equipment, or the equipment may be adversely affected by external electromagnetic interference, which may constitute safety risks.

The EU's EMC-directive on "Electromagnetic compatibility" provides a general description of what demands can be made of the machine from a safety perspective, where permitted limit values have been determined and stated according to international standards.

A machine or device which meets the requirements should be CE-marked. Our machines have been specifically tested for electromagnetic interference. The CE marking of the machine and the declaration of conformity also cover the EMC directive.

If other electronic equipment is fitted to this machine, the equipment must be CE-marked and tested on the machine with regard to electromagnetic interference.

### EU's noise directive

Within the EU there is a noise directive, dictating that the machine may not have noise values that exceed a certain level. Values are given on a decal that can be read from the outside of the machine. Also, every machine is delivered with a noise certificate where Volvo CE ensures that the machine meets governing legislation. **It is also important that this certificate accompanies the machine when it is sold.** It is also important that no changes are made to the machine's noise-damping components in order to meet the limit values.

### NOTE!

Modification of or removal of material which affects sound, e.g., noise-insulating, noise-dampening, or noise-absorbing materials, is not allowed. Also, it is not permitted to make openings/holes in the cab or engine compartment as this may increase the noise level in the cab.

### Unauthorized modifications to the cab's roll-over protective structure (ROPS/FOPS)

Never make any unauthorized modifications to the ROPS, such as lowering the roof height, drilling, welding on fire extinguisher brackets, radio antenna or other equipment.

Such unauthorized modifications will affect the structural strength of the ROPS cab and will void the certification.

The Roll Over Protective Structure (ROPS) has been approved following testing and meets standards according to ISO 3471-1.

The cab's roof is also tested and approved according to the standard for FOPS (Falling object protective structure, protection from falling objects) according to ISO 3449.

All planned modifications of the cab's supporting construction must be discussed in advance with Volvo CE's engineering department to determine if the modification can be performed without affecting the approval.

It is important that all persons in your organization, including management, are made fully aware of these rules involving ROPS.

**If anyone in your company discovers that a certain machine has been modified in a non-approved manner, your company must notify the customer and manufacturer in writing regarding the applicable machine and how it was modified.**

Document Title: <b>Safety when handling the machine</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L20B, L20F, L25B, L25F [GB]</b>			

## Safety when handling the machine

### Volvo Construction Equipment is only responsible if:

- the machine has been used correctly and has been maintained according to recommendations in the service manuals and the machine's Operator's manual.
- prescribed service and inspections have been performed at the specified intervals.
- lubricant recommendations in the manual have been followed.
- no safety seals have been opened by an unauthorized person.
- all modifications and repairs have been performed in the manner prescribed by Volvo.
- only genuine Volvo parts/accessories, or attachments that fulfil Volvo's requirements have been used.

### **WARNING**

**Machine operators must have sufficient skills and knowledge of the content in the Operator's Manual before operating the machine.**

**It is important that the operator reads and follows the instructions in the machine's Operator's Manual.**

**An untrained operator may cause serious injuries and fatalities.**

**Never operate a machine for which there is no Operator's Manual available.**

**Learn to understand the warning plates, symbols and operating instructions for the machine before you start operating.**

### **A few simple safety rules**

#### **General**

- Repair malfunctions or defects that affect safety as soon as possible.



## Figure 1

### Entering/leaving the machine

- Always wear a hard hat, protective goggles, gloves, work shoes and other safety items that your work requires.
- Avoid standing in front of or behind the machine when the engine is running.
- Always use a rubber window scraper or brush with a long handle when cleaning the outside of the windows in order to avoid unnecessary climbing on the machine.
- When servicing the machine, i.e. changing light bulbs, a ladder may be needed.
- Make sure that stepping surfaces, service areas, handles and slip-protection are clean and free from oil, diesel fuel, dirt and ice and that they're replaced if they are defective or missing.
- Check at regular intervals that all slip-protection is firmly attached. If not, these shall be attached or replaced.
- Always face the machine and use the steps and handrails when entering or leaving the machine. Use two hands and one foot, or two feet and one hand. Do not jump!

### Before operating

- Read the Operator's manual before you operate the machine! Follow the instructions for operating and perform the indicated recommended actions before operating.  
Some important rules below:
- Perform a control light test before starting the engine by turning the ignition key to position I, see Operator's Manual.
- Perform all safety checks prescribed in the Operator's manual.



#### **Never operate the machine if you are tired or under the influence of alcohol, medicine or other drugs.**

- Before starting the engine indoors, make sure that the extraction capacity of the ventilation system is sufficient. The machine is equipped with a diesel engine and the exhausts may be hazardous to your health. Make sure that ventilation is sufficient, and avoid running the engine indoors for longer than necessary where ventilation is insufficient.
- Read all plates and instructions on the machine and in the Operator's manual before you operate or perform service on the machine. Each one of these contains important information regarding safety, handling and service.
- Use the seat belt during all operation.
- Always sit in the operator's seat when you start the engine.
- The machine must be fully functional before it's put into operation, that is, all defects that may cause eventual accidents must have been repaired.
- Never operate the machine for long periods without ventilation, or with a completely closed cab without the fan on (to avoid lack of oxygen).
- Only step and stand on surfaces with slip-protected treads and hold on to the available handles and handrails.

### Hip-type seatbelt

- If the seatbelt needs washing: Use a mild soap solution when washing and let the belt dry while it's fully pulled out before it's rolled up. Make sure that the belt is installed correctly.
- Replace the seatbelt immediately if it's worn, damaged or the machine has been involved in an accident where the belt had to take some strain.
- Modifications of the belt or its mountings is never permitted.
- The hip-type seatbelt is intended for one adult, not more.
- Always keep the belt rolled up when not in use.

### When the engine is running

- Respect the warning lights. The red lights require immediate attention or consideration, see instructions in the Operator's manual in the section Instruments.
- Apply the parking brake and make sure that the attachment/attachment bracket rests on the ground.
- Move the gear selector to neutral before you leave the machine.



#### **Risk of crushing injuries**

- Do not stand near the frame joint unless it has been locked with the frame joint lock.
- Empty and tilt back the attachment before operating the machine on a road.

- Stop the engine and lower the attachment so that it rests on the ground before you leave the machine unattended.

#### **When there is a risk of roll-over**

The cab is the operator's protection and meets the standards for roll-over protection according to test standards, (ROPS), see further [191 CE-marking, EMC-directive](#) Prerequisite for protection is that the operator uses the lap-type seat belt and remains in the cab in case of a roll-over. Therefore, hold on to the steering wheel if the machine rolls over. **Do not jump!**

#### **Falling objects**

The cab is dimensioned to fulfill the requirements for objects falling on to the cab roof according to given test methods (that is, FOPS, see further [191 CE-marking, EMC-directive](#)

#### **Emergency exits from cab**

The cab has two emergency exits, the door and the right side window.

#### **Actions before recovering and towing**

See Section 1, Towing

#### **Actions after recovering and towing**



**Do not forget to unlock the frame joint lock and secure it in the running position when the machine is to be operated again.**

See Section 1, Service and Maintenance

Document Title: <b>Safety rules when servicing</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L20B, L20F, L25B, L25F [GB]</b>			

## Safety rules when servicing

**This section covers general safety rules when checking and servicing.**

**Other rules, information and warning texts are given in the Operator's manual.**

### CE marking

This machine is CE-marked. This means that, when delivered, the machine meets the applicable "Essential Health and Safety Requirements", which are given in the EU Machine Safety Directive. If changes are made that affect the safety of the machine, the person making the changes is responsible for the same.

Therefore, the following applies:

- Install communication equipment (two-way radio), mobile phone unit, etc. according to the manufacturer's instructions in order to eliminate interference with electronic systems and components intended for the machine's function. See further [191 CE-marking, EMC-directive](#).
- When retro-fitting equipment in or on the cab; do not drill, weld or cut in the cab structure since such actions may impair the operator's protection in case of roll-over. See further [191 CE-marking, EMC-directive](#).

### Before you begin any service work:

Service work done incorrectly is dangerous.

Make sure that you have sufficient knowledge, correct information, the right tools and the correct equipment to perform the service in a correct manner.

Repair or replace damaged tools and defective equipment.

Place the machine in service position 1 or 2 acc. to: [191 Service position](#)

## NOTICE

**When lifting the machine, the frame joint should be locked and the marked eyes intended for lifting should be used.**

### NOTE!

No work may be done on the machine until you have the correct skills and knowledge of the machine to do the work.



**Figure 1**

**Read the Operator's manual, plates and instructions before you operate the machine.**

**General**

- Machine working in a environmentally contaminated area, see [191 Working in environmentally contaminated areas](#)  
See also [191 Checklist after a fire or heat exposure](#).
- If someone is to take over the job that you have started, make sure that this person is informed about what part of the work has been completed and what remains to be done.
- When high-pressure washing the machine, do not aim the water jet directly at anti-slip surfaces or decals that are glued on.

## **! WARNING**

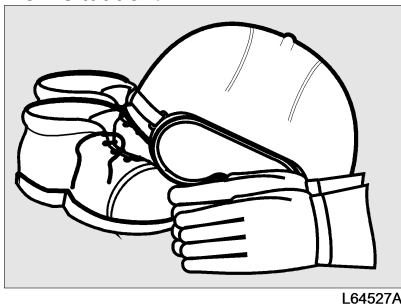
**Only walk or step on the machine's prepared stepping surfaces, see operator's manual.**



**Figure 2**

**Do not step on engine covers.**

- Never wear loose fitting clothing, for example, a scarf or jewellery, that can get caught and cause injury when working on the machine.
- Always use a hard hat, safety glasses, gloves, protective work shoes and other protective items as required by the work situation.



**Figure 3**

**Protective equipment**

- Always stop the engine when servicing the machine unless instructions on plates or in this manual state otherwise.
- Do not stand near the frame joint unless it has been locked with the frame joint lock.

## **NOTICE**

**There is a risk of crushing even with the engine off if the machine is equipped with an electric secondary steering pump.**

- Turn off the engine before opening engine covers, radiator casing, etc. Make sure that no tools or other objects that can cause damage are forgotten in the machine.



**Figure 4**



**Keep engine covers, etc. closed when the engine is running and when the machine is operating.**

Document Title: <b>Service position 1</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25F [GB]</b>			

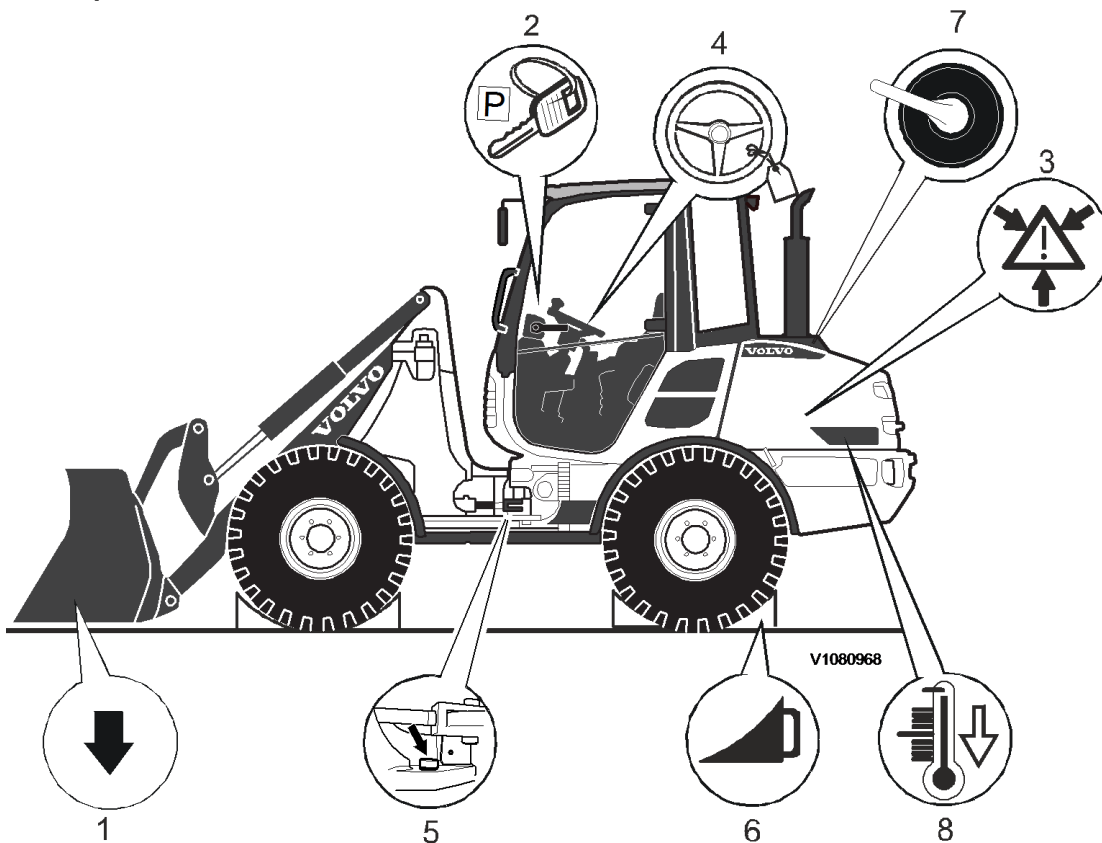
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## Service position 1

Op nbr 191-021

1. Park the machine on a level and hard surface and prepare it for service by placing it in the service position according to figure:

### Service position



**Figure 1**  
**Service position**

1. Attachment resting on the ground.
2. Engine off and ignition key removed. (Does not apply for special checks, when the parking brake also should be applied).



**WARNING**

3. **If the pressure is not released before opening the system, oil under high pressure will jet out, resulting in serious personal injuries.**

Pressurized lines and tanks shall be depressurized so that the high pressure is released without risk. See [191 Safety when working on hydraulic systems](#)

4. Yellow-black warning flag should be attached to the steering wheel (USA - a red flag may be used instead)
5. Frame joint lock connected.
6. Wheels blocked with wedges or similar.
7. Switch off the battery connection switch.
8. Allow the machine to cool down.

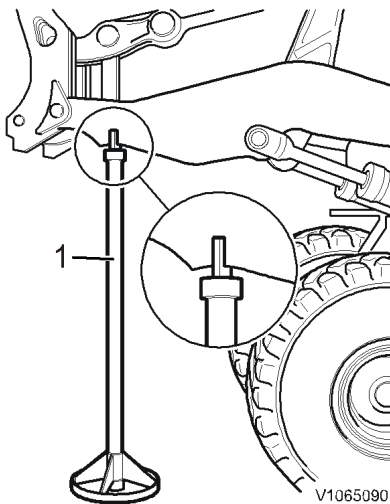


**If work must be done on the machine before it has cooled down; beware of hot fluids and hot components that can cause severe burns.**

Document Title: <b>Working under raised boom</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25F [GB]</b>			

## Working under raised boom

Always secure the loader linkage with support 999 3831 before starting to work. Position the support on an even and firm ground surface.



**Figure 1**  
**Securing the boom**

1. 999 3831 Support



**Note the exact positioning of the support against the lifting arm!**

**If the support is positioned too far forward, it may be knocked out of position when the attachment bracket is tilted forward.**

Document Title: <b>Fire prevention measures</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Fire prevention measures

### General

- There is always a risk of fire. Find out which type of fire extinguisher to use, where it is located and how to use it. The fire extinguisher in the machine should be located according to the figure or in an external box that can be locked.
- Fire-fighting equipment installed in or on the machine must be maintained in working order. Such equipment should be regarded as a complement to the operator's own efforts in case of a fire. The equipment should not be considered as a replacement of the operator's own fire fighting efforts.
- Fire extinguishers mounted on the machine or used when working on the machine must fulfil certain requirements. See the Operator's Manual.
- At the slightest sign of fire, if the situation allows it and keeping in mind your own safety, take the following action:
  - drive the machine away from the danger area.
  - lower the lift arms to their bottom position so that the attachment rests on the ground.
  - stop the engine by turning the ignition key to the "0" position.
  - leave the cab.
  - turn off the battery disconnect switch.
  - start fighting the fire and call the fire department if necessary.



**Figure 2**

**Smoking and open flames are absolutely forbidden when filling fuel or any time diesel fuel is in contact with the open air.**

- Smoking or open flames are absolutely forbidden close to the machine when filling fuel or at any time the fuel system is in contact with the open air.
- Diesel fuel is flammable and must not be used for cleaning. Use an approved solvent instead.
- Remember that certain solvents can cause skin rashes and are usually flammable. Avoid inhaling solvent vapour.
- Engine starting aids are flammable. Store such items in cool and adequately ventilated areas. Remember that such aids must not be used in combination with electric preheating of induction air.

### Cleanliness

- Cleanliness is a decisive factor for operational reliability of the machine's systems. Therefore, keep the servicing area clean. Oil or water make floors and steps slippery and are also dangerous in combination with electrical systems or tools. Oily clothes or clothes drenched in grease constitute a serious fire hazard.
- Check daily that the machine and equipment, such as underbody skid plates, are free from dirt and oil. This reduces the risk of fire and makes it easier to detect defective components or loose parts.

## NOTICE

**If a high-pressure washer is used when cleaning, work carefully since damage may be caused to electrical components and insulation of the electrical cabling even at relatively moderate water pressure and temperature. Protect electrical cabling in a suitable manner.**

- Keep the machine especially clean when operating in environments with fire hazards, such as saw mills, garbage dumps, etc. In such environments, suitable equipment to reduce the risk of accumulation of material and spontaneous combustion should be fitted (for example muffler guard, radiator screen, heavy-duty cyclone pre-cleaner, etc.).

### Electrical system

- Check electrical cables with regard to chafing damage and make sure that they cannot be damaged in such a way. This applies particularly to unfused electrical cables, which are red.  
For example, electrical cables between:
  - Batteries
  - Battery–starter motor
  - Alternator–starter motor
  - Cable to engine preheating coil.
- When unfused cables have been disconnected, it is important to check that they are re-connected and clamped in such a way that they cannot be exposed to chafing. Unfused cables must not rest against oil and fuel hoses.
- When fitting any optional equipment, make sure that all cables (circuits) are connected across a fuse and routed and clamped so that there is no risk of chafing.

### Fuel, hydraulic and brake systems

- Check to make sure that there is no chafing damage to fuel, hydraulic and brake hoses.

### Welding and grinding

- Welding and grinding on the machine may only be performed on well-cleaned areas and not in places filled with combustible fluids, e.g., tanks, hydraulic pipes.  
Work with extra care when welding and grinding near flammable objects.
- Never weld on a painted surface without first removing the paint. Welding on a painted surface generates, in addition to health-hazardous vapours, technically inferior welds which may lead to future failures, with subsequent accidents.  
Use personal protective equipment and, where possible, air extraction shall be used to handle gases from welding and grinding.

Actions after a fire: see [191 Checklist after a fire or heat exposure](#).

Document Title: <b>Some simple rules regarding tyre handling</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Some simple rules regarding tyre handling



### **WARNING**

**Tires installed on a split rim may explode and cause very severe injuries.**

#### **Inflating**

- Never stand to the side of the tyre while inflating which is fitted on a split rim. Use a self-locking outlet with a hose long enough to allow you to stand outside of the hazard zone during inflation, see the illustration.
- Make sure that the hazard zone is clear when the tyre is inflated.
- The machine must be unladen when checking tyre pressure.
- Spare tyres should only be filled with enough air to allow the rim parts to be held in place.
- Secure a loose wheel with an inflation cage, cable or chains before inflating. Before removing the inflation cage, check that the tyre is properly fitted to the rim. Adjustments should be made before the wheel is inflated.
- Do not attempt to adjust side rings or lock rings when the tyre is inflated.
- Tyres used at less than 80% of normal pressure and rims or tyres suspected of being damaged should not be inflated with the wheel attached to the machine.

#### **Fitting of tyres and rims**

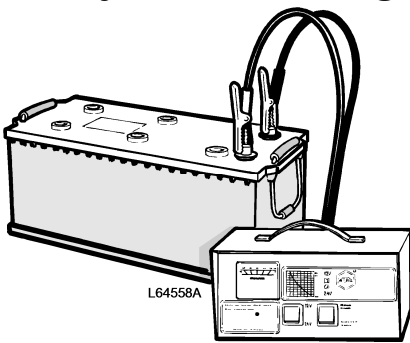
- Handling of tyres should be performed by authorised personnel only.
- The tyre should be deflated before removal from the machine.
- Never install a tyre on a rim that has not been recommended for that tyre.
- Never assemble rim parts for different dimensions or use damaged or faulty parts.
- Exercise caution if using reconditioned wheel details. Welding errors, faulty heating or soldering may have weakened the parts and may cause the detail to break.
- Make sure the lock ring groove in the rim is cleaned from foreign matter and rust before fitting the lock ring.
- Use a lubricant recommended by the tyre manufacturer when fitting onto the rim.

#### **Repairing tyres and rims**

- Never cut, weld nor heat the wheel parts in any manner.
- Exercise caution when using bead breakers and hydraulic jacks. Remain outside the hazard zone when removing foreign objects from the tyres. A bead breaker that releases can cause severe personal injury and may result in death.

Document Title: <b>Safety when working with batteries</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Safety when working with batteries



**Figure 1**  
**Battery charging**



**Risk of serious corrosive injuries!**

Batteries contain sulphuric acid which is very corrosive to the human body and parts of the machine. In addition, batteries give off hydrogen gas when they are loaded (supplying electricity) or being charged. Together with the oxygen in the air, hydrogen gas forms a very explosive mixture.

This combination, **corrosive acid and explosive gas**, means a high risk of accidents during all work with batteries used in vehicles.

Therefore, it is very important that you take great care and follow the rules below when you are working with batteries.

**Follow these instructions when charging batteries:**

- Batteries give off explosive gases. Never smoke near batteries.



**Figure 2**  
**Do not smoke near batteries!**

- Begin by disconnecting the ground lead when removing a battery. In order to reduce the risk of sparks that can cause fire, always connect the ground lead last when fitting a battery.
- Never tilt a battery to any great extent in any direction. Battery electrolyte may leak out.
- Do not connect a discharged battery in series with a fully charged battery. The current surge can cause the batteries to explode.
- Do not allow metal objects (such as tools, rings, wristwatches) to come in contact with battery terminals. Risk of fire and personal injury.



- Always cover the top of the battery with a rag or other non-conducting material when you work close to the batteries.
- Always refit the terminal caps on the batteries.
- Batteries contain substances hazardous to health and the environment. Therefore, discarded batteries be handled according to governing local/national regulations. See [191 Environmentally safe handling](#)

### Charging batteries

Explosion hazard

When a battery is being charged, an explosive mixture of oxygen and hydrogen is formed. A short circuit, open flame or spark near the battery can cause a powerful explosion. Always turn off the charging current before disconnecting the charging clamps. Ventilate well, especially if the battery is charged in a confined space.



**Risk of serious corrosive injuries!**



**Figure 3**

### Corrosive acid

#### Corrosive sulphuric acid

The battery electrolyte contains corrosive sulphuric acid. Electrolyte spilled on bare skin must be removed immediately. Wash with soap and plenty of water. If electrolyte gets into your eyes or any other sensitive body part, rinse immediately with plenty of water and seek immediate medical attention.

Document Title: <b>Starting with booster batteries</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Starting with booster batteries

When starting with booster batteries, the following must be observed:

Check that the booster batteries or other power source have **the same voltage** as the standard batteries.



**The batteries could explode due to the current surge if a fully charged battery is connected to a completely discharged battery. Since the batteries contain sulphuric acid, this could result in personal injuries.**

Follow these steps:

1. Move the gear selector to neutral.
2. Apply the parking brake.
3. Check that the booster batteries or other power source have the same voltage as the standard batteries.
4. Do not disconnect the cables to the standard batteries!
5. Connect (+) on the booster battery to (+) on the battery nearest the starter motor.
6. Connect the other start cable from (-) on the booster battery to the machine chassis, such as on the frame member close to the starter motor.
7. Start the engine with the ignition key in the cab.
8. Once the engine has started, remove the start cable between the chassis and the booster battery negative terminal (-). Then remove the start cable between the positive terminals (+).
9. Refit the terminal caps on the battery terminals.

Document Title: <b>Safety when handling oils and fuel</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Safety when handling oils and fuel

- When changing oil in engine, hydraulic system or transmission: Keep in mind that the oil may be hot and can cause scalding or burn injuries.
- Engine, hydraulic and transmission oils as well as diesel fuel have a corrosive effect on mucous membranes, for example, in eyes and throat and on skin. Therefore, take special care to keep such oils away from these sensitive body parts.
- When emptying/draining oils or fuel, steps must be taken to avoid unnecessary spills. In places where a container for collecting the liquid cannot be used, use a pump or connect a hose to ensure safe handling. Oil released or spilled on the ground will harm the environment and could also cause a fire.  
Waste oils/fluids shall always be taken care of by a company authorized for this work. See [191 Environmentally safe handling](#)
- Remember the fire hazard!

Document Title: <b>Safety when working with air conditioning refrigerant</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Safety when working with air conditioning refrigerant

### General

Special competence is required for service work and more involved work which requires opening of the air conditioning system.

Many countries also require special training and official authority approval. Find out about governing regulations for your country and follow them!

Refrigerant R134a is used in the air conditioning unit, see also Section 8.

The type of refrigerant and the amount to be filled are shown on the type plate.

### NOTE!

R134a adds to the greenhouse effect and should never be intentionally released into the open air.

### Personal protective equipment

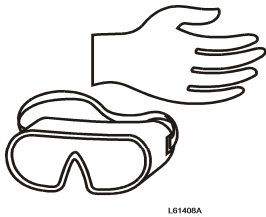


Figure 1

**Protective goggles and gloves should be worn when there is a risk of contact with refrigerant.**

When there is a risk of skin contact with refrigerant, use:

Tight-fitting protective goggles and protective gloves, and protect other bare skin (risk of frostbite).

### Risks



**The gases have no smell and may cause serious damage to the lungs already at low concentrations.**

Refrigerant R134a may, if incorrectly handled, cause serious personal injuries as well as damage to the environment. Therefore, great care must be taken in all work with air conditioning units! The rules given below may be a great help to avoid injuries to all who come into contact with refrigerants.



**Risk of frostbite! Wear protective work gloves.**

- In liquid form the refrigerant may cause:  
**Frostbite.**
- When in the form of a gas and at low concentration, the gas may:  
**Have some effect, especially on the nervous system.**
- When in the form of a gas and at high concentration it may:  
**Have an anaesthetic effect.**
- The air conditioning unit is pressurized and the refrigerant can unintentionally leak out. **Never disconnect hoses or**

**remove the filler plug on the compressor.**

If you suspect a leak, certified and trained personnel at a licensed workshop should be contacted for troubleshooting and repair.

- The refrigerant gas is heavier than air and will sink to the floor. Therefore, make sure that any escaped gas is ventilated before work is started in any low-lying areas.

Smoking, welding or other open flames are not allowed in a workplace where work with refrigerant is in progress. The refrigerant gas will then burn and form a toxic gas which is very dangerous to inhale. The gases formed when heating the refrigerant have a pungent smell at high concentrations.

The symptoms may appear several hours (perhaps up to 24 hours) after exposure to the gases.

**Action in case of accidents**

**Inhalation**

If escape of gas is suspected, leave the area, try to find fresh air and move affected persons out of the danger area. Small amounts of vapour from refrigerant R134a may have some effect especially on the nervous system. In large amounts, the gas may have an anaesthetic effect. In serious cases, seek immediate medical attention.

**Skin contact**

In case of frostbite, flush with lukewarm water for a long time. If a large amount of liquid refrigerant comes into contact with unprotected skin, the injured area should be carefully warmed with lukewarm water or warm clothes.

Seek medical attention immediately if symptoms persist.

**Splash in eyes**

Flush with warm water until the irritation ceases. Seek immediate medical attention.

Document Title: <b>Safety when handling accumulators</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Safety when handling accumulators

### **WARNING**

**If the pressure is not released before opening the system, oil under high pressure will jet out, resulting in serious personal injuries.**

Before an accumulator is removed from the machine, the system must first always be depressurized, see [191 Safety when working on hydraulic systems](#).

Some accumulators contain pressure even if they are removed from the machine, so-called pre-charge pressure. Therefore, be very careful during all handling and work with accumulators.

The pre-charge pressure must be lowered to atmospheric pressure before working on a piston accumulator.

Avoid exposing the accumulator to high temperatures and careless handling.

### **WARNING**

**A discarded accumulator which is not punctured may still contain high pressure and must always be handled with great care.**

Discarded accumulators shall be punctured before they are scrapped to avoid the risk of explosion. See [527 Accumulator discarding](#).

Document Title: <b>Safety when working on hydraulic systems</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Safety when working on hydraulic systems

The hydraulic systems in our loaders operate at very high pressures. To avoid serious personal injuries it is very important that the systems are maintained in the right way, and that all persons who come into contact with the machines are very careful in their work and are very attentive to any defects.

Those who follow the simple rules below have laid a good foundation for avoiding accidents.

### General

- Never adjust a pressure limiting valve to a higher pressure than that recommended by the manufacturer.
- A hydraulic hose that swells, e.g., at a connection, shows that it is about to rupture. Replace the hose as soon as possible! Pay attention to leaks from hydraulic hoses and connection. Repair the leak before the part ruptures!
- Discarded pressure accumulators shall be punctured before they are scrapped to avoid the risk of explosion. See [527 Accumulator, discarding](#).

### **WARNING**

**If the pressure is not released before opening the system, oil under high pressure will jet out, resulting in serious personal injuries.**

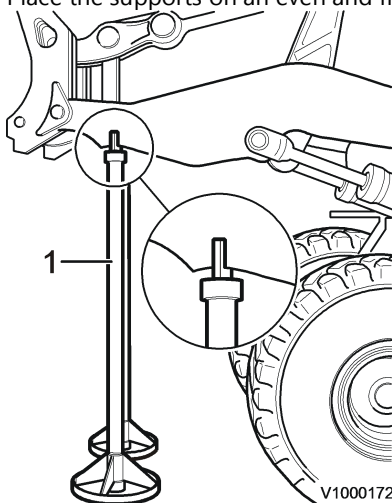
### Releasing pressure (depressurizing)

An accumulated pressure remains in the system when the engine has been stopped. Before loosening or opening hose couplings, plugs, etc. in the hydraulic system or brake system, the residual pressure in the system must be released by so-called depressurizing.

In case the engine stops, the accumulators for lowering the lift arms are depressurized by moving the lift lever back and forth several times.

- Accumulators for the boom suspension system are depressurized as follows:

1. Place two supports 999 3831 under the boom.  
Place the supports on an even and firm surface



**Figure 1**  
**Securing the boom**

1. 999 3831, Support, 2 pcs.

2. Start the engine and engage float mode with the switch SW903 on the instrument panel
3. Activate the boom suspension system in gear-dependent position.
4. Move the control lever (lift/lower) forward to float position and wait for 30 seconds.  
**NOTE!** The engine shall run at idle since there is a risk that the machine lifts in case float mode is not activated. Since the lever has to pass the lowering position to reach float position, the lever shall be pulled quickly to the float position to minimize the lowering function.
5. Hold the servo lever in float position and turn off the engine at the same time.  
**Now the accumulators shall be drained and the boom suspension system should be pressureless. Only a residual pressure of approx. 300 kPa (44 psi) shall be left in the system. To make sure that the system is depressurized before starting any service work, proceed as follows:**
6. Connect a loose pressure check connection on a hose.
7. Place the end with the loose pressure check connection in a suitable container and connect the other end of the hose to the pressure check connection on the boom suspension system's valve block. In case the hose cannot be connected to the boom suspension system's valve, the residual pressure in the system may be too high. Repeat steps 1 up to and incl. 5.
8. Any residual pressure in the system is drained through the hose.

- All pressurized tanks/vessels shall be opened carefully so that any residual pressure is released.
- Check-tightening of leaking couplings and connections shall only be performed after the system is completely depressurized.



**Leaking high-pressure hydraulic hoses may cause severe injuries. Fine jets have high penetrating capacity on bare skin.**

- To check for leaks, use a steel plate or a stiff board, **never use your hand.**



Document Title: <b>Safety when using lifting equipment</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## **Safety when using lifting equipment**

- All lifting devices, e.g., slings, straps, ratchet blocks, etc., must meet governing national regulations for lifting devices.  
We will not accept any responsibility if other lifting devices, tools or work methods are used, other than those described in this publication.
- Make sure that the ground surface is flat and has sufficient strength to support the expected load for lifting device with load.
- When lifting or supporting machine parts, use equipment with a lifting capacity that at least equals the weight of the part in question.
- Use the lifting eyes or lifting points that are located on certain machine components.

Document Title: <b>Checklist after a fire or heat exposure</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Checklist after a fire or heat exposure

- As a precaution, seal rings (O-rings or axle/shaft seals) should always be handled as if they were made of fluor rubber, see also section "Fluor rubber".

### **WARNING**

**Avoid splashing when washing a machine damaged by fire. For this reason, never use high-pressure washing equipment.**

- Never touch burned components or parts with your bare hands when there is a risk that you may be exposed to contact with melted polymers. First, wash thoroughly with plenty of lime water (a solution or a suspension of calcium hydroxide, i.e. slaked lime).  
Use thick, protective gloves made of rubber and wear goggles that are certain to protect your eyes.
- Seek medical attention if your skin may have come in contact with burnt fluor rubber. The skin should be treated with Hydrofluoric Acid Burn Jelly or similar.  
Symptoms may not appear until several hours after contact with burnt fluor rubber.
- Discard protective gloves, rags and other items that may have come into contact with burnt fluor rubber.
- Ensure good ventilation during the work.
- In case of splash in eyes: rinse immediately with plenty of water for at least 15 minutes. Contact a doctor.

Document Title: <b>Health hazards with paint, plastics and rubber</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Health hazards with paint, plastics and rubber

### Work on painted surfaces

Never weld or cut with a torch on painted surfaces. All paint decomposes when heated and generates a vast number of different substances that may be irritating and, in case of repeated exposure, be very hazardous to health

#### The following safety actions must be taken:

- Remove the paint by sandblasting at least 10 cm (4 in) around the welding or cutting point (use breathing mask). If the paint cannot be removed by sandblasting, it must be removed in another way, such as with paint solvent.  
**NOTE!**  
If the paint is removed with a paint solvent, use an air extractor, face mask/breathing protection and protective gloves.
- Grinding machines with high-speed grinding discs also heat the paint and should only be used if equipped with an air extractor. Also wear a face mask or other breathing protection.

### Rubber and plastics



**WARNING**

**When heated, rubber and plastics can give off substances that are hazardous to personal health and the environment.**

#### The following safety rules must be followed:

- Do not weld or cut with a torch near polymer materials (plastics and rubber) without first protecting them from the heat.
- Never burn polymer materials when scrapping them.
- Be careful when handling machines that have been exposed to fire or other intense heat. See also [191 Checklist after a fire or heat exposure](#).
- Always use gloves, safety goggles and a face mask or other breathing protection.

### Fluor rubber



**WARNING**

**Risk of serious corrosive injuries!**



**WARNING**

**When hydrogen fluoride rubber is heated, there is a risk of hydrogen fluoride gas build-up already at approx. 320 °C (610 °F). When inhaled, the gas is extremely corrosive to respiratory tracts.**

Certain seals designed to withstand high operating temperatures (i.e. in engines, transmissions, axles, brakes, hydraulic motors and pumps) may be made of fluor rubber which, when heated to high temperatures, forms hydrogen fluoride and hydrofluoric acid.

Hydrofluoric acid is highly acidic and corrosive. It cannot be rinsed or washed off the skin and causes very severe burn and corrosive injuries that take a very long time to heal. As a rule, injured tissue must be removed surgically.

Hydrofluoric acid may remain on machine parts for a very long time (several years) after a fire.

#### **NOTE!**

In case of contact with hydrofluoric acid, it may take several hours before any symptoms appear.

If swelling, redness or burning sensations appear and it is suspected that contact with heated fluor rubber may be the cause, seek immediate medical attention. If a machine or a component has been exposed to fire or other source of intense heat, it should be handled by specially trained personnel.

For all handling of machines after a fire, wear heavy-duty, neoprene rubber gloves and effective protective goggles. See [191 Checklist after a fire or heat exposure](#).



**Burning of painted parts, plastic or rubber parts constitutes a health hazard.**

See [191 Environmentally safe handling](#)

#### **Decontamination**

The area around a heated machine part that is suspected to be made of fluor rubber shall be decontaminated by thorough and ample washing with lime water (a solution or suspension of calcium hydroxide, that is, slaked lime) in water. After completing the decontamination work, wash the gloves in the lime water and then discard them.

If the machine has been exposed to a fire or other intense heat, the safety actions in the following checklist shall be followed unconditionally at all times: [191 Checklist after a fire or heat exposure](#)

#### **Asbestos information**

The components in Volvo CE's machines are free from asbestos, that is why it is important to use genuine Volvo spare parts.

Document Title: <b>Environmental handling for the future</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25F [GB]</b>			

## Environmental handling for the future



**Figure 1**

The world stands before gigantic challenges on environmental matters where clean water, climate change, and use of chemicals are some of the most important issues. Volvo has an important function in meeting these challenges and contributing to a more ecologically sustainable development. Quality, safety and environment are Volvo core values and have for a long time been integral parts of our company and our products.

Volvo Construction Equipment works with continuous improvement of the machines' environmental performance. An important factor to retain the machine's performance is the service offered by the workshops. This service manual contains recommendations, warning texts, etc. to facilitate your work for the environment.

Document Title: <b>Waste handling</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Waste handling

Contribute to careful use of natural resources by following the steps below when handling waste.  
If possible, deposit the waste for recycling.

**REUSE** of products is the best from an environmental aspect.

**MATERIAL RECYCLING** for use in new products is a good environmental alternative.

**ENERGY RECOVERY** by burning combustible materials is a good alternative when recycling is not possible.

**DESTRUCTION** is used for hazardous waste. Destruction is performed in special facilities.

**DEPOSITION** is the worst from an environmental aspect and should be avoided as much as possible.

**STORAGE** is a temporary measure until a suitable recycling method has been developed.

Document Title: <b>Environmentally safe handling</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Environmentally safe handling

**Always choose an environmentally friendly alternative where one is available, e.g., biodegradable oils.**

**Always follow national and local environmental regulations.**

**All waste shall be brought to a waste handling company, approved by the authorities.**

### Oils and fluids

Oils and fluids, e.g., coolant, that are not reused shall be collected in tight-sealing containers and left for destruction.

### Filters

Oil and fuel filters shall be drained and put into sealed containers before they are left for destruction.

### Refrigerant R134a

Refrigerant R134a contains substances that affect the greenhouse effect and may never be released into the open air. Shall be recycled according to instructions in separate component manual for the air conditioning.

### Batteries



**Risk of serious corrosive injuries!**



**Figure 1**  
**Corrosive acid**

Batteries contain environmentally hazardous substances and corrosive acid. Shall be left for recycling.

### Chemicals

Chemicals, paints, glue, cleaning agents, etc. shall be left for recycling and destruction.

### Rubber and plastics

Rubber materials and plastics may not be burned. Shall be left for recycling.  
Tires shall be handled according to special rules.

### Electronics

Electrical and electronic waste, e.g., circuit boards and bulbs, shall be left for recycling.

Document Title: <b>Environmentally hazardous fluids</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Environmentally hazardous fluids

Pay attention to leakage of fuel, oils and other fluids from the machine that may contaminate the environment.

**Take appropriate actions to seal the leak immediately and decontaminate contaminated ground as soon as possible.** See [191 Decontamination](#)

### Oils and fuels

**When emptying/draining** oils and fuels, take appropriate actions so that unnecessary spills are avoided. In places where containers for draining cannot be used, use a pump or hose for safe handling.

### Air conditioning

Refrigerant R134a contains substances that affect the greenhouse effect and may never be released into the open air.

Service personnel who work with refrigerants must know the laws/rules that apply in the local country but also international rules.

Special training is recommended for all service work on the air conditioning. Many countries require certification from an authority for such work. See also [191 Safety when working with air conditioning refrigerant](#)



Document Title: <b>Working environmentally contaminated areas</b>	in	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>				

## **Working in environmentally contaminated areas**

Machines that are used in environmentally contaminated and/or health-hazardous areas shall be specially equipped for operation in such an environment.

Used cab and engine air filters from machines working in environments with asbestos or other hazardous dust shall be put into tight-sealing plastic bags that the new filters come in, then leave the used filters for destruction.

Document Title: <b>Decontamination</b>	Function Group: <b>191</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/8 0</b>
Profile: <b>CWL, L25B, L25F [GB]</b>			

## Decontamination

**Start decontamination as soon as possible. Certain substances spread quickly in the environment.**

### Decontamination after leaks/spills

Use suitable absorbing materials to collect leaking oil or fuel, e.g., absorbent mats.

Prevent leaking oil/fuel from draining into rain water/storm water drains.

Contaminated soils and ground materials must be removed and collected in suitable containers.

Collected soils and absorbent materials shall be left for destruction.

### Decontamination after accident

If possible, seal leaks from the machine.

Isolate the leakage area using banks drain booms.

Add absorbent materials, e.g., absorbent sand or bark cuttings.

Stop leaking fluids so that they do not drain into rain water/storm water drains or ditches.

Collect the absorbent materials and the top layer of soil, put it into sealed containers for transport to destruction.

### Decontamination after fire

First of all, put out the fire.

Decontaminate in the same way as after an accident.

### NOTE!

Pay attention and be aware that certain substances may be poisonous after a fire. See [191 Health hazards with paint, plastics and rubber](#)

See also [191 Checklist after a fire or heat exposure](#)

Many thanks for your purchase.  
Happy every day.