



# Fire safety guidelines for working machines

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## Risk management is more than just insurance

### Risk and risk management

A risk is a potentially harmful event – in everyday language, it often refers to a failure or threat. Business operations always involve different types of risks that affect the company's success. Risks can be related to the company's assets, personnel, market position or business environment, for example.

The scope of the risk must be assessed so that the role of various risks for the organisation can be identified. The magnitude of risk usually consists of the severity of the loss and the probability of a harmful event.

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Risk management involves systematic efforts to identify, analyse and assess the organisation's risks as well as processing them so that they correspond to the organisation's ability and willingness to take risk.

At best, risk management is a natural part of daily operations and management. Risk management helps organisations in decision-making by placing measures in order of importance and distinguishing alternative methods.

### Risks are interrelated

Different types of risks always relate to each other. As a result, cause and consequence relations must be taken into consideration in risk management: the fire loss of a working machine can paralyse the company's operations for a short or long time, depending on how the company

has been able to prepare for the risk. The interruption of business can have major or long-term financial consequences. Securing the continuity of the operations in exceptional situations and business continuity planning constitutes good risk management.

The company can transfer its risk-containing assets or operations to another company by way of subcontracting agreements or insurance, for example. Despite insurance, the entrepreneur still has to bear their responsibility: insurance terms and conditions and safety regulations determine the scope in which insurance covers the loss.

### It is important to look after safety

The management is responsible for safety in the company. Corporate culture affects occupational safety – the management must issue clear instructions about matters affecting occupational safety and supervise their compliance. A company investing in a good occupational safety culture also has better prerequisites to identify and prevent risks of loss or damage.

## Fire risks of working machines

These safety regulations for working machines provide advice on where fire risks may occur and how they can be identified. Only identified risks can be managed.

A working machine's risk of fire must be evaluated on a case-by-case basis, taking into account the machine's operating environment. Keep in mind that a fire always causes a risk of personal injuries. The consequences of a fire may be severe.

## Operating conditions and environment

Working machines are always designed to be operated under normal conditions. Using a machine for other purposes or in a dangerous environment heightens the risk of accident. In these cases, special safety instructions must be followed. The machine must be equipped for the task being performed. The site supervisor must always confirm that the machine meets the minimum requirements and level of equipment and ensure that the machine's operators are aware of these.

Working machines are used in various different tasks and locations. Some locations may be easily accessible by rescue authorities in the event of a fire. In this case, the harm or damage caused to the surrounding area may be significant, for example, if streets must be closed for fire and rescue workers or the area needs to be evacuated. Other operating environments may be located further from population centres. In these cases, the impact of a fire on the surrounding area is less significant, but help will take longer to arrive.

Some operating environments pose a particular risk of fire. These include sawmills, peat production areas, energy plants and energy storage facilities.

Fire is always a hazard. Underground and indoor sites are typical environments that do not necessarily present a particular risk of fire, but where toxic fumes caused by a fire can be hazardous.

## Tools to help assess the risk of fire

Accurate assessment of risks can help prevent them from happening. When assessing risks of fire, always consider the continuity of the company's business:

- How does the risk of fire impact the company's other risks?
- Is the company taking on a suitable risk?
- What action will the company's employees take in the event of an accident?
- Is preventive service and maintenance at an adequate level
  - in terms of business continuity?
  - in terms of managing fire risks?
- Are fire risks managed in day-to-day work?
- Are employees aware of the most significant fire risks involved with working machines?

## Fire risk arises as soon as a working machine is taken into service

The progression of a fire is described on the fire timeline. The timeline begins when the working machine is taken into service at the company. When a working machine is operated, its temperatures rise. Operation causes vibration and abrasion between the machine's parts, especially if fasteners are inadequate. At some point, the machine's use may cause a component such as the sealant of a wire or hose to wear out. This results in a leak, voltage drop or even a short circuit. Temperatures rise more quickly and smoke and fire develop.

When fire risks are controlled, it is a good idea to focus on the initial point on the fire timeline before temperatures begin to rise. This allows time to react and take correct preventive action. In practice, this means that service and maintenance must be high-quality and ongoing.

Therefore, risk points should be identified and controlled before a fire breaks out.

Fire cannot always be prevented. If a fire breaks out, first-aid extinguishing equipment, i.e. fire extinguishing systems and hand-held fire extinguishers, are needed to extinguish it. For more information on first-aid extinguishing equipment see Section "First-aid extinguishing equipment."

## Servicing and maintenance to prevent fire losses

The purpose of normal scheduled maintenance is to ensure that the working machine functions without problems until the next servicing. Therefore, it is especially important to perform scheduled maintenance according to the manufacturer's instructions. During maintenance, the machine is also inspected for certain risks of fire, mostly related to potential leaks.

If the company has its own service workshop, maintenance must be performed according to the manufacturer's instructions.

Importers of working machines occasionally send out invitations to recall campaigns. It is advisable to always take part in recall campaigns.

## Replacement parts

When servicing a machine, always use authentic replacement parts from known manufacturers. While they may be more expensive, they have been designed for the machine in question. Machine-specific spare parts are sure to withstand the temperatures and other conditions prevailing in the engine compartment.

High temperatures place particular requirements on a working machine's materials and components.

## Inspecting and cleaning a working machine

When operating the machine in conditions with dust or a fire hazard, the engine compartment and its surroundings must be inspected and cleaned daily. Typical environments that involve dust and fire hazard are found in the timber industry, wood chip and peat processing and grain and animal feed processing.

In other environments, the machine must be inspected and cleaned at least once a week.

Dirt and other loose matter must be removed using compressed air, for example. Cleaning should take place after a shift before the machine is parked. This way, possible smouldering is also most readily detected. After cleaning, the machine must be inspected for possible leaks and any necessary repairs performed.

Keeping the engine compartment clean prevents flammable material from igniting in high temperatures. When the engine compartment is clean, also cooling works better and technical components last longer, which saves costs and improves safety.

## Liquids and leaks

Many liquids in the vehicle tanks or hydraulic systems, such as hydraulic oil, diesel fuel and motor oil, are flammable. Liquid leaks constitute a risk of fire when the temperature of hot surfaces rises to approximately 240°C. The risk is aggravated further if the liquid is pressurised, because any leak could then result in a flammable oil mist.

## Fuel leaks

Shut down the engine before inspecting for possible fuel leaks. Do not perform the inspection while the engine is running. Due to high injection pressure, a fuel leak in an engine may cause injuries.

Check that there are no visible fuel leaks. Be sure to check the joints of hoses and pipes.

## Oil and hydraulic oil leaks

Check the engine compartment for oil leaks that may cause a fire. Even a small amount of motor oil on a hot engine is enough to start a major fire that will destroy the engine and its surroundings.

Working machines contain a large amount of hydraulics. Hydraulic pumps require oil to operate according to design. For this reason, oil tanks are placed higher in the working machine than the hydraulic pumps and engine. A fire near the engine always presents the risk that a hydraulic oil hose is burnt out. This causes a greater fire load, resulting in an even larger fire.

Normal hydraulic oil hoses can withstand temperatures of about 120 °C. If a hose is too close to hot engine surfaces, its operating life shortens significantly. In these cases, it is recommended that the hose is protected with a thermal protection tube designed for this purpose. Hydraulic hoses should be protected whenever the machine is used to handle high-temperature materials such as slag.

Hydraulic hoses and other components can also be protected with thermal shields.

If a spot indicating a leak appears under the working machine, the leaking point should be located and repaired immediately.

## Electrical equipment

According to statistics, electrical fires are the most common type of fire. Engine fires can be prevented by regularly inspecting electrical equipment and ensuring that electrical systems are in order. Electrical systems should be inspected visually at least once a year and preferably each time the machine is taken in for maintenance. Inspections of electrical systems must be documented (see Appendix).

In electric-powered and hybrid machines, electrical systems must be serviced daily.

## Inspecting electrical systems

The risk of electrical fire can be controlled by measuring voltage drop in different components using a standard multimeter. When the calculated amount of voltage drop exceeds 20W, various changes are already visible in the machine's plastic components as the risk of fire increases.

A thermal imaging camera is also a good tool for detecting anomalies in alternators, main power cables, plus points and earthing points.

When using a thermal camera, compare the measurement values with those of an intact machine in order to assess the severity of a potential anomaly. External conditions and temperatures should also be taken into account in the measurement. When measuring electrical components, take into account the component's current consumption. If the current passing through the component is high, its temperature should not be allowed to rise. If the temperature rises, the component is malfunctioning or incorrectly designed.

A thermal camera can also be used to detect damage to bearings in an alternator's belt tensioner, for example.

## Main power switch

All working machines weighing more than 500 kg must be equipped with a main power switch. The main power switch must be located outside the engine compartment and visibly marked. The main power switch poles must be protected with terminal covers.

In modern machines, the main power switch may be electrically operated. Check that power to the machine is cut off whenever the main power switch is turned off.

## **Emergency kill switch**

Machines often include a visibly marked emergency kill switch. The location and operation of the emergency kill switch must be determined before the machine is turned on.

Typically, the emergency kill switch works by shutting down the engine and cutting off the main power. Note that some machines contain a separate kill switch for hydraulics.

If you need to use the emergency kill switch due to an operating malfunction, repair the malfunction before resuming the machine's use.

Never use the emergency kill switch to shut down the engine under normal circumstances.

## **Battery**

Batteries contain a lot of energy, so even minor deviations in them must be repaired immediately.

Battery cable terminals must be intact and firmly tied down. If they are incorrectly attached, damaged or show signs of corrosion, they will overheat during start-up to temperatures that may cause nearby materials to ignite. Battery cable terminals must be protected with terminal covers.

The battery compartment must have sufficient ventilation.

## **Cables**

All cables not protected with a fuse, such as battery, alternator and starter motor cables, should be checked several times a year. Lead-throughs must be checked with particular care. Lead-throughs must be equipped with rubber collars that are in place and intact.

If the cables show signs of damage caused by abrasion or heat, they must be replaced. Cables must always be protected with a housing pipe. The operating conditions of cables should always be taken into account.

All cables and their insulations must be clean of oil and other dirt. Oil increases fire load and shortens the operating life of the cables' plastic insulation.

Do not attach cables to hoses or pipes. All cables not protected with a fuse, such as battery, alternator and starter motor cables, should be inspected visually in connection with each maintenance.

Cable harnesses in working machines must be protected against wear and tear and firmly attached. If the cables or cable harnesses show signs of damage caused by abrasion or heat, they must be replaced. The conditions which the cables must withstand must be taken into account.

All cable connections must be tight, correctly installed and protected with terminal covers.

## **Electric panel**

The working machine's electric panel must always be checked in connection with maintenance. If there are redundant or hanging wires on or behind the electric panel, their purpose and origin must be checked and their attachments repaired.

Electric panels and fuse boxes must be intact and protected with a lid.

In some electric panels, the fuse size is indicated on the fuse panel. During inspection and maintenance, check that the fuses are of the correct size. A blown fuse may be an early sign of a problem. For this reason, the cause of the blown fuse should be investigated.

Anomalies in a vehicle's electric panel can also be detected with a thermal camera. Note that fuses and relays heat up whenever a current passes through them.

## **Attachment of cables**

Cables must be properly and adequately attached. Because the engine compartment is a high-vibration area, the distances between cable fastening brackets may not exceed 150 mm.

The engine temperature should also be taken into account in installing the brackets. In a modern working machine, fastening and even cable ties should withstand temperatures of 120 °C.

Cables may not be attached to pipes or hoses, as they vibrate more than other components.

If a cable has been attached to a pipe or hose that contains flammable material, possible short circuit is likely to pierce the hose and ignite the liquid.

## **Alternator**

The alternator must be firmly attached and have a correct belt tension. The alternator must also be equipped with terminal covers.

If the alternator is equipped with a filter, ensure that it is clean. Otherwise, the component's temperature rises as cooling air intake is limited, increasing the risk of fire.

The alternator's temperature can also be checked easily for anomalies with a thermal camera.

When inspecting the alternator, check the condition of the fasteners and belt.

During maintenance, detach the alternator belts and listen to the bearings in the alternators and belt tensioners. If they are noisy, they should be replaced. A worn bearing increases temperature and poses an evident fire risk.

## **Other parts of a working machine**

### **Exhaust pipe**

In connection with maintenance, always check that the machine's exhaust system (turbocharger and catalytic converter) is free of leaks and that all thermal shields are in place. No hoses that contain flammable liquids may run too close to the exhaust system.

The engine compartment's sound insulators and thermal shields must be firmly tied down. If they are detached, the risk of fire increases.

### **Urea systems and diesel particulate filter**

Modern working machines are equipped with urea systems that do not as such pose a risk of fire. However, problems may occur if urea refuelling fails or there are leaks in the system.

When filling the urea tank, particular care must be taken to prevent contamination. Impurities in the urea may cause malfunctions.

Urea both crystallises and causes corrosion, which in turn disrupts the operation of electrical equipment and increases the risk of fire.

### Regeneration

The diesel particulate filter is cleaned by a combustion process known as regeneration. When the machine indicates that regeneration is needed, always ensure that the process takes place in a safe environment. A safe environment for regeneration is outdoors away from any flammable materials.

During regeneration, the temperature of the exhaust fumes and exhaust pipe rises.

While the working machine is in an environment with a fire hazard, such as underground, in a pit or indoors, regeneration must be delayed until the machine is taken to a safe environment.

The machine must never be left unattended during regeneration even if this is permitted by the manufacturer's manual.

### Swivelling joint

If the machine is equipped with a swivelling joint (such as a loader, forest harvester or roller), the condition of all hoses and electrical systems in the swivelling joint must be inspected weekly. The machine operator must remove any rocks and twigs from the joint immediately as these may damage the hoses and even cause a fire.

### Operating manual

Ensure that all operating manuals, including those of accessories, are available in the machine. Operating manuals instruct on the safe and correct use of the machine and detail what operators should know about the machine.

In the event of even the smallest malfunction, always check the operating manual for the manufacturer's advice in such situations. A potential fire hazard may be detectable early on as a malfunction or active warning light, in which case there is still time to easily address the issue and prevent a possible fire.

The operating manual must be provided in a language that the operator understands.

## Fire caused by auxiliary heater

Every year, fires are caused by auxiliary heaters. This type of fire can be easily prevented.

Before the winter months, it is a good idea to check the cleanliness and condition of the auxiliary heater and the heater compartment. The various parts of the auxiliary heater are hot, so the heater and its compartment must always be clean and have no fuel leaks. The heater's wirings must also be inspected to ensure that they are intact and firmly tied down.

The exhaust pipe of the auxiliary heater must also be inspected. The exhaust pipe may not touch anything or point to flammable material.

Before use, the heater should be tested under supervision in order to detect possible malfunctions.

## First-aid extinguishing equipment

### Hand-held fire extinguishers

Working machines weighing more than 3,000 kg must be equipped with at least two 34A233B hand-held fire extinguishers. Pohjola Insurance recommends the use of frost-resistant liquid-based extinguishers. The nozzles of liquid extinguishers must fit through the extinguishing openings. Liquid-based extinguishers do not cause mess in the same way as traditional dry powder extinguishers, which allows the working machine to be returned to operation more quickly.

Hand-held fire extinguishers must be kept in a place where they are easily available. The locations of hand-held fire extinguishers must be marked clearly.

Working machines used to crush or tear timber products or other energy waste must be equipped with four 34A233B hand-held fire extinguishers. The extinguishers must be positioned so as to be available at ground level.

All hand-held fire extinguishers must be serviced at least once a year.

The operator must be instructed on the use and inspection of fire extinguishers.

### Fire extinguishing systems in autonomous working machines

Autonomous working machines that do not require an operator must always be equipped with fixed fire extinguishing systems. The fire extinguishing system must protect any components in the engine compartment with a surface temperature high enough to ignite materials in the compartment. The fire extinguishing system is also used to protect hoses and tanks containing flammable liquids or gases and electrical components, wires and cables that may cause sparks and fires.

The amount of extinguishing agent used in an autonomous working machine is six litres per protected cubic metre.

The fire detection system must cover the entire engine compartment in a manner that ensures that any fires are detected sufficiently quickly and extinguished. Detection systems that use hoses or wires must also be connected to all cables in the engine compartment that are not protected by a fuse and be located in the immediate vicinity of the electrical system's main components.

In other respects, the fire extinguishing system must meet all requirements of fire extinguishing systems in conventional working machines.

### Hydraulic and electrical systems in autonomous working machines

If the autonomous working machine is equipped with a hydraulic system, the hoses in its engine compartment must be protected with thermal protection tubes. Thermal protection tubes must withstand temperatures of 260 °C continuously and 1000 °C temporarily for at least 15 minutes.

Electrical systems must be equipped with a control system covering all electrical circuits in the system. The control panel must be alerted of any anomalies in electrical circuits.

## Requirements for fire extinguishing systems

### Requirements by Finance Finland (FFI)

Finance Finland places special requirements on the fire extinguishing systems of working machines. Finance Finland's safety regulations (in Finnish) for fire extinguishing systems in working machines is titled "Moottorijoneuvojen ja työkoneiden sammutusjärjestelmät FA-127." See the regulations.

### The requirements of Pohjola Insurance

Machines operated in environments with dust or fire hazards, such as the timber industry, wood chip and peat processing and grain and animal feed processing must be equipped with a fixed fire extinguishing system.

The fire extinguishing system must be fully automatic.

There must be at least three litres of extinguishing agent for each protected cubic meter of engine compartment or auxiliary heater compartment.

The fire detection system must cover the entire engine compartment in a manner that ensures that any fires are detected sufficiently quickly and extinguished. Detection systems that use hoses or wires must also be connected to all cables in the engine compartment that are not protected by a fuse and be located in the immediate vicinity of the electrical system's main components.

Installation of the fire extinguishing system is proved with a certificate of installation, and the system's compliance with requirements is certified with a test report (see list of approved manufacturers).

At machine start-up, the operation of the fire extinguishing system must be confirmed on the system screen. If the fire extinguishing system has a malfunction or is activated, it must be immediately repaired or refilled.

The fire extinguishing system may only be refilled or repaired by an authorised repair shop.

The fire extinguishing system must be serviced according to the manufacturer's maintenance instructions at least once a year.

In addition, the machines' engine compartments and their surroundings must be cleaned daily.

### Fire extinguishing openings

In addition to fire extinguishing systems, Pohjola Insurance recommends that all working machines be equipped with fire extinguishing openings. The machine should have clearly marked fire extinguishing openings to the engine compartment and auxiliary heater compartment.

## Approved extinguishing equipment suppliers

Fire extinguishing systems for working machines recommended by Pohjola Insurance

Manufacturer of fire extinguishing system	Representative in Finland	Contact information
Dafo	Dafo Oy	<a href="http://www.dafo.fi">www.dafo.fi</a> +358 10 666 5120
Fogmaker	OEM Finland Oy	<a href="http://www.oem.fi">www.oem.fi</a> +358 403 412 473
Firestop	YTM-industrial	<a href="http://www.ytm.fi">www.ytm.fi</a> +358 29 006 5701
ExAct Guard	Mikro-Pulssi	<a href="http://www.mikro-pulssi.fi">www.mikro-pulssi.fi</a> +358 3 3122 1400
Ceodeux Extinguisher Valves Technology S.A / Rotarex	Teknosafe Oy	<a href="http://www.teknosafe.fi">www.teknosafe.fi</a> +358 5 680 7700

## Fire safety inspection

Owner of the machine
Contact person
Phone
Address
Email address

The machine's owner/holder must correct any issues without delay.

<b>Component</b>	<b>OK</b>	<b>Issues</b>
1 Signs and markings		
1:1 Machine markings		
2 Machine electrical systems		
2:1 Battery cables, other wires not protected by a fuse		
2:2 Cable harnesses		
2:3 Battery		
2:4 Main power switch		
2:5 Alternator fasteners/belt tension		
3 Engine mechanics		
3:1 Condition of fuel manifold and oil & hydraulic pipes/hoses		
3:2 Fastening and sealing of the above (3:1)		
3:3 Condition and sealing of the exhaust system		
4 First-aid extinguishing equipment		
4:1 Inspection and general condition of hand-held fire extinguishers		
4:2 Maintenance and inspection log of the fire extinguishing system		
5 Auxiliary heater (Webasto)		
5:1 Installation		
5:2 Fuel manifold		
5:3 Exhaust pipe		
5:4 Electrical system		
5:5 Mains power systems, block and interior heaters		
6 General condition		
6:1 Cleanliness of the engine and components		
<b>Other comments</b>		

Inspector	Date
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## In the event of engine fire

In the event of engine fire, the engine must be shut down as quickly as possible, taking into account the machine's operating environment (indoors/outdoors). Remain calm and in control of the situation. Stop the spread of the fire and prevent injuries. The emergency number is 112.

- If the machine is being used indoors, it should be moved outdoors if possible before taking fire extinguishing measures.
- If the machine catches fire near other flammable material (such as wood chip), the machine must be moved before the engine is shut down.
- After the engine is shut down, cut off electricity from the main power switch.
- The machine can be switched off using the emergency kill switch, which shuts down the engine and cuts off power.
- The operator must call for help or ask others present to call for help. Whenever possible, use the 112 application on a smartphone.
- Perform first-aid fire extinguishing. If action is taken quickly to extinguish the fire, the damage caused is often only minor.
- Even if the fire is controlled, the fire department should visit the site to confirm that the fire has been put out and there is no danger of re-ignition.
- Report the incident to the occupational health and safety officer and the site manager.
  - Describe the incident in as much detail as possible and review the event internally within the company, when possible.
  - Be sure to also go over what could have been done differently in the situation. Inform your coworkers about the incident, as your experience may be valuable to them.
  - Be sure to also report the incident to the insurance company. On the basis of the information, the insurance company can specify its instructions and help avoid new losses.

## Other accident

- Report all accidents and dangerous situations to the supervisor of the work without delay.
- If possible, stop and leave the machine in place.
- Prevent further damage and take action to minimise the consequences of the accident, in particular personal injuries.
- Otherwise, wait for the supervisor to decide on the course of action.

## Operator's safety

- Wear protective clothing and a helmet.
- Avoid using your phone unnecessarily. Use a hands free device when speaking on the phone.
- Be seated before starting up the machine.
- Always wear a safety belt if one is available.
- Use the stepladders and handrails when getting in and out of the machine. Maintain three points of contact by keeping both feet and one hand or both hands and one foot for support at all times.
  - Always face the machine when climbing or descending.
  - Don't jump.
- On the machine, only stand and move on surfaces with non-slip protection.
- Keep the doors closed while driving and operating the machine.
- Keep your hands away from places with a danger of becoming stuck.
- Make sure that any tools are firmly tied down and locked.
- Emergency exits must be marked.
- The machine must be in working order. All malfunctions that could lead to an accident must be repaired without delay.

Actions in an accident or fire are also good topics for training. Be sure to also arrange practical training on what to do in an accident or fire.

## Checklists for inspections

The checklists below can be used as templates for regular inspections. The lists are not exhaustive. Add items to the lists depending on the machine's use and operating environment.

<b>Cables and fasteners</b>	
During each instance of use	<ul style="list-style-type: none"> <li>•</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>• Are cables properly secure in place?</li> <li>• Are cables properly secure in place also in the engine compartment?</li> </ul>
Otherwise regularly, every _____	<ul style="list-style-type: none"> <li>• Are fastening brackets heat-resistant? Including cable ties?</li> <li>• Are fastening brackets electricity-insulating?</li> <li>• Are lead-throughs in order?</li> </ul>
As part of regular maintenance	<ul style="list-style-type: none"> <li>•</li> </ul>
Other things to note	<ul style="list-style-type: none"> <li>• Only certified replacement parts are used</li> <li>• Operating and/or installation manual</li> </ul>

<b>Fuses and batteries</b>	
During each instance of use	<ul style="list-style-type: none"> <li>•</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>•</li> </ul>
Otherwise regularly, every _____	<ul style="list-style-type: none"> <li>• Are all cables not protected by a fuse intact?</li> <li>• Are battery cable terminals and fuse cable terminals protected with terminal covers?</li> </ul>
As part of regular maintenance	<ul style="list-style-type: none"> <li>•</li> </ul>
Other things to note	<ul style="list-style-type: none"> <li>• Only certified replacement parts are used</li> <li>• Operating and/or installation manual</li> </ul>

<b>Engine compartment and interior heater compartment</b>	
During each instance of use	<ul style="list-style-type: none"> <li>• Are the engine and interior heater compartments clean?</li> <li>• Are there leaks or "sweating" that could be an early sign of a leak?</li> <li>• etc.</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>•</li> </ul>
Otherwise regularly, every _____	<ul style="list-style-type: none"> <li>•</li> </ul>

<b>Cables and fasteners</b>	
During each instance of use	<ul style="list-style-type: none"> <li>•</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>• Are cables properly secure in place?</li> <li>• Are cables properly secure in place also in the engine compartment?</li> </ul>
Otherwise regularly, every _____	<ul style="list-style-type: none"> <li>• Are fastening brackets heat-resistant? Including cable ties?</li> <li>• Are fastening brackets electricity-insulating?</li> <li>• Are lead-throughs in order?</li> </ul>
As part of regular maintenance	<ul style="list-style-type: none"> <li>•</li> </ul>
Other things to note	<ul style="list-style-type: none"> <li>• Only certified replacement parts are used</li> <li>• Operating and/or installation manual</li> </ul>

<b>Fuses and batteries</b>	
During each instance of use	<ul style="list-style-type: none"> <li>•</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>•</li> </ul>
Otherwise regularly, every _____	<ul style="list-style-type: none"> <li>• Are all cables not protected by a fuse intact?</li> <li>• Are battery cable terminals and fuse cable terminals protected with terminal covers?</li> </ul>
As part of regular maintenance	<ul style="list-style-type: none"> <li>•</li> </ul>
Other things to note	<ul style="list-style-type: none"> <li>• Only certified replacement parts are used</li> <li>• Operating and/or installation manual</li> </ul>

<b>Engine compartment and interior heater compartment</b>	
During each instance of use	<ul style="list-style-type: none"> <li>• Are the engine and interior heater compartments clean?</li> <li>• Are there leaks or “sweating” that could be an early sign of a leak?</li> <li>• etc.</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>•</li> </ul>
Otherwise regularly, every _____	<ul style="list-style-type: none"> <li>•</li> </ul>
As part of regular maintenance	<ul style="list-style-type: none"> <li>•</li> </ul>
Other things to note	<ul style="list-style-type: none"> <li>• Only certified replacement parts are used</li> <li>• Operating and/or installation manual</li> </ul>

<b>First-aid extinguishing equipment</b>	
During each instance of use	<ul style="list-style-type: none"> <li>• Is there enough first-aid extinguishing equipment?</li> <li>• Is the equipment clearly marked and in the correct locations?</li> <li>• Are operators trained in the equipment's use?</li> <li>• etc.</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>•</li> </ul>
Otherwise regularly, every _____	<ul style="list-style-type: none"> <li>•</li> </ul>
As part of regular maintenance	<ul style="list-style-type: none"> <li>•</li> </ul>
Other things to note	<ul style="list-style-type: none"> <li>• Operator training</li> <li>• First-aid fire extinguishing skills</li> <li>• Site address/coordinates for rescue authorities</li> </ul>

<b>Option 2 - Checklist for working machines</b>	
During each instance of use	<p>First-aid extinguishing equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Electrical equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Engine compartment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Etc.</p>
Weekly	<p>First-aid extinguishing equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Electrical equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Engine compartment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Etc.</p>
Otherwise regularly, every _____	<p>First-aid extinguishing equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Electrical equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Engine compartment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Etc.</p>
As part of regular maintenance	<p>First-aid extinguishing equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Electrical equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Engine compartment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Etc.</p>
Other things to note	<p>First-aid extinguishing equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Electrical equipment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Engine compartment:</p> <ul style="list-style-type: none"> <li>• x</li> </ul> <p>Etc.</p>

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