VOLVO

Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Safety concerns everybody!	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety concerns everybody!

Always follow the instructions in the machine's operator's manual, which is a supplement to this Service Manual.

The Operator's Manual **must always** be kept in the cab for easy reference.

Volvo designs and manufactures machines with a high level of safety as well as effectiveness. All this work may be wasted if anyone who is about to perform service on any of our machines does not read the safety instructions, or does not follow them, e.g., does not replace guards, climbs on slippery machine parts instead of using a ladder, grabs a hold of hoses instead of handles or uses the wrong tools for the job.

In order to maintain safe and effective function, always use the intended and adapted spare parts for the machine. Using genuine Volvo spare parts is recommended since they are adapted to the machine for highest safety and quality.

Machines seldom cause accidents, instead people often do.

A safety-conscious person and a well-maintained machine make for a safe, effective and profitable combination.

Those who do not follow the safety instructions and observe the warnings in this manual must make sure that their work method is safe. Otherwise, there is a great risk of accidents, perhaps even accidents that result in 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!"

Get to know the capacity and limits of your machine!

VOLVO
Construction Equipment

Service Information

Document Title: **Safety when handling the machine**	Function Group: **191**	Information Type: **Service Information**	Date: **2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety when handling the machine

Volvo Construction Equipment Group 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 safety rules

General

- Repair malfunctions or defects that affect safety as soon as possible.
- 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, and on or under the machine when the engine is running.
- To avoid unnecessary climbing on the machine, use a window scraper or brush with long handle when cleaning external window glass or rear-view mirrors.
- 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!

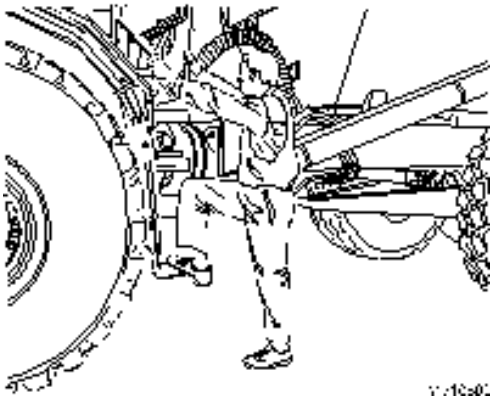

Figure 1
Entering/leaving the machine

Figure 2
Read the Operator's manual, plates and instructions before you operate the machine.

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 1 (see Operator's manual).
- Perform all safety checks prescribed in the Operator's manual.

WARNING

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 ventilation is adequate for this. The machine is equipped with a diesel engine and the exhausts may be hazardous to your health. Therefore, ensure adequate ventilation and avoid running the engine more than necessary where ventilation is inadequate.
- 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.
- Always sit in the operator's seat when you start the engine.
- Use the lap type seat belt during all operation.
- 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).
- Step only on the prepared non-slip surfaces and use the provided handles and rails.

Hip-type seatbelt

- Use the seat belt during all operation.

Figure 3
Use the seat belt during all operation

- 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

- Respecter symbols and alarm displays. The red alarm displays require immediate action or consideration, see instructions in the Operator's Manual under information display unit.
- Move the gear selector to neutral position and apply the parking brake before leaving the machine.

WARNING

Risk of crushing injuries

- Do not stand near the frame joint unless it has been locked with the frame joint lock.
- Stop the engine before you leave the machine unattended.

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!**

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).

Alternative exit

Figure 4

1. Alternative exit (right side of cab)
2. Hammer

Alternative exit is possible through the split side window in front of the B-pillar on both the right and left sides of the cab. Alternative exits are marked with a decal. In an emergency situation the window glass can be broken using the hammer. When the window glass has been broken, the moulding between the window's two parts falls away.

NOTE!
It is only possible to break windows marked with decal for alternative exit.

Figure 5

The hammer is used in emergencies to:

- break the window glass for alternative exits,
- cut the seatbelt with the knife located in the rear edge of the hammer.

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Service Information

Document Title:	Function Group:	Information Type:	Date:
Service position 1	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Service position 1

Op nbr 191-021

88830046 Dump body support

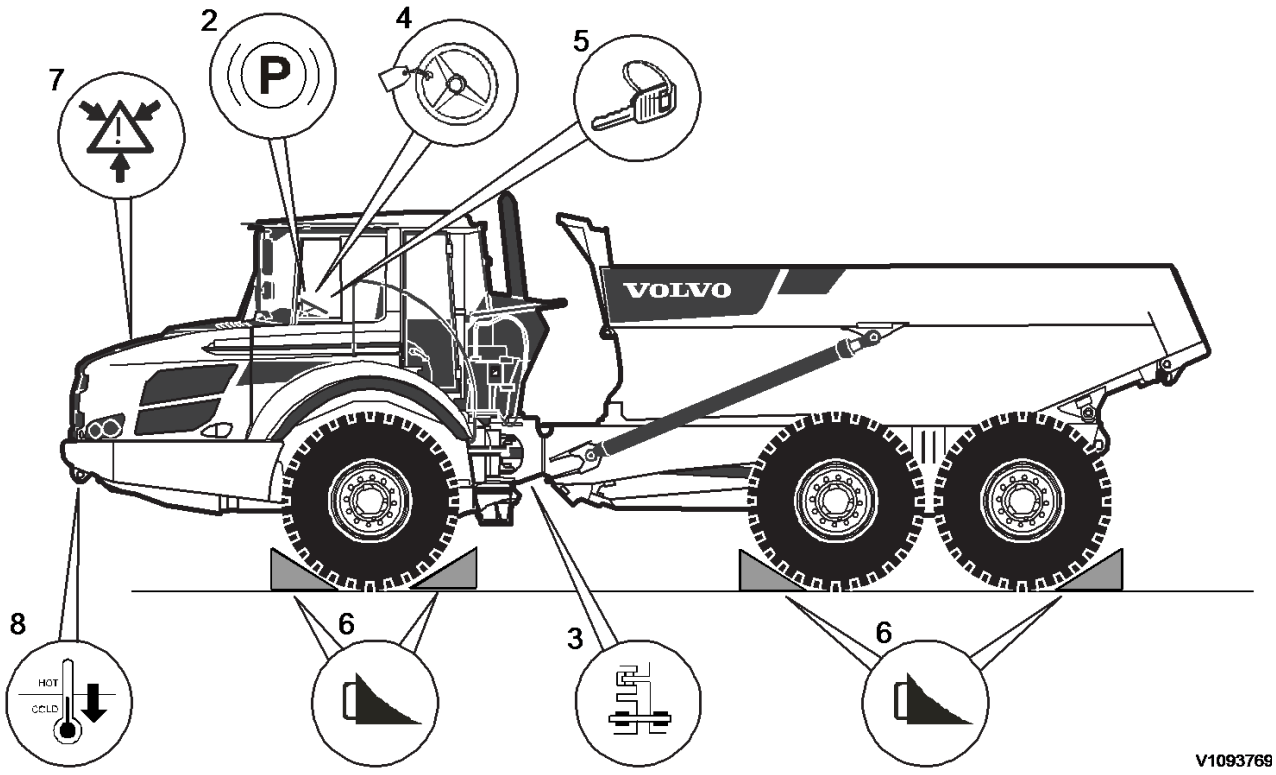

Figure 1

1. Place the machine on firm and level ground.
2. Apply the parking brake.

WARNING

Risk for personal injury caused by crushing. The machine could turn. Lock the steering lock.

WARNING

Risk of crushing.

An unlocked raised dump body can fall down. Personnel standing under a falling dump body could be seriously injured, including death.

Always lock the dump body before entering under it.

3. Lock the steering joint with the steering joint lock. Lower the load body against the frame or elevate the load body and secure with the load body lock or 88830046 Dump body support.

4. During on-going service work, fasten a warning sign on the steering wheel with information that service is in progress.

5. Turn off the engine and remove the start key.

6. Block the wheels in a suitable manner (i.e. with wedges).

7. Depressurize pressurized lines and pressure tanks. See 520 Brake system, relieve pressure and 900 Hydraulic system, relieve pressure.

8. Allow the machine to cool down.

Document Title:	Function Group:	Information Type:	Date:
Checking function	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Checking function

After work in a safety-related electrical system, a function check shall be performed to meet the requirements in ISO 15998.

Safety-related electrical system

Systems covered by function check for safety-related electrical system are:

- Parking brake. For check, see 550 Parking brake, function check.
- Load and dump brake. For checking, see 553 Load and Dump brake, function check.

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Service Information

Document Title:	Function Group:	Information Type:	Date:
Safety when working with air conditioning refrigerant	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety when working with air conditioning refrigerant

WARNING

There are a number of safety aspects that should be kept in mind when working with repairs and maintenance of the air conditioning. Therefore, read and consider the safety section in the Service Manual Air Conditioning R134a before starting any work.

For repairs of the air conditioning, refer to the **Service Manual Air Conditioning R134a**.

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Service Information

Document Title:	Function Group:	Information Type:	Date:
Safety when lifting and supporting the machine	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety when lifting and supporting the machine

- When lifting or supporting machine parts, use equipment with a lifting capacity that equals at least the weight of the part in question.
- All lifting devices, such as straps, slings, ratchet blocks, must comply with governing national regulations for lifting devices. We will not accept any responsibility if any lifting devices, tools or work methods are used other than those described in this publication.
- If a jack is to be used, make sure that the ground or floor is even and is sufficiently firm or strong to support the expected load.
- Prevent the machine from rolling by applying the parking brake and placing suitable wedges on both sides of the wheels which are not to be raised off the ground.
- Always use a jack with sufficient lifting capacity and position it under the axle or on the inside of the wheel that is to be removed.
  Make sure that the jack is correctly positioned and is at the correct angle to the lifting point on the machine.
- Take care to position supports under the machine in a safe way.

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Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Safety when using lifting equipment	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety when using lifting equipment

WARNING

Do not work under a hanging or suspended load!

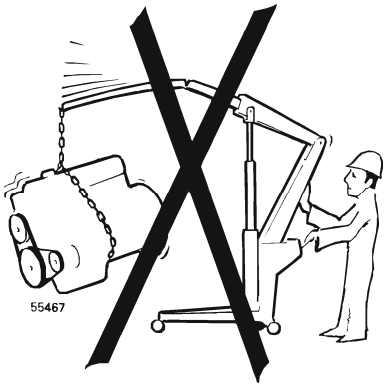

Figure 1
Do not overload lifting or support equipment.

- 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.

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Service Information

Document Title:	Function Group:	Information Type:	Date:
Rules when handling tyres	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Rules when handling tyres

WARNING

Make sure that you stand off to the side of the tyre when inflating a tyre mounted on a split rim. Wheels of this type may explode, causing personal injury and even death.

Use a self-attaching air-chuck with a hose long enough to allow you to stand outside the danger area when inflating a tyre.

Inflating

- Always stand to the side of the tire when inflating a tire installed on a split rim. Use a self-locking nozzle with a hose that is long enough to allow you to stand outside of the hazard zone during inflation, see figure.

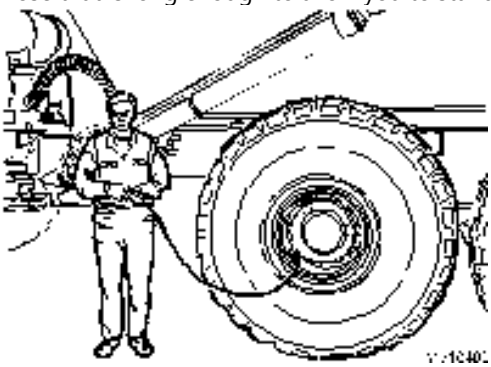

Figure 1
Always stand off to the side of the tyre when inflating it with air.

- Spare tyres should only be inflated with enough air to keep the rim parts in place.
- Use an inflation cage, safety cables or chains to secure a loose wheel when inflating it with air.
- The machine should be without load when checking the tyre pressure.

Installing tyres and rims

- Never fit a tyre on a rim if the tyre is not clearly recommended for that rim.
- Never assembly rim parts for different dimensions and never use damaged or defective parts.
- Be careful if you are using reconditioned wheel parts. Defective or incorrect welding, heating or soldering may have weakened the parts and could result in future failure.
- Make sure that the lock ring groove in the rim is free from dirt and rust before fitting the lock ring.

Repairing tyres and rims

- Never cut or weld on the rim of an inflated tyre.
- Be careful when working with bead-breakers and hydraulic jacks. Keep outside the danger area when removing foreign objects from the tire tread. A bead-breaker that disengages releases with enough force to cause severe personal injuries, even death.

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Construction Equipment

Service Information

Document Title: **Safety when working with batteries**	Function Group: **191**	Information Type: **Service Information**	Date: **2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety when working with batteries

WARNING

Explosion hazard.

WARNING

Handling batteries may lead to that electrolyte comes into contact with eyes, skin or clothes. Wear protective equipment. Electrolyte splashes in eyes must be rinsed off with water immediately. Electrolyte on skin must be washed off with soap and water immediately. Seek medical advice.

Batteries contain sulphuric acid, which is highly corrosive on the human body and on machine parts. Also, batteries generate hydrogen gas when they are loaded or charged. Hydrogen gas and the oxygen in the air generate so-called oxy-hydrogen gas, which is very explosive.

This combination, **highly corrosive acid and explosive gas**, entails a major risk of accidents during all work with vehicle batteries. That is why it is very important to be careful and to follow the rules below when working with batteries.

When charging batteries, follow the instructions given below:

- Do not smoke near batteries since they generate explosive gases.
- Ventilate well, especially if the battery is charged in a closed room.
- In order to reduce the risk of sparks that may cause a fire, always start by disconnecting the ground cable when removing a battery and finish by connecting the ground cable when installing a battery.
- Never tilt a battery to a great extent in any direction. Battery electrolyte may leak out.

- Do not connect a discharged battery in series with a fully charged battery. Explosion hazard!
- Make sure that metal objects (such as tools, rings, watch straps, etc.) do not come into contact with the battery terminals. Personal injury and fire may result.

- Always cover the top of the batteries with a cloth or other non-conducting material when working close to the batteries.
- Always refit the terminal caps on the batteries.
- Batteries contain substances that are hazardous to health and the environment. Therefore, discarded batteries must be disposed of according to applicable local/national regulations.

Charging of batteries

WARNING

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.

Corrosive sulphuric acid

The battery electrolyte contains corrosive sulphuric acid. Electrolyte spilled on bare skin should be removed immediately. Wash the affected area 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.

VOLVO

Construction Equipment

Service Information

Document Title: **Safety when handling oils and fuel**	Function Group: **191**	Information Type: **Service Information**	Date: **2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety when handling oils and fuel

- When changing oil in the engine, hydraulic system or transmission: remember that the oil may be hot and can cause scalding/burn injuries.
- Oils as well as diesel fuel have are corrosive to mucous membranes in, for example, eyes, throat, and on skin. Therefore, avoid getting oil on these body parts.
- When emptying and/or draining oil or fuel, actions must be taken to avoid unnecessary spills. In places where it is not possible to use a container for collecting the liquid, use a pump or connect a hose for safe handling. Oil and fuel that is freely released is harmful to 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!

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Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Safety when working on pressurized systems	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety when working on pressurized systems

WARNING

Gas and oil under high pressure!

Figure 1
Pressurized systems

Be extremely careful during all handling and work with pressurized systems since there is a risk of fatal accidents and serious personal injuries.

Depressurize all pressures according to methods in each function group before work in the systems.

Make sure that the person working with pressurized systems has the right training, the right equipment, and follows the safety rules.

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Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Safety when working on hydraulic systems	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety when working on hydraulic systems

The hydraulic systems on our machines operate at very high pressures. In order to avoid serious personal injuries, it is very important that the systems are maintained correctly, and that all persons who come into contact with the machines act with great caution and with special attention 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 191 Safety when handling accumulators

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.

WARNING

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

- 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.

  WARNING

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

- When checking for leaks, use paper or a stiff board. Never use your hand.

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Construction Equipment

Service Information

Document Title: **Safety when handling accumulators**	Function Group: **191**	Information Type: **Service Information**	Date: **2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

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 precharge pressure. Therefore, be very careful during all handling and work with accumulators.

The precharge 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 pressure accumulators shall be punctured before they are scrapped to avoid the risk of explosion, see 527 Accumulator, discarding and 720 Accumulator, suspension system, discarding.

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Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Safety when working on the machine's electrical system	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety when working on the machine's electrical system

- Do not use a test light with a bulb when troubleshooting the electrical system!
  The highfiring voltage of the bulb can destroy expensive electronic components.
- When installing a two-way radio, mobile telephone, etc., the installation must be performed according to the manufacturer's instructions in order to eliminate interference with electronic systems and components that are necessary for the machine's functions.

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Service Information

Document Title: **Safety during electric welding**	Function Group: **191**	Information Type: **Service Information**	Date: **2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Safety during electric welding

NOTICE

Before starting any electric welding, disconnect the battery connections. All connections to the control units (ECU) should be disconnected. Connect the welding unit's ground cable as close as possible to the welding point.

The following ECU-connections shall be unplugged:

- V-ECU
- V2-ECU
- E-ECU
- W-ECU
- HMIM
- ECC
- ACM (only applies to machine equipped with DXXH-engine)

Observe the following:

- The welding unit's grounding point must be in direct connection with the welding point. Joints or bearings may be damaged by the high current.
- Before welding, paint must be removed at least 10 cm (4 in.) around the welding or cutting point.
    - All paint decomposes when heated and generates a wide variety of substances that may be both irritating and very health hazardous in case of prolonged or repeated exposure.
    - In addition to the health-hazardous effects, the weld will be of inferior quality, which may lead to future failures. Therefore, never weld on a painted surface.
- Make sure that ventilation is adequate.

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Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Fire prevention measures	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Fire prevention measures

NOTE!

Take extra care if a high-pressure washer is used for cleaning since the water jet may damage electrical components and cable insulation, even at moderate water pressures and temperatures. Protect electrical cabling in an appropriate manner. The engine and battery disconnect switch should be turned off.

General

- There is always a risk of fire. Find out what type of fire extinguisher to use, where it is located and how to use it.
- Fire-fighting equipment installed in or on the machine must be maintained in working order. This equipment should be regarded as a complement to the operator's own efforts in case of a fire.
  The equipment must not be regarded as a substitute for the operator's own fire-fighting efforts.

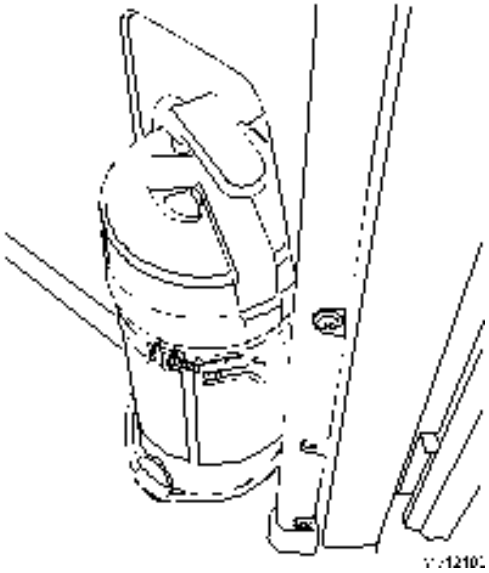

Figure 1
The fire extinguisher is located directly to the right inside the door in the cab.

- A fire extinguisher installed on the machine or used when working on the machine should be of an approved type.
- At the slightest sign of fire, if the situation allows it and keeping your own safety in mind, take the following action:
  - drive the machine away from the fire hazard and danger area
  - lower the load body onto the frame
  - turn off the engine
  - leave the cab
  - turn off the electric power with the battery disconnect switch
  - start putting out the fire and call the fire department if necessary.
- Smoking or open flames are absolutely forbidden in the vicinity of machines when refuelling or when the fuel system is open to contact with the air.
- Regeneration may only be run in fireproof locations. This means, among other things, that it may not be run when refuelling.
- Diesel fuel is flammable and must not be used for cleaning. For cleaning, use an approved solvent.
- Remember that certain solvents can cause skin rashes or can constitute a fire hazard. Avoid inhaling the vapour from solvents.
- Engine starting gases, e.g., ether, may be fire hazards. Store these in cool and well ventilated spaces. Remember

that such starting gases, etc., may not be used in combination with electric preheating of the induction air.

Cleanliness

- Cleanliness is of decisive importance for the trouble-free operation of the machine and the reliability of machine systems. For this reason, keep the area clean where service work is performed. Oil and water make floors and steps slippery and are also dangerous in connection with electrical systems and electric power tools. Oily clothes constitute a serious fire hazard.
- Check daily that the machine and equipment, i.e., underbody skid plates, are free from dirt and oil. This reduces the fire hazard and makes it easier to detect defective components and 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 extra clean in a fire hazardous environment, e.g., in sawmills, landfill sites, etc. Especially important for the engine compartment, see Operator's Manual.

Electrical system

- Check electrical cabling for chafing damage and make sure that they cannot be damaged in such a way. This applies especially to unfused leads, which are coloured red.
  For example, electrical cabling between:

  - Batteries
  - Battery – starter motor
  - Alternator – starter motor
  - Electrical cabling to the engine's preheating coil.

- If unfused leads are disconnected, it is important to check that they are reconnected and clamped in such a way that the risk of chafing is eliminated. Unfused leads must not rest against oil or fuel hoses.
- If connectors have been unplugged from a control unit, both the plug and socket should be clean and dry before they are reconnected.
- When installing any optional equipment, make sure that all electrical cabling is connected across a fuse and that they are routed and clamped in such a way 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 clean areas and not in areas containing combustible liquids, such as tanks, hydraulic pipes and similar.
  Take extra care when welding and grinding close to such places.

  NOTICE

  A fire extinguisher should be easily accessible during all welding work.

- When performing electric welding on the machine, the battery cables must be disconnected and the connectors unplugged from the control units.
- Never weld on a painted surface without first having removed the paint. Welding on a painted surface not only causes health-hazardous effects but also results in technically inferior welds, which in the future could lead to failures and subsequent accidents.

Actions after a fire, see 191 Checklist after a fire or heat exposure

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Construction Equipment

Service Information

Document Title: **Checklist after a fire or heat exposure**	Function Group: **191**	Information Type: **Service Information**	Date: **2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

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.

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Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Health hazards with paint, plastics and rubber	**191**	**Service Information**	**2014/7/25**
Profile: **ART, A35F (37142) [GB]**			

Health hazards with paint, plastics and rubber

Work on painted surfaces

WARNING

Heating of painted surfaces, rubber or plastics parts may cause the formation of substances dangerous to health or environment. Take care when, for example, welding, grinding or gas cutting. Wear protective equipment.

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.
- When blasting, use breathing protection, protective clothing, and tight-fitting safety goggles.
- If the workplace cannot be sandblasted, remove paint in another way, e.g., with paint remover. When using paint removers, use an air extractor, breathing protection, protective clothing, 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 use breathing protection, protective clothing, and tight-fitting safety goggles.

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, protective clothing, safety goggles, and 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, injures tissue must be removed surgically.

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