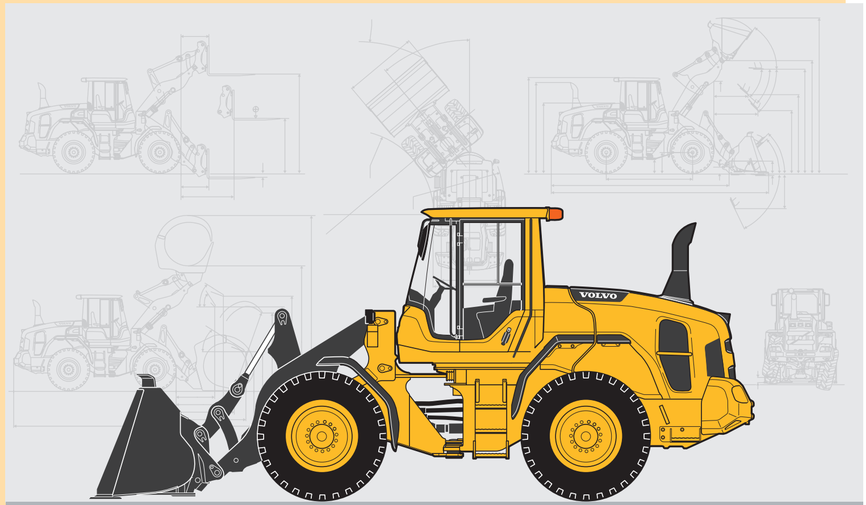
L60G/L70G/L90G

VOLVO CONSTRUCTION EQUIPMENT

OPERATOR'S MANUAL

L60G/L70G/L90G



ORIGINAL INSTRUCTIONS

VOLVO

Volvo Construction Equipment

Ref. no. PUB20029002
2012.01
Volvo, Eskilstuna

English
CST

English

Foreword

OPERATOR'S MANUAL

This Operator's Manual is intended as a guide for the correct use and maintenance of the machine. Therefore, study it carefully before starting and operating the machine, or before carrying out any preventive maintenance. Keep the manual in the cab so that it always is at hand. Replace it immediately if it is lost. The manual describes the applications for which the machine primarily is intended and is written to apply for all markets. We therefore ask you to disregard the sections which are not applicable to your machine or to the work for which you use your machine.

NOTICE

If this manual includes more than one machine, the information applies to all machines, unless otherwise stated.

Many hours are spent on design and production to make a machine that is as efficient and safe as possible. The accidents which occur in spite of this, are mostly caused by the human factor. A safety conscious person and a well maintained machine make a safe, efficient and profitable combination. **Therefore, read the safety instructions and follow them.** We continually strive to improve our products and to make them more efficient through changes to their design. We retain the right to do this without committing ourselves to introduce these improvements on products, which have already been delivered. We also retain the right to change data and equipment, as well as instructions for service and other maintenance measures without prior notice.

Safety regulations

It is the operator's obligation to know and follow the applicable national and local safety regulations. The safety instructions in this manual only apply to cases when there are no national or local regulations.

⚠ WARNING

The warning symbol above appears at various points in the Operator's Manual together with a warning text. Read the text carefully, your safety depends on it! It is the obligation of the operator to make sure that all warning decals are in place on the machine and that they are readable.

⚠ CAUTION

Indicates a potentially hazardous situation which may result in machine damage.

NOTICE

Is used to notify of installation, operation, or maintenance information which is important but not hazard related.

Get to know the capacity and limits of your machine!

Ref. No. PUB 20029002-A

2012.01

Identification numbers

Enter the identification number of the machine and the components below. The number should be stated when contacting the manufacturer and when ordering spare parts. The position of the plates is shown on page *17*.

Manufacturer	Volvo Construction Equipment SE-631 85 Eskilstuna Sweden
Machine Product Identification Number (PIN)	
Engine	
Transmission	
Front axle	
Rear axle	
Boom	
Cab	

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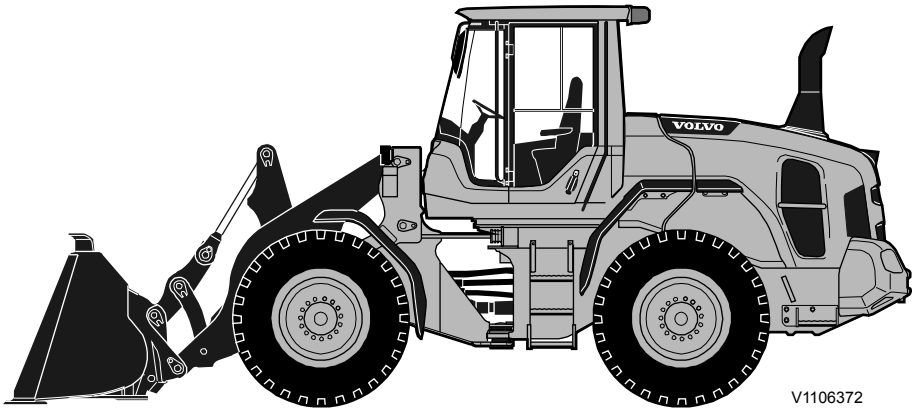
Presentation



Intended use

The basic machine is intended to be used under normal conditions, that is, outdoors, above ground, up to 1,500 metres above sea level (with optional equipment at elevations above 2,000 metres above sea level), off-road, for earthmoving operations, at an ambient temperature between -25 °C and +45 °C with only the operator in the cab. Conditions that deviate from this are also described in the Operator's Manual. For use on public roads the machine must be adapted according to governing national legislation.

If it is used for other purposes or in potentially dangerous environments, e.g., explosive and/or flammable environments or areas with dust containing asbestos, special safety regulations must be followed and the machine must be equipped for such use and handling. Contact the manufacturer/dealer for more information.

The machine is designed for a max. total weight (incl. equipment and attachments), see page *276*. The max. weight applies when the machine is equipped for certain applications approved by Volvo. If the maximum weight is exceeded, safety is compromised. In addition, no warranties on the part of the manufacturer will apply. However, always pay attention to national regulations for travelling on public roads.

Operating underground

The need for ventilation of the exhausts shall be checked before the machine is used in tunnels or other underground operations. Other legislation and rules may be applicable, such as national and labour laws.

Environmental requirements

Be aware of the environment when operating and during service and maintenance of the machine. Always follow local and national environmental legislation applicable to all handling of the machine.

Engine

The machine is equipped with a straight six-cylinder, four-stroke, turbocharged diesel engine with direct injection and intercooler.

The engines for USA meet US Tier 4i and California Tier 4i. Engines for the EU meet EU's Stage IIIB emission requirements.

NOTICE

Machines with engines intended for the USA-market may not be sold or used within the EU, and machines with engines for the EU-market may not be sold or used within the USA, unless the engine is replaced by an engine valid for the applicable market. Which market the engine is designed for is shown on the exhaust decal (see page *17*).

In order to reduce nitrogen oxides, particles, hydrocarbons, and carbon monoxide, the engine features external, cooled exhaust gas recirculation (EGR) and an exhaust aftertreatment system (EATS).

The exhaust system is certified as spark arrester according to test method described in EN 1834 -1, -2, -3 paragraph 6.4.2. or corresponding and the method found in BS6680:1985, appendix B paragraph B.3.8.

Exhaust aftertreatment system

Exhaust aftertreatment system

The engine is equipped with an exhaust after treatment system (EATS) in the form of a diesel oxidation catalyst (DOC) and a diesel particulate filter (DPF), in order to meet the legal limit for soot particles.

The DPF is constantly charged with soot from the engine exhausts and has to be regenerated at regular intervals. The regeneration process means that a mixture of air and fuel is injected into the exhausts to generate heat in the diesel oxidation catalyst (DOC) that heats up the diesel particle filter (DPF) to the necessary level to burn off the soot.

During the regeneration process, the exhaust temperature increases significantly above the normal temperature, by the end-pipe. Due to the increased temperature, the regeneration process is not automatic but it is started manually. The operator receives an indication via the machine's information display unit when the filter needs a regeneration.

Electrical system

The machine has the following control units (Electronic Control Unit).

- V-ECU (standard) and V2-ECU (optional equipment) (for the machine) receive signals from sensors on the machine and these are sent on to the I-ECU.

- The I-ECU (for the instruments) is integrated with the information display unit, warning lights, and instruments. All of these provide the operator with information.
- ECC-ECU (for climate control system).
- E-ECU (for engine control).
- W-ECU (handles CareTrack).
- ACM-ECU (handles the exhaust aftertreatment system).

Transmission

The transmission is electro-hydraulically controlled, where all gears are in constant mesh. Gear ranges are selected by application of different clutches. Between engine and transmission there is a hydraulic torque converter which steplessly controls the output torque. Front and rear axles have planetary gears in the wheel hubs, which reduce the strain on the drive shafts. The axles are of the type AWB (Axle Wet Brakes).

Brake system

The machine is provided with a dual-circuit all-hydraulic brake system with one circuit for each axle. Each circuit meets the requirements for secondary brake capability. The brakes are cooled with oil that circulates in the axle.

Parking brake

The parking brake is electro-hydraulically controlled with a switch on the instrument panel. The parking brake is external with caliper and disc. The brake is applied by spring force and is released hydraulically.

Steering system

The machine is equipped with a load-sensing, hydraulic steering system as well as a secondary steering system*. The steering system receives its hydraulic pressure and flow from a hydraulic pump that is driven by the engine. The electrically driven secondary steering pump* is engaged, e.g., if the engine stops, and is checked at each engine start. Comfort Drive Control (CDC) is also available as optional equipment.

*) The secondary steering pump is standard on certain markets.

Cab

The cab has a heating and ventilation system with defrosting for all windows. Air conditioning is available as an option.

Emergency exit

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

FOPS and ROPS

The cab is approved as a protective cab according to the FOPS and ROPS standards, see page *272*. FOPS is an abbreviation of Falling Object Protective Structure and ROPS is an abbreviation of Roll Over Protective Structure.

If any part of the cab's protective structure is affected by plastic deformation or failures, the cab shall be replaced immediately.

Never perform any unauthorised modifications to the cab, e.g., lowering the roof height, drilling, welding on brackets for fire extinguisher, radio aerial, or other equipment, without first, via a dealer, having discussed the modifications with personnel at Volvo Construction Equipment's Engineering Department. This department will decide whether the modification may cause the approval to become void.

Hydraulic system

The hydraulic system is load-sensing, which means that the oil in the system is delivered in proportion to the position of the hydraulic levers. If the hydraulic control levers are in neutral position, consequently no oil is supplied.

Equipment

The machine can be provided with different types of optional equipment, depending on the requirements of different markets. Examples are Comfort Drive Control (CDC), BSS (Boom Suspension System), secondary steering, separate attachment locking, automatic engine shut-down, and automatic greasing system.

Anti-theft device

(Optional equipment)

Installed theft protection makes it more difficult to steal the machine. Volvo CE can supply theft protection as optional equipment. If your machine is not equipped with such an option, look into the possibility of having one installed by your dealer.

Modifications

Modifications of this machine, including the use of unauthorized attachments, accessories, units, or parts, may affect the machine's integrity (condition) and/or the machine's ability to function in the way for which it is designed. Persons or organizations performing unauthorized modifications assume all responsibility for consequences that arise due to modifications or can be attributed to modifications, including damaging affect to the machine.

No modifications of any kind may be performed on this product unless each specific modification first has been approved in

writing by Volvo Construction Equipment. Volvo Construction Equipment reserves the right to reject all warranty claims that have arisen due to or can be traced to unauthorized modifications.

Modifications may be considered to be officially approved, if at least one of the following conditions has been met:

1 The attachment, the accessory, the unit, or the part has been manufactured or distributed by Volvo Construction Equipment and has been installed according to the factory-approved method described in a publication available from Volvo Construction Equipment; or

2 The modification has been approved in writing by the Engineering Department for the relevant product line at Volvo Construction Equipment.

Logged machine data

The machine is equipped with software systems that register and store various types of information. The information can be transferred to Volvo to be used for product development purposes and when troubleshooting. Stored information includes, among others, travel speed, fuel consumption, and various temperatures. Volvo and its authorized workshops will make use of this information.

CareTrack

The machine may be equipped with CareTrack, a telematics system developed by Volvo Construction Equipment. The system stores machine data, e.g., machine position, operating hours, fuel consumption, fuel level, that can be sent by wireless transmission to a computer. CareTrack is available in different versions, depending on the required information level.

CareTrack makes it easier to plan for service and reduces costly downtime. Productivity is improved by knowing if machines are being operated correctly and how much fuel is being consumed. CareTrack also allows the customer to restrict the operating area of the machine, by using virtual fences. This helps to eliminate unauthorized machine use and theft. For further information, contact a Volvo Construction Equipment dealer.

Fire suppression system

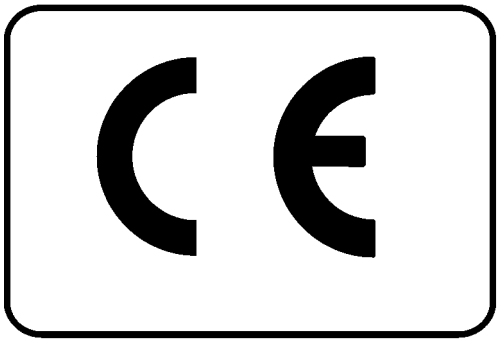
(Optional equipment)

Fire Suppression System is a sprinkler system for the engine compartment.

The system meets the standards according to SBF 127 (Swedish rules for permanently installed sprinkler system and other fire protection equipment on forestry and construction machines).

See page *181* for more information.

CE-marking, EMC-directive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CE-marking

(Declaration of Conformity)

This machine is CE-marked. This means that, when delivered to the customer, the machine meets the applicable "Essential Health and Safety Requirements" according to EU's so-called Machine Safety Directive, 2006/42/EC.

The person making any changes that affect machine safety is also responsible for the same.

As proof of that the requirements are met, an EU Declaration of Conformity and a sound certificate regarding sound level in dB(A) are supplied with the machine. The sound certificate includes both measured external values and guaranteed sound level. These declarations are issued by Volvo for each individual machine. This EU declaration also covers attachments manufactured by Volvo. The documentation is valuable and should be kept safe and **saved for at least ten 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 ensured all times and in each separate case. A modification may in certain cases require new CE-marking and issuing of a new EU declaration of conformity. The person performing the modification is responsible for this.

EU's EMC-directive

The machine's electronic equipment may in some cases cause interference with other electronic equipment, or be subjected to external electromagnetic interference which may result in safety risks.

The EU EMC-directive on "Electromagnetic compatibility", 2004/108/EC, provides a general description of what requirements can be made of the machine from a safety perspective, where limit values have been established in international standards.

A machine or device must meet the standards in order to be CE-marked. Our machines are tested especially for electromagnetic interference. The machine's CE-marking and the declaration of conformity also include the EMC-directive.

If other electronic equipment is installed on this machine, the equipment must be CE-marked and tested on the machine for electromagnetic interference.

Declaration of Conformity

The following pages show an example of a general translated copy of the declaration of conformity for machine and a general translated copy of the declaration of conformity for attachments in the category **"interchangeable equipment"** (attachments that can be changed by operator).

NOTE! Declaration of conformity only applies within the European Union.

Valid for Volvo Wheel Loaders
This document is only applicable within the EU

EG DECLARATION OF CONFORMITY FOR MACHINES (IIA)

Volvo Construction Equipment, SE-631 85 ESKILSTUNA, Sweden, hereby declares that the product:

Manufacturer	Volvo Construction Equipment
Type:	Wheel loader LYYYY
Product identification number (PIN):	*VCELXXXXXXXXXXXX*

for which this declaration is intended, meets the relevant regulations for "Essential Health and Safety Requirements" according to:

European Council's directive 2006/42/EC for machines,

European Council's directive 2000/14/EC for noise emission to the environment from outdoor equipment

European Council's directive 2004/108/EC for electromagnetic compatibility, as well as amendments of these for machines, and other applicable directives.

Governing harmonised standards:

EN 474-1:2006+A1:2009 Earthmoving machines – Safety general requirements,

EN 474-3:2006+A1:2009 Earthmoving machines – Requirements for loaders.

This declaration only covers the machine in the condition in which it was introduced on the market, and does not include components that have been retrofitted or work after this which has been done by the end-user.

Authorized issuer's signature and person authorized to compile the technical file which has been established in the European Community:

.....

Signature / Clarification of signature (print)

.....

Occupation or title

.....

Address and date of issue

Signature of authorised representative in the European Community with authorisation to complete the manufacturing process and produce the manufacturer's declaration of conformity (if applicable)

.....

Signature / Clarification of signature (print)

.....

Occupation or title

.....

Address and date of issue

This declaration covers attachments that have been developed, designed/approved, marked, and marketed by the manufacturer mentioned above.

The machine owner must save this declaration for at least ten years after delivery.

Valid for attachments in the category “interchangeable equipment” (attachments that can be changed by operator) for Volvo Wheel Loaders
This document is only applicable within the EU

EG DECLARATION OF CONFORMITY FOR MACHINES (IIA)

Volvo Construction Equipment, SE-631 85 ESKILSTUNA, Sweden, hereby declares that the product:

Manufacturer	Volvo Construction Equipment
Model / Type number *):	YYYYY
Serial number:	XXXXXXXXXX

for which this declaration is intended, meets the relevant regulations for "Essential Health and Safety Requirements" according to:
European Council's directive 2006/42/EC for machines and supplements for machines, and other applicable directives.

Governing harmonised standards:
EN 474-1:2006+A1:2009 Earthmoving machines – Safety general requirements,
EN 474-3:2006+A1:2009 Earthmoving machines – Requirements for loaders.
This declaration only covers the machine in the condition in which it was introduced on the market, and does not include components that have been retrofitted or work after this which has been done by the end user
Authorized issuer's signature and person authorized to compile the technical file which has been established in the European Community:

.....
Signature / Clarification of signature (print)

.....
Occupation or title

.....
Address and date of issue

Signature of authorised representative in the European Community with authorisation to complete the manufacturing process and produce the manufacturer's declaration of conformity (if applicable)

.....
Signature / Clarification of signature (print)

.....
Occupation or title

.....
Address and date of issue

The machine owner must save this declaration for at least ten years after delivery.

*) On page *289* there is a combination table showing attachments in the category **“interchangeable equipment”** (attachments that can be changed by operator) and for which machines these attachments are approved.

Communication equipment, installation

CAUTION

All installation of optional electronic communication equipment must be performed by trained professionals and in accordance with the Volvo Construction Equipment instructions.

Protection against electromagnetic interference

This machine has been tested according to EC directive 2004/108/EEC concerning electromagnetic interference. Therefore it is very important that all non-approved electronic accessories, such as communication equipment, are tested before they are installed and used since they can interfere with the machine's electronic system.

Guidelines for installing aerial (antenna)

The following guidelines should be followed when installing:

- The aerial placement must be chosen to give good adaptation to the surroundings.
- The aerial cable must be of the coaxial type. Make sure that the cable is undamaged, that the screen is not split up at the ends, but thoroughly encased in the connector and has good galvanic contact with the same.
- The surface between the mounting bracket for the aerial and the point of attachment must be free from dirt and oxide. Apply corrosion protection to the surfaces after installation so that good galvanic contact is maintained.
- Make sure that cables which may cause interference are separated from those that may be subjected to interference. Interfering cables are the power supply cable and the aerial cable to the communication equipment. Cables that may suffer from interference are connecting cables for the machine's electronics. Install cable harnesses as close as possible to grounded metal surfaces since these have a screening effect.

Safety components

Genuine Volvo spare parts guarantee the best service life, reliability, and safety for the machine and operator. If reliable and purpose-built parts are not used, your safety, health, and the machine's function may be compromised. Contact your dealer and state the machine's model designation/serial number (PIN-number) when ordering spare parts. Position of PIN-plate, see section "Product plates".

Your Volvo dealer always has up-to-date spare part information that is updated at regular intervals via the information system PROSIS.

Safety-classified machine and spare parts

Safety-classified machine and spare parts means that the components are intended to fulfil a safety function.

Examples of safety-classified machine parts/spare parts

- Removable protective devices/guards over rotating parts and hot surfaces
- Protective plates, rails, covers, and steps
- Components included in systems to reduce sound and vibrations
- Components included in systems to improve the operator's visibility
- Complete operator's seat incl. lap-type seatbelt
- Decals and plates
- Cab filter

NOTICE

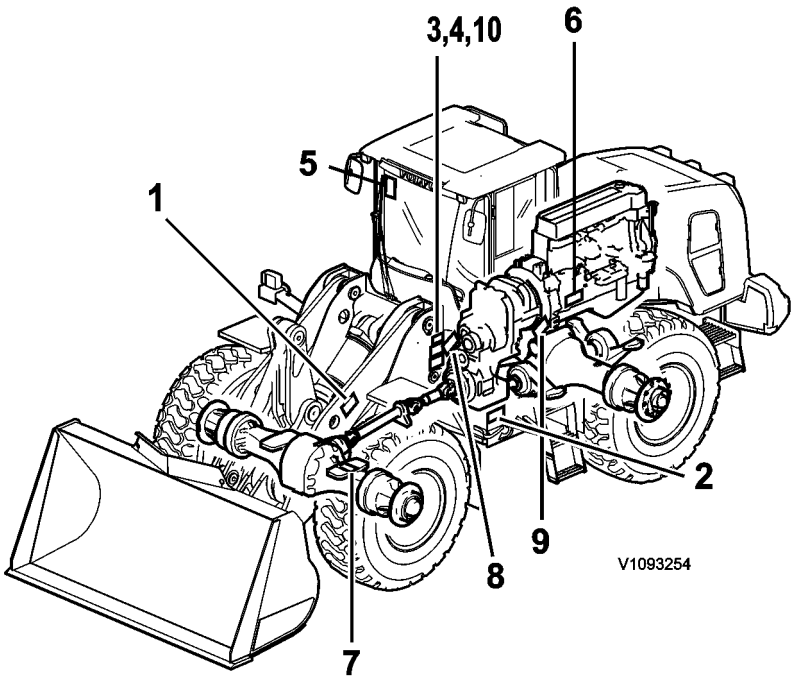
Safety-classified machine and spare parts shall be reinstalled, repaired, or replaced immediately if they have been removed or damaged.

When changing machine operator/owner, malfunctions and defects of safety-classified machine and spare parts shall be reported immediately and an action plan shall be established.

There is more important information in this Operator's manual about the components that are considered safety-classified.

Product plates

Using the product plates listed below, it is possible to identify the machine and its components. State these numbers when ordering spare parts or when making enquiries.



1 Boom

The manufacturer's name and address, the boom's component number and serial number.

2 Primary marking

Machine's PIN (stamped in on left side).

3 Product plate (PIN plate)

Manufacturer's name and address, machine's model designation.

4 Addition to product plate (only countries within EU/EES)

Machine weight[1)] (the machine's most common configuration +10%), engine power, year of manufacture, year of delivery, and location of CE-marking.

5 Cab

Manufacturer's name and address, product number, machine's model designation, max. tested weight[2)] (for which the cab is approved acc. to the ROPS-test), cab serial number, ROPS/FOPS number, and ROPS/FOPS certificate number.

6 Engine + exhaust decal

The engine's type designation and component number.

7 Front axle

The manufacturer's name and address, and the front drive axle's component number.

8 Transmission

The manufacturer's name and address and the transmission's component number.

9 Rear axle

The manufacturer's name and address and the rear drive axle's component number.

10 Supplementary exhaust decal

The engine's type designation and component number (easier to access than ordinary exhaust decal, which may be concealed).

1) For relevant machine weight (depending on tires, equipment, and attachment combinations), see page *283*.
2) For the machine's max. total weight, see page *276*.

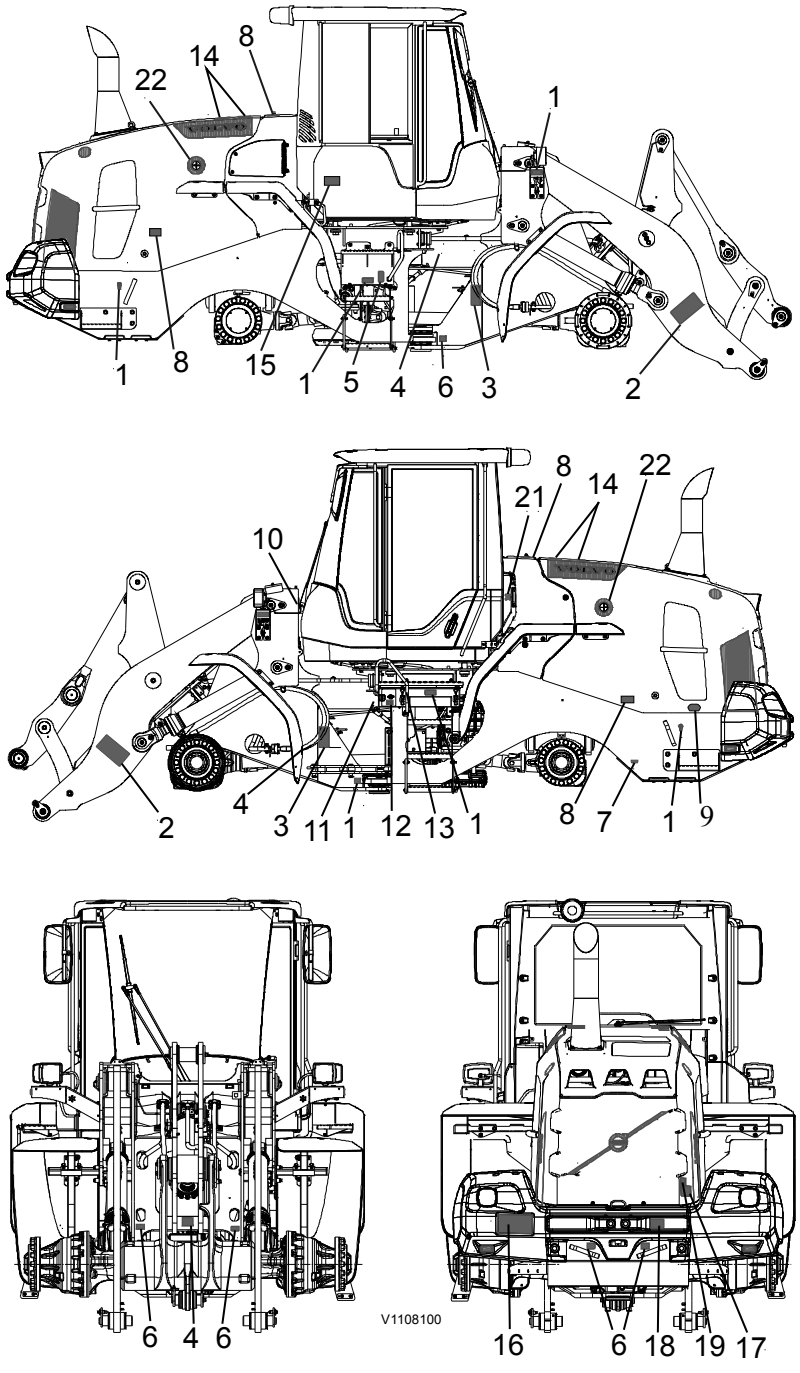
Information and warning decals

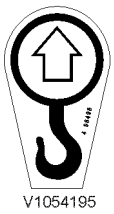
The operator should know and pay attention to the information and warning plates/decals that are located on the machine. All plates/decals are not installed on all machines, as they are market-dependent and machine-dependent.

The decals/plates must be kept free from dirt, so that they can be read and understood. If they have been lost or are no longer legible, they must be replaced immediately. The part number (order number) is shown on each decal /plate and in the parts catalogue.

NOTICE

"WARNING" is written on the warning decals for North America.

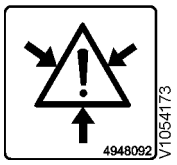




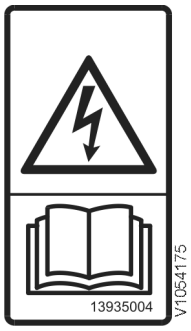
1 Lifting points

2 WARNING! do not walk under raised attachment (spare part number in usa: 11027566)

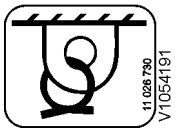
3 WARNING! Risk of crushing at frame joint if machine is steered (Spare part number in USA: 13935000)



4 WARNING! Pressurized system (Spare part number in USA: 11301451)

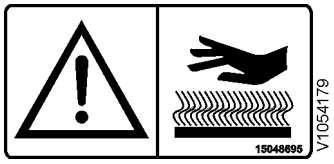


5 WARNING! Before connecting jump-start cables, read the Operator's Manual (Spare part number in USA: 13935004)



6 Attaching point for lashing

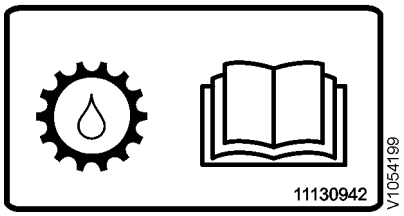
7 Drain point



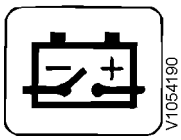
8 WARNING! Hot surfaces (Spare part number in USA: 14531179)

9 WARNING! Rotating fan (Spare part number in USA: 13935001)

10 Sound power level outside the machine



11 Transmission – read the Operator's Manual



12 Battery disconnector