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VOLVO

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OPERATOR'S MANUAL

A25G, A30G

English

VOLVO

A25G, A30G

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OPERATOR'S MANUAL



Foreword

OPERATOR'S MANUAL

This Operator's Manual is intended to be a guide to correct use and maintenance of the machine. Therefore, study it carefully before starting and operating the machine, or before performing any preventive maintenance. Keep the manual in the cab so that it is always available for easy reference. If the Operator's Manual is lost, replace it immediately. The manual describes the primary applications for which the machine is intended and is written to apply for all markets. Disregard the sections that are not relevant for this machine or for the applications for which this machine will not be used.

NOTE!
If this Operator's Manual covers more than one machine, the information applies to all machines unless otherwise indicated.

A lot of work has been spent on the machine's design and manufacture to make it as effective and safe as possible. Accidents that occur in despite of this can most often be contributed to 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 continuously strive to improve our products and to make them more effective by changes to their design. We reserve the right to do this without committing ourselves to introduce these improvements on already delivered products. We also reserve the right to change data and equipment, as well as instructions for service and maintenance 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 where there are no national or local regulations.

⚠ DANGER

The safety symbol combined with this signal word indicates a hazardous situation which, if not avoided, ***will result in death or serious injury.*** Danger is limited to the most extreme situations.

⚠ WARNING

The safety symbol combined with this signal word indicates a hazardous situation which, if not avoided, could result in ***death or serious injury***.

⚠ CAUTION

The safety symbol combined with this signal word indicates a hazardous situation which, if not avoided, could result in ***moderate or minor injury***.

NOTICE

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

NOTE!
It is used to highlight information for installing, use, or maintenance that is important but is not safety-related.

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Instrument panels
Other controls
Operating instructions
Operating techniques
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⚠ Maintenance
Specifications
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Get to know the capacity and limits of your machine!

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 *30*.

Manufacturer	Volvo Construction Equipment Carl Lihnells väg SE-36341 Braås Sweden
Machine's product identification number	
Engine	
Transmission	
Dropbox	
Front axle	
Front bogie axle	
Rear bogie axle	
Cab	

Compliance marking and directives



(Declaration of Conformity)

Machines delivered to an EU country are CE marked. This means that, when delivered to the customer, the machine meets the applicable "Essential Health and Safety Requirements" as set out in the EU's so-called Machinery directive, 2006/42/EC.

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

Proof of compliance is confirmed by the provision of an EU declaration of conformity. The declaration is issued by Volvo Construction Equipment for each individual machine. This EU declaration also includes attachments manufactured by Volvo Construction Equipment. The documentation is a valuable resource which should be kept safe and retained for at least ten years. The document should always accompany the machine when it is sold.

If the machine is used for purposes other than those described in this manual, safety must be guaranteed in all circumstances. 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.

Compliance marking and directives

EU Machinery Directive, 2006/42/EC

The directive is the main regulatory framework that sets out the criteria for meeting the "Essential Health and Safety Requirements" for machinery. The regulatory framework covers, for example, steering, brakes, access routes, visibility, cab structure, sound levels, EMC characteristics, etc. Modifications, for example to the cab's ROPS/FOPS structure, may in certain cases require new CE marking and the issuing of a new EU declaration.

EU EMC Directive, 2014/30/EC

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's EMC directive on "Electromagnetic compatibility", 2014/30/EC, provides a general description of what demands can be made of the machine from a safety standpoint, where thresholds have been determined according to international standards.

A machine or device must meet the standards in order to be CE-marked. Our machines are tested especially for electromagnetic interference.

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

EU Outdoor Noise Directive (2000/14/EC)

The machine and its components emit noise which, at high levels, can be harmful to human health.

Proof of compliance is confirmed by the provision of an EU declaration of conformity for each individual machine.

Modifications that negatively impact the machine's noise level (for example engine/exhaust silencers, pumps, fans or sound absorbers) may in certain cases require new CE marking and the issuing of a new EU declaration.

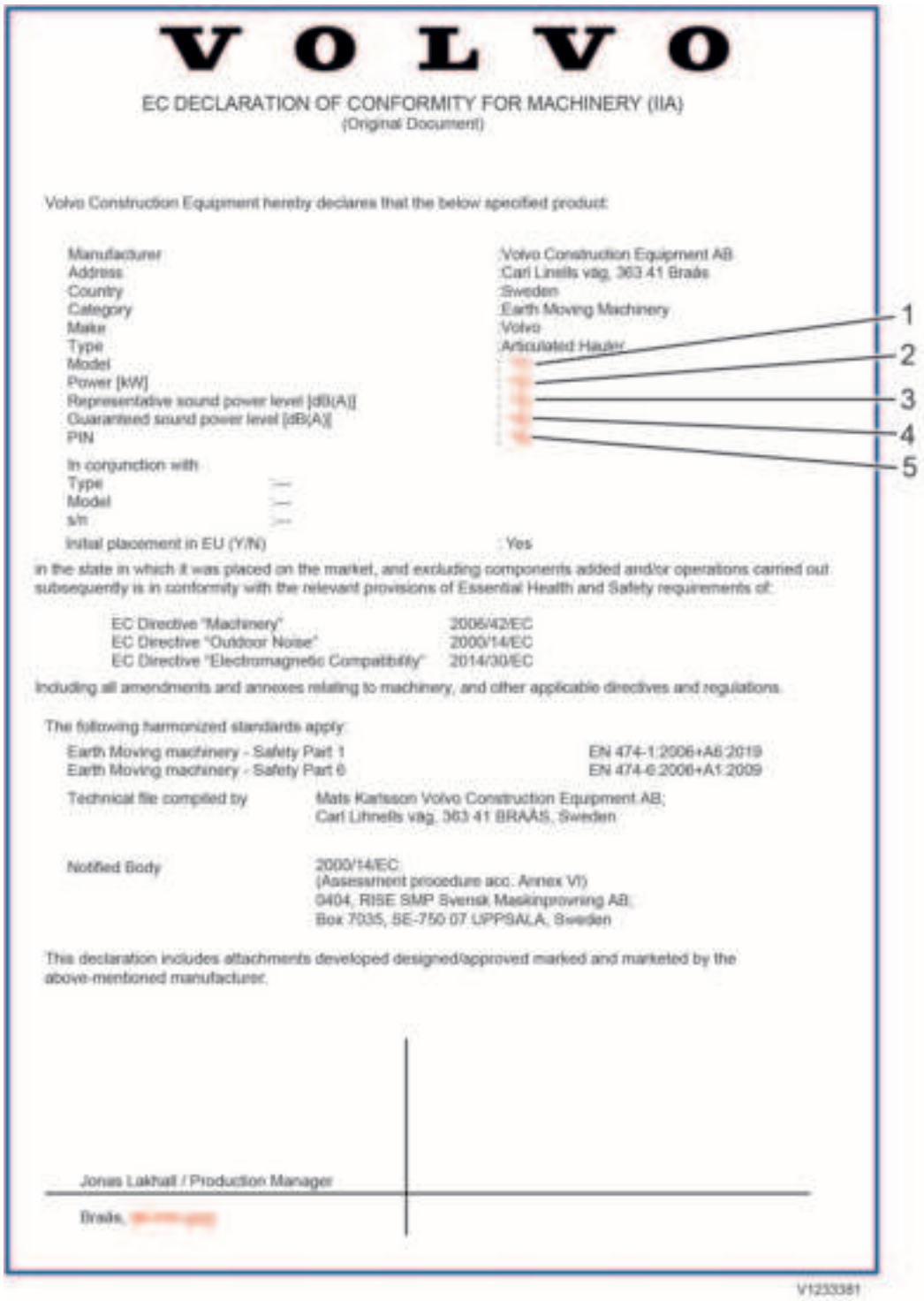
Compliance marking and directives

The next page shows a copy of the DoC (= EU declaration of conformity for machines (IIA)), and on the following page is a copy of the DoI(= EU declaration of conformity for incorporation of partially completed machines (IIB)).

The machine owner must save this declaration for at least ten years after delivery. The declaration must accompany the machine if it is sold within these ten years.

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

NOTE!
The declaration is only supplied within the European Union and in the language of the country.



VOLVO

EC DECLARATION OF CONFORMITY FOR MACHINERY (IIA)
(Original Document)

Volvo Construction Equipment hereby declares that the below specified product:

Manufacturer	:Volvo Construction Equipment AB
Address	:Carl Lineils väg, 363 41 Braås
Country	:Sweden
Category	:Earth Moving Machinery
Make	:Volvo
Type	:Articulated Hauler
Model	:
Power [kW]	:
Representative sound power level [dB(A)]	:
Guaranteed sound power level [dB(A)]	:
PIN	:

1
2
3
4
5

In conjunction with

Type	:—
Model	:—
s/n	:—

Initial placement in EU (Y/N) : Yes

in the state in which it was placed on the market, and excluding components added and/or operations carried out subsequently is in conformity with the relevant provisions of Essential Health and Safety requirements of:

EC Directive "Machinery"	2006/42/EC
EC Directive "Outdoor Noise"	2000/14/EC
EC Directive "Electromagnetic Compatibility"	2014/30/EC

Including all amendments and annexes relating to machinery, and other applicable directives and regulations.

The following harmonized standards apply:

Earth Moving machinery - Safety Part 1	EN 474-1:2006+A6:2019
Earth Moving machinery - Safety Part 6	EN 474-6:2006+A1:2009

Technical file compiled by: Mats Karlsson Volvo Construction Equipment AB; Carl Lihnells väg, 363 41 BRÅÅS, Sweden

Notified Body: 2000/14/EC (Assessment procedure acc. Annex VI) 0404, RISE SMP Svensk Maskinprovning AB; Box 7035, SE-750 07 UPPSALA, Sweden

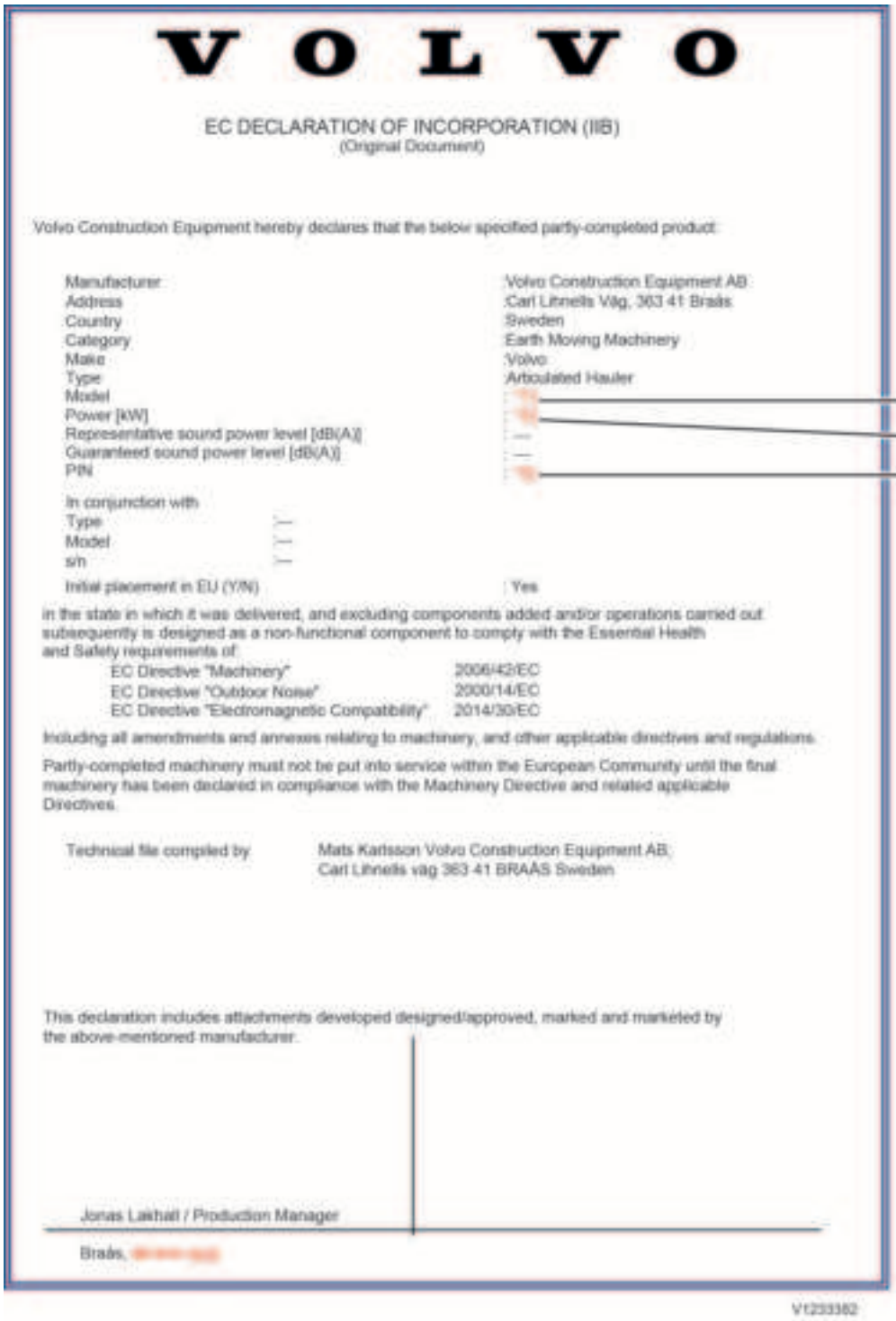
This declaration includes attachments developed designed/approved marked and marketed by the above-mentioned manufacturer.

Jonas Lakhall / Production Manager

Braås, [redacted]

V1233381

1 Model applicable to machine supplied.
2 Engine output applicable to machine supplied.
3 Representative sound pressure applicable to machine supplied.
4 Guaranteed sound pressure applicable to machine supplied.
5 Product identification number applicable to machine supplied.



VOLVO

EC DECLARATION OF INCORPORATION (IIB)
(Original Document)

Volvo Construction Equipment hereby declares that the below specified partly-completed product

Manufacturer	Volvo Construction Equipment AB
Address	Carl Lihnells Väg, 363 41 Braås
Country	Sweden
Category	Earth Moving Machinery
Make	Volvo
Type	Articulated Hauler
Model	[redacted] 1
Power [kW]	[redacted] 2
Representative sound power level [dB(A)]	—
Guaranteed sound power level [dB(A)]	—
PIN	[redacted] 3

In conjunction with

Type	—
Model	—
s/n	—
Initial placement in EU (Y/N)	Yes

in the state in which it was delivered, and excluding components added and/or operations carried out subsequently is designed as a non-functional component to comply with the Essential Health and Safety requirements of

EC Directive "Machinery"	2006/42/EC
EC Directive "Outdoor Noise"	2000/14/EC
EC Directive "Electromagnetic Compatibility"	2014/30/EC

Including all amendments and annexes relating to machinery, and other applicable directives and regulations.

Partly-completed machinery must not be put into service within the European Community until the final machinery has been declared in compliance with the Machinery Directive and related applicable Directives.

Technical file compiled by: Mats Karlsson Volvo Construction Equipment AB, Carl Lihnells väg 363 41 BRAÅS Sweden

This declaration includes attachments developed designed/approved, marked and marketed by the above-mentioned manufacturer.

Jonas Lakhall / Production Manager

Braås, [redacted]

V1233382

1 Model applicable to machine supplied.
2 Engine output applicable to machine supplied.
3 Product identification number applicable to machine supplied.

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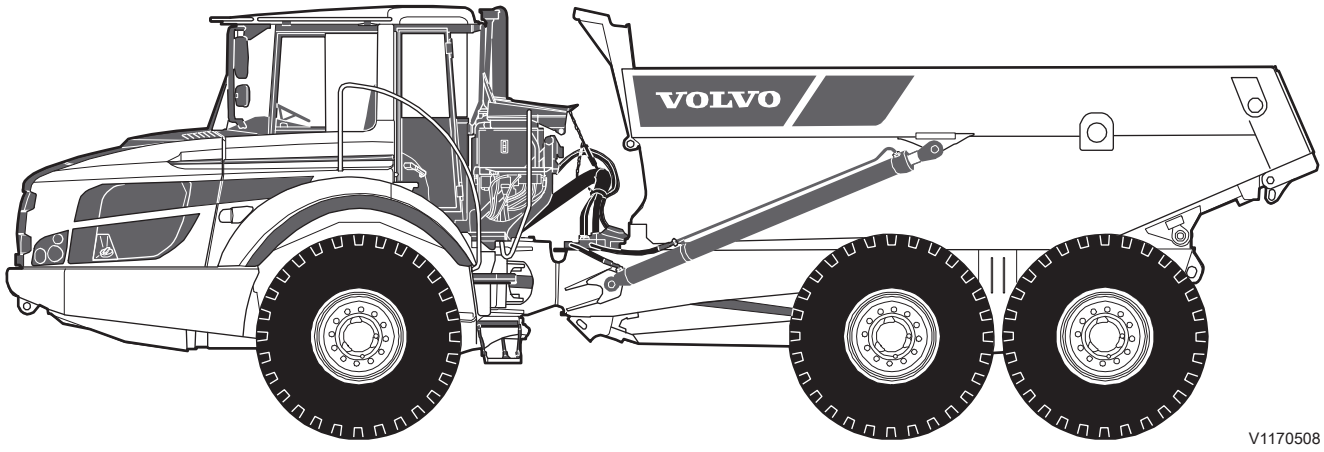
Abbreviations

Glossary of Abbreviations

This chapter contains abbreviations and acronyms which are used in the operator's manual and listed with a short explanation.

Abbreviations		Explanation
ACM	Aftertreatment Control Module	Control unit for exhaust gas aftertreatment
ASTM	American Society for Testing and Materials	A standardisation organisation for testing and materials.
ATC	Automatic Traction Control	An automatic system that prevents wheelspin on slippery surfaces. Activate the longitudinal differential lock.
AUT	Automatic	Automatic
BTL	Biomass-To-Liquids	A method of producing biodiesel from biomass
CARB	California Air Resources Board	An environmental authority in California which is responsible, among other things, for the promotion and protection of public health, welfare and ecological resources by effectively reducing air pollution.
CCTV	Closed-Circuit Television	A camera that monitors a certain location, for example a back-up camera.
CE	Conformité Européenne	Means that it complies with the EU directive.
CTL	Coal To Liquids	A method of producing liquid fuel from carbon.
DEF	Diesel Exhaust Fluid	A liquid comprising urea (32.5%) and distilled water 67.5%, used to reduce harmful nitrogen oxide emissions.
DOC	Diesel Oxidation Catalyst	The diesel oxidation catalyst is part of the emission control system.
DoC	Declaration of Conformity	EU declaration of conformity for the machine (IIA)
DoI	Declaration of Incorporation	The EU declaration of conformity for incorporation of partly completed machinery (IIB)
DPF	Diesel Particulate Filter	Diesel particulate filter
EAC	EurAsian Conformity	A marking indicating that the product meets the necessary technical requirements and is approved by the Eurasian Customs Union.
EATS	Exhaust After-Treatment System	Exhaust aftertreatment system
ECC	Electronic Climate Control	Electronic control unit for the climate control system.
ECM	Engine Control Module	Engine control unit
ECU	Electronic Control Unit	Electronic control unit
EGR	Exhaust Gas Recirculation	Return of a small amount of the exhaust gas to the engine's intake side on diesel and petrol engines. The exhaust gases will act as an inert gas at combustion, lowering the peak temperature during combustion and substantially reducing the nitrogen oxide.
EMC	ElectroMagnetic Compability	The ability of a device, system or equipment to operate in an electromagnetic environment without affecting it.
EMF	ElectroMagnetic Field	Electromagnetic fields exist around anything powered by an electric current. Light and radio waves, among other things, fall under the definition of an electromagnetic field.
EPA	Environmental Protection Agency	An independent executive body in the US federal government dealing with environmental protection.
ESC	Escape	Indicates a button which, when pressed, moves up one level in the menu system.
EU	European Union	A union of European democracies bound by a treaty.
FAME	Fatty Acid Methyl Ester	The generic name for biodiesel whose main raw material is vegetable oil. A renewable fuel component that can be mixed with diesel or replace diesel in a diesel engine.
FOPS	Falling Object Protective Structure	A structure designed to protect against falling objects. A safety device fitted to the cab to protect the operator from falling objects.
FS	Full Suspension	Full suspension
FSS	Fire Suppression System	Fire extinguishing system
GHS	Gas Hydraulic Suspension	Gas-hydraulic suspension
GNSS	Global Navigation Satellite System	The generic name for global satellite-based systems for navigation, positioning and time transfer.
GPS	Global Positioning System	A satellite navigation system. Through contact with several satellites, anyone with a GPS receiver can determine their position, regardless of the weather, time or place.
GSM	Global System for Mobile Communications	A digital mobile telephone system.
GTL	Gas-To-Liquid	A method that converts gaseous raw material such as natural gas or biogas, whose primary constituent is methane, into a liquid fuel.
GWP	Global Warming Potential	A method of measuring a gas's impact on the greenhouse effect.
HEST	High Exhaust Temperature	High exhaust temperature
HMIM	Human Machine Interface Module	The module that handles the user interface enabling communication between the operator and the machine.
HS	Hydraulic Suspension	Hydraulic suspension
HVO	Hydrotreated Vegetable Oil	Biodiesel manufactured by combining vegetable oils with nitrogen to produce a substance very similar to diesel oil.
IBC	Intermediate Bulk Container	A type of container for liquids or bulk cargo. Designed to facilitate the transport of substances with complex handling constraints. They are usually more or less cube-shaped and suitable for mechanical handling.
IC	Instrument Cluster	Instrument cluster
IP	Internet Protocol	The communication protocol and rules used for transferring information.
ISO		ISO is an independent, non-governmental international organisation with a membership of 164 national standards bodies. The short form of the name ISO is not an abbreviation, but instead derives from the Greek word for "equal".
LAM	Latin America	The Latin American market.
LCD	Liquid Crystal Display	Type of screen in which a thin layer of cells with liquid crystals forms the screen image.
LED	Light Emitting Diode	A light source based on semiconductor materials.
LoD	Load and Dump	A brake used for loading and tipping.
LpA	Ljudtrycksnivå A	The average sound pressure level in the audible frequency range, measured with a weighting filter A in accordance with the SS-EN 61672-1 standard. Can also be expressed with the dB(A) unit.
LwA	Ljudeffektnivå A	The sound power level for noise, measured in decibels, dB(A). Measuring method in accordance with 2000/14/EC with applicable appendices and in accordance with ISO 6395 (guaranteed value).
MAX	Maximum	Indicates the highest permitted level.
MB	Megabyte	An information unit The name is derived from "mega" (M), meaning million, and byte (B). A megabyte contains one million bytes of information. A byte can be described as a bit sequence with 8 positions, where each position can have the value 1 or 0.
MIN	Minimum	Indicates the lowest permitted level.
MK1	Miljöklassning 1	Swedish quality certification of diesel fuel.
NLGI	National Lubricating Grease Institute	Institute that develops measuring methods for lubricants.

Abbreviations		Explanation
NOx	Nitrogen Oxides	Gases which are, among other things, produced in combustion engines. Gases are toxic in concentrations above 30 ppm (parts per million).
NRSC	Non-Road Stationary test Cycle	An international test used for emissions certification/type approval of diesel engines for off-road machinery.
NRTC	Non-road Transient Cycle	A temporary driving cycle test for mobile diesel engines designed for off-road use.
NTRIP	Network Transport of RTCM (Radio Technical Commission for Maritime Services) via Internet Protocol	A general internet protocol based on Hypertext Transfer Protocol HTTP/1.1.
OBD	On-Board Diagnostics	A diagnostic function included in the machine functions.
OtA	Over the Air	A method of distributing new software and configuration settings and updating encryption keys via the wireless or mobile network.
PDS	Proximity Detection System	See page *17*
PIN	Product Identification Number	The product identity code is shown on the data plate. This number is used to identify the machine and when ordering spare parts.
PIN	Personal Identification Number	A personal safety code consisting of a numerical password. (PIN)
Pos.	Position	Position for various important points.
PTFE	PolyTetraFluorEthylene	A fluoropolymer with properties that ensure very low friction.
PWM	Pulse Width Modulation	A method of creating a continuously variable power supply by switching the voltage on and off more quickly than the connected device can detect. The scope includes the control of electric motors, heater elements and similar components, or the transmission of a control signal, e.g. servos.
RMC	Ramped Mode Cycle	Part of the emissions tests for diesel engines. It is performed as a continuous cycle with ramped transitions between individual positions.
RME	Rape-seed Methyl Ester	Biodiesel, a type of fatty acid methyl ester. Rapeseed methyl ester manufactured using rapeseed oil and methanol, along with methoxides of potassium or sodium (as the catalyst).
RMS	Root Mean Square	The quadratic mean that can be used to obtain an average of the signals with both positive and negative values. Used for oscillating systems, e.g. electrical oscillator circuits, acoustic waves, pipe and cavity resonators.
ROPS	Roll Over Protective Structure	Structures or systems for operator environments designed to protect operators from injury in case of tipping or overturning.
RTCM	Radio Technical Commission for Maritime Services	An international standardisation organisation that issues standards for radar systems, etc.
RTK	Real Time Kinematic	A precise form of positioning calculation via GNSS that requires at least two interoperable receivers. A fixed base station set up over one known point and one variable point, which can be used for the measurement itself.
SCR	Selective Catalytic Reduction system	A method of reducing nitrogen oxides in the engine exhaust gases.
SEMS	Service Management System	A system for downloading software.
SIM	Subscriber Identity Module	SIM card is an electronic card intended for use in a mobile phone, tablet, notebook or mobile broadband modem. The card contains information on the services included in the subscription.
SME	Soy Methyl Ester	Biodiesel, a type of fatty acid methyl ester. Soybean methyl ester manufactured using soybean oil and methanol, along with methoxides of potassium or sodium (as the catalyst).
SOME	Sunflower Oil Methyl Ester	Biodiesel, a type of fatty acid methyl ester. Sunflower oil methyl ester manufactured using sunflower oil and methanol, along with methoxides of potassium or sodium (as the catalyst).
TPMS	Tyre Pressure Monitoring System	A Tyre pressure monitoring system which controls the tyre pressure.
ULSD	Ultra Low Sulphur Diesel	A term used to describe diesel fuel that meets the requirements for very low sulphur content.
US	United States	
USB	Universal Serial Bus	A standard for fast serial data buses on which data is sent with information carriers. Instead of several conductors, all information is sent in a certain order.
VCB	Volvo Compression Brake	Solenoid-operated engine brake
VCS	Volvo Coolant VCS	Part of the name for Volvo coolant: Volvo Coolant VCS.
VDC	Volts Direct Current	Voltage is measured in volts. Direct current (DC) is an electric current that always travels in the same direction, as opposed to alternating current
VE		Name of a connector
VGT	Variable Geometery Turbo	Variable geometry turbo



V1170508

Volvo A25G 6×6 is a 3-axle articulated hauler with suspension, a load capacity of 25 tons (28 sh. tons), and a load volume of 15.3 m^3 (540 ft^3). The machine has 4–wheel drive with automatic engagement of the longitudinal differential locks and 6–wheel drive (6x6). The differential locks can also be engaged manually.

Volvo A30G 6×6 is a 3-axle articulated hauler with suspension, a load capacity of 29 tons (32.5 sh. tons), and a load volume of 17.8 m^3 (629 ft^3). The machine has 4–wheel drive with automatic

engagement of the longitudinal differential locks and 6–wheel drive (6x6). The differential locks can also be engaged manually.

Intended use

The basic machine is off-road and intended for use outdoors for earth moving above ground. It operates with sustained performance up to an altitude of 2000 metres (6600 ft) above sea level and at an ambient temperature of between -25 °C (-13 °F) and 45 °C (113 °F). 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 national legislation.

If it is used for other purposes, or in potentially hazardous environments, for example explosive atmospheres, flammable environments or areas with asbestos-containing dust, special safety rules must be followed and the machine equipped for this type of use. Contact an authorised dealer for more information.

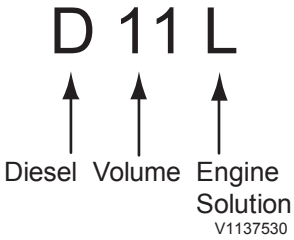
Operating underground

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 engine has an overhead camshaft and each cylinder has a unit injector. The cylinder head is common to all cylinders and has four valves per cylinder.
There are four engine alternatives; D11L, D11M, D11F, and D11E.

D11L, D11M

The engines apply to the markets in the USA and EU.
Engines intended for the USA fulfil US Tier 4 Final and California Tier 4 Final emission requirements.
Engines intended for the EU fulfil EU's Stage IV emission requirements.
Engines intended for the EU, and built after January 1, 2019, meet EU's Stage V emission requirements.

NOTE!
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. The market for which the engine is intended is evident on the emission plate and by the engine's serial number (see page *30*).

The engine must be run on low-sulphur diesel. The engine is equipped with an aftertreatment system for exhausts (EATS) in order to reduce nitrogen oxides, hydrocarbons, and carbon

monoxide. The system consists of a catalyst and AdBlue®/DEF-injection.
The system is monitored and controlled by the aftertreatment control module (ACM).

The exhaust system is certified as spark arrester according to Directive 97/68/EC and EN 1834.

D11E

The engine is only valid for Brazil, LAM, and China markets.

D11F

The engine applies to other markets where the M-engine and E-engine markets mentioned do not apply.

AdBlue®/DEF information

AdBlue®/DEF is needed to reduce nitrogen oxides (NOx). AdBlue®/DEF is filled in a separate tank on the machine which is completely separated from the fuel tank. AdBlue®/DEF may not be mixed in the fuel tank, and fuel may not be mixed in the AdBlue®/DEF-tank.

For information on ordering AdBlue®/DEF (only applies to USA-market):
- **Volvo CE Customer Support: 1-877-823-1111 (office hours)**
- **www.volvoce.com (outside of office hours)**

For information on ordering AdBlue®/DEF (other markets), contact an authorized dealer.

See *347* for information on filling AdBlue®/DEF.

Exhaust aftertreatment system

Engines without diesel particulate filter (DPF)

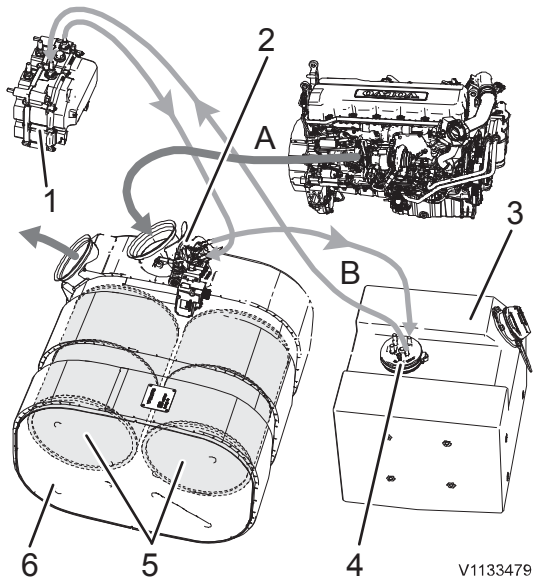
The engine features an exhaust aftertreatment system (EATS) that consists of a muffler that contains a selective catalytic reduction system (SCR) which reduces the emissions content of nitrogen oxide (NO_x) from the exhaust gases.

EATS uses fluid for diesel exhaust gases, known as AdBlue® or DEF, to reduce NO_x emissions. AdBlue®/DEF is injected into the exhaust muffler, where it reacts in the SCR.

The AdBlue®/DEF tank is fitted with sensors for quality, level and temperature. The quality sensor is used to assess the correct quality and concentration of AdBlue®/DEF. It registers whether anything other than AdBlue®/DEF is added to the tank.

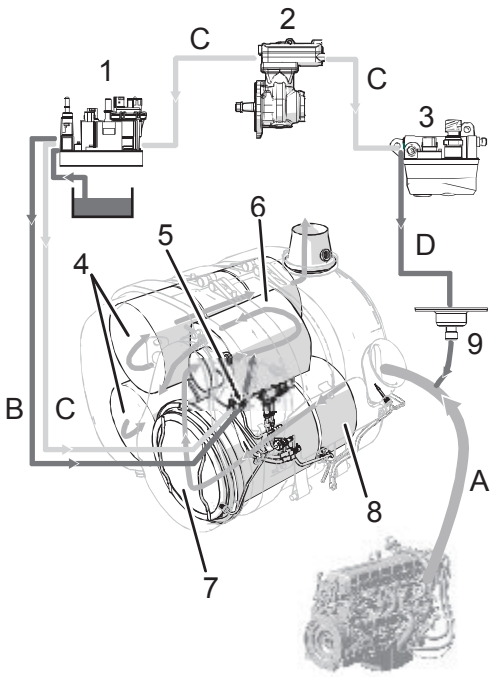
In order to ensure reduction of NO_x emissions, EATS is monitored by the aftertreatment control module (ACM).

For information on images in the EATS information display, see page *199*.



1 AdBlue®/DEF pump unit
2 AdBlue®/DEF metering injector
3 AdBlue®/DEF tank
4 AdBlue®/DEF tank fitting with sensors for quality, level and temperature
5 SCR catalytic converters
6 Muffler

A Exhaust gases from the engine
B AdBlue®/DEF



1 AdBlue®/DEF unit
2 Compressor
3 Fuel metering unit, aftertreatment
4 SCR catalytic converters
5 AdBlue®/DEF nozzle
6 Mixing zone
7 Diesel particulate filter (DPF)
8 Diesel oxidation catalyst (DOC)
9 Fuel nozzle, aftertreatment

A Exhaust gases (from the engine)
B AdBlue®/DEF
C Compressed air
D Fuel + air for cleaning

Exhaust aftertreatment system

Engines equipped with diesel particulate filter (DPF)

The engine features an exhaust aftertreatment system (EATS) that consists of a diesel particulate filter (DPF) which reduces particles, and a selective catalytic reduction system (SCR) which reduces the content of nitrogen oxide (NO_x). The DPF and SCR catalysts are all located in the machine's muffler. AdBlue®/DEF is injected in the exhaust flow to reduce NO_x.

In the muffler there is also a diesel oxidation catalyst (DOC) that supports the function in the DPF and SCR.

The DPF traps particles from the engine's exhausts and, as it is filled with these particles, it needs to be regenerated so that the particles are burned off. Regeneration is also needed to release sulphur (SO_2) and other substances that have collected in the SCR and reduce the efficiency of the SCR unless they are removed.

In order to ensure reduction of NO_x emissions, EATS is monitored by the aftertreatment control module (ACM).

For more information, see page *193*.

Electrical system

Machines with engine alternative D11L/D11M have eight control units (ECU).
Machines with engine alternative D11F have six control units (ECU).
Machines with engine alternative D11E have seven control units (ECU).

- **V-ECU**
  Located on the left side in the cab, in front of the circuit board. Handles brakes, gearshifting, steering, and cooling fan control on the machine.
- **V2-ECU**
  Located on the left side in the cab, in front of the circuit board. Handles dumping system, brake cooling system, ATC, and differential locks.
- **W-ECU**
  Located on the left side in the cab, over the circuit board. Handles CareTrack. (telematics system for remote monitoring of information from the machine).
- **HMIM**

Located on the left side in the cab above the circuit board.
Handles information for the operator via the instruments, information display unit, warning lights, and instruments.

- ECC
  Located in the cab on the right side under the under gear selector.
  Handles the climate control system (air conditioning).

Only applies to machines with engine alternative D11L/ D11M:

- ECM (E-ECU)
  Located on the engine's left side.
  Handles the engine.
- ACM
  Located under the engine hood on the right front fender's leading edge.
  Handles the exhaust aftertreatment system.
- Engine Gateway
  Located on the front cab wall under the left instrument panel.
  Handles communication between the engine system and the machine system.

Only applies to machines with engine alternative D11F:

- E-ECU
  Located on the engine's left side.
  Handles the engine.

Only applies to machines with engine alternative D11E:

- E-ECU
  Located on the engine's left side.
  Handles the engine.
- Engine Gateway
  Located on the front cab wall under the left instrument panel.
  Handles communication between the engine system and the machine system.

Power transmission

The **transmission** is fully automatic and of the planetary gear type. It has a torque converter with free-wheeling stator and automatic direct drive clutch (Lock-up) in all gears. The machine has six forward gears and two reverse gears.

The dropbox has a differential which distributes the torque equally between the front axle and rear axles, which reduces tire and road wear as well as fuel consumption. The longitudinal differential is provided with a locking function.

ATC Automatic Traction Control automatically controls engagement and disengagement of longitudinal differential lock and 6x6-drive as needed.

The drive axles are provided with a differential and hub reduction gears of the planetary gear type. All drive axles have a differential lock.

Brakesystem

Engine brake

Depending on setting of switches, the engine brake is available to reduce wear of the brakes.

Service brakes

The service brake is operated hydraulically. All wheel axles are provided with sealed, wet multi-disc brakes with external oil cooler. The brake system and hydraulic system have a common oil tank. The brake cooling system has a separate oil tank.

Parking brake

The parking brake is hydraulically operated with a spring-applied disc brake. It acts on both the front axle and front bogie axle by automatic activation of the differential lock in the dropbox.

Proximity Detection System (PDS), interface

The machine may be equipped with a positioning detection system (PDS).
PDS detects objects and prevents the machine from running into them using automatic control of the throttle and brakes.
In the event of a communication error, the machine may enter protection mode and reduce the maximum speed to 10 km/h (6.2 mph).
Contact an authorized dealer for more information.

Haul Assist

The machine may be equipped with Haul Assist. The Haul Assist functions can affect the machine's speed by regulating the throttle application.

Steering system

The steering system is self-compensating, hydro-mechanical and has a secondary steering function. A ground-dependent pump on the dropbox allows the steering to function even if the engine should stop.

Suspension

GHS (Gas Hydraulic Suspension)

The machine features GHS, Gas Hydraulic Suspension, on the tractor unit's front axle. There are two hydraulic cylinders filled with oil and nitrogen gas. The cylinders work both as springs and shock absorbers.

Machines with GHS may lean sideways a little depending on the individual wheel suspension and amount of fuel in the diesel tank.

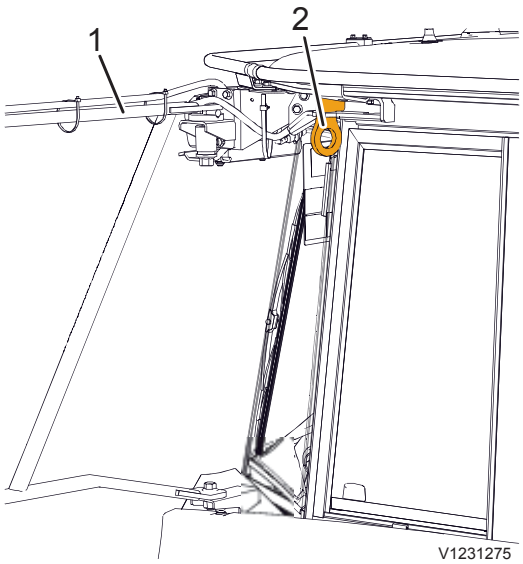
Cab

The cab has an automatically controlled heating and ventilation system with defroster system for the windows. Air conditioning is standard. The cab has three emergency exits; the door and the front side windows on the right and left side, which are broken with the hammer in the cab if use of that evacuation route is necessary.

Safety harness anchor points

(Optional equipment)

The machine may be equipped with safety belt attachment points. There is one on each side of the cab. For further information, see page *278*.

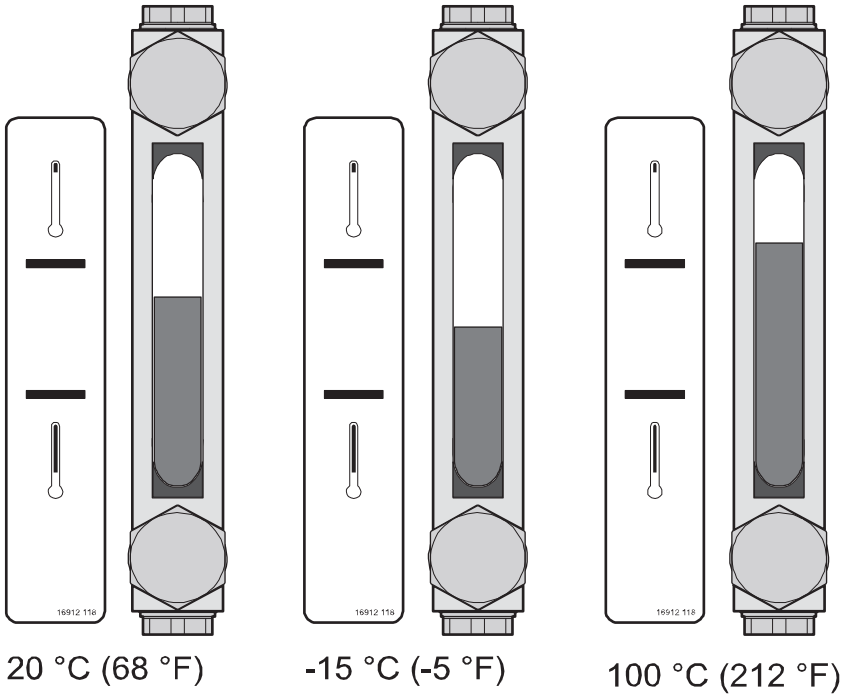


1 Rear-view mirror arch
2 Safety harness anchor points

Level glass

Brake cooling oil

The level glass is located behind the cab, on the machine's right side.
Critical or normal level is also shown on the information display, see page *62* and an alarm is generated at critical level, see page *96*.
The brake cooling oil level is best to read off before the machine is used. To enable read-off of correct value, the level glass should be located at eye level when reading off.



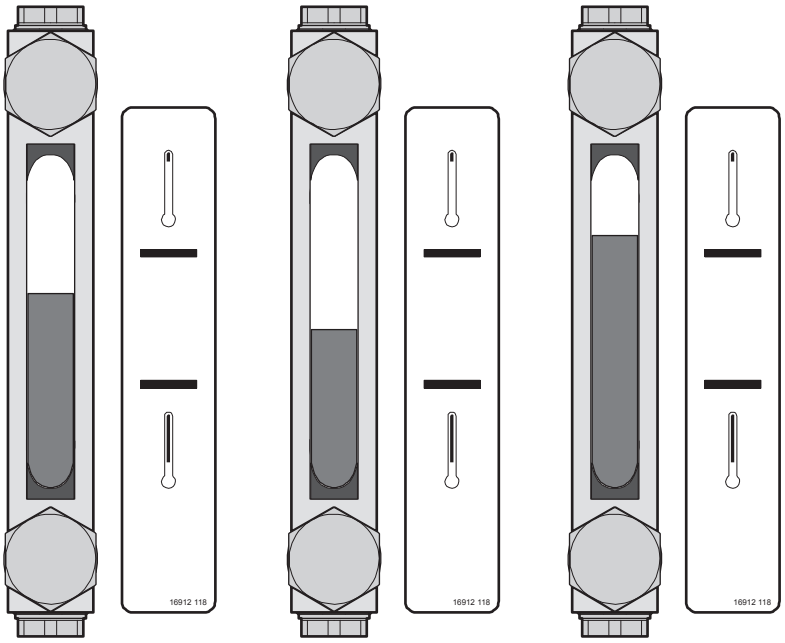
- The level should be between the MIN. and MAX. lines in the measuring range when the ambient temperature and oil temperature are approx. 20 °C (68 °F).
- If the ambient temperature and oil temperature are lower, the oil level will still be between the MIN. and MAX. lines in the measuring range.
- If the machine has been operated (oil temperature is approx. 100 °C (212 °F), the oil level may be above the MAX. line for the measuring range. This is completely normal.

Filling:

For filling instructions, see page *337*.

Hydraulic oil

The level glass is located behind the cab, on the machine's left side.
Low or normal level is also shown on the information display, see page *62* and an alarm is generated at low level, see page *98*.
The hydraulic oil level is best to read off before the machine is used. To enable read-off of correct value, the level glass should be located at eye level when reading off.
To enable read-off of correct value, the load body must always be lowered.



20 °C (68 °F) -15 °C (-5 °F) 80 °C (176 °F)

V1170918

- The level should be between the MIN. and MAX. lines in the measuring range when the ambient temperature and oil temperature are approx. 20 °C (68 °C).
- If the ambient temperature and oil temperature are lower, the oil level will still be between the MIN. and MAX. lines in the measuring range.
- If the machine has been operated (oil temperature is approx. 80 °C (176 °F), the oil level will be above the MAX. line for the measuring range. This is completely normal.

Filling:
For filling instructions, see page *341*.

FOPS and ROPS

The cab is approved as a protective cab according to FOPS and ROPS standards, see page *422*. FOPS is an abbreviation of Falling Object Protective Structure (roof protection) and ROPS is an abbreviation of Roll Over Protective Structure (roll over protection).

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

Never carry out any unauthorised alterations 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 alteration with personnel at the Volvo CE Engineering Department. This department will decide whether the alteration may cause the approval to become void.

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.

Hydraulics

The hydraulic system has five hydraulic pumps of piston pump type, with endless variable displacement. There are two pumps for the steering and dumping system, two for fan drive, and one ground-dependent hydraulic pump mounted on the dropbox. The radiator's fan pump also supplies the brake system with flow via a hydraulic valve that switches between brake charging and fan drive. The ground-dependent pump delivers oil via a non-return valve to the steering system when the machine rolls forward.

Tipping system

The machine has an electric dump lever that sends an electric signal to two electro-hydraulic valves. These send a hydraulic signal to the dumping valve which controls the load body's movement. The machine has damping at the load body's top and bottom positions.

Additional structures (retrofits)

All modifications of the basic product may affect its stability. For example, this applies when body extensions are installed.

For the warranty to be valid, the retrofits must be approved by Volvo Construction Equipment.

Fire suppression system

(Additional options)

The Fire Suppression System is a sprinkler system for the engine compartment, the compartment under the cab, and the compartment for the aftertreatment system (EATS) (if installed) with 16 sprinkler nozzles.
The nozzles are distributed 9 in the engine compartment, 6 in the compartment under the cab, and 1 in the EATS-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 *286* for more information.

Anti-theft system

(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.

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 qualified service technician will make use of this information.

CareTrack

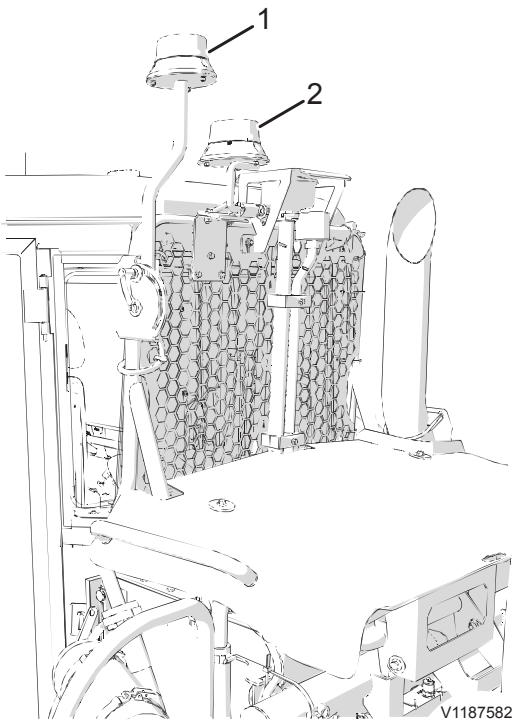
The machine may be equipped with CareTrack, a telematics system developed by Volvo Construction Equipment. The system stores machine data, e.g., machine position, operating hours, fuel consumption, fuel level, that can be sent by wireless transmission to a computer. CareTrack is available in different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

The CareTrack system transmits data, in the same way a mobile phone does, with a maximum output rate of 10 W. The transmitter is always on and the operator cannot switch it off.
Local precautions and restrictions applicable to mobile phones, for example safety distance, also apply to the CareTrack system.

Rotating beacon

(Additional options)



1 Rotating beacon
2 Seatbelt indicator, external

The purpose of the rotating beacon is to indicate the prescence of a machine and to warn other road users or persons nearby.

The rotating beacon can be lowered and is installed on the cab's spill guard. The rotating beacon emits an orange light.

Seatbelt Indicator, external

(Additional options)

The purpose of the external seatbelt indicator is to show if the operator is using the seatbelt.

The light showing if the seatbelt is used is located on the cab roof and has a flashing green light. The light is off when the seatbelt is not in use.

Tailgate

(Optional equipment)

The machine may be equipped with some version of a tailgate. The tailgate is mounted directly to the load body and is designed to reduce spills when hauling, e.g., gravel, sand, and very wet/ water-logged materials.

Body height extension for light material

(Optional equipment)

It is possible to equip the machine with body extensions in order to transport light material.

The body extensions are attached directly to the ordinary load body and while it is mounted, only light material may be transported in the load body.

Hauler chassis

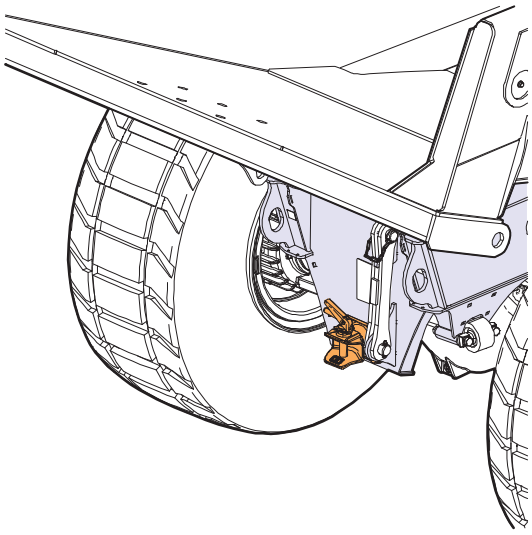
Hauler chassis is a standard hauler without load body. The machine serves as a platform for different transport and hauling solutions.
The concept consists of a tractor with a rear frame prepared for a retrofit (superstructure).

Trailer hitch

(Additional options)

The trailer hitch is used to tow small trailers. For weight restrictions, see page *440*.

For recovering or towing another machine, use the intended eyes, see page *212*.



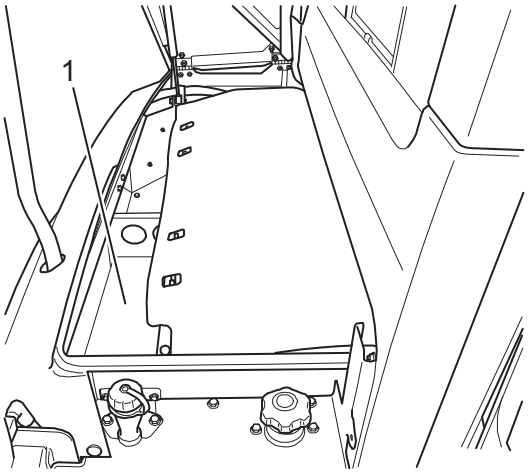
V1177667

Position of trailer hitch

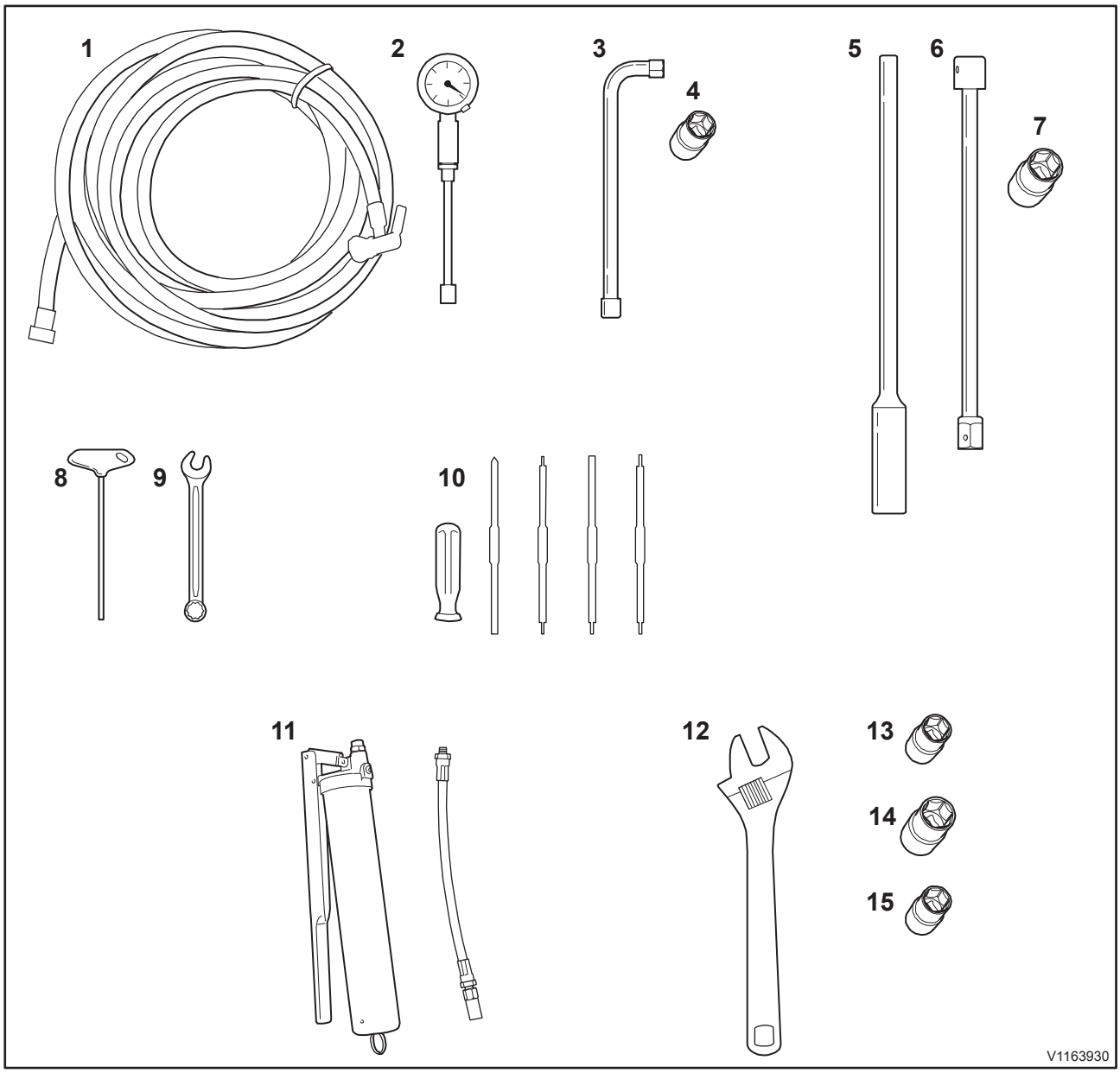
Tool kit

(Additional options)

The toolbox is located under the battery cover on the cab's left side.
A number of standard tools are delivered with the machine.



1 Tool box

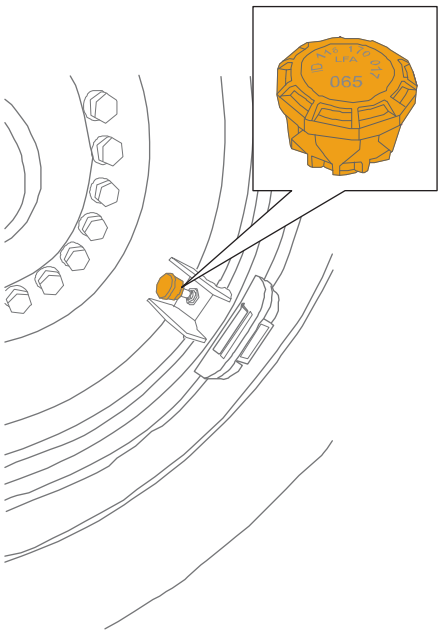


Standard tools

1	Hose for inflating tires	9	Combination wrench 13 mm for secondary lowering of load body
2	Air pressure gauge for checking tire pressure	10	Combination screwdriver
3	Handle	11	Grease gun
4	Socker for lowering and removing underbody skid plates. Alternative 1. Socket 17 mm Alternative 2. Socket 15 mm	12	Wrench
5	Handle for socket wrench, for check-tightening wheel nuts	13	Alternative 1. Socket 12 mm Alternative 2. Socket 10 mm
6	Extension for check-tightening wheel nuts	14	Socket 21 mm for radiator/cooler
7	Socket 32 mm for check-tightening wheel nuts	15	Alternative 1. Socket 1/2” Alternative 2. 13 mm
8	Allen head key 4 mm for secondary lowering of load body		

Tyre pressure monitoring system

(Additional options)



V1224811

Pressure sensor

NOTE!
This optional equipment requires Volvo Co-Pilot to operate.

Tyre pressure monitoring system or TPMS (Tyre Pressure Monitoring System) is an information system for checking the tyre pressure and temperature.
The system comprises:
- pressure sensors on the tyre valves
- a receiver on the outside of the cab

The receiver is linked to the Volvo Co-Pilot.

For further information, see page *147*.

Communication equipment, installation

NOTICE

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 2014/30/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, as they can interfere with the electronic system of the machine.

Mobile telephones

An external aerial shall be used for other than handheld cell phones, and it shall be installed according to the manufacturer's instructions. If a handheld cell phone is used, note that it may continuously transmit information to its base station, even when the telephone is not used. For this reason, it shall not be placed near electronic equipment in the machine, e.g., directly on a control panel or similar.

Guidelines

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 shield and braid are not split at the ends but covers the connector casings and has good galvanic contact with them.

- 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 communication equipment's voltage feed cables and the aerial cable. Cables that may be subjected to interference are cables to and from the machine's electronic units. 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. seatbelt
- Decals and plates
- Cab filter

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

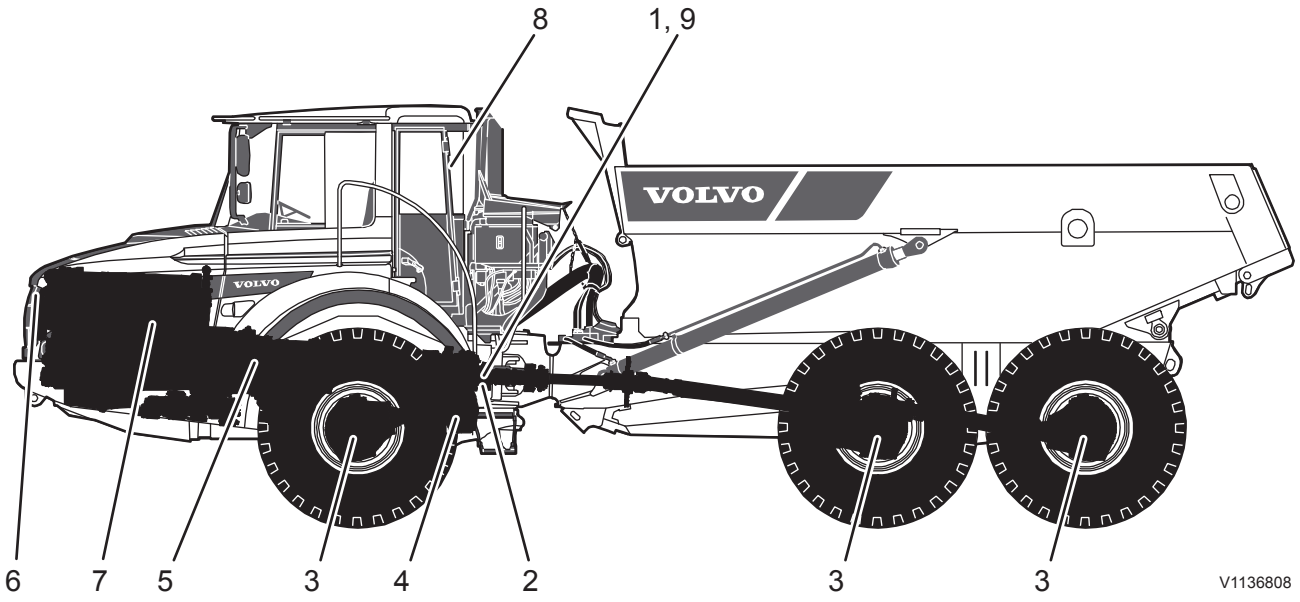
When changing machine operator/owner, malfunctions and defects of safety-classified machine parts and spare parts shall be reported immediately and an action plan shall be established.

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

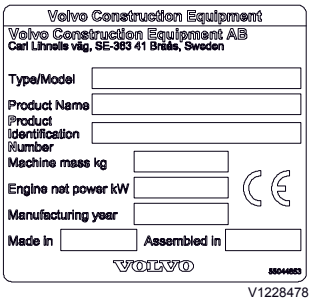
Product plates

The illustration and text below show the product plates that should be found on the machine.

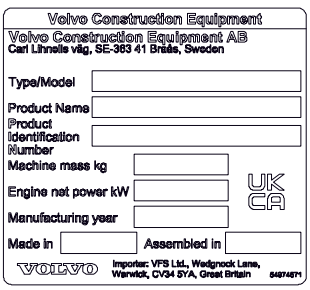
When ordering spare parts and when making enquiries by telephone or correspondence, the model designation and **P**roduct **I**dentification **N**umber **(PIN)** should be stated.



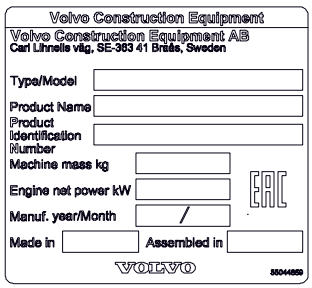
1 The data plate is located on the left side of the tractor unit's frame by the steering joint. The data plate varies depending on the market. The information is indicated as follows:
- manufacturer's name and address
- type/model for complete machine
- product name
- **P**roduct **I**dentification **N**umber (**PIN**)
- machine weight (machine's most common configuration)
- motor power
- year of manufacture
- month of manufacture (only countries within Eurasian Customs Union)
- country of manufacture



Data plate for countries within the EU/EEC

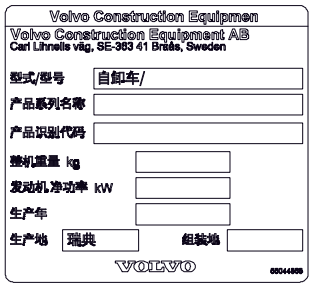


UKCA identification plate



V1228586

Data plate for countries within Eurasian Customs Union



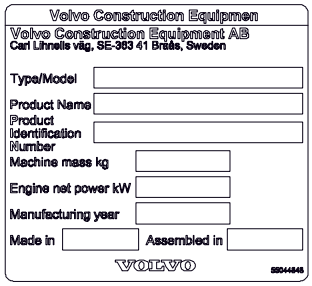
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Data plate for China



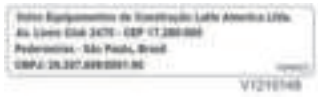
V1187107

Additional eco label for China



V1228596

Data plate for rest of the world



Additional sign with Brazilian address

- assembled

2 The machine's serial number is stamped into the frame on the left side of the tractor unit, by the steering joint.

3 The drive axles' serial numbers are located on the axle housing.

4 The dropbox's serial number is located at the front, on its right side.

5 The transmission's type designation and serial number are located on its left side.

6 The decal ”Important Engine Information” is located on the front of the engine and on the left side of the tractor unit's frame by the steering joint.

7 The engine's type designation, part number, and serial number are stamped into the engine on both sides.

8 Cab type, type approval, and serial number are located on the left side in the cab, on the pillar to the left of the door (seen from inside the cab), closest to the rear window.

9 Engine and exhaust decal with the engine's type designation and component number.

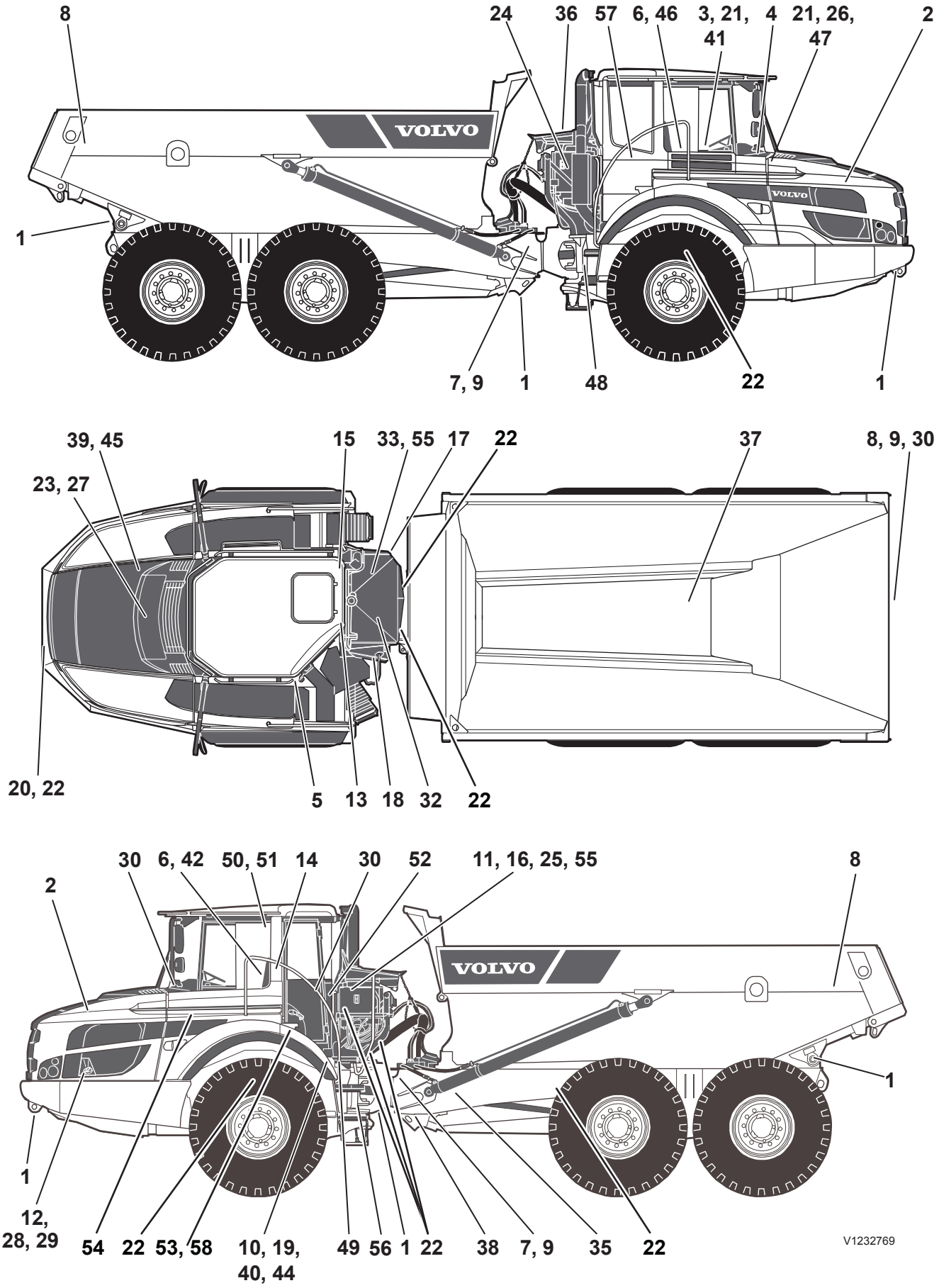
Information and safety decals

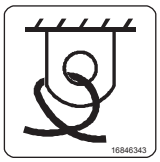
The machine operator should know and pay attention to the warnings and information on decals and plates. Decals may differ depending on the machine and the market.

The decals must be kept clean so that they can be read. Replace damaged, overpainted or missing decals and plates immediately.

The spare part number (order number) is shown on the decals/ plates and in the part catalogue.

NOTE!
The text "WARNING" is shown on warning decals in North America.


8
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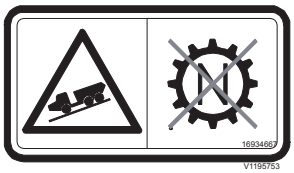


1. Attaching point for lashing
Spare part number: 16846343



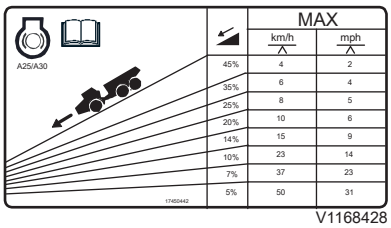
V1185992

2. Avoid aiming water jets at sound absorbents
Spare part number North America: 16929638
Spare part number China: 16315803
Spare part number, all other markets: 16929639



V1195753

3. WARNING! Do not operate downhill with the gear selector in neutral. Only change gear with the accelerator released.
Spare part number North America: 16929626
Spare part number China: 16934522
Spare part number, all other markets: 16934667



V1168428

4. Retarder diagram
Spare part number: 17450442



V1093385

5. Oil fill point transmission
Spare part number: 11197518

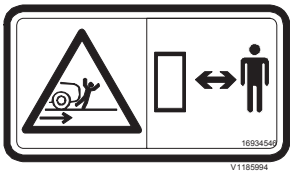


V1086535

6. Emergency exit
Spare part number: 11116814



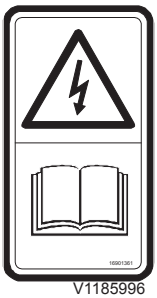
7. WARNING! Risk of crushing – articulated frame steering
Spare part number North America: 16929620
Spare part number, all other markets: 16901162



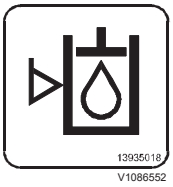
8. WARNING! Do not stand within the work area of a reversing machine
Spare part number North America: 16929627
Spare part number, all other markets: 16934546


V1195752

9. WARNING! Do not lean in under raised load body unless it is blocked
Spare part number North America: 16929625
Spare part number, all other markets: 16934539


V1185996

10. WARNING! Before connecting start cables, read the Operator's Manual
Spare part number North America: 16929621
Spare part number, all other markets: 16901361



V1086552

11. Hydraulic oil
Spare part number: 13935018



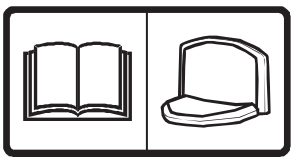
12. Fuel
Spare part number: 11055037



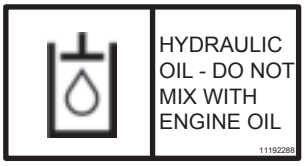
13. Sound pressure level (LpA) in cab
Spare part number 70 dB: 11180148
Spare part number 72 dB: 11180150



14. Sound power level (LwA) outside machine
Spare part number 110 dB: 11180165
Spare part number 111 dB: 11180166
Spare part number 108 dB (optional equipment): 11196588
Spare part number 109 dB (optional equipment): 11196589

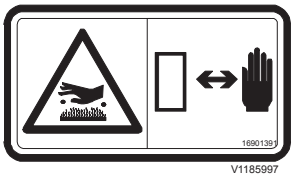

V1093411

15. Compartment for Operator's Manual
Spare part number: 15164402



V1093347

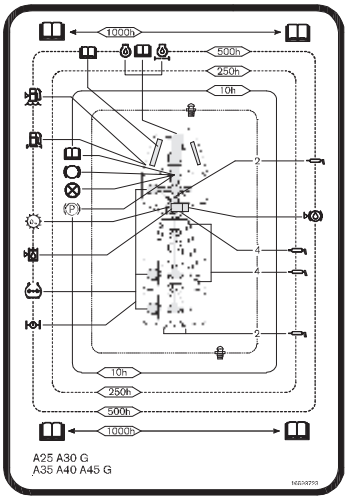
NOTE! Only North American market.
16. Hydraulic oil. Do not mix with engine oil.
Spare part number: 11192288


V1185997

17. WARNING! Hot surfaces
Spare part number North America: 16929623
Spare part number, all other markets: 16901391

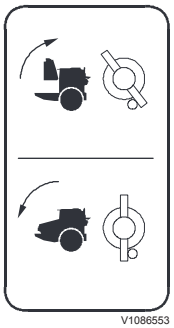

V1093384

18. Oil fill point dropbox
Spare part number: 15170937

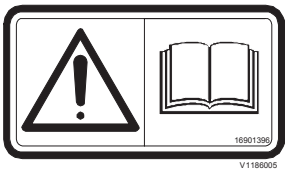


V1171141

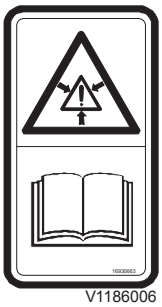
19. Service decal
Spare part number: 16893723


V1086553

20. Engine hood
Spare part number: 11116228


V1186005

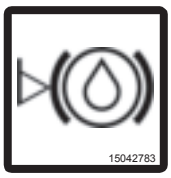
21. Read the Operator's Manual
Spare part number North America: 16929624
Spare part number, all other markets: 16901396


V1186006

22. System/component with pressure
Spare part number North America: 16929633
Spare part number, all other markets: 16930663


V1228468

23. WARNING! Hot coolant
Spare part number North America: 16948457
Spare part number, all other markets: 16943076

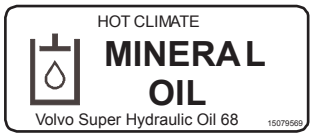

V1093354

24. Brake cooling oil
Spare part number: 11116416



V1093357

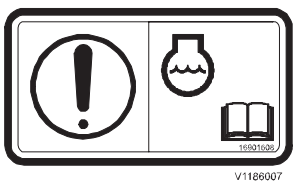
25. Synthetic ester
Spare part number: 11411924



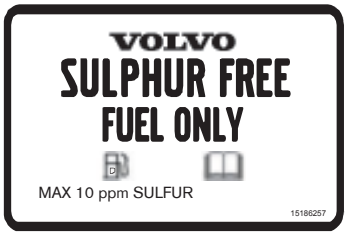
25. Mineral oil for warm climate
Spare part number: 15079569


V1218616

26. The air conditioning system is filled with R134a.
Spare part number: 16354765


V1186007

27. WARNING! Only use Volvo coolant VCS – read the Operator's Manual
Spare part number North America: 16902967
Spare part number, all other markets: 16901608



28. Fuel decal
Max. 10 ppm SULPHUR (only EU).
Spare part number: 15186257



29. Fuel decal
Max. 15 ppm SULPHUR (only North America).
Spare part number: 15152938



V1186008

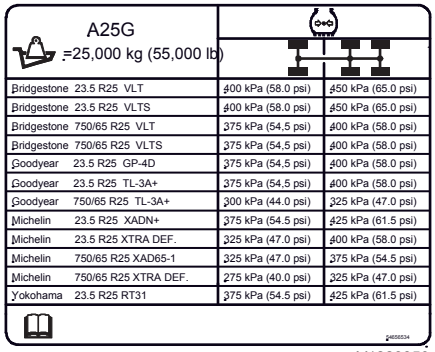
30. WARNING! The machine may not carry a heavier load than that which is stated on the decal (only on machines with body extensions for light materials).
Spare part number: 16929637, 16929636



32. Hydraulic oil
Spare part number: 4948103



33. Brake cooling oil
Spare part number: 15042783



V1223859

35. Tyre pressure
Spare part number A25G: 54656534
Spare part number A30G: 54656542



V1186009

NOTE! Only North American market.
36. WARNING! High pressure in the brake system
Spare part number: 16929630



NOTE! Only North American market.
37. WARNING! Spring under high pressure
Spare part number: 4952177



V1186011

NOTE! Only North American market.
38. Disconnect the steering joint lock before moving the machine
Spare part number: 16929628



V1186012

NOTE! Only North American market.
39. Do not use flammable gas in the air intake. Risk of fire.
Spare part number: 16929629



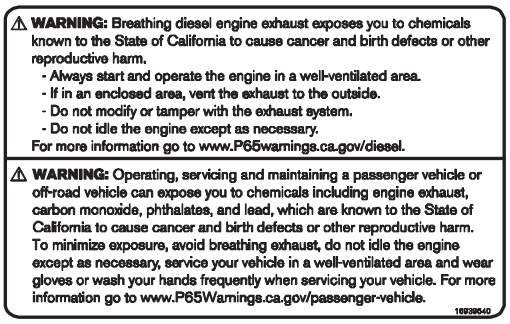
V1186013

NOTE! Only North American market.
40. Information compressed air system. Turn off the engine and depressurise the systems before checking and servicing.
Spare part number: 16929631



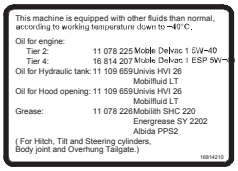
V1186014

41. Apply the parking brake before leaving the operator's seat
Spare part number: 16929634

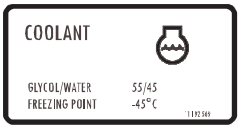


V1197392

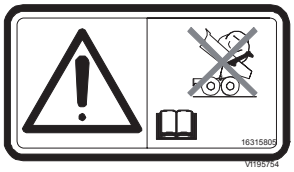
NOTE! Only North American market.
42. Information diesel exhausts
Spare part number: 16939540



44. The machine is equipped with other fluids than normal for operating in temperatures down to -40 °C
Spare part number: 16814210

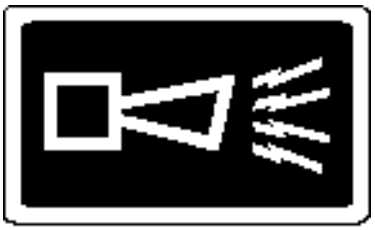


45. The machine has coolant with another mix ratio than normal for operating in temperatures down to -45 °C
Spare part number: 11192569

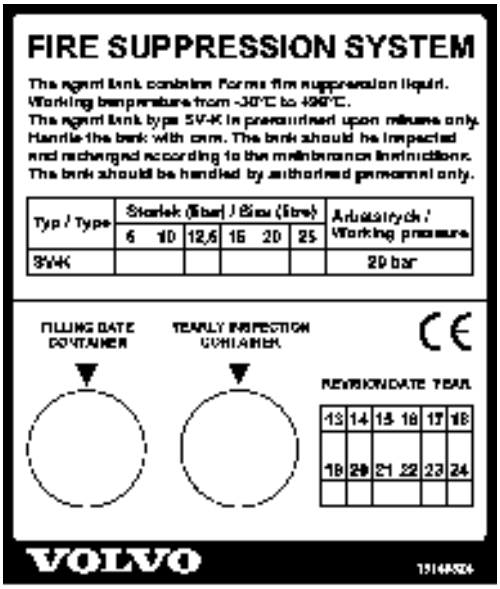


V1195754

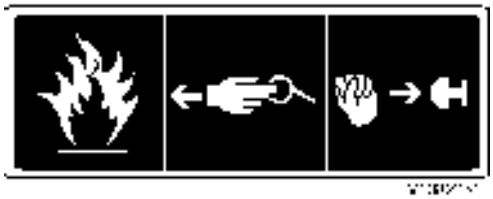
46. Overhung tailgate
Spare part number North America: 16929635
Spare part number China: 16315807
Spare part number, all other markets: 16315805



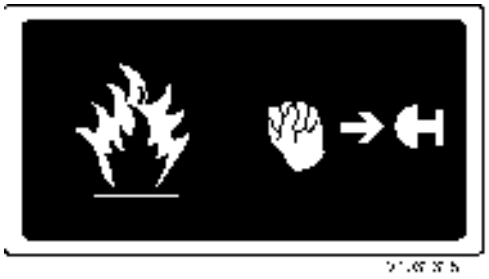
47. Strobe light and sound
Fire Suppression System (Optional equipment)
Spare part number: 15126353



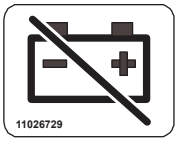
48. Extinguishing agent tank decal
Fire Suppression System (Optional equipment)
Spare part number: 15149324



49. Manual activation
Fire Suppression System (Optional equipment)
Spare part number: 15126559



50. Inner activation button
Fire Suppression System (Optional equipment)
Spare part number: 15126372

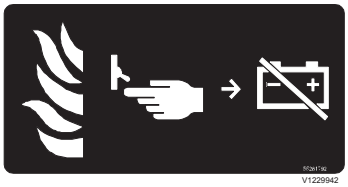


V1118495

51. Battery disconnector
Fire Suppression System (Optional equipment)
Spare part number: 11026729

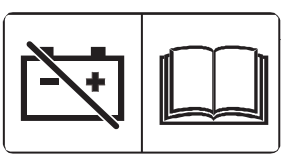


52. Handheld fire extinguisher
Fire Suppression System (Optional equipment)
Spare part number: 15126327



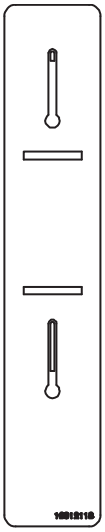
V1229942

53. Emergency switch
Spare part number: 55281792



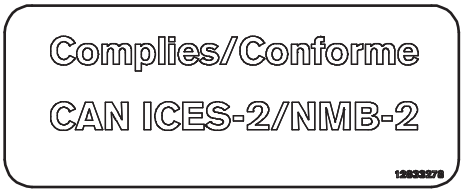
V1151528

54. Service switch
Spare part number: 16892452



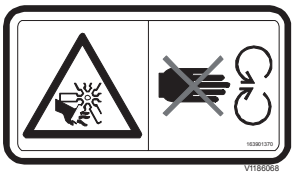
V1171137

55. Brake cooling oil level/hydraulic oil level
Spare part number: 16912118

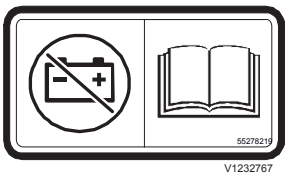


V1179124

NOTE! Only North American market.
56. Meets Canadian EMC-requirements
Spare part number: 12833278



57. WARNING! Rotating parts
Spare part number North America: 16929622
Spare part number China: 16925041
Spare part number, all other markets: 16901370

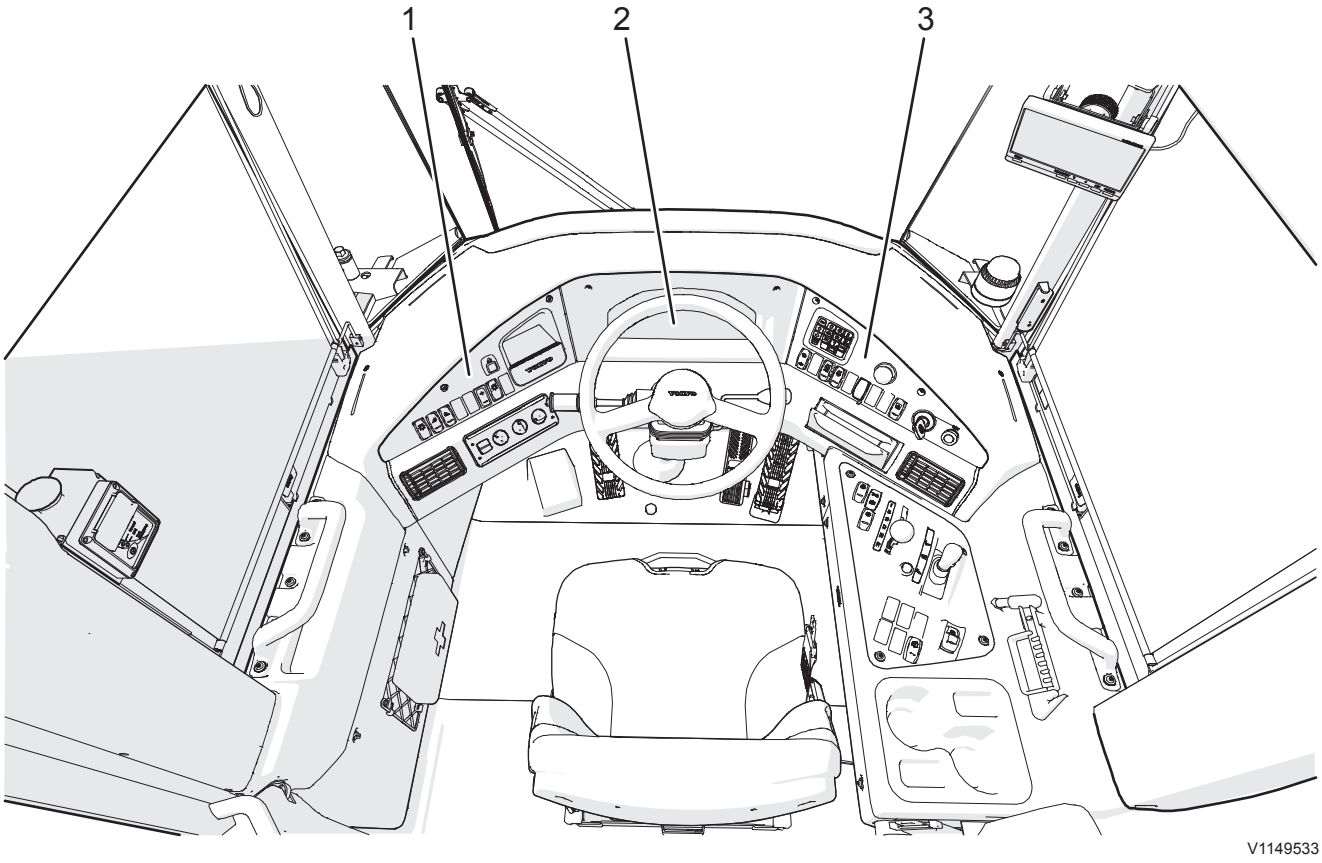


V1232767

58. Emergency switch
Spare part number North America: 55278292
Spare part number, all other markets: 55278219

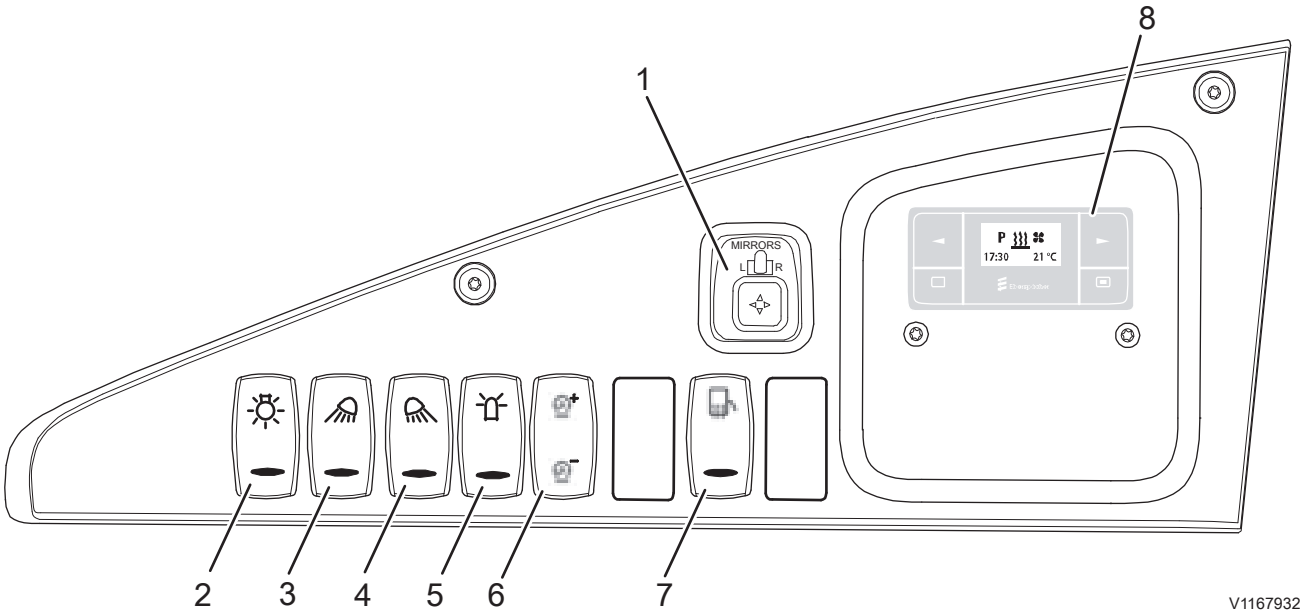
Instrument panels

NOTE!
Do not operate the machine until you are thoroughly familiar with the positions and functions of the various instruments and operating controls. Read through this Operator's Manual thoroughly - your safety is involved!

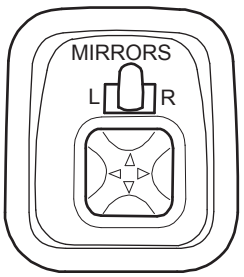


1.	Left instrument panel	3.	Right instrument panel
2.	Middle instrument panel		

Instrument panel, left



1.	Electrically controlled rear-view mirrors ('power mirrors') (optional equipment)	5.	Rotating beacon (optional equipment)
2.	Headlights	6.	Dimmer
3.	Front work lights (optional equipment)	7.	Electrically heated rear-view mirrors (optional equipment)
4.	Rear work lights (optional equipment)	8.	Timer function for engine and cab heater (optional equipment)



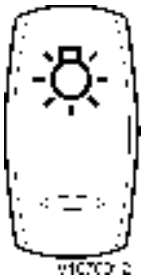
V1091717

1. Electrically controlled rear-view mirrors ('power mirrors') (optional equipment)

Select the left or right rear-view mirror by moving the small button at the top.

Adjust the mirrors by moving the lower button in the direction of the arrows.

NOTE!
Only the upper mirror of the two mirrors on each side can be operated electrically. The lower curb mirror has to be adjusted manually.



2. Headlights

The switch has three positions and controls headlights and parking lights.

Switch, upper part pressed in = headlights on.

Switch in middle position = parking lights on.

Switch, lower part pressed in = lighting off.

A control light on the middle instrument panel indicates that the main beam is on (see section **Instrument panel, middle** on page *45*).



3. Front work lights (optional equipment)

NOTE!
Work lights must be off when operating on public roads.

The switch has three positions and controls the front work lights on the cab's upper edge.

Switch, upper part pressed in = work lights on.

Switch in middle position = automatic work lights. The work lights are turned on and off together with the high beams.

Switch, lower part pressed in = work lights off.



4. Rear work lights (optional equipment)

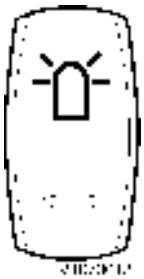
NOTE!
Work lights must be off when operating on public roads.

The switch has three positions and controls the rear work lights on the tractor's fenders.

Switch, upper part pressed in = work lights on.

Switch in middle position = automatic work lights.
Depending on which setting is selected, see "Setting automatic rear work lights" in section "Settings" starting on page *67*, the work lights are turned on and off automatically.

Switch, lower part pressed in = work lights off.

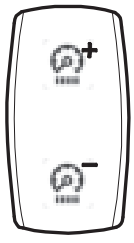


5. Rotating beacon (optional equipment)

Switch, upper part pressed in = rotating beacon on, also see page *176*.

Switch, lower part pressed in = rotating beacon off.

Control light on the middle instrument panel (see section **Middle instrument panel** page *45*) indicates that the rotating beacon is on.



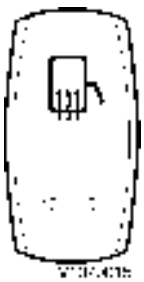
6. Dimmer

Adjusts the light intensity of lights in illuminated symbols on switches, middle instrument panel, information display unit (display panel), symbols by the gear selector, as well as the load & dump lever. The illuminated symbol on the switch for flashing hazard lights and the green light on switches indicating that the relevant switch is activated, are not affected.

Switch, upper part = light intensity increases.

Switch, lower part = light intensity decreases.

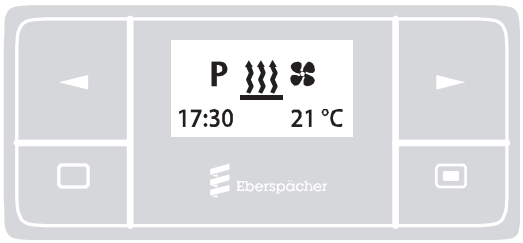
NOTE!
Headlights or work lights must be turned on for the light in the symbols in switches, etc., to be on.



7. Electrically heated rear-view mirrors (optional equipment)

Switch, upper part pressed in = heating is on.

Switch, lower part pressed in = heating is off.



V1162214

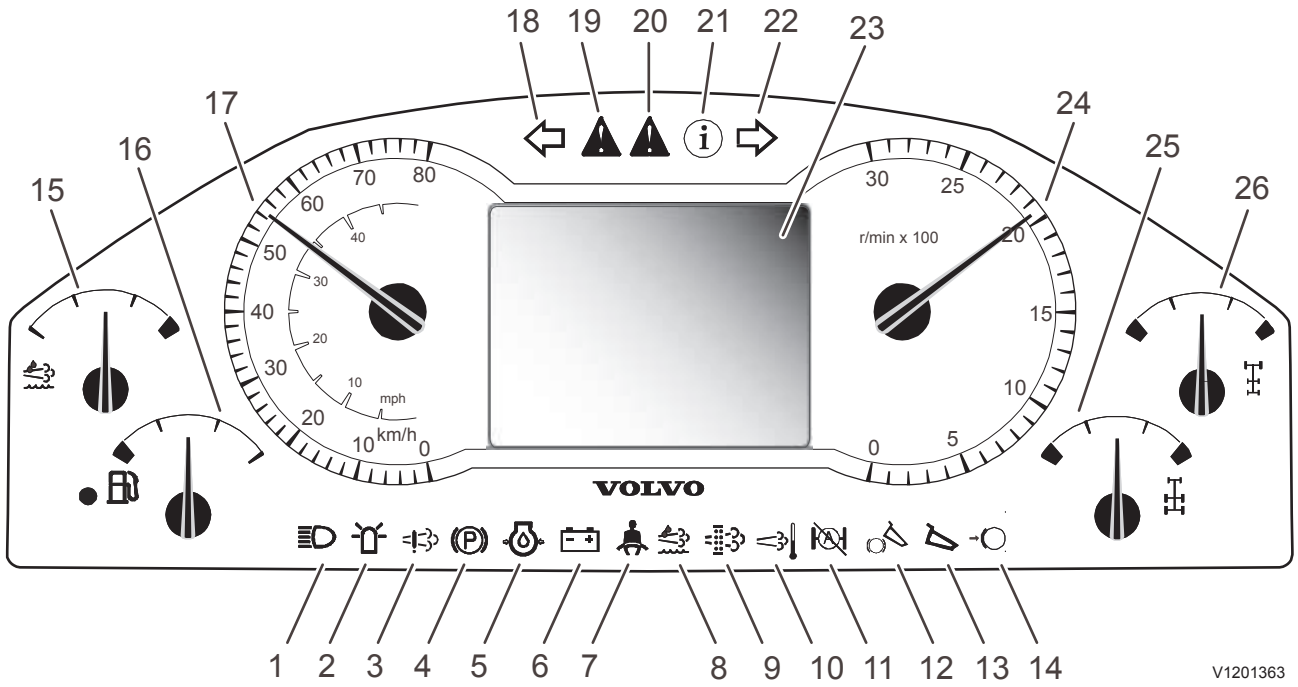
8. Timer function for engine and cab heater (optional equipment)

Timer function for engine and cab heater is used to activate the diesel-powered engine and cab heater. Warming can be activated directly or pre-set with the timer function.
For more information about the timer function and engine and cab heater, see page *139*.

Instrument panel, centre

Instrument panel, centre

At start all control lights come on for a few seconds. If any of these lights do not turn on when the ignition key is turned to operating position (1), the light is defective or there is a malfunction in the electrical system. This should be taken care of before start.



1	High beams (blue)	14	Service brakes applied (green)
2	Rotating beacon (yellow)	15	AdBlue®/DEF-level
3	DPF particulate filter, malfunction (yellow)	16	Fuel level
4	Parking brake (red)	17	Speedometer
5	Low engine oil pressure (red)	18	Direction indicator, left (green)
6	Charging failure (red)	19	Central warning (red)
7	Seatbelt reminder (red)	20	Central warning (amber)
8	AdBlue®/DEF general warning (amber)	21	Central warning (green)
9	Regeneration requested (amber)	22	Direction indicator, right (green)
10	Regeneration in progress, high exhaust temperature (amber)	23	Information display unit
11	ATC (Automatic Traction Control) disengaged (yellow)	24	Tachometer
12	Load and dump brake (amber)	25	Accumulator pressure in trailer unit's brake circuit
13	Load body up (red)	26	Accumulator pressure in tractor unit's brake circuit



1 High beams

The indicator light is on when the high beams are activated, see page *126*.



2 Rotating beacon (optional equipment)

The light is on when the rotating beacon is activated. See page *176*.



3 DPF particulate filter, malfunction (yellow)

The light turns on in case of malfunction or failure of the DPF particulate filter.



4 Applied parking brake

Turns on when the parking brake is applied.

5 Low engine oil pressure



NOTICE

Risk of machine damages
An instrument warning light and buzzer could indicate a serious malfunction.
Stop the machine immediately and investigate the cause of the signal.

The indicator light is on if the engine's oil pressure is too low.



6 Charging failure

Turns on when the alternator does not provide any charging voltage. If the light turns on when operating, the cause must be repaired, otherwise the batteries may be damaged.



7 Seatbelt reminder

Turns on if the engine is running and the operator sits in the operator's seat without buckled seatbelt.



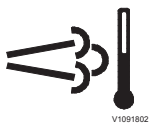
8 AdBlue®/DEF general warning (Only applies to machines with engine alternative D11L or D11M)

The indicator light is on with a fixed light or flashes in case of incorrect level, quality, or metering of AdBlue®/DEF.



9 Parked regeneration (Only applies to machines with engine alternative D11M)

Turns on when it is time to run a parked regeneration, see page *193*



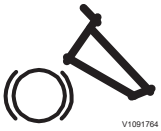
10 High exhaust temperature (Only applies to machines with engine alternative D11M)

HEST (High exhaust temperature). The indicator light is on when parked regeneration is in progress and indicates that the temperature of exhausts from the outlet pipe is higher than normal.



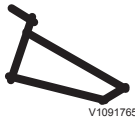
11 ATC (Automatic Traction Control) disengaged

The indicator light is on when the ATC (Automatic Traction Control) function is deactivated.



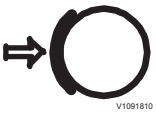
12 Load and dump brake

The indicator light is on when the load and dump brake is activated, see page *190*.

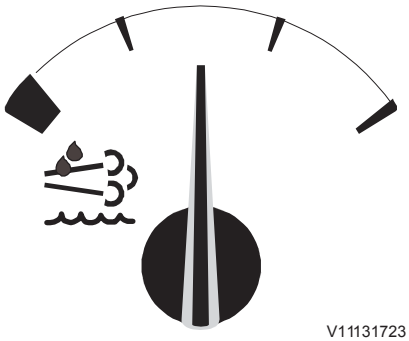


13 Body up

Turns on when the load body is up.

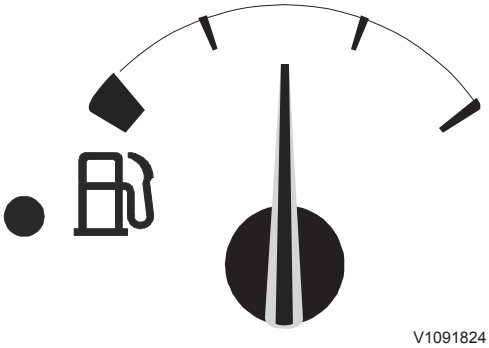


14 Service brake applied



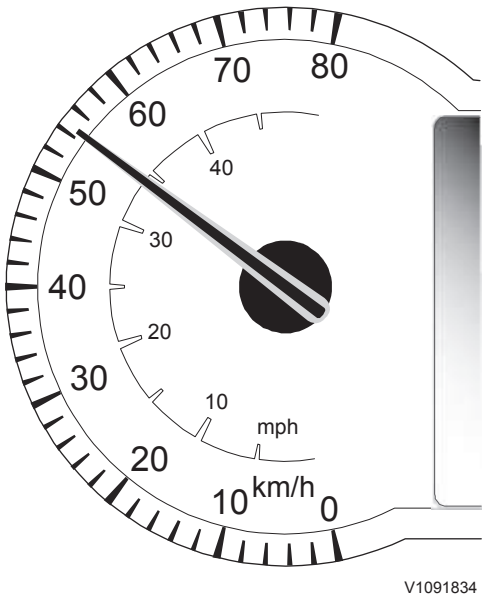
15 AdBlue®/DEF level (Only applies to machines with engine alternative D11L or D11M)

Shows AdBlue®/DEF-level in tank. When the gauge needle moves into the red sector there is enough AdBlue®/DEF left for approx. one hour of normal operation.



16 Fuel level

Shows fuel level in tank. When the gauge needle moves into the red sector, the light to the left of the gauge turns on. The remaining fuel volume at that time is enough for approx. one hour of normal operation.



V1091834

17 Speedometer

The speedometer shows the machine's current ground speed and is graded between 0 up to 80 km/h (0 - 50 mph).



18 Direction indicator, left

The control light indicates left direction indicator. The light flashes when the lever is moved downward, see section **Controls** on page *126*.
The operator is informed of failure of the direction indicator's bulb with a warning on the information display unit, see section **Information display unit** on page *51*.



19 Alarm — Central warning, red

If the light flashes during operation:

WARNING

Risk of serious injury.
Malfunction could lead to loss of machine control resulting in accidents and serious injury.
Warning light combined with buzzer indicate serious malfunction. Stop the machine immediately and investigate the cause of the malfunction.

In addition to the activated control light, an alarm display is shown on the information display unit, the alarm is added to the message list, and the buzzer sounds until the malfunction is solved.
See section **Alarm displays** on page *76*.



20 Alarm — Central warning, amber

Turns on in case of abnormal condition. In addition to the activated control light, an alarm display is shown on the information display unit, the alarm is added to the message list, and the buzzer emits four short signals. Actions may have to be taken depending on the affected function, investigate the cause at the next stop, see page *85*.


V1091874

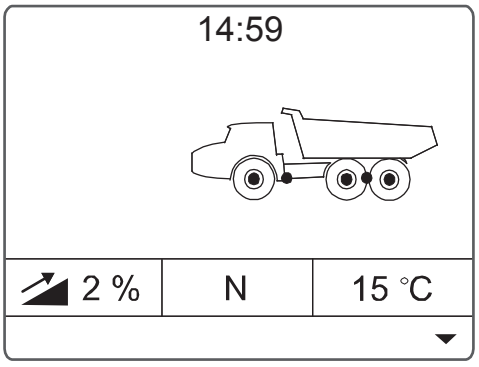
21 Information symbol, green

Indicates deviation of some kind. An alarm display is shown on the information display unit, and the buzzer emits four short signals.
See section **Alarm displays** on page *99*.



22 Direction indicator, right

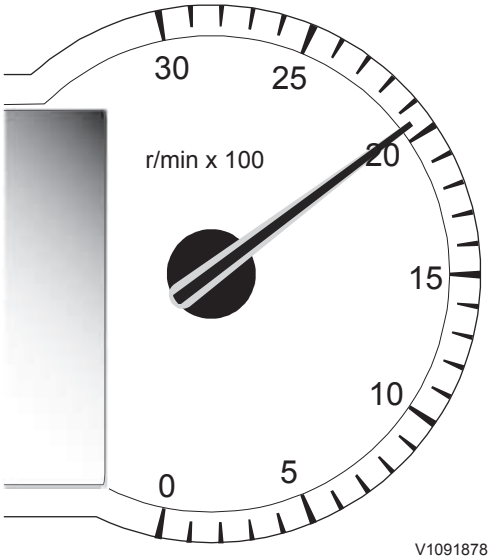
The control light indicates right direction indicator. The light flashes when the lever is moved upward, see section **Controls** on page *126*.
The operator is informed of failure of the direction indicator's bulb with a warning on the information display unit, see section **Information display unit** on page *51*.



V1202072

23 Information display unit

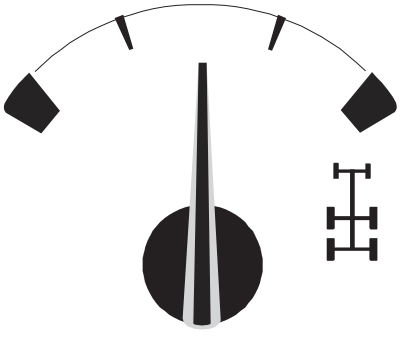
In addition to alarm texts, the display unit also shows start sequence, operating information, and settings, see section **Display unit** starting on page *51*.



V1091878

24 Tachometer

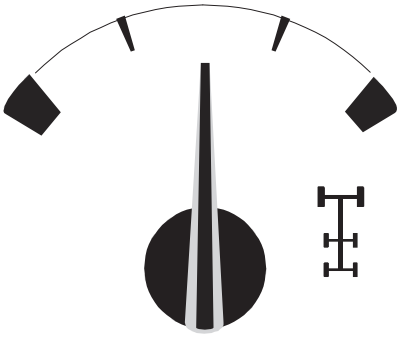
The tachometer shows the current engine speed (rpm). It is graded from 0 to 3,000 rpm (30 stands for 30 x 100 rpm, that is, 3,000 rpm).



V1091887

25 Accumulator pressure in trailer unit's brake circuit

Shows brake accumulator pressure in the trailer unit's brake circuit.



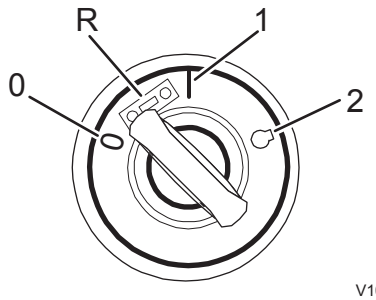
V1091888

26 Accumulator pressure in tractor unit's brake circuit

Shows brake accumulator pressure in the tractor unit's brake circuit.

Display unit

The information display unit, located on the middle instrument panel, shows start sequence, component information, operating information, alarm display figures, and vehicle messages.



V1092158

Ignition

0 Off position
R Radio position
1 Operating position
2 Start position

In position 0 the battery disconnector is OFF (after a certain delay). It is ON in positions R, 1, and 2.

At start of electronics

Initial display

When the ignition is turned from position 0 to position R, the machine's battery disconnector (main switch) connects the power supply and accumulated machine hours are shown on the information display unit for three minutes.



V1092340

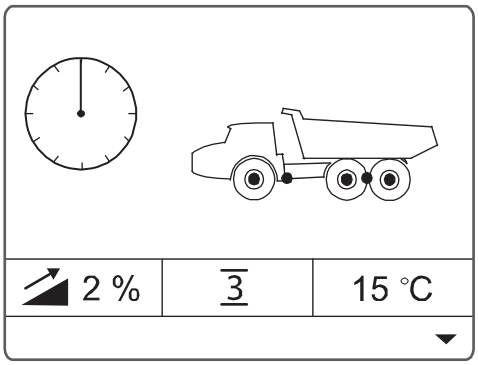
Machine hours

When the ignition is turned to position 1, the electronics start and the control light test is run. Start display is shown on the information display unit with a rotating Volvo logo.
This sequence takes a few seconds. Thereafter the electronics are ready for engine start and the start key can be turned to start position (position 2).



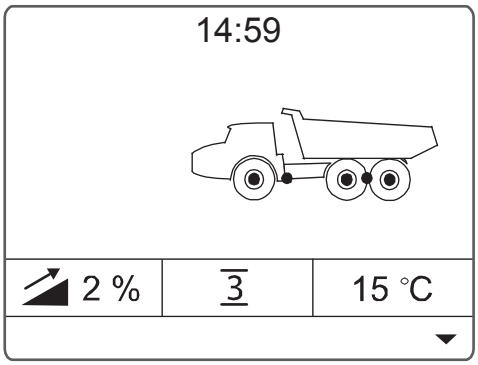
V1092812

Volvo logo



V1095258

Example of operating display before Quarter 2, 2019



V1202073

Example of operating display from Quarter 2, 2019



V1101673

Operating display

There are several versions of operating display (see page *53*). When electronics start is finished, the operating display that was shown last before the electronics were turned off is shown.

At stop of electronics

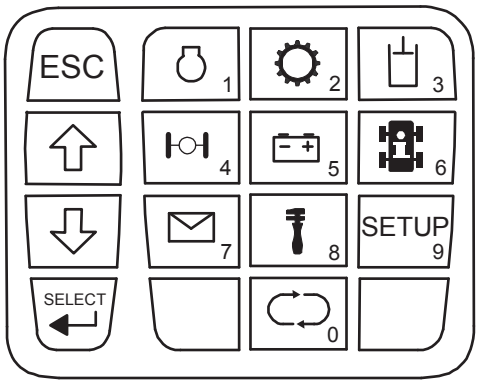
When the ignition is turned from position 1 to R, the machine's electronics shut down in a controlled way. The accumulated machine hours are shown on the information display unit for a time. The battery disconnector (main switch) is still on.

When the ignition is turned from position R to 0 the battery disconnector is deactivated. Voltage may remain for some time to shut down various systems in a controlled way.
The machine is supplied with voltage as long as the ignition is in position R or the information display is on.

If the function "Delayed engine shutdown" (optional equipment) is activated, see page *206*), the engine is not turned off until "the delay time" has elapsed. During this time, if the start key is turned from position 0 to operating position 1, the delay is cancelled.

Keypad, information display unit

Using the keypad, the operator can get information about the machine's status as well as perform settings on the operating information display unit (also see page *53*).



V1091529

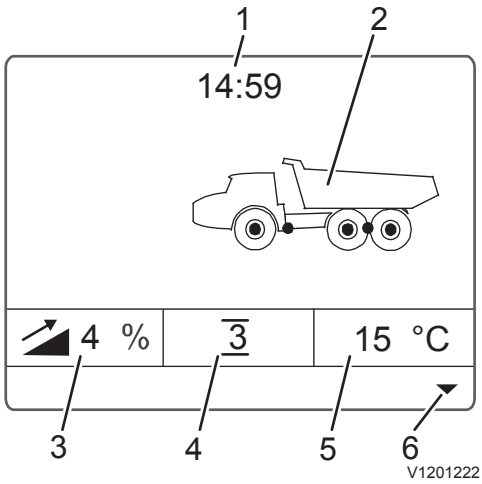
1	Engine
2	Transmission
3	Hydraulics
4	Axles/Brakes
5	Electrical system
6	Machine information
7	Vehicle messages
8	Service
9	Settings
0	Cycle information
ESC	The key is used to go back to the previous display figure and to acknowledge alarms.
 V1069847	Key to scroll up in menu.
 V1069848	Key to scroll down in menu.
SELECT	Key to select. Also used to get more information when an information or control message is shown on the operating information display unit.
0, 1...9	When entering numerical values, for example, when setting date or entering theft protection code, the number down on the bottom right of the keys applies.

Display unit

When the engine is started and in normal operating mode, the operating display is shown on the information display unit. There are three or four versions of the operating display; operating display 1, operating display 2, and operating display 3 are always shown. Operating display 4 is shown if the machine is equipped with On-Board Weighing.
To alternate between operating displays, use the arrow keys.

Operating display 1

The fields in operating display 1 show the following:



Operating display 1

1 An clock is shown in the upper field of the operating display when the machine is running.

2 The hauler is always shown in the operating display. This display can also show, for example, if differential locks are engaged or if the load body is up. Engagement of longitudinal differential lock and 6x6–drive is shown on the hauler.

3 Angle indicator (inclination), longitudinal



Grade less than 3%



Grade downhill in %



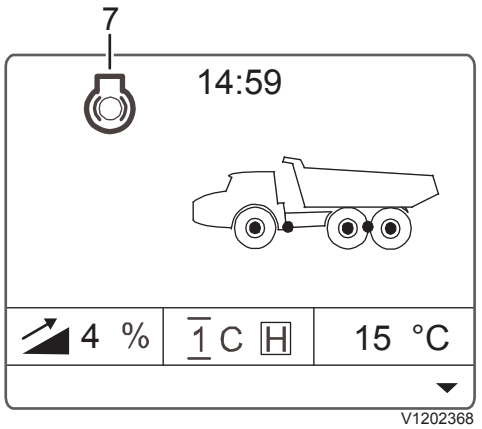
Grade uphill in %

4 Gear indicator shows active gear; N/1/2/3/4/5/6/R1/R2.
A 'C' is shown after the gear indication, when Forward or Reverse gear is active, and if the Lock–up clutch (see page *16*) is disengaged.
A line above and below, respectively, the gear indication shows that the gearshift lock-out function (see page *184*) is engaged.

5 Ambient temperature.

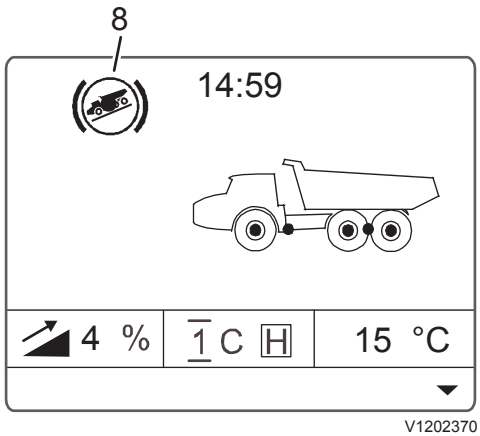
6 Several selections possible. When operating display 1 is shown, it is possible to use the arrow down key on the keypad for the operating information display unit (see page *52*) to select operating display 2.

7 The symbol for Engine retarding is shown when it is activated (also see page *190*).

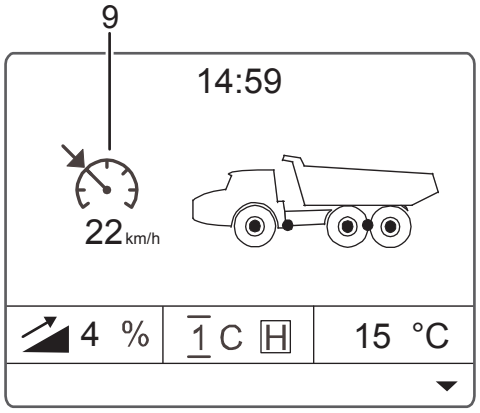


Alternative operating display 1

8 The symbol for Downhill Speed Control (applies to machines with this function) is shown when it is activated (also see page *252*).

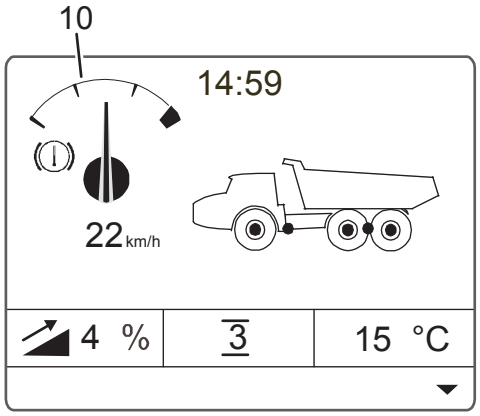


Alternative operating display 1 applies to machines with Downhill Speed Control



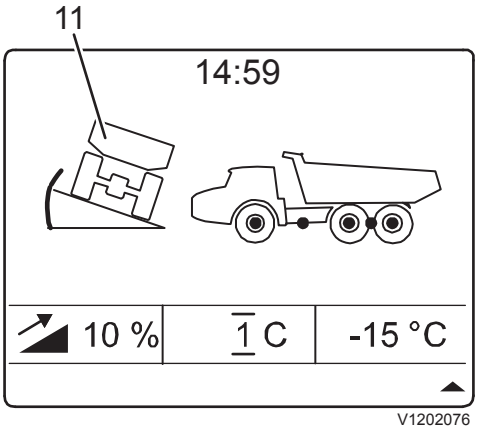
Alternative operating display 1 applies to machines with Cruise Control

9 The symbol for Cruise Control (applies to machines with this function) is shown when it is activated (also see page *248*).



Alternative operating display 1

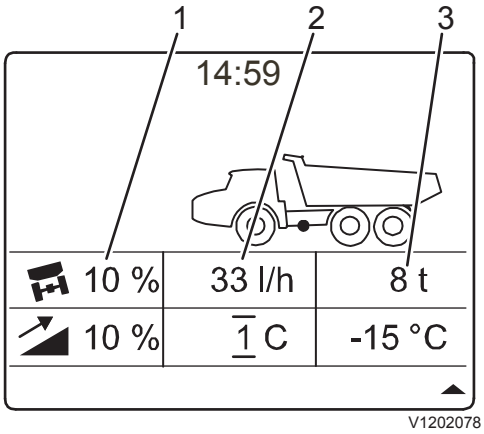
10 If the brake cooling oil temperature exceeds 105°C (221°F), a temperature gauge for brake cooling oil is shown. When the brake cooling oil temperature is below 95 °C (203 °F), the temperature gauge disappears. If the indicator needle enters the scale's red field, the brake cooling oil temperature is above 120 °C (248 °F) and amber alarm display is shown. If the indicator needle is to the far right in the scale's red field, the brake cooling oil temperature is above 130 °C (266 °F) and red alarm display is shown.



Alternative operating display 1

11 The load unit's sideways angle is shown to the left on the operating display when the angle exceeds 33% of the alarm value, the load body is up, or reverse gear is selected. The display figure is shown with a white or yellow symbol, depending on how much of the alarm value has been reached (see page *253*).

If any information is missing or fails to appear, – – – will be shown.



Operating display 2

Operating display 2

Operating display 2 shows the same information as operating display 1. In addition, the following is shown;

1 Load unit's angle indicator (inclination), sideways



Up to 33% of alarm value at increasing angle
Below to 30% of alarm value at decreasing angle



Above 33% of alarm value at increasing angle
Down to 30% of alarm value at decreasing angle
When angling to the left



Above 33% of alarm value at increasing angle
Down to 30% of alarm value at decreasing angle
When angling to the right

2 Instantaneous fuel consumption in litres per hour

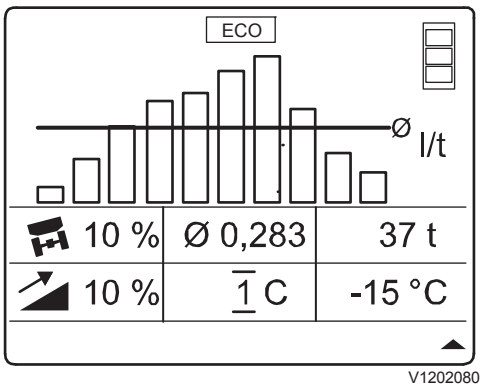
3 On-Board Weighing (Additional options)

When this operating display is active, select arrow up on the keypad for the operating information display unit to change to operating display 1 (see symbol down in the right corner in the figure to the left).

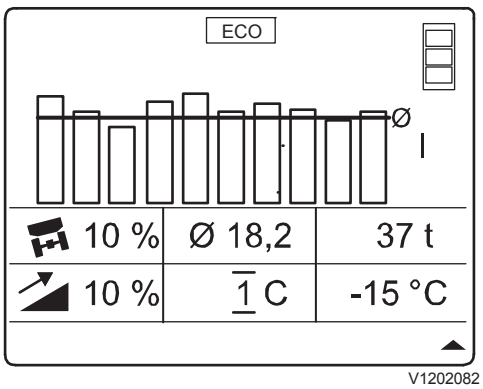
If any information is missing or fails to appear, – – – will be shown.

Operating display 3 and operating display 4

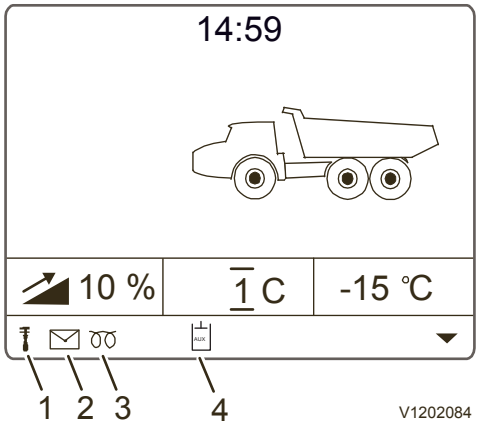
Operating display 3 and operating display 4 show information about the machine's fuel consumption; litres per tonne per work cycle (only shown if the machine is equipped with On-Board Weighing) as well as litres per work cycle, see page *243*.



Litres per tonne per work cycle



Litres per work cycle



Symbol field

In the symbol field the different symbols that are shown in the display figure can be lit up.

The symbols have the following meaning:

1 time for service

2 vehicle message available

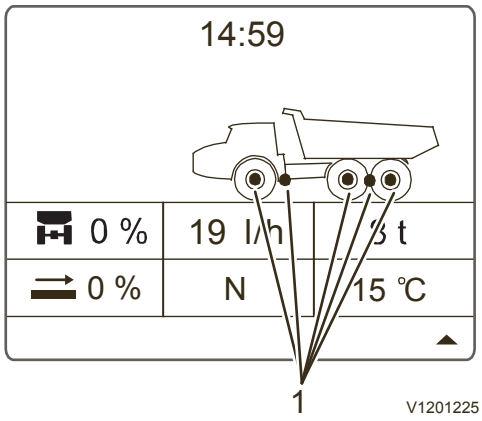
3 preheating or afterheating is activated

4 extra hydraulics activated (Hauler chassis) (see under heading **8.1 Extra hydraulics (optional equipment)** in section **Controls** starting on page *126*)

Differential locks

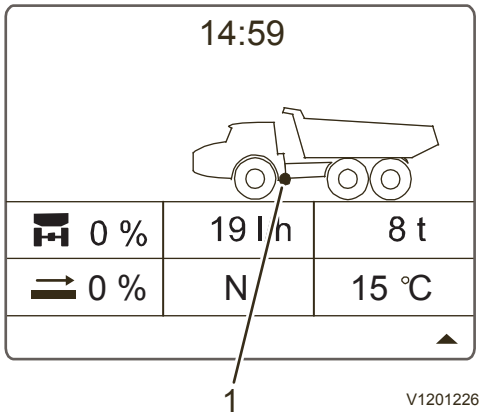
Differential locks are engaged automatically or manually. Operating display 1 and 2 show if the differential locks are engaged or disengaged.

All differential locks are engaged.



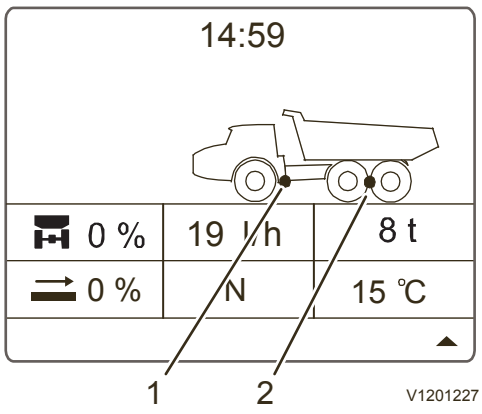
1 All differential locks

Longitudinal differential lock is engaged.

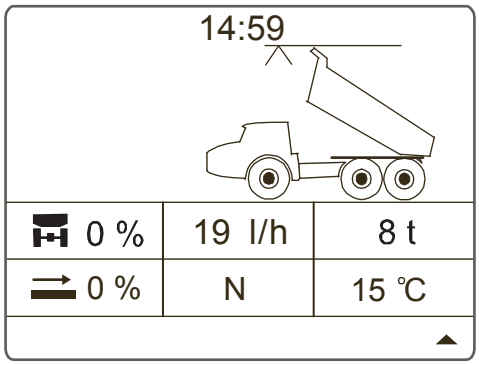


1 Longitudinal differential lock

Longitudinal differential lock and 6x6–drive are engaged.



1 Longitudinal differential lock
2 6x6 drive (6–wheel drive)



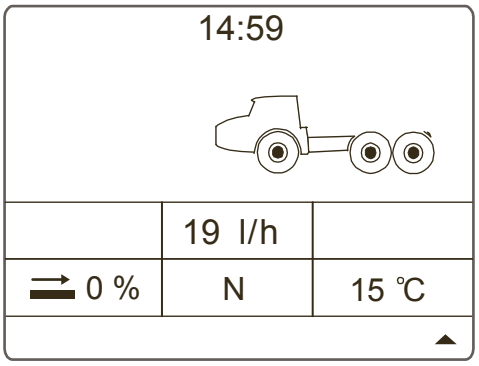
V1201447

Load body position

The true position of the load body is shown.
When the function max. dump height is activated, a line is shown above the load body.
Float mode is indicated by showing the load body using white lines.
The load body's lines are red when the body is in position up, raise, or hold, and the engine is running.

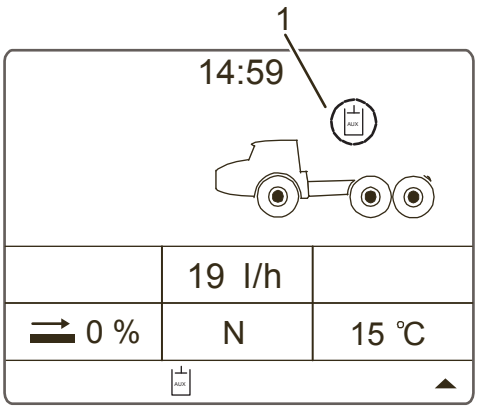
Alternative to dumping function

If the machine is not equipped with a load body, e.g. Hauler chassis, the load body is not shown in the operating display. Instead the operating display looks like the adjacent figure.



V1201448

When the extra hydraulics for Hauler Chassis are activated, this can be shown using an animation, see figure.

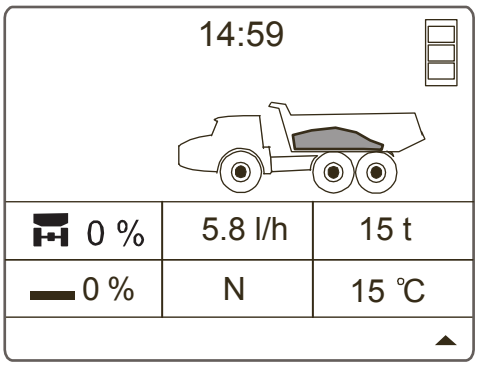


V1201449

1 Animated display of activated extra hydraulics

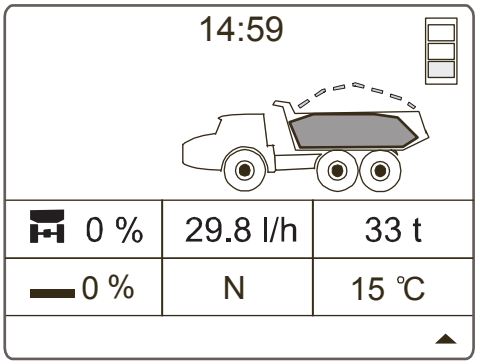
Load weighing

(Additional options)



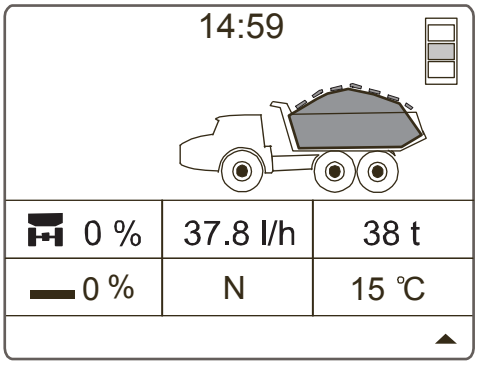
V1201383

Loading in progress. The load in the dump body is shown animated. No load indicator light is on, which means that the machine's load weight is below 75% of max. load weight.



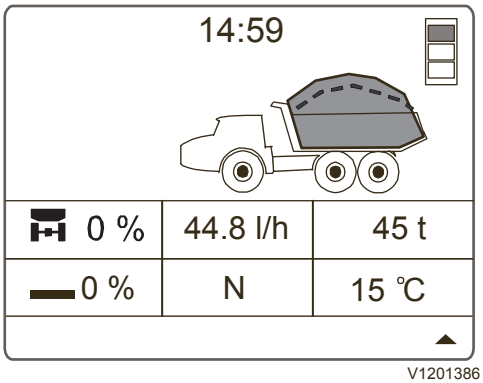
V1201384

Loading in progress. The load in the dump body is shown animated. Amber load indicator light is on, which means that the machine's load weight is 75–95% of max. load weight.



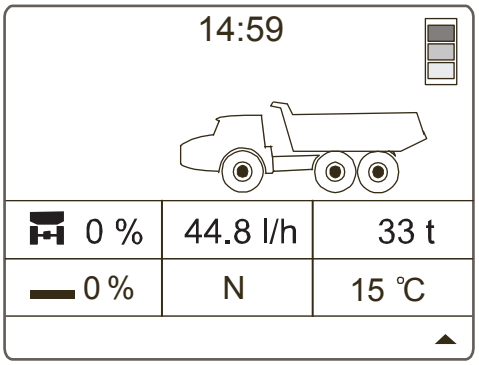
V1201385

Loading in progress. The load in the dump body is shown animated. Green load indicator light is on, which means that the machine is loaded with max. load weight.



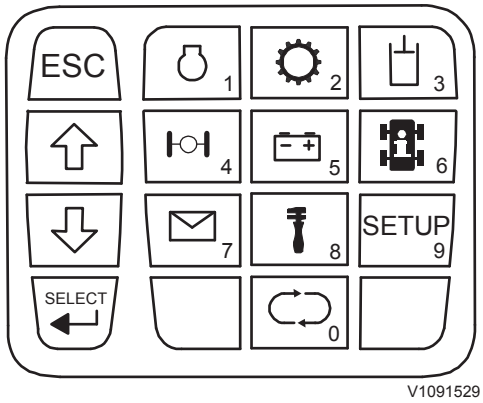
V1201386

Loading in progress. The load in the dump body is shown animated. Red load indicator light is on, which means that the machine is overloaded.



V1201387

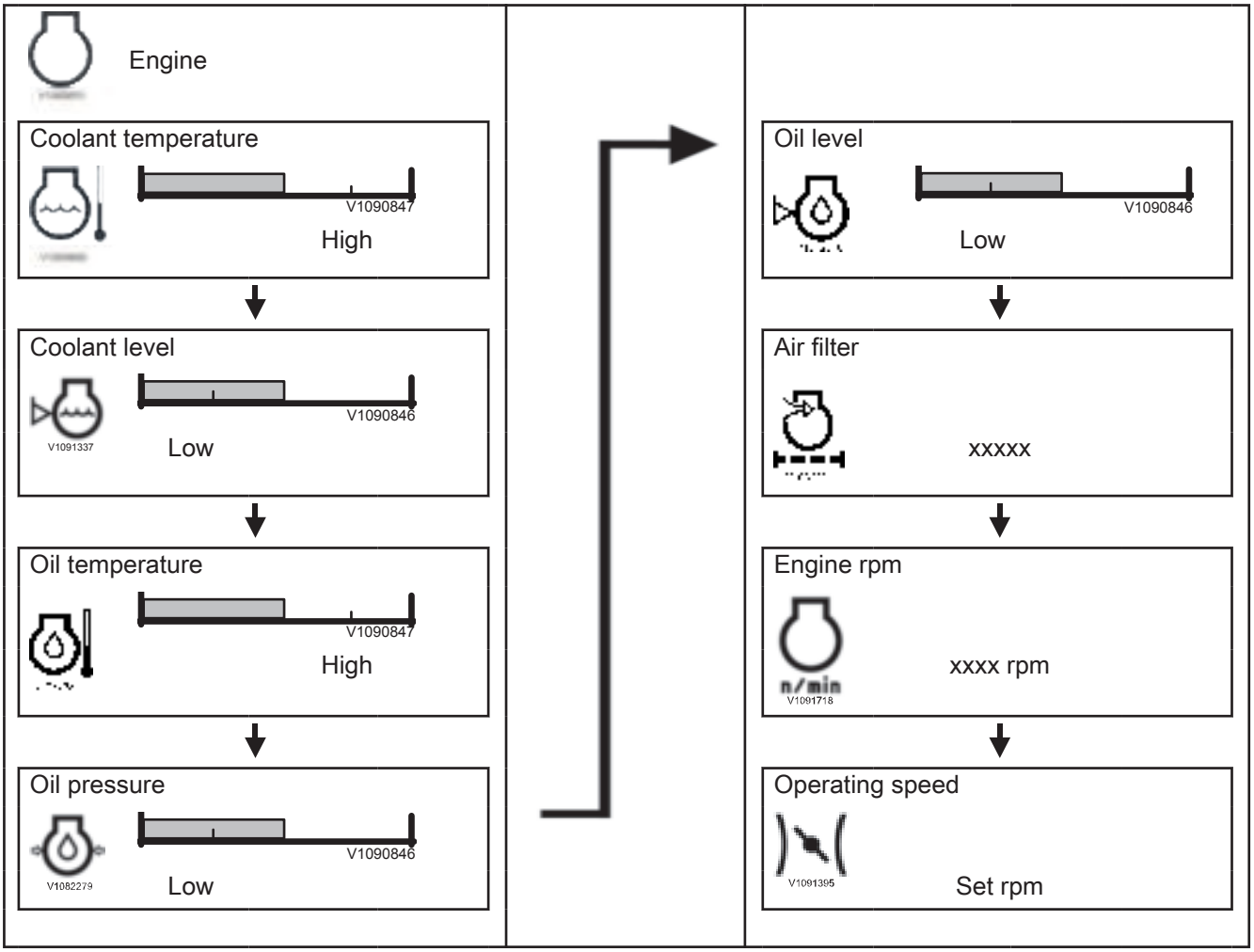
Conditions for load weighing are not fulfilled. All load indicator lights are on.



Information

Information about the machine's status is obtained by pressing each function on the keypad for the information display unit (see page *52*).
Each function group consists of one or more display figures or menus.
Use the arrow keys to scroll up or down in the menu.
Settings can be made in certain menus. Then the text is highlighted by a white box.
To go back to the operating display figure, press the ESC-key on the keypad for the information display unit.

Engine

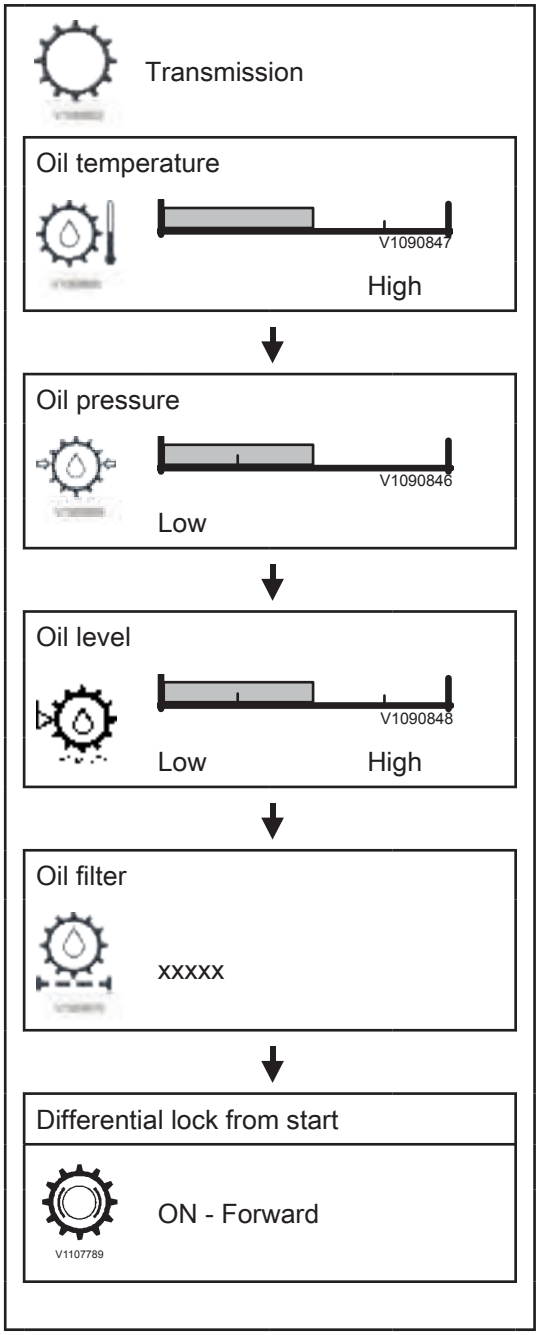


The above menu is shown after pressing the engine key.

- **Coolant temperature** — shows current status for coolant temperature; normal or high.
- **Coolant level** — shows current status for coolant level; normal or low.
- **Oil temperature** — shows current status for oil temperature; normal or high.
- **Oil pressure** — shows current status for oil pressure; normal or low.

- **Oil level** — shows current status for oil level; normal or low. For example, when the machine has just been started and there has not been enough time to read off the oil level, the text **Not read** is shown by the bar diagram.
- **Air filter** — shows current status for the air filter; normal or clogged.
- **Engine rpm** — shows current engine speed (rpm).
- **Operating speed** — here it is possible to set the desired working speed (rpm).
  Setting working speed (rpm), see under heading "Setting working speed (rpm)" in section "Settings" on page *67*.

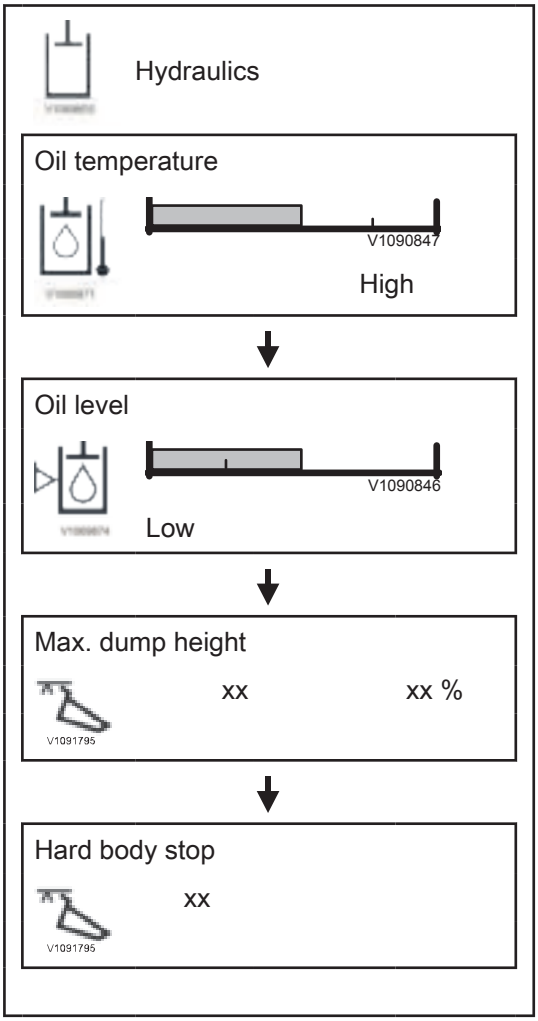
Transmission



This menu is shown after pressing the transmission key.

- **Oil temperature** — shows current status for oil temperature; normal or high.
- **Oil pressure** — shows current status for oil pressure; normal or low.
- **Oil level** — shows current status for oil level; low, normal, or high.
  The oil level in the transmission is only read off if; the oil temperature is between 25 – 80 °C (77 – 176 °F), the machine is not angled horizontally (fore-aft), the engine is running, and the machine is stationary. If these requirements are not fulfilled, the oil level is not read off and the text **Not read** is shown by the bar diagram.
- **Oil filter** — shows current status for the oil filter; normal or clogged.
- **Differential lock from start** (from Quarter 2, 2019) — shows if the function “Differential lock from start” is activated. Activation and deactivation of “Differential lock from start”, see under heading “Activating/deactivating differential lock from start” in section “Settings” starting on page *67*.

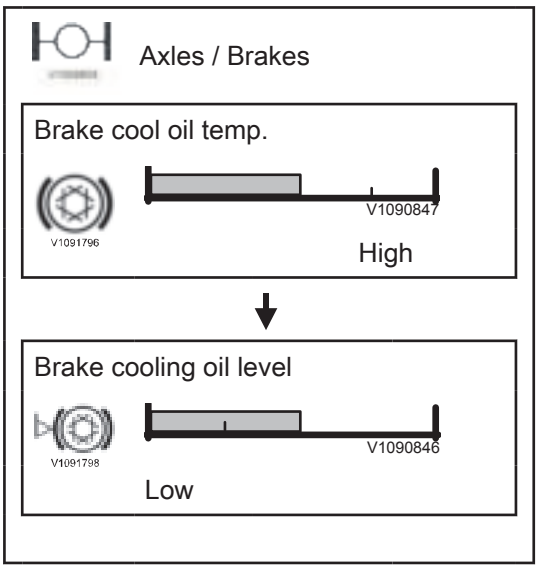
Hydraulics



The menu is shown after pressing the hydraulics key.

- **Oil temperature** — shows current status for oil temperature; normal or high.
- **Oil level** — shows current status for oil level; normal or low.
- **Max. dump height** — shows if the function "max. dump height" is activated. Also, the set dump height is shown as a percentage of possible dump height (100%).
  Activation and deactivation of "max. dump height", see under heading "Activating/deactivating max. dump height", in section "Settings" starting on page *67*.
  Setting "max. dump height", see under heading "Setting max. dump height", in section "Settings" starting on page *67*.
- **Hard load body stop** — shows if the function "Hard load body stop" is activated.
  Activation and deactivation of "Hard load body stop", see under heading "Activating/deactivating hard load body stop" in section "Settings" starting on page *67*.

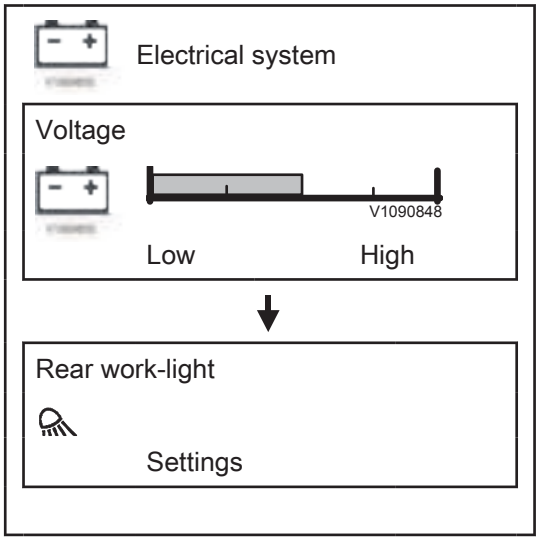
Axles / Brakes



This menu is shown after pressing the key for axles/brakes.

- **Brake cool oil temp.** — shows status for brake cooling oil temperature; normal or high.
- **Brake cooling oil level** — shows status for brake cooling oil level; low or normal.

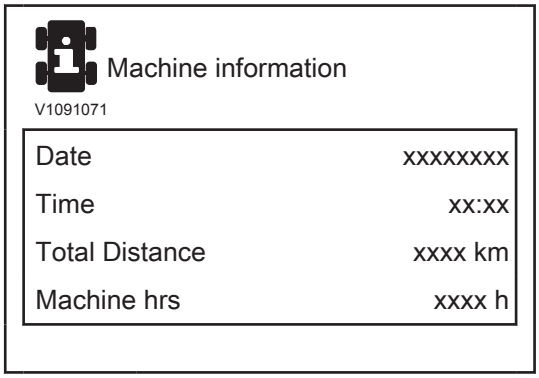
Electrical system



This menu is shown after pressing the electrical system key.

- **Voltage** — shows status for system voltage; low, normal, or high.
- **Rear work-light** — automatic rear work lights can be set under Settings. See section "Settings" starting on page *67*.

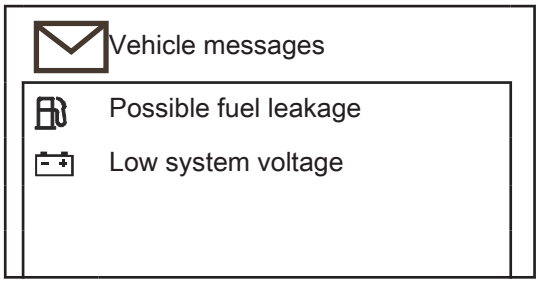
Machine information



The menu is shown after pressing the machine information key. The menu shows operating information.

- **Date** — shows current date.
- **Time** — shows real-time.
- **Total Distance** — shows total distance in the unit km or mile (shown unit is set under the Setup menu), for the latest operating cycle.
- **Machine hrs** — shows machine's total operating time in hours.

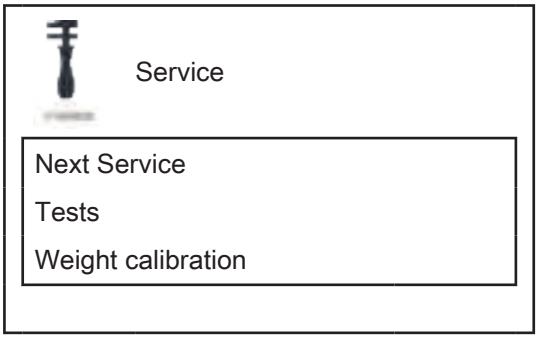
Vehicle messages



This menu is shown after pressing the message key if there are any machine messages, otherwise the field is blank.

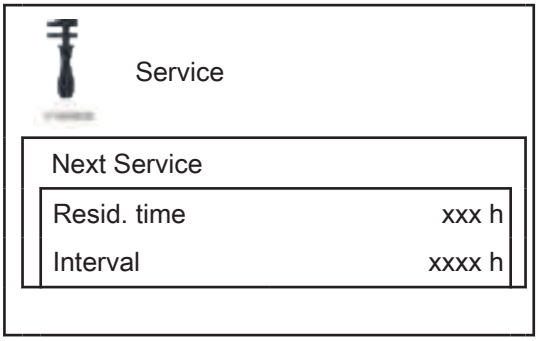
To read vehicle messages, see description on page *103*.

Service

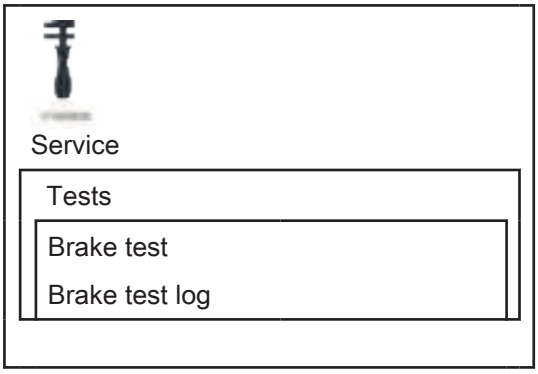


The menu is shown after pressing the service key.

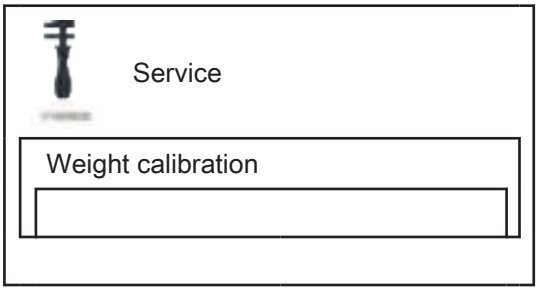
This menu shows information about the next service interval, tests, and load calibration.



- **Next Service** — this sub-menu shows information about service. To access the service information, scroll down to **Next Service** in the menu with the arrow keys. Choose with the SELECT-key.
  - **Resid. time** — shows remaining time in hours until next service is needed.
  - **Interval** — shows next service interval.



- **Tests** — this sub-menu shows any tests that can be run.
  - **Brake test** — here you find information about the brake test. For more information on stationary brake test, see page *323*.
  - **Brake test log** — here you find logged information for the four latest brake tests.

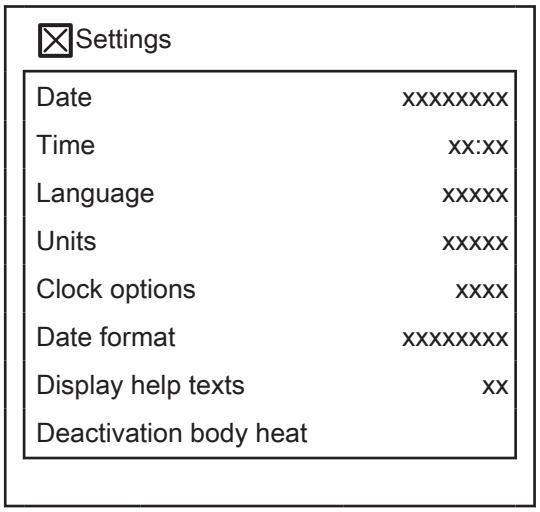


- **Weight calibration** — load calibration is started in this submenu, see also *371*.

Settings

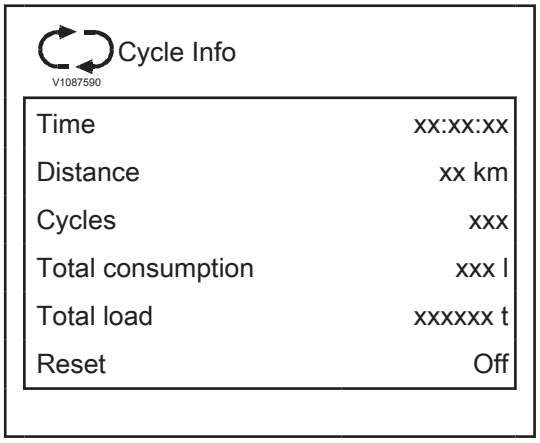
This menu is shown after pressing the SETUP-key. The menu shows current settings and here it is also possible to change these settings. Scroll up or down in the menu with the arrow keys. Detailed information on how to perform the following settings, see under section "Settings" starting on page *67*.

- **Date** — here it is possible to change the date.
- **Time** — real-time can be set here.
- **Language** — set language can be changed here.
- **Units** — here it is possible to choose if values should be shown in Metric or US units.



- **Clock options** — format for display of real-time is set here. Alternatives are 12–hour or 24–hour display.
- **Date format** — format for display of date is set here; day–month–year, year–month–day, or month–day–year.
- **Display help texts** — here it is possible to activate and deactivate display of text in alarm figures.
- **Deactivation body heat**: — deactivation and activation of load body heat.

Cycle Info

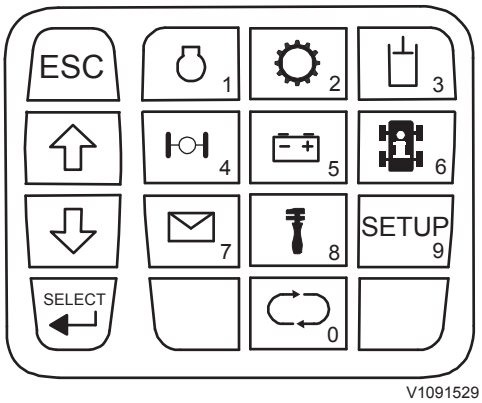


This menu is shown after pressing the cycle information key.

The information in this menu shows values since the last reset.

- **Time** — shows time that the machine has been operated since last reset.
- **Distance** — shows driven distance in km, or miles, since last reset.
- **Cycles** — shows number of completed operating cycles since last reset.
- **Total consumption** — shows total fuel consumption in litres, or US gallons, since last reset.
- **Total load** — shows total transported load in tons, alt. short tons, since last reset.
- **Reset** — here the above values can be reset.
  Scroll down in the menu until the word Off is highlighted. Press the SELECT-key on the keypad. Then the word Reset is shown briefly before Off is shown again. Reset has been completed.

Settings



Keypad for information display unit

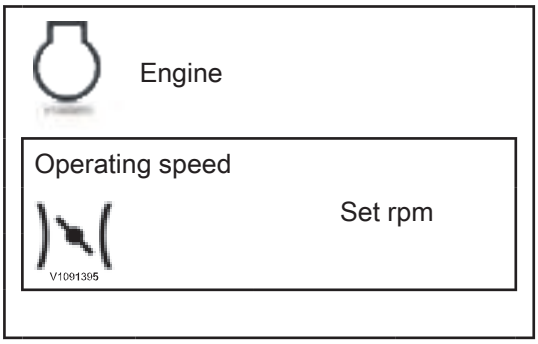
All selections are confirmed with the SELECT-key on the keypad for the information display unit.
The ESC-key can be used at any time go back to the previous page. Press the ESC-key once or twice to return to the operating display. (See also page *52*).

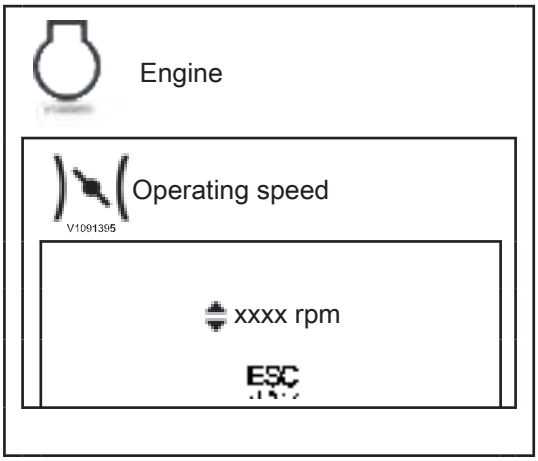
Setting working rpm (optional equipment)

1 Press key 1 Engine.

2 Scroll down in the engine menu with the arrow keys until “Set rpm" under "Operating speed” is highlighted.

3 Confirm the selection with the SELECT-key.



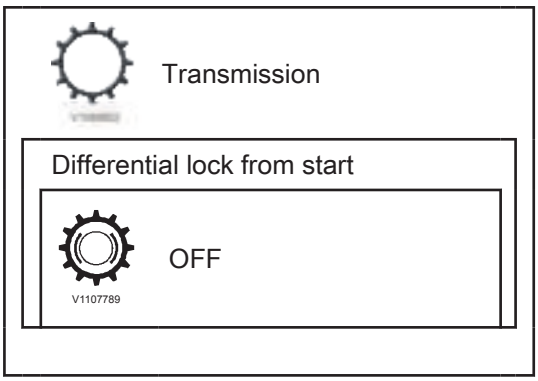


4 Set desired rpm with the arrow keys on the keypad.

5 Confirm the setting and close the sub-menu with the SELECT-key.

Activating/deactivating differential lock from start

(From quarter 2, 2019) see page *186*



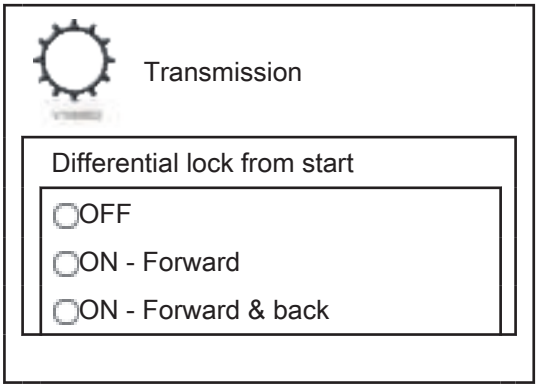
1 Press key 2, Transmission.

2 Scroll down in the transmission menu with the arrow keys until the text closest to the transmission symbol under “Differential lock from start” is highlighted.

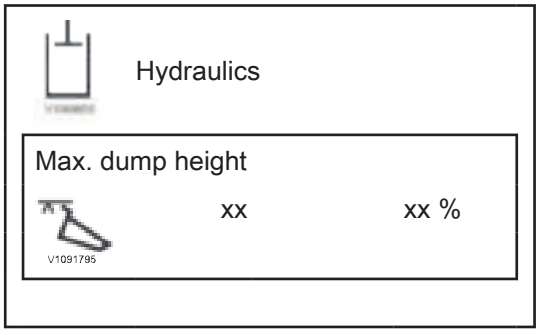
3 Confirm the selection with the SELECT-key.

4 Set the desired selection for differential lock from start with the arrow keys on the keypad.

5 Confirm the setting and close the sub-menu with the SELECT-key.



Activating/deactivating max. dump height

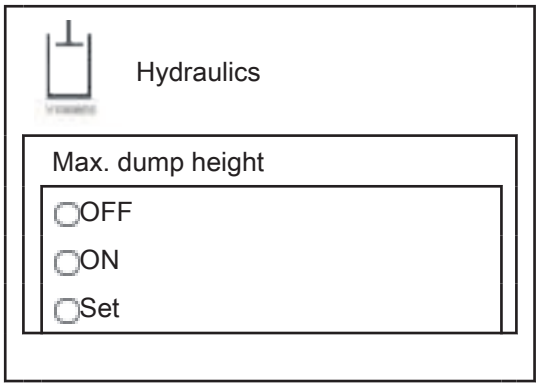


When max. dump height is set to ON the max. dump height that was set earlier will be activated automatically.

1 Press key 3 Hydraulics.

2 Scroll down in the hydraulics menu with the arrow keys until the text closest to the load body symbol under “Max. dump height” is highlighted.

3 Press the SELECT-key to open the sub-menu with available choices.

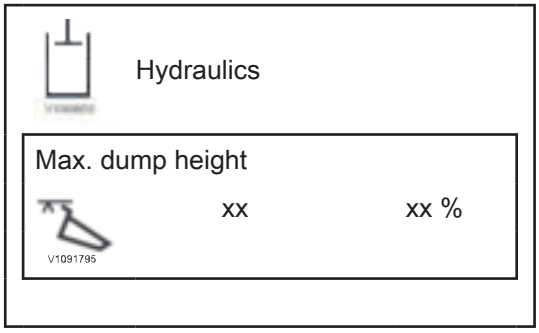


4 Scroll with the arrow keys to the desired choice (ON or OFF) is highlighted.

5 Press the SELECT-key to confirm the selection and return to the hydraulics menu.

Setting max. dump height

NOTE!
Before the dump height is changed, make sure that the area above the load body is unobstructed.



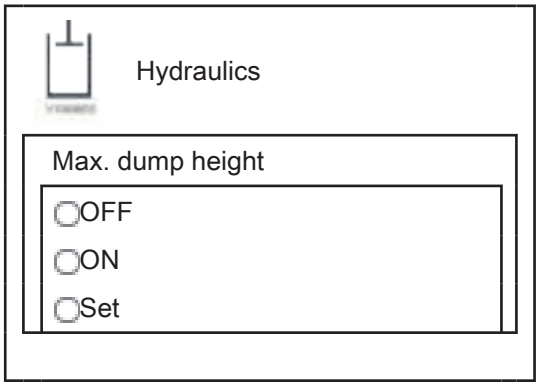
If max. dump height is to be increased, first "Max. dump height" must be set to OFF. This is to enable raising of the load body regardless of the earlier setting.

1 Press key 3 Hydraulics.

2 Scroll down in the hydraulics menu with the arrow keys until the text (OFF) under "Max. dump height” is highlighted.

3 Press the SELECT-key to enter the sub-menu.

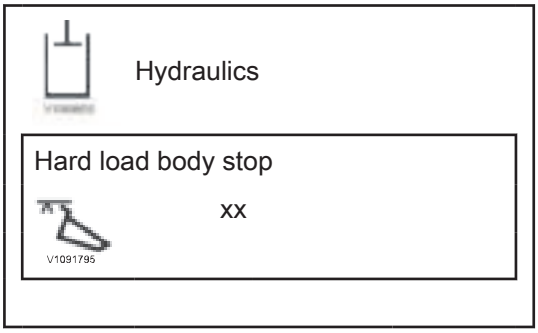
4 Raise the load body to desired height for max. dump height.



5 Scroll down in the menu with the arrow keys until "Set” is highlighted.

6 Confirm the setting and return to the hydraulics menu by pressing the SELECT-key

Activating/deactivating hard load body stop



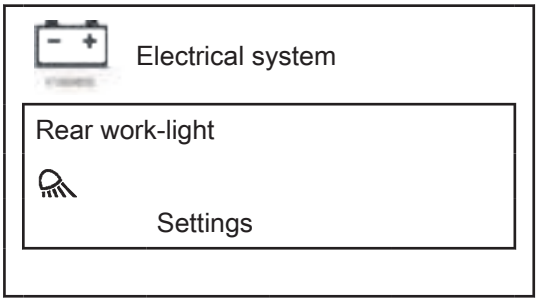
1 Press no. 3 Hydraulics.

2 Scroll down in the hydraulics menu with the arrow keys until the text beside the load body symbol under Hard body stop is highlighted.

3 Activate (ON), or deactivate (OFF), hard load body stop with the SELECT-key.

4 Return to the operating display with the ESC-key.

Setting automatic rear work lights



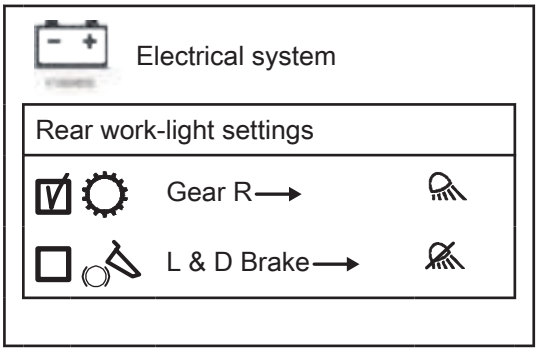
1 Press no. 5 Electrical system.

2 Scroll down in the electrical system menu with the arrow keys until the text **Settings** under **Rear work-light** is highlighted.

3 Press the SELECT-key to enter the sub-menu.

4 Scroll down with the arrow keys to select one of the alternatives.

The following settings are possible:

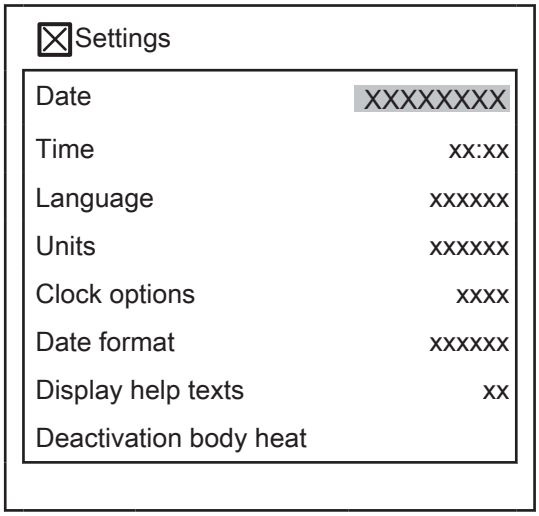


- No selection - no automatic work lights
- **Gear R** selected - work lights turn on when the gear selector is in reverse position.
- **L & D Brake** selected - work lights turn off when the load and dump brake is activated.
- **Gear R** and **L & D Brake** selected - work lights turn on when the gear selector is in reverse position and turn off when the load and dump brake is activated

5 Activate or deactivate the alternatives by pressing the SELECT-key.
When the alternative is activated, a checkmark is shown in the box in front of the alternative. When the alternative is deactivated, the box is shown without a checkmark.
As default, both lighting in reverse gear and lighting with load and dump brake are selected.

6 Return to the menu for the electrical system by pressing the ESC-key.

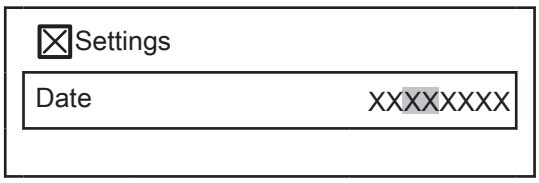
Setting date



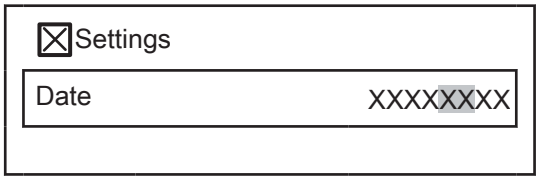
1 Press key no. 9 Settings, to open the setup menu.

2 Highlight the date in the setup menu by scrolling with the arrow keys.

3 Press the SELECT-key to highlight the first part of the date (may be year, month, or day depending on set date format, see below).

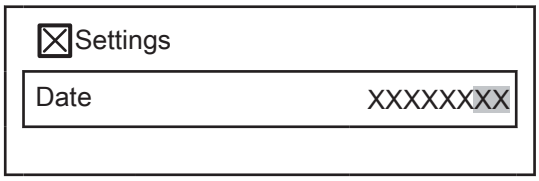


4 Use the arrow keys or number keys to change the setting.



5 If needed, press the SELECT-key to skip to the next part of the date.

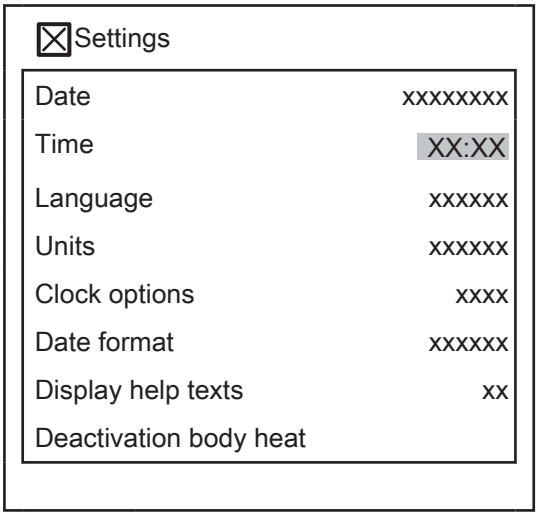
6 Use the arrow keys or number keys to change the setting for the second part of the date.



7 Press the SELECT-key to skip to the third part of the date.

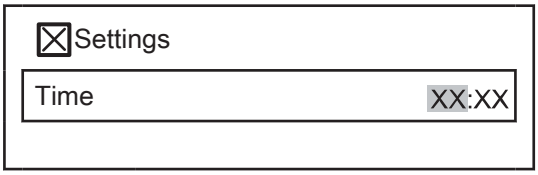
8 Use the arrow keys or number keys to change the setting. If the change is performed using the number keys the whole date is highlighted directly, otherwise you need to confirm the change with the SELECT-key.

Setting time/clock



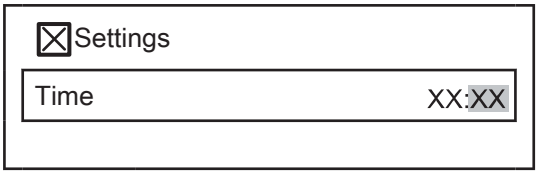
1 Press key no. 9 Settings.

2 Scroll down with the arrow keys until the time is highlighted.



3 Press the SELECT-key to highlight hour.

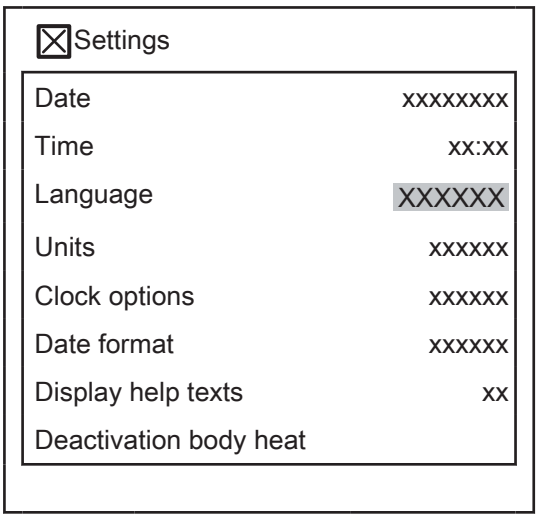
4 Use the arrow keys or number keys to change the hour setting.



5 If needed, press the SELECT-key to highlight minute.

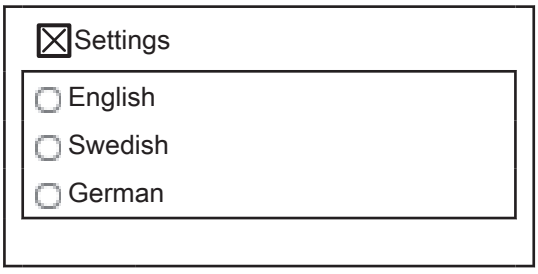
6 Use the arrow keys or number keys to change the minute setting. If needed, confirm with the SELECT-key.

Setting language



1 Press key no. 9 Settings.

2 Scroll down in the setup menu with the arrow keys until “Language” is highlighted.

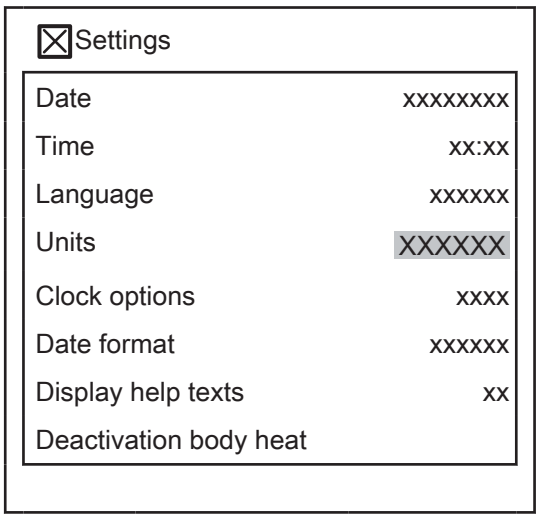


3 Press the SELECT-key to open the sub-menu with available languages.

4 Scroll in the setup menu with the arrow keys until desired language is highlighted.

5 Confirm the selection and return to the setup menu with the SELECT-key.

Setting units



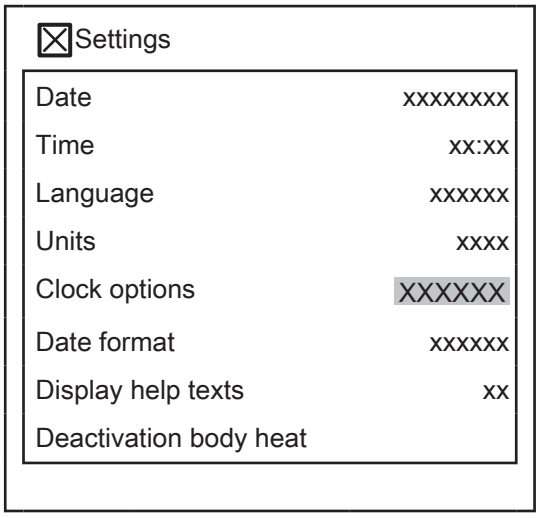
1 Press key no. 9 Settings.

2 Scroll with the arrow keys to highlight the text to the right of "Units".

3 Press the SELECT-key to change unit system. Possible choices are; Metric and US.

4 Return to the operating display by pressing the ESC-key.

Setting time format



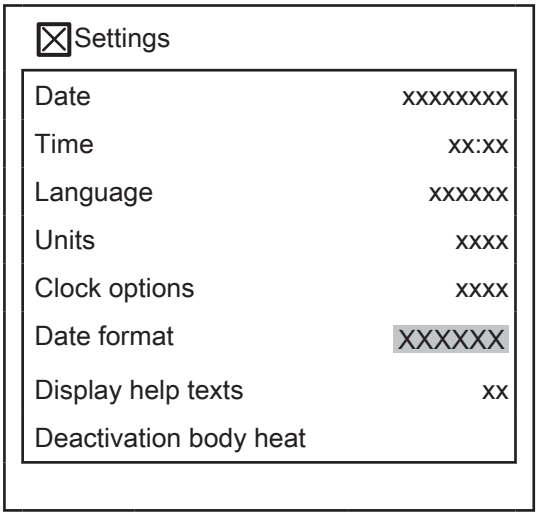
1 Press key no. 9 Settings.

2 Scroll down in the setup menu with the arrow keys until "Clock options" is highlighted.

3 Press the SELECT-key to change between 12 hour display (am pm) and 24 hour display.

4 Return to the operating display by pressing the ESC-key.

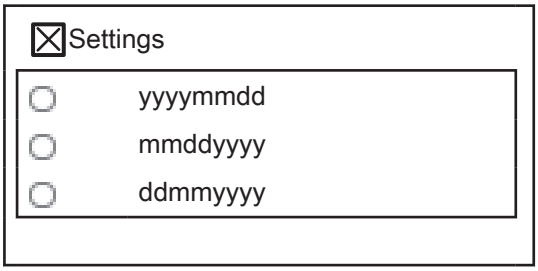
Setting date format



1 Press key no. 9 Settings.

2 Scroll down in the setup menu with the arrow keys until Date format is highlighted.

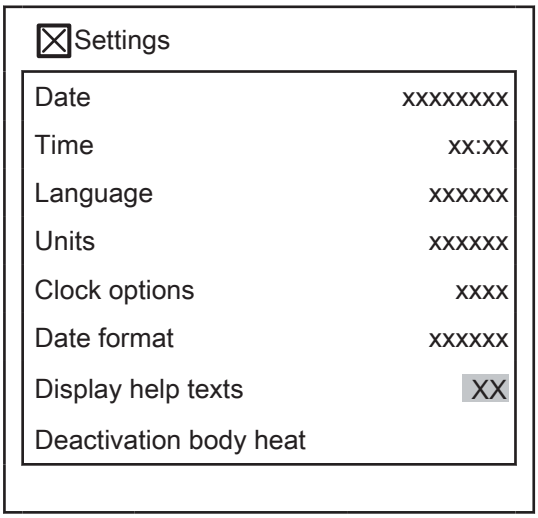
3 Open the sub-menu by pressing the SELECT-key.



4 Scroll in the menu with the arrow keys until the desired date format is highlighted.

5 Confirm the selection and return to the setup menu by pressing the SELECT-key.

Activating/deactivating help text in operating mode



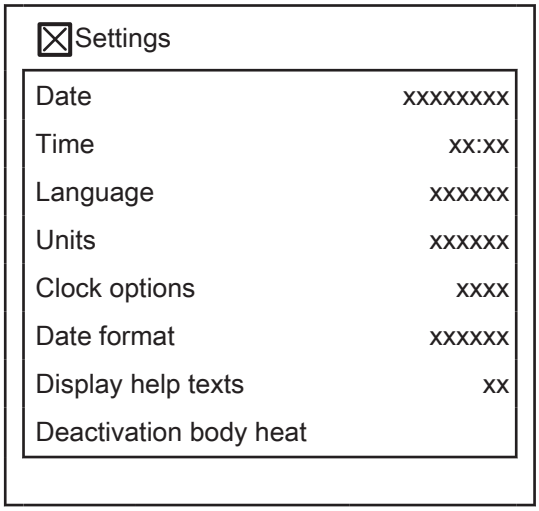
1 Press key no. 9 Settings.

2 Scroll down in the setup menu until the text beside “Display help texts” is highlighted.

3 Use the SELECT-key to change between both possible choices; OFF and ON.

4 Return to the operating display with the ESC-key.

Activating/deactivating load body heat



For permanent dismantling and removal of load body heating, contact an authorized Volvo dealer.

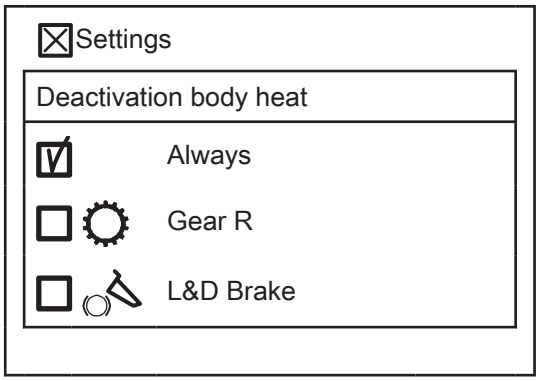
1 Press key no. 9 Settings.

2 Scroll down in the setup menu until the text “Deactivation body heat” is highlighted.

3 Open the sub-menu for "Deactivation body heat" by pressing the SELECT-key.

4 Scroll down with the arrow keys to highlight one of the alternatives with the SELECT-key.

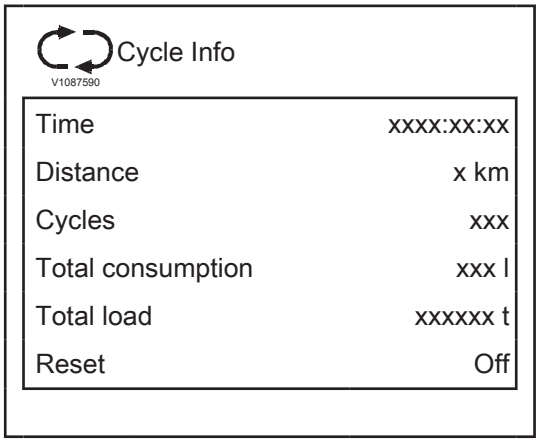
The following settings are possible:



- **Always** selected - load body heat deactivated.
- **Gear R** selected - load body heat deactivated when gear selector is in reverse position.
- **L&D Brake** selected - load body heat deactivated when load and dump brake is activated.

5 Return to the operating display with the ESC-key.

Resetting cycle information



1 Press key no. 0 Cycle information to open the menu.

2 Scroll down with the arrow keys until the text "Off" beside "Reset” is highlighted.

3 Press the SELECT-key to reset the cycle information. The text "Reset" is shown for a few seconds before "Off" is shown again.

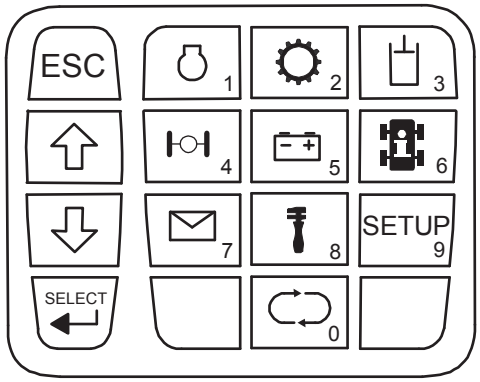
4 Return to the operating display by pressing the ESC-key.

Alarm screens

The alarm display is shown for as long as the problem remains.

If more than one alarm occurs at the same time, the latest one is shown at the top. If any of the alarms result in activation of the red central warning light and the buzzer, only this, or these, are shown.

It is not possible to scroll between different warning levels, e.g., between amber and red. The higher red level always has priority.



Keypad, information display unit

Error codes

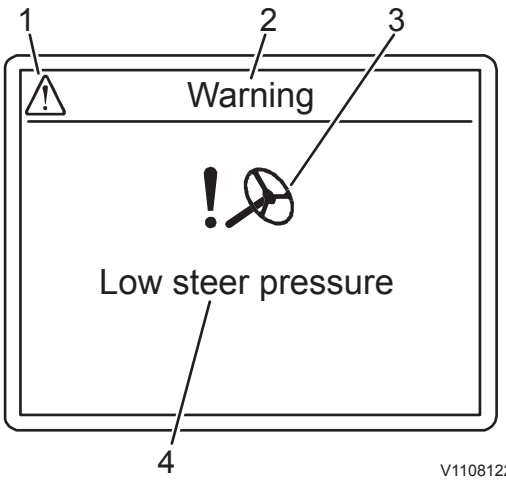
In the event of an alarm requiring action from an authorized workshop, reporting the error code is recommended.
To access the error code, click on SELECT the keypad on the information display unit.



Red alarm display

Alarm screens, warnings

If red alarm display is shown, stop the machine immediately and investigate the cause. The buzzer sounds with a warning frequency as long as the alarm is active, and a red central warning light comes on in the instrument panel.
The alarm can only be acknowledged by a qualified service technician.



The adjacent figure is an example of how the alarm display **Warning** is shown on the information display unit. Text, lines, and symbols are shown red on black background.

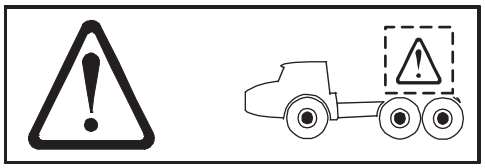
1 Symbol ... (is shown in table below)

2 ... and text that shows what type of alarm display it is. In this case, red alarm display — Warning.

3 Symbol to what the alarm applies, in this case steering (is shown in table below).

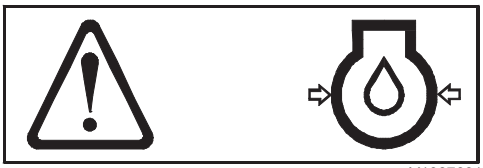
4 Describing text (is shown in table below)

Alarm screens warnings, general

Warnings	Actions
 V1092474 Low steer pressure	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1088237 Hardware failure Reduced functionality	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1092473 External equipment failure	1 Contact an authorized workshop.

Alarm screens warnings, engine

Warnings	Actions
 V1087621 High engine oil temperature	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Wait until the temperature has reached a normal level. 3 If the alarm recurs, contact an authorized workshop.
 V1087623 Engine failure	1 Stop the machine immediately, safely and in the nearest appropriate location 2 Contact an authorized workshop.
 V1087623 High crankcase pressure	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.

Warnings	Actions
 V1087627 Engine overspeed	1 Reduce the speed. 2 If the alarm recurs after action, contact an authorized workshop.
 V1087628 Low oil level engine	1 Fill with engine oil to correct level. See page *351* 2 If the alarm recurs after action, contact an authorized workshop.
 V1087631 Low engine oil pressure	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1087632 High coolant temp. engine	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Check whether the radiator is clogged. See page *333* 3 If the alarm recurs after action, contact an authorized workshop.
 V1087634 Coolant level low	1 Fill with coolant. See page *360* 2 If the alarm recurs after action, contact an authorized workshop.

Alarm screens warnings engine, turbo

Warnings	Actions
 V1088237 Turbocharger compressor outlet temperature	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.

Alarm screens warnings engine, charge air pressure

Warnings	Actions
 V1088297 High boost pressure	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1092553 High boost temperature	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Check whether the charge-air cooler needs to be cleaned. See *356* 3 If the alarm recurs after action, contact an authorized workshop.

Alarm screens warnings engine, regeneration

Warnings	Actions
 V1088273 Engine emission system failure	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1088 269 Park safely Service regeneration needed Derate active	1 Park the machine in a fireproof area. Apply the parking brake. 2 Turn off the engine. 3 Contact an authorized workshop for regeneration 4 See also page *194*
 V1088 269 Park machine Service needed. Derate activ	1 Park the machine in a fireproof area. Apply the parking brake. 2 Turn off the engine. 3 Contact an authorized workshop to have the diesel particulate filter replaced. 4 See also page *194*

Alarm screens warnings engine, AdBlue®/DEF

NOTE!
For alarms relating to AdBlue®/DEF “AdBlue®” or “DEF” is displayed depending on the market. “AdBlue®” is used in the following descriptions of the information display unit texts.

Warnings	Actions
 V1132842 Park safely AdBlue emptyFull derate soon	1 Park safely 2 Top up with AdBlue®/DEF, see page *347* 3 If the alarm recurs after action, contact an authorized workshop.
 V1132842 Refill AdBlue AdBlue emptyFull derate active	1 Top up with AdBlue®/DEF, see page *347* 2 If the alarm recurs after action, contact an authorized workshop.
 V1132842 Park safely Wrong AdBlue qualityFull derate soon	1 Park safely 2 Drain the AdBlue® and change grade. See page *349* and *347* 3 If the alarm recurs after action, contact an authorized workshop.
 V1132842 Replace AdBlue Wrong AdBlue qualityFull derate active	1 Drain the AdBlue® and change grade. See page *349* and *347*. 2 If the alarm recurs after action, contact an authorized workshop.

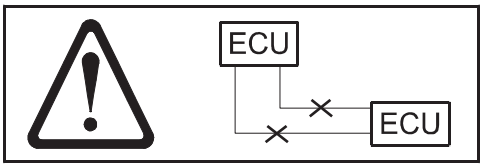
Alarm screens warnings engine, SCR

Warnings	Actions
 V1132842 Park safely SCR-system failureFull derate soon	1 Park safely. 2 See information on page *201*. 3 Contact an authorized workshop.
 V1132842 Check SCR-system SCR-system failureFull derate active	1 See information on page *201*. 2 Contact an authorized workshop.

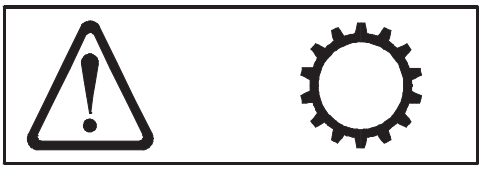
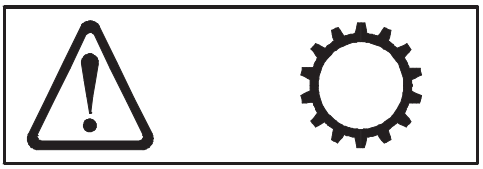
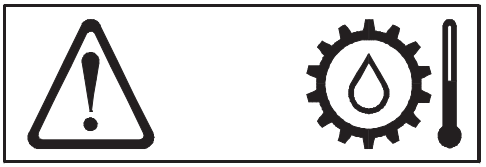
Alarm screens warnings engine, DPF

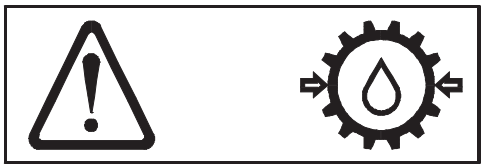
Warnings	Actions
 V1088273 Check DPF-system DPF-system failure Full derate active	1 Stop the machine safely in the nearest appropriate location. 2 For information, see page *202*. 3 Contact an authorized workshop
 V1088273 Check DPF-system DPF-system missing Full derate active	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 For information, see page *202*. 3 Contact an authorized workshop
 V1088273 Check DPF-system DPF-system deactivated Full derate active	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 For information, see page *202*. 3 Contact an authorized workshop
 V1088273 Park safely DPF-system missing Full derate soon	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 For information, see page *202*. 3 Contact an authorized workshop
 V1088273 Park safely DPF-system deactivated Full derate soon	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 For information, see page *202*. 3 Contact an authorized workshop

Alarm screens warnings, electrical system

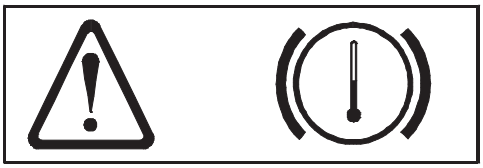
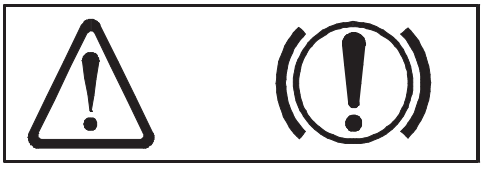
Warnings	Actions
 A1393600 ECU network comm. interrupt	1 Contact an authorized workshop.

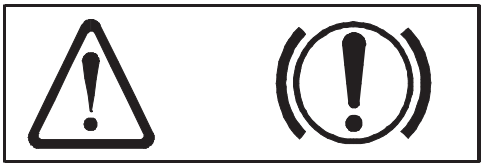
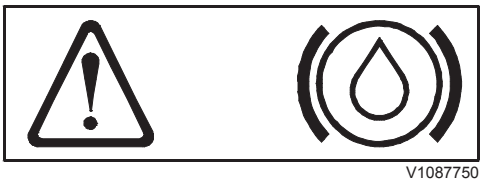
Alarm screens warnings, power transmission

Warnings	Actions
 V1087651 Low pressure transmission lubrication	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1087651 Transmission error	1 Stop the machine immediately, safely and in the nearest appropriate location 2 Contact an authorized workshop.
 V1087653 High transmission oil temp.	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Let the machine idle until the temperature has reached a normal level. 3 If the alarm recurs after action, contact an authorized workshop.
 V1087654 Transmission oil level high	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 For information, see page *367* 3 If the alarm recurs after action, contact an authorized workshop.
 V1087654 Transmission oil level low	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 For information, see page *367* 3 If the alarm recurs after action, contact an authorized workshop.

Warnings	Actions
 V1087655 Low transmission oil pressure	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1088237 Reduce speed	The transmission requests action: 1 Reduce the speed. 2 If the alarm recurs after action, contact an authorized workshop.

Alarm screens warnings, brakes

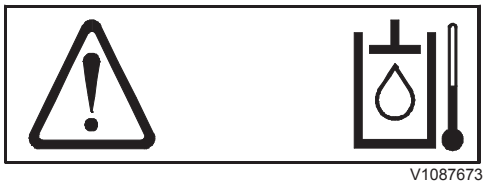
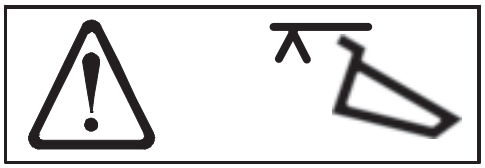
Warnings	Actions
 V1088312 Brake cooling oil high temperature	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Let the machine idle until the temperature has reached a normal level. 3 Drive at a lower speed. 4 If the alarm recurs, contact an authorized workshop.
 V1087660 Low brake pressure	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1087661 Parking brake NOT applied	1 Apply the parking brake before leaving the operator’s seat. 2 If the fault persists, contact an authorized workshop.
 V1088314 Emergency brake failure	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.

Warnings	Actions
 V1088314 Brake system failure	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1087750 Brake cooling oil level low	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.

Alarm screens warnings, cab

Warnings	Actions
 V1088300 Door open	1 Close the door! 2 If the fault persists, contact an authorized workshop.
 V1087663 Fasten seat belt	1 Put on the seatbelt. 2 If the fault persists, contact an authorized workshop.

Alarm screens warnings, hydraulic system

Warnings	Actions
 V1087673 High hydraulic oil temp.	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Wait until the temperature has reached a normal level. 3 If the fault persists, contact an authorized workshop.
 V1092554 Max. dump height failure Deactivate	1 Deactivate the function; follow the instructions. See page *67* 2 If the fault persists, contact an authorized workshop.

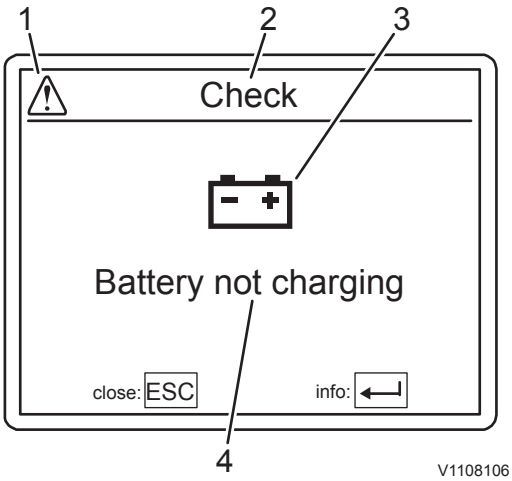
Warnings	Actions
 V1088301 Tip lever failure	1 Contact an authorized workshop.
 V1088317 Body movement	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop.
 V1088317 Dump system failure	1 Contact an authorized workshop.



Amber alarm display

Alarm screens, check

If an amber alarm display is shown, the cause must be investigated at the next stop. The buzzer emits four short signals and the amber central warning light is activated on the instrument panel.
The alarm is repeated at the next engine start, if it is still active.
The alarm can be acknowledged with the ESC-key.



V1108106

The adjacent is an example of what the alarm display **Check** may look like on the information display unit. Text, lines, and symbols are shown yellow on black background.

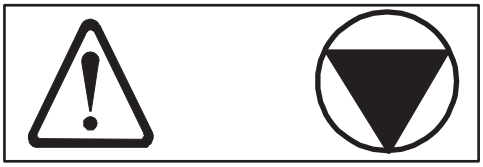
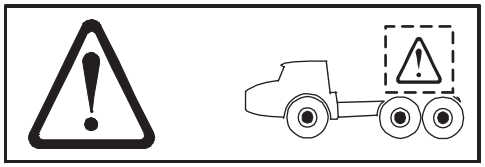
1 Symbol ... (is shown in table below)

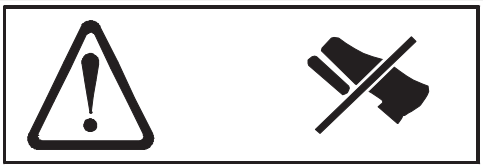
2 ... and text that shows what type of alarm display it is. In this case, yellow alarm display — Check.

3 Symbol to what the alarm applies, in this case battery/system voltage (is shown in table below).

4 Describing text (is shown in table below).

Alarm screens check, general

Check	Actions
 V1087641 Time remaining XXX h Next service, interval XXXX h	1 Contact an authorized workshop to book a service.
 V1092511 Emergency stop	1 Engine switched off with emergency stop, reset the knob to be able to restart. See page *204*
 V1092473 External equipment failure	1 Work carefully and contact an authorized workshop when appropriate.
 V1088340 Vehicle speed limit exceeded	1 Reduce the speed.
 V1088340 Slippery road conditions Deactivate speed control (Applies to Downhill Speed Control)	1 Disable cruise control.
 V1088340 Slippery road conditions Speed control deactivated (Applies to Cruise Control)	1 Cruise control disabled. 2 Reactivate when the slippery conditions have ceased.
 V1136476 Machine overloaded	1 Unload parts of the load. See page *175*, *260* and *261*

Check	Actions
 V1200721 Radar not functional (Additional options)	1 Check the instruction manual for the optional equipment for information. See also page *17*
 V1211264 Release accelarator pedal Uncontrolled wheel slip	1 Release the accelerator pedal 2 Activate the diff locks

Alarm screens check, engine

Check	Actions
 V1087621 High engine oil temperature	1 Reduce the speed 2 Stop the machine with the engine running 3 Wait until the temperature has reached a normal level. 4 If the alarm recurs after action, contact an authorized workshop
 V1087629 Clogged air filter	1 See information and follow the instructions, see page *357* 2 If the alarm recurs after action, contact an authorized workshop.
 V1087632 High coolant temp. engine	1 Reduce the speed 2 Stop the machine with the engine running 3 Check whether the radiator is clogged. Clean as needed, see page *333* 4 If the fault persists, contact an authorized workshop
 V1087627 Engine underspeed	1 When starting with a low outdoor temperature. Let the machine idle for at least 30 seconds before selecting a gear. 2 If the fault persists, contact an authorized workshop.
 V1087627 Engine overspeed	1 Reduce the speed 2 If the fault persists, contact an authorized workshop.

Check	Actions
 V1087623 High crankcase pressure	1 Work carefully and contact an authorized workshop when appropriate.
 V1087623 Engine failure	1 Work carefully and contact an authorized workshop when appropriate.
 V1088203 Automatic Engine shutdown	1 For information, see page *205*
 V1108120 High temp. starter motor. Wait 5 min. before start	1 Wait 5 min. before start 2 If the alarm recurs after action, contact an authorized workshop.
 V1087628 Low oil level engine	1 Fill with engine oil to correct level. See page *351* 2 If the alarm recurs after action, contact an authorized workshop.
 V1108121 Operating speed	1 Select neutral gear 2 Disable the function Increased engine rpm with the switch. See page *123* 3 If the alarm recurs after action, contact an authorized workshop.

Alarm screens check engine, turbo

Check	Actions
 V1088237 Turbocharger compressor outlet temperature	1 Work carefully and contact an authorized workshop when appropriate.
 V1092525 Turbo charger failure	1 Work carefully and contact an authorized workshop when appropriate.
 V1092525 Turbo charge failure	1 Work carefully and contact an authorized workshop when appropriate.

Alarm screens check engine, fuel

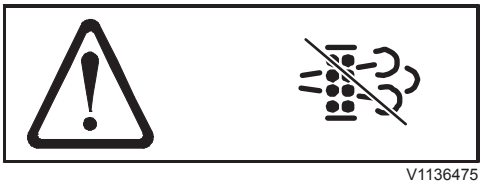
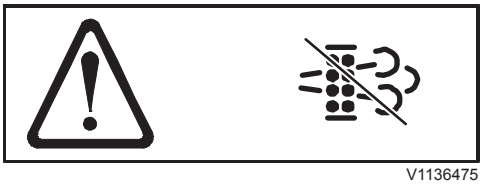
Check	Actions
 V1087622 Water in fuel. Empty cup	1 Empty the reservoir. See page *352* 2 If the alarm recurs after action, contact an authorized workshop.
 V1092514 Fuel level low	1 Top up fuel. See page *347*.
 V1092513 Possible fuel leakage	1 Switch off the machine and check whether there is any fuel leakage. 2 If no leak is found, check whether the machine's output is affected. 3 Contact an authorized workshop.

Check	Actions
 V1087633 Fuel filter clogged	1 Contact an authorized workshop.
 V1092513 Fuel injection system failure	1 Contact an authorized workshop.

Alarm screens check engine, charge air pressure

Check	Actions
 V1088297 Low boost pressure	1 Work carefully and contact an authorized workshop when appropriate.
 V1088297 High boost pressure	1 Work carefully and contact an authorized workshop when appropriate.
 V1092553 High boost temperature	1 Reduce the speed! 2 See information and follow the instructions, see page *356*. 3 If the alarm recurs after action, contact an authorized workshop.
 V1087623 Clogged Charge-air cooler	1 See information and follow the instructions, see page *356*. 2 If the alarm recurs after action, contact an authorized workshop.

Alarm screens check engine, regeneration

Check	Actions
 V1088 269 Park soon Parked regeneration needed	1 Park the machine in a fireproof area. Apply the parking brake. 2 Start regeneration.
 V1088 269 Confirm action Parked regeneration possible	1 Park the machine in a fireproof area. 2 Apply the parking brake. 3 Start regeneration
 V1136475 Regeneration cancelled Derate soon	1 Start regeneration at the earliest opportunity.
 V1136475 Regeneration cancelled Derate active	1 Start regeneration at the earliest opportunity.
 V1088273 Service need. Regeneration not possible. System failure	1 Service required. Contact an authorized workshop.
 V1088 269 Keep machine parked Regeneration ongoing.	1 Keep the machine parked with applied parking brake until control light 'HEST' is off.
 V1088 269 Apply parking brake Regeneration needed	1 Apply the parking brake. 2 Start regeneration.

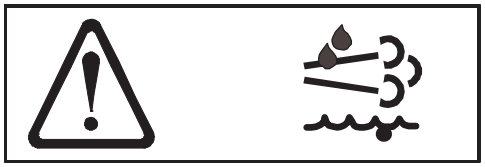
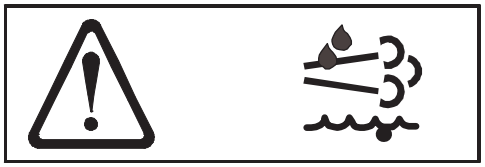
Check	Actions
 V1088 269 Parked regeneration required. Derate active	1 Park the machine in a fireproof area. Apply the parking brake. 2 Start regeneration.
 V1088273 Exhaust aftertreatment fault	1 Work carefully and contact an authorized workshop when appropriate.

Alarm screens check engine, AdBlue®/DEF

NOTE!
For alarms relating to AdBlue®/DEF “AdBlue®” or “DEF” is displayed depending on the market. “AdBlue®” is used in the following descriptions of the information display unit texts.

Check	Actions
 V1132842 Refill AdBlue AdBlue emptyDerate active	1 Top up with AdBlue®/DEF, see page *347*. 2 If the alarm recurs after action, contact an authorized workshop.
 V1132842 Replace AdBlue Wrong AdBlue qualityDerate soon	1 Drain the AdBlue® and fill with the right grade. See page *349* and *347*. 2 If the alarm recurs after action, contact an authorized workshop.
 V1132842 Replace AdBlue Wrong AdBlue qualityDerate active	1 Drain the AdBlue® and fill with the right grade. See page *349* and *347*. 2 If the alarm recurs after action, contact an authorized workshop.

Alarm screens check engine, SCR

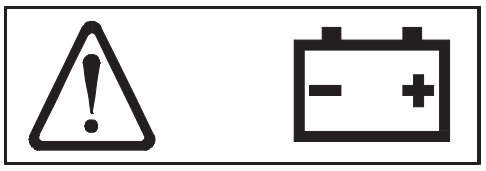
Check	Actions
 V1132842 Check SCR-system SCR-system failureDerate soon	1 For information, see page *201*. 2 Contact an authorized workshop.
 V1132842 Check SCR-system SCR-system failureDerate active	1 For information, see page *201*. 2 Contact an authorized workshop.

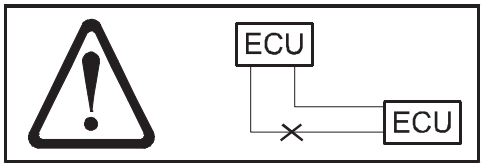
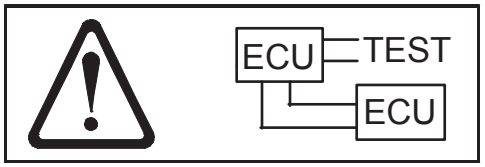
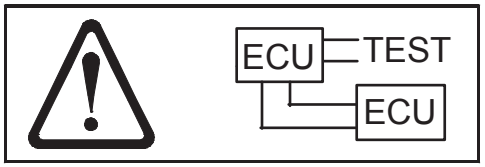
Alarm screens check engine, DPF

Check	Actions
 V1088273 Check DPF-system DPF-system deactivated	1 For information, see page *202*. 2 Contact an authorized workshop
 V1088273 Check DPF-system DPF-system failure	1 For information, see page *202*. 2 Contact an authorized workshop
 V1088273 Check DPF-system DPF-system missing	1 For information, see page*202* . 2 Contact an authorized workshop
 V1088273 Check DPF-system DPF-system failure Derate soon	1 For information, see page *202*. 2 Contact an authorized workshop

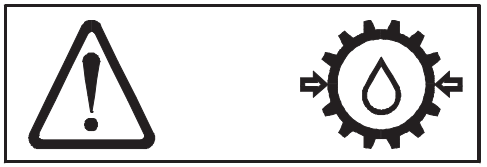
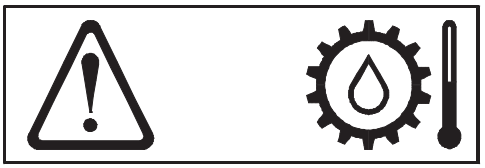
Check	Actions
 V1088273 Check DPF-system DPF-system failure Derate active	1 For information, see page *202*. 2 Contact an authorized workshop
 V1088273 Check DPF-system DPF-system deactivated Derate soon	1 For information, see page *202*. 2 Contact an authorized workshop
 V1088273 Check DPF-system DPF-system deactivated Derate active	1 For information, see page *202*. 2 Contact an authorized workshop

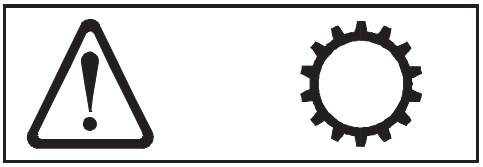
Alarm screens check, electrical system

Check	Actions
 V1087640 Battery not charging	1 Switch off any unused power consumers. 2 Contact an authorized workshop.
 V1087640 High system voltage	1 Disconnect any battery chargers or jump leads that may cause high voltage. 2 If the problem persists, contact an authorized workshop.
 V1087640 Low system voltage	1 Charge the battery using an appropriate battery charger, or start the machine using jump leads. See pages *362* and *364* 2 If the problem persists, contact an authorized workshop.

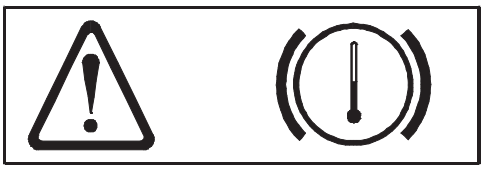
Check	Actions
 V1088342 Direction indicator failure	1 Check the light. 2 If the light is not working, contact an authorized workshop.
 V1087642 ECU Network Reduced comm.	1 Work carefully and contact an authorized workshop when appropriate.
 V1108118 Test mode active	1 Tech Tool is connected to the machine by a qualified technician. 2 End the test and disconnect Tech Tool.
 V1108118 Bus monitoring disabled	1 Tech Tool is connected to the machine by a qualified technician. 2 End the test and disconnect Tech Tool.

Alarm screens check, power transmission

Check	Actions
 V1087655 Low transmission oil pressure	1 The machine does not engage a gear. 2 Contact an authorized workshop.
 V1087653 High transmission oil temp.	1 Let the machine idle until the temperature falls to a normal level. 2 If the problem recurs, contact an authorized workshop.
 V1092532 Transmission oil filter clogged	1 Work carefully and contact an authorized workshop when appropriate.

Check	Actions
 V1092531 Reduced shift function	1 Work carefully and contact an authorized workshop when appropriate.
 V1139159 ATC failure	1 Work carefully and contact an authorized workshop when appropriate.
 V1139159 ATC Long actuation time	1 Avoid driving in ATC mode. 2 Work carefully and contact an authorized workshop when appropriate.
 V1087651 Transmission not calibrated	1 Contact an authorized workshop when appropriate.

Alarm screens check, brakes

Check	Actions
 V1088237 Brake cooling oil pump	1 Work carefully and contact an authorized workshop when appropriate.
 V1088312 Brake cooling oil high temp.	1 Stop the machine. 2 Let the machine idle until the temperature has returned to a normal level. 3 Drive at a lower speed. 4 If the alarm recurs, contact an authorized workshop.
 V1088314 Brake system failure	1 Work carefully, and contact an authorized workshop.

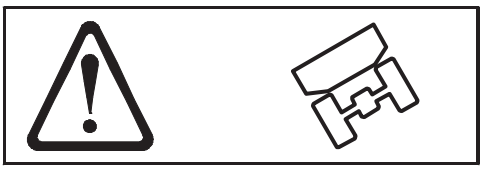
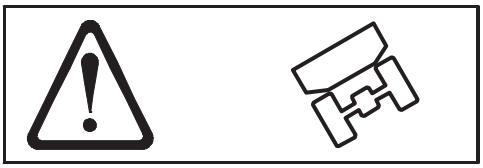
Check	Actions
 V1087750 Brake cooling oil level low	1 For information, see page *337*. 2 If the alarm recurs after action, contact an authorized workshop.
 V1087660 High brake pressure	1 Work carefully and contact an authorized workshop when appropriate.
 V1087661 Parking brake failure. Check at next stop	1 Check at next stop. 2 Work carefully and contact an authorized workshop when appropriate

Alarm screens check brakes, stationary brake test

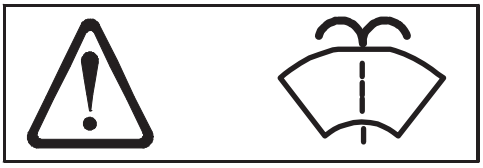
Check	Actions
 V1116615 Brake test deniedAborted by driver	1 Follow the instructions. See page *323*
 V1116615 Brake test deniedWrong gear	1 Follow the instructions. See page *323*
 V1116615 Brake test deniedBrake pressure error	1 Follow the instructions. See page *323*

Check	Actions
 V1116615 Brake test deniedFunctions time out	1 Follow the instructions. See page *323* 2 If the alarm recurs after action, contact an authorized workshop.
 V1116615 Brake test deniedSignal error	1 Follow the instructions. See page *323* 2 If the alarm recurs after action, contact an authorized workshop.

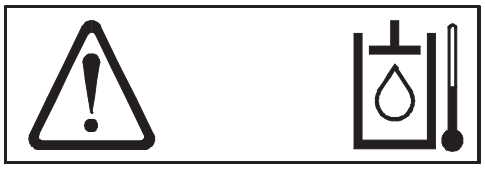
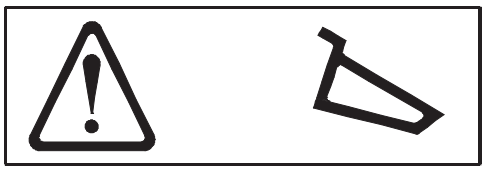
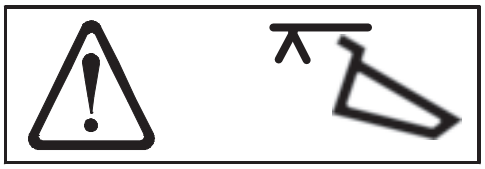
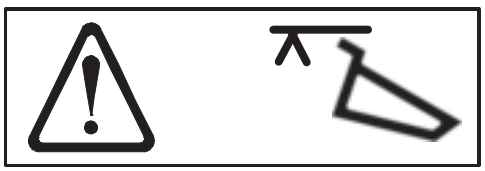
Alarm screens check, suspension

Check	Actions
 V1170015 Critical lateral Inclination	1 If dumping has begun, lower the load body. 2 Move the machine to reduce sideways tilting before dumping.
 V1170015 Critical lateral InclinationTipping inhipited	1 If dumping has begun, lower the load body. 2 Move the machine to reduce sideways tilting before dumping.

Alarm screens check, cab

Check	Actions
 V1088300 Door open	1 Close the door!
 V1170014 Low washer fluid level	1 Top up washer fluid. See page *369*.

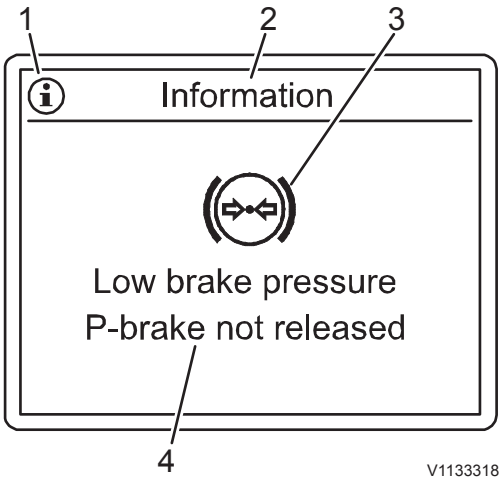
Alarm screens check, hydraulic system

Check	Actions
 V1087673 High hydraulic oil temp.	1 Reduce the speed! 2 Stop the machine with the engine running. 3 Wait until the temperature has reached a normal level. 4 If the fault persists, contact an authorized workshop.
 V1087671 Low hydraulic oil level	1 Follow the instructions. See page *341*
 V1087673 Low hydraulic oil temp.	1 Stop the machine! 2 Let the engine run until the hydraulic oil temperature has increased and the alarm has stopped. 3 To accelerate warming up, hold the dump lever in “power down” position. 4 If the alarm does not stop, or occurs in a warm ambient temperature (> approx. 10 °C), contact an authorized workshop.
 V1087675 Body heat system failure	1 Contact an authorized workshop.
 V1092554 Max dump height denied	1 Change max. dump height. Follow the instructions. See page *67*
 V1092554 Max. dump height failure Deactivate	1 Deactivate the function; follow the instructions. See page *67*
 V1144471 Set body to float manually	1 Set the load body to float mode. See page *217*



V1091874

Green alarm display



V1133318

Alarm screens, information

A green alarm display indicates a deviation. The buzzer emits a short signal and the green central warning light is activated on the instrument panel.
The alarm can be acknowledged with the ESC-key.

The adjacent figure is an example of how the alarm display **Information** is shown on the information display unit. Text, lines, and symbols are shown green on black background.

1 Symbol ... (is shown in table below)

2 ... and text that shows what type of alarm display it is. In this case, green alarm display — Information.

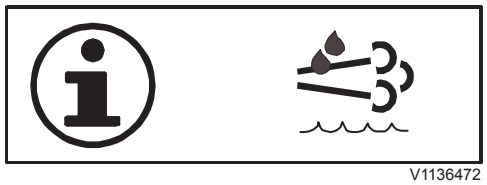
3 Symbol indicating subject of the alarm, in this case parking brake (shown in table below).

4 Describing text (is shown in table below).

Alarm screen information, general

Information	Actions
 V1116087 Weight calibration successful	1 Follow the instructions. See page *371*.
 V1201552 Be carefulRadar Override (Additional options)	1 Check the instruction manual for the optional equipment for information.

Alarm screens information, engine

Information	Actions
 V1136472 Engine power temporarily restored	1 Information text, no action necessary.
 V1136472 Full engine power temporarily restored	1 Information text, no action necessary.
 V1242577 Full engine power temporarily restored	1 Information text, no action necessary.

Alarm screens information engine, regeneration

Information	Actions
 V1088268 Regeneration not needed	1 Information text, no action necessary.
 V1088268 Regeneration not possible System not warmed up	1 Wait until the system is warmed up before restarting regeneration.
 V1088268 Regeneration not possible Engine speed too high	1 Reduce the engine speed before restarting regeneration.

Alarm screens information, power transmission

Information	Actions
 V1209393 Gear selector not in neutral	1 Before starting, place gear selector in neutral

Alarm screens information, brakes

Information	Actions
 V1088259 Low brake pressure P-brake not released	1 Wait until the parking brake is released.
 V1116607 Time for brake test	1 Follow the instructions. See page *323*.

Result, Weight calibration

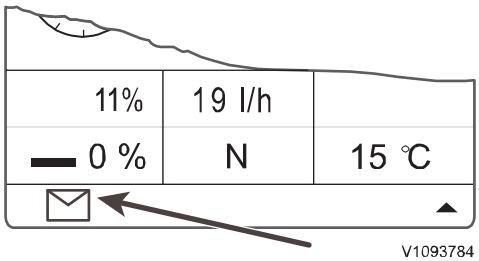
Information	Actions
 Weight calibration denied	1 Start load calibration. See page *371* 2 If the fault recurs, contact an authorized workshop.
 Weight calibration failed Aborted by driver	
 Weight calibration failed Poor driving conditions	1 Operate on a ground surface without major inclines. 2 Start load calibration. See page *371*

Information	Actions
 Weight calibration failed Diff. lock engaged	1 Disengage the differential lock 2 Start load calibration. See page *371*
 Weight calibration failed Too large inclination	1 Operate on a ground surface without major inclines. 2 Start load calibration. See page *371*
 Weight calibration failed Acc. prs too variable	1 Check that the accumulator pressure is normal. See the hydraulic part in the section starting on page *62* 2 Check that the pressure difference between the left and right accumulator is less than 6 MPa. 3 Check that the pressure is less than 16 MPa. 4 Start load calibration. See page *371* 5 If the fault recurs, contact an authorized workshop.
 Weight calibration failed Invalid speed	1 Adjust the speed to 8–18 km/h (5–11.2 mph). 2 Start load calibration. See page *371*

Vehicle messages

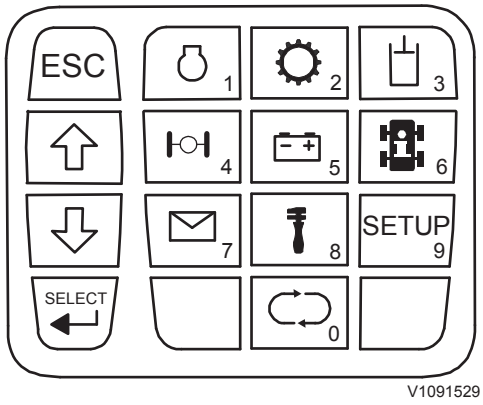
Vehicle message indicates that some part in the system is not working. Check cause at next stop. If needed, contact a qualified workshop . Forward the error code for identification of the problem.

If the machine has active vehicle messages, the symbol for vehicle messages is shown on the bottom row in the information display unit.



V1093784

Symbol for vehicle message



7 Vehicle messages

Vehicle messages, retrieving

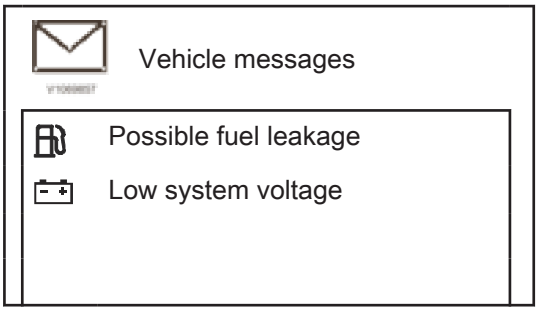
1 To get information about the error code, press key 7 Vehicle messages.

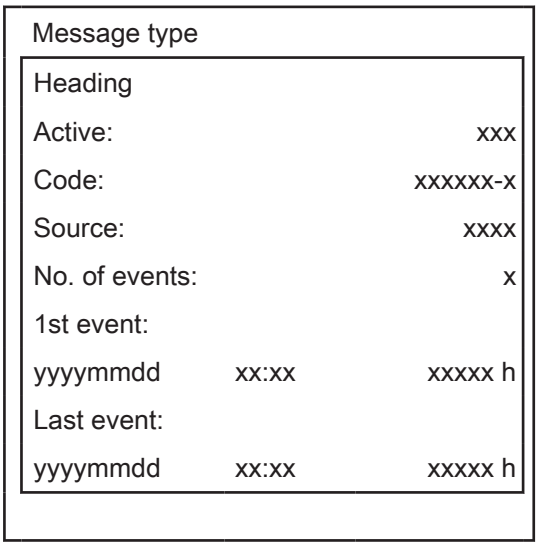
2 The menu “Vehicle messages” is shown with all active messages in chronological order. Use the arrow keys to highlight the desired vehicle message.

3 Confirm the selection with the SELECT-key.

4 Scroll in the message with the arrow keys.

5 Press the ESC-key once or twice to return to the operating display.





Vehicle message, description

- **Message type** shows which type of vehicle message has been activated: Warning (red), Check (amber) or Information (green).
- **The heading** gives a reference to the type of system failure that has occurred.
- **Active** shows if the problem is still active or not.
- **Code** shows the relevant error code.
- **Source** shows which electronic control unit registered the failure.
- **No. of events** shows how many error codes the problem generated.
- **1st event** shows date, time, and number of machine hours when the error code was activated the first time.
- **Last event** shows date, time, and number of machine hours when the error code was activated the last time.

Engine

xx22xx-xx	Lubrication and oil system	xx26xx-xx	Cooling system
xx23xx-xx	Fuel system	xx27xx-xx	Engine controls
xx25xx-xx	Inlet and exhaust system		

Electrical system

xx32xx-xx	Alternator and charging regulator	xx37xx-xx	Leads and fuses
xx33xx-xx	Start system	xx38xx-xx	Instruments, sensors, and warning system
xx36xx-xx	Other electrical equipment		

Power transmission

xx42xx-xx	Transmission, hydraulic	xx46xx-xx	Drive axles
xx43xx-xx	Transmission, mechanical		

Brakes

xx52xx-xx	Brake system, hydraulics	xx59xx-xx	Brakes, miscellaneous
xx55xx-xx	Parking brake		

Steering

xx64xx-xx	Steering angle sensor		

Cab

xx85xx-xx	Cab interior	xx87xx-xx	Temperature/Climate control system

Hydraulics

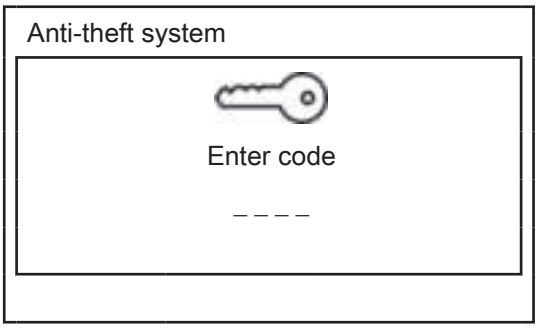
xx91xx-xx	Working hydraulics and servo system		

Anti-theft device

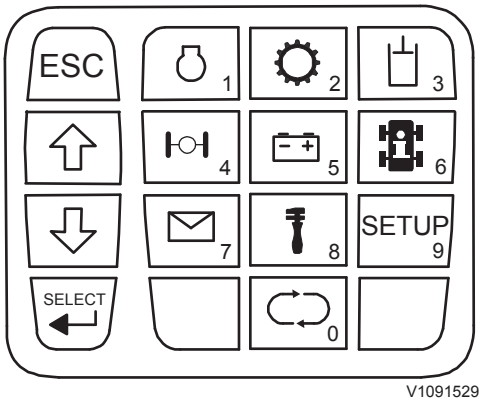
(Optional equipment)

The anti-theft protection makes machine theft more difficult by:
- locking the engine
- locking the gear selector
- applying the parking brake

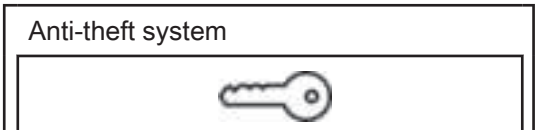
When starting the engine



1 Turn the ignition to position 1
2 Wait until the following display is shown on the information display unit.

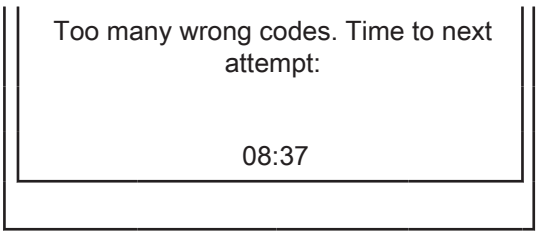


3 Enter the four-digit PIN-code using the keypad.
- Correctly entered PIN-code deactivates the anti-theft system, the operating display is shown, and the engine can be started.
- Use the ESC-key to move the cursor to the left to change incorrectly entered digit.
- In case incorrect PIN-code, the start display returns automatically on the information display unit. Enter the PIN-code again.



After three incorrect code entries, the theft protection is locked for 10 minutes. After that, three new attempts can be made.

■ The PIN-code can only be changed by a qualified service technician.



- The engine can be restarted up to 15 minutes after it was turned off without having to enter the code.

Volvo Co-Pilot

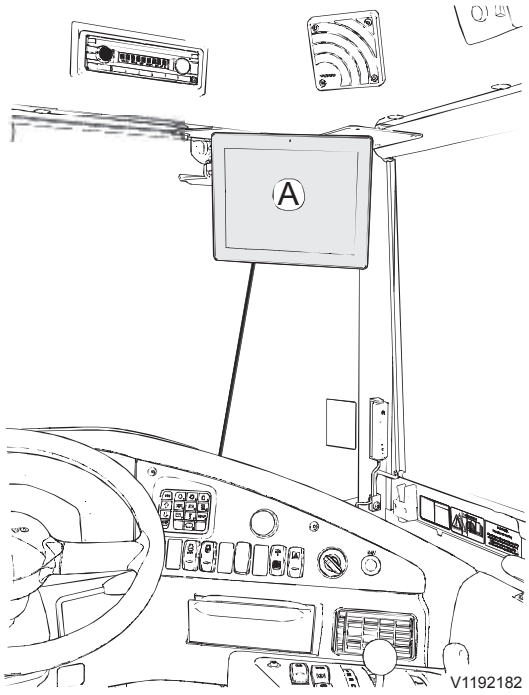
Volvo Co-Pilot

Volvo Co-Pilot is the platform for software applications.

NOTE!
Different applications may have specific system requirements. Check the system requirements with the application's supplier, and check whether these requirements are met with the dealer for the machine.

NOTE!
Installed software applications are diverse tools which do not relieve the operator of the obligation to operate the machine in a safe way. When operating the machine, attention must be focused on the risk zone around the machine.
Use direct view, mirrors and reversing camera to move safely.

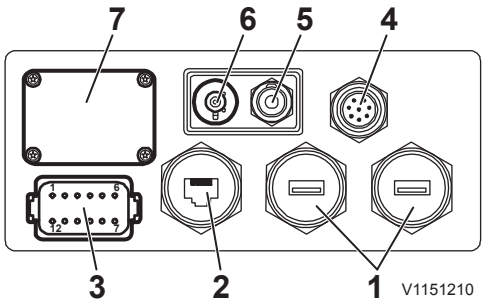
Settings can be made on the touchscreen's display, independent of the application in the action centre. The status field shows the current status of the Volvo Co-Pilot.



Volvo Co-Pilot position
A Display



1 Status bar
2 Action centre



Connector, back of display unit

Connectors, overview

The following connectors are located on the back of the display unit:

1 **USB 2.0:** For connecting a printer, exporting to USB stick, and system updates
2 **Ethernet:** For system updates and local networks
3 **Connector, 12 pin:** For electric power and machine interface
4 **Audio in/out:** For future use
5 **Video in:** For camera signal
6 **External GSM:** 3G/4G/GSM antenna input.
7 **Cover for Mini SIM card:** Remove the cover to access the Mini SIM card.

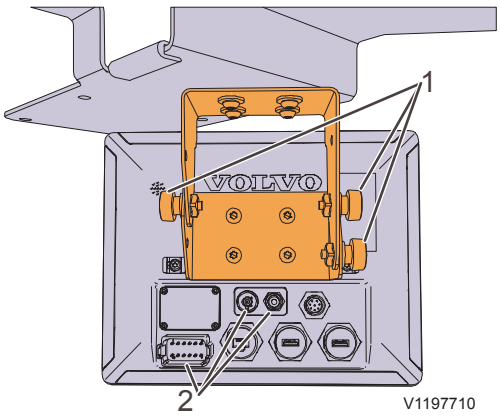
NOTE!
The mobile modem is deactivated for certain markets.

SIM card, installing

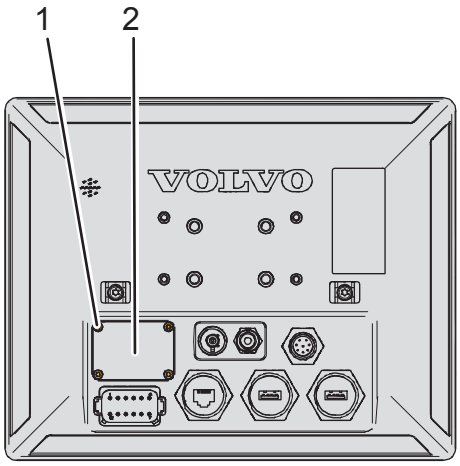
The following describes installing a SIM-card in Volvo Co-Pilot.

NOTE!
Make sure that you have Mini SIM-card and a subscription with a network operator that is approved for Volvo Co-Pilot. If needed, check with your dealer.

1 Stop the machine, apply the parking brake, and shut down the engine.
2 Turn off the electric power with the battery disconnector switch.
3 Remove the three adjusting bolts.
4 Suport Volvo Co-Pilot with one hand.
5 Disconnect the wire harnesses from the back of the Volvo Co-Pilot.



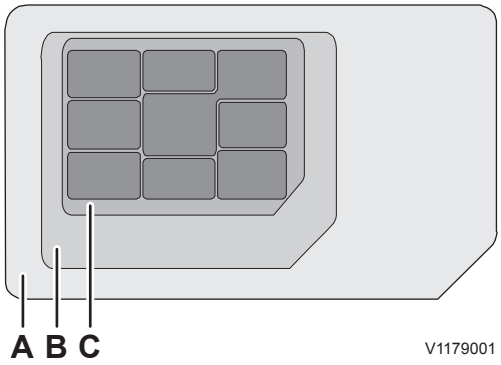
1 Adjusting bolts
2 Connectors



V1171962

1 Attaching bolts
2 Cover plate

6 Loosen the bolts and remove the cover (2) on the back of Volvo Co-Pilot.



V1179001

A **Mini SIM (2FF)**
B Micro SIM
C Nano SIM

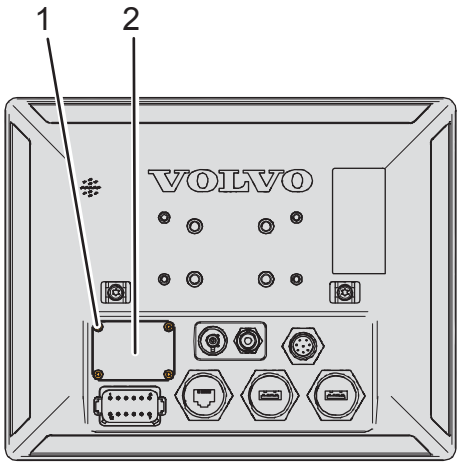
7 Install the Mini SIM-card.
8 Install the cover.
9 Turn on the electric power with the battery disconnector switch.
10 Turn on the ignition.
11 If the SIM-card is protected by a PIN-code, wait until the message box for the PIN-code is shown and then enter the code in Volvo Co-Pilot.
12 Volvo Co-Pilot connects automatically to the Internet.

SIM card, installing

The following describes installing a SIM-card in Volvo Co-Pilot.

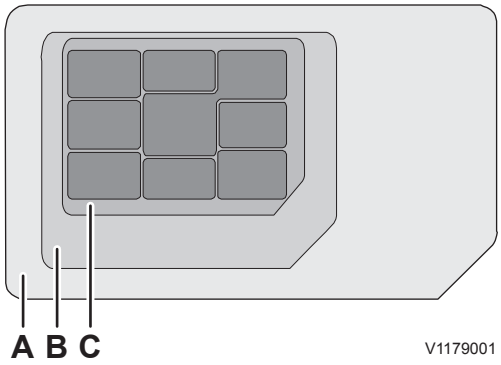
NOTE!
First, make sure that you have Mini SIM-card and a subscription with a network operator that is approved for Volvo Co-Pilot. If needed, check with your dealer.

1 Make sure the machine/vehicle is steady and that the engine is switched off.
2 Make sure the machine/vehicle is powered off.
3 Disconnect the leads on the back of Volvo Co-Pilot.



1 Attaching bolts
2 Cover plate

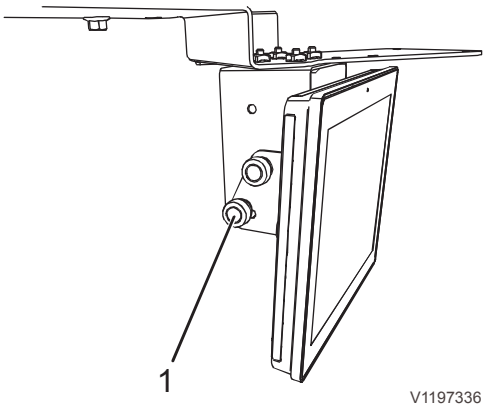
4 Loosen the screws and remove the cover (2) on the back of Volvo Co-Pilot.



A **Mini SIM (2FF)**
B Micro SIM
C Nano SIM

5 Install the Mini SIM-card.
6 Install the cover.
7 Reconnect the leads on the back of Volvo Co-Pilot.
8 Turn on the power.
9 Turn on the ignition.
10 If the SIM-card is protected by a PIN-code, wait until the message box for the PIN-code is shown and then enter the code in Volvo Co-Pilot.
11 Volvo Co-Pilot connects automatically to the Internet

Display, adjusting



Display unit, adjusting
1 Lock mechanism

NOTE!
Adjust the display according to the instructions below to ensure that it does not obstruct the view or reduce visibility.

1 Adjust the seat and steering wheel to a safe and comfortable operating position, see the machine's Operator's Manual.
2 Adjust the display unit to the most suitable position, and with the least reflections.
- Loosen the lock (1) to adjust the display's angle, then tighten the lock securely.

Display, cleaning

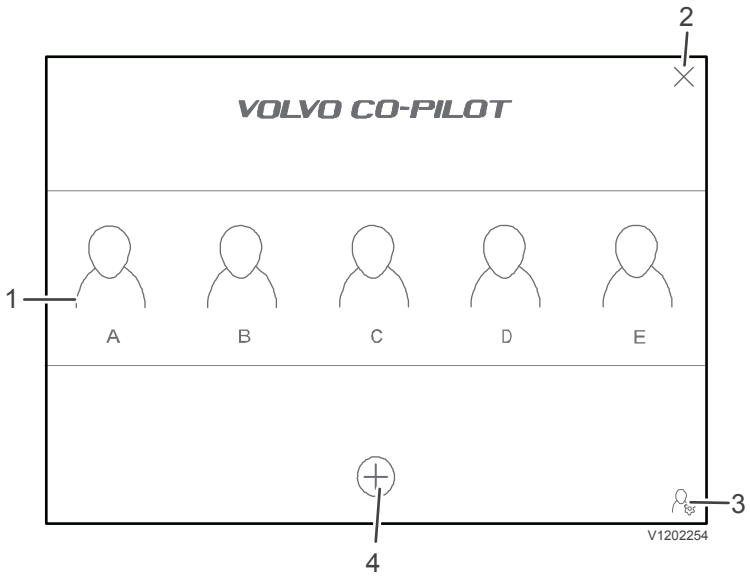
NOTICE

Risk of equipment damage.
Aggressive chemicals could cause defective pixels on the display.
Clean the display with a mild cleaner only.

Clean the display and the casing using a soft cloth/rag and a cleaning agent approved for screens.

Co-Pilot login

When Volvo Co-Pilot starts for the first time after 12 hours, or if the last user has logged out, the login display is shown.

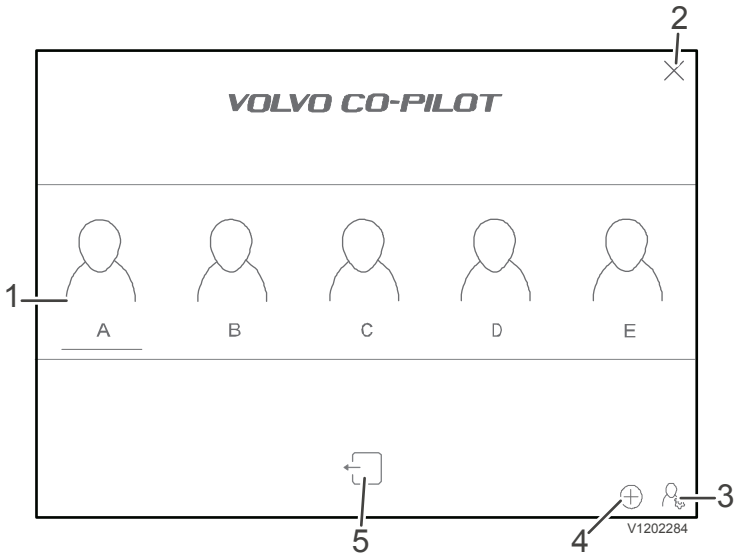


Login display

1 Active users
2 Closes login display
3 Shortcut to operator profiles in Setup
4 Shortcut to add user

1 The latest active user/operator profile. The latest to the left. Click on user for login.
2 If no user is logged in and the login display is closed, then the machine's chassis-ID will be logged in.
3 Shortcut to operator profile Setup. See page *118*
4 Shortcut to add new operator profile and user. See page *118*

When Volvo Co-Pilot starts for the first time after 12 hours and the last user is still logged in, then the following login display is shown.



Login display with logged-in user

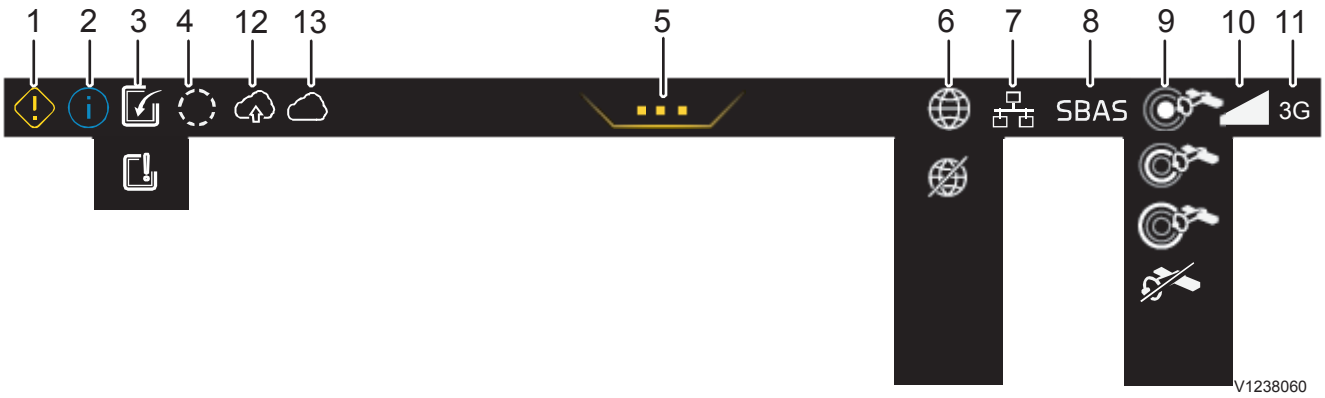
1 Active users
2 Close login display
3 Shortcut to operator profiles in Setup
4 Shortcut to add user
5 Log-out

1 The latest active user/operator profile. The logged-in user is to the far left, highlighted with a line.
2 Close login display.
3 Shortcut to operator profile settings. See page *118*
4 Shortcut to add new operator profile and user. See page *118*
5 Click on the symbol and the user is logged out.

If Volvo Co-Pilot is started before 12 hours have elapsed and the user is logged in, the last used application is opened.

Status bar

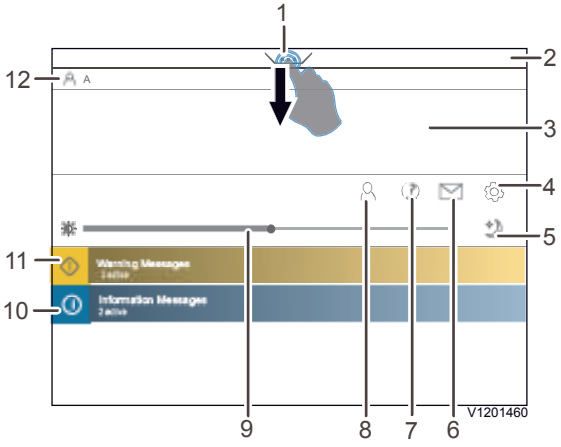
The status field indicates current status for Volvo Co-Pilot and the applications that are used. Available functions are dependent on the application, subscription, and their associated components. Different symbols are shown in the status field, depending on what is active. If only the four left symbols are shown, it will have position 1. if more are shown, they spread out to the right in given priority order (1 to 4). For the symbols to the right, they are spread out from right to left in priority order (11 down to 6)



1		Warning message active	Swipe down to access the action centre — active messages are found in the message centre.
2		Information message active	Swipe down to access the action centre — active messages are found in the message centre.

3		SEMS download	Software download in progress. The symbol indicates a temporary download problem.
4		Process on-going	A process that the user has started is ongoing.
5		Action centre access	Swipe down (from any position in the status field) to open the action centre. The action centre gives fast access to applications, more basic functions and messages.
6		Internet connection	The symbol shows if an Internet connection is available.
7		Ethernet connection	Ethernet cable is connected. The symbol is used by applications that use Ethernet as a means of communication.
8		GNSS-type	SBAS, L-BAND, RTK and NTRIP are different external types of correction to achieve better precision in GPS-positioning.
9		GNSS accuracy	The accuracy level for external correction for better precision in GPS-positioning. The illustration shows best accuracy at the top, to no GNSS at the bottom.
10		Signal strength	Mobile connection signal strength
11		Mobile connection type	2G > E (for Edge in 2G) > 3G > H (for High speed in 3G) depending on available connection type
12		Activity in the cloud	Uploading to the cloud service
13		Connected to the cloud	Cloud service active via the Internet

Action centre



1	Action centre access (swipe down/double click)	7	Help centre (Manuals)
2	Status field (not visible when action centre is open)	8	User profiles
3	Software application area (program area)	9	Light intensity (swipe to adjust)
4	Volvo Co-Pilot-settings	10	Information messages

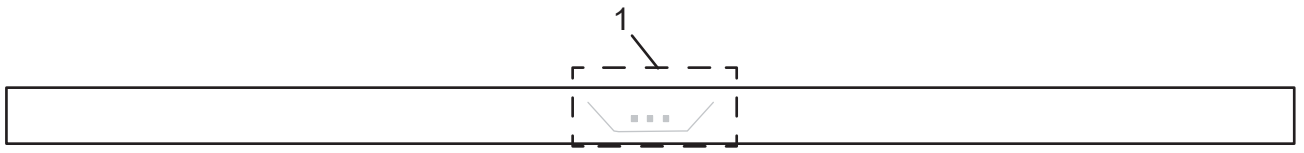
5	Day mode / Night mode	11	Warning messages
6	Message centre	12	User field (with active user)

NOTE!
Messages are shown on the main screen and in the message centre. Tap the message to open it in the message centre. The number by the message symbol indicates the number of unread messages since the last start. The number drops as the messages are opened and closed. Closed messages are active until the necessary action has been taken by the driver or a qualified service technician.

Co-Pilot settings

Access to settings for Volvo Co-Pilot is found in the Action centre.

1 Open the Action centre via the screen's status bar.



V1192122

Status bar

1 Action centre



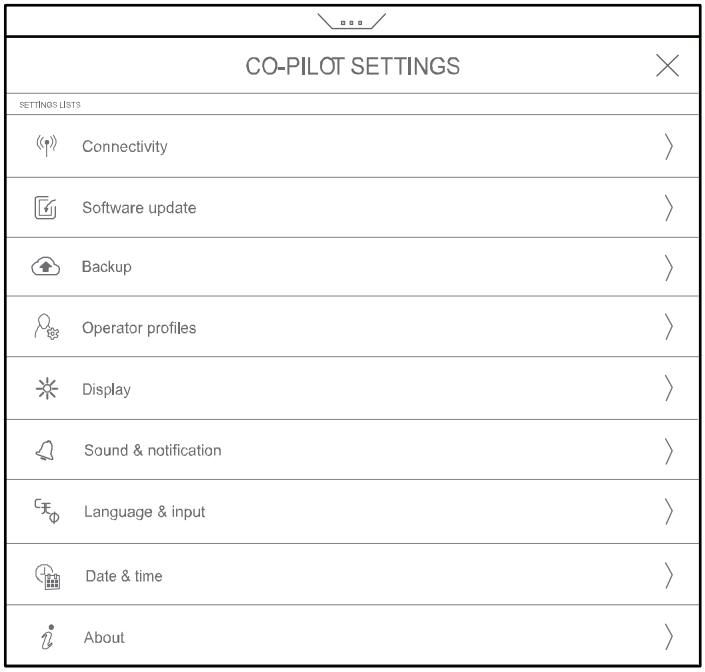
V1201760

1 Settings

2 The Action centre's menu bar appears.

3 Press on the symbol for settings 

4 Settings for Volvo Co-Pilot appear.



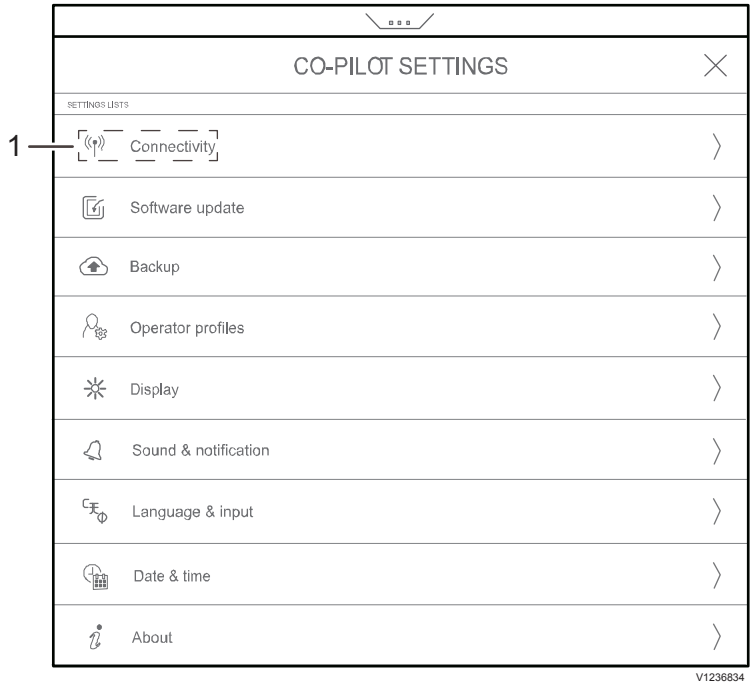
In the menu for Co-Pilot settings it is possible to choose between different submenus.

Co-Pilot, connectivity settings

Connectivity

In Connectivity the user can select and enter the internet and mobile network. It is also possible to see if Volvo Co-Pilot is connected to any network.

NOTE!
Before using connection services, local or via satellite, check the responsibility based on local regulations and provisions.



Settings
1 Connectivity

Connection settings in case of failed automatic connection:

1 Open the Action centre via the screen's Status bar.
2 The Action centre's menu bar appears.
3 Press on the symbol for settings , then **Connectivity**.
4 Press **Automatic**
A message is shown:
"Reset Connectivity Settings?"
Press **OK** to reset the settings.

NOTE!
This message is not shown the first time after a new installation

Volvo Co-Pilot will be connected automatically to the Internet.
5 This may take up to 1 minute.
6 If the connection succeeds:
Connection status is shown at the bottom of the page.
Press **OK**
7 If the connection fails:
If Volvo Co-Pilot is unable to connect to the Internet, this image is shown.



Press **OK** then follow the instructions below.
NOTE!
The cause of a failed connection may be poor mobile network connection, no data left on the subscription, mobile network requirements, etc.
Check network performance, SIM card characteristics and mobile network requirements.

If automatic registration does not work:

1 Press **Custom setup**, then **Cellular network settings.**
2 Press **Access Point Names** and select connection to change access point settings according to the mobile network requirements.
3 To save the changes, tap the three-point symbol and press **Save**



Co-Pilot settings, software update

Volvo Co-Pilot software can be updated online via OtA (Over the Air)

1 Press **Software update** and then **OtA update**
2 The system checks if there are any updates
3 Follow the instructions

NOTE!
Software download and update will take place in several stages and with restarts.

NOTE!
Make sure that there is at least 500 MB mobile data left for each update.

When connected to the internet, the system automatically checks for new software updates daily.
If this does not happen, it can be requested manually using the **OtA update** menu.

- The system in Volvo Co-Pilot gives information about the installed hardware, the machine software's version, and the Android application's version.
- The remote server checks if there is a new software version available. If a new version is found, a message is shown on the display and the operator can download and install the software.

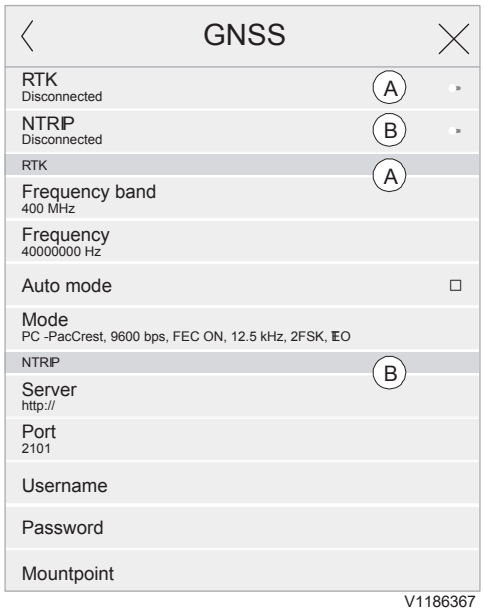
NOTE!
Software can also be updated using the service tool by an authorized service technician, who also can give advice on other apps and system updates.

Co-Pilot settings, GNSS

NOTE!
This function is only possible with high-precision GNSS!



Settings
1 GNSS-settings



GNSS

Position data for GNSS can be set in two ways; using
Real Time Kinematic (RTK) is a technology used to improve the precision in position data received from GNSS.

In order to obtain precision at centimeter level, then Smart Receiver must have access to a data stream, which supplies a number of parameters to compensate for atmospheric and other interference with the satellite positioning signals.

There are two ways to send a correction signal: Real Time Kinematic (RTK) and Networked Transport of RTCM via Internet Protocol (NTRIP)

A RTK corrections from a local base station
A local base station on the work site equipped with a radio transmitter, sends RTK-corrections across the whole work site.
The radio signals from the base station are received by Smart Receiver.
- Enter data to connect if the work site has a local RTK base station, or:
- Use **Auto-mode**.

NOTE!
Auto-mode searches for different correction protocols. Correct frequency must be set by the operator

- Press **Connect**.

Establishing the connection may take a few minutes and is shown in the status field.
After this setting is done, the connection is established automatically at start within the area for the local base station.
If not, press **Connect**.

B Corrections through Internet and an NTRIP-service:
NTRIP is a protocol that enables use of the same RTK-correction as the one from the local base station, but distributed using the Internet.
The function's principle is exactly the same, but there is no need for a local base station.
Corrections using NTRIP requires:
- An Internet connection to Volvo Co-Pilot. SIM-card installed and correction data received by the 3G-antenna.
- A user account with an NTRIP-transmitter.
Every machine has to add data, such as from the NTRIP-supplier:
* Server
* Port
* User name
* Password
* Installation point

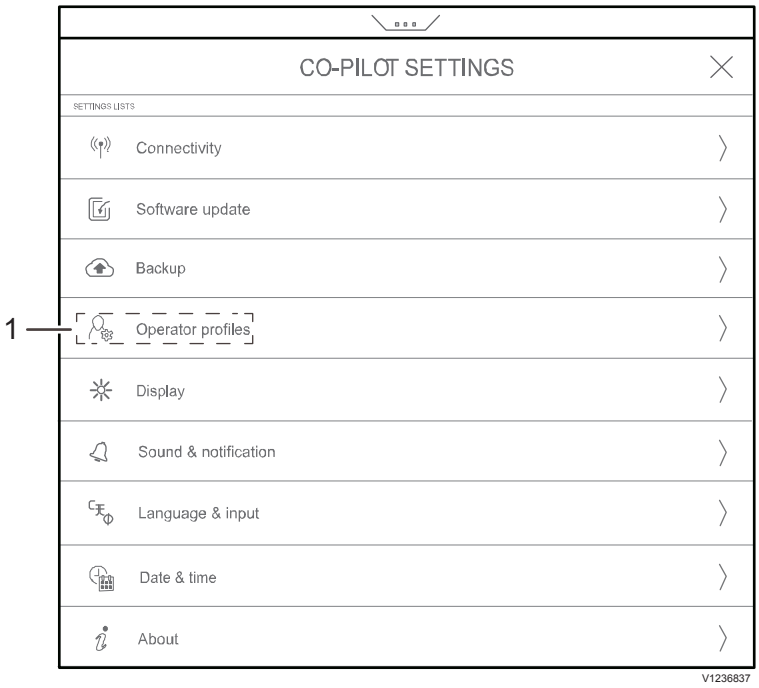
- Press **Connect**.

Establishing the connection may take a few minutes and is shown in the status field.
After this setting is done, the connection is established automatically at start-up within the area for the local base station. If not, press **Connect**.

NOTE!
In case of any changes to the NTRIP-settings, the current run session must be disconnected.

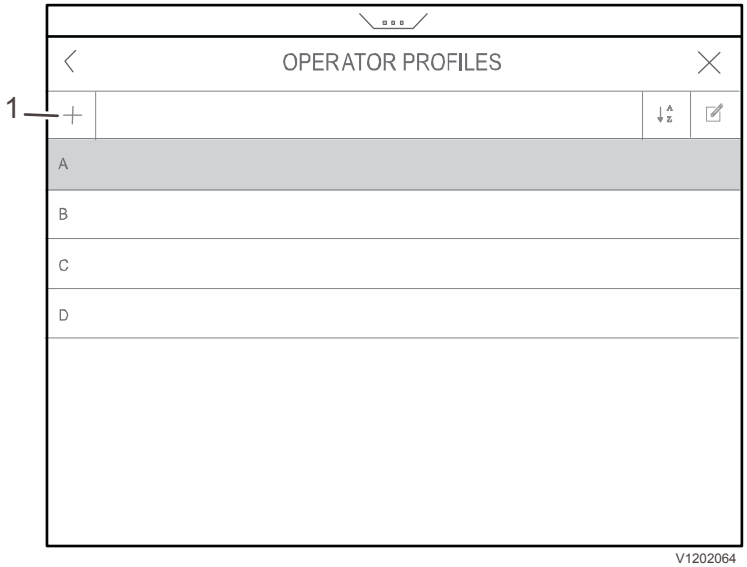
Co-Pilot settings, operator profiles

Add, remove, and edit operator profiles.



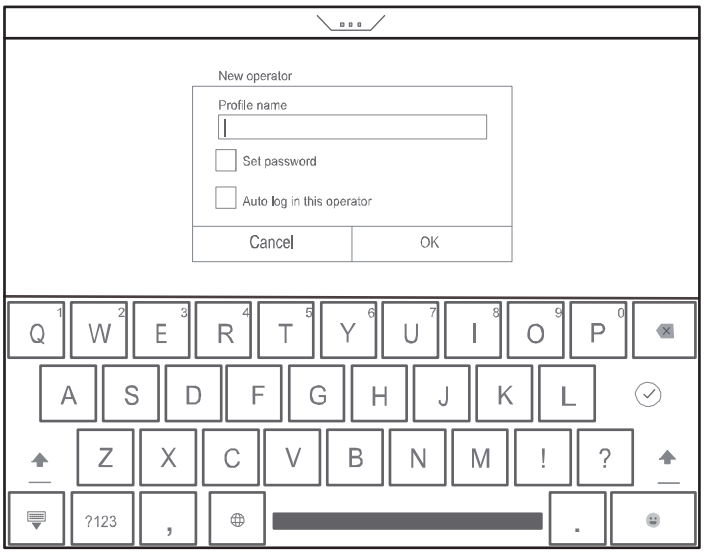
1 Operator profiles

Adding an operator profile



1 Add operator profiles

Press the plus key (+) to add a profile.



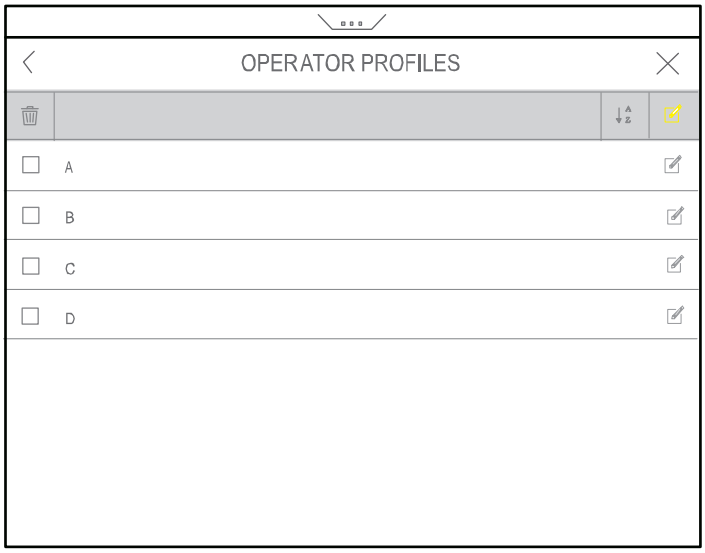
V1236838

Enter the profile name, specify whether a password (6 digits) is to be requested and whether the operator should be logged in automatically.
Then press OK to save.

Forgotten passwords can be reset by a service technician.

Removing an operator profile

To delete an operator profile, select it and then press the waste paper basket.



V1202069

Co-Pilot settings, operator profile, data removal

To remove all operator-specific data, the operator profile should be deleted.

Co-Pilot settings, display

Adjust the screen's brightness manually or set using "Adaptive brightness"

Co-Pilot settings, language & input

Here it is possible to select language and type of keypad (keyboard).

Co-Pilot settings, date & time

Under this heading it is possible to set:
- Date
- Time zone
- “Automatic” can be set if a network is available
- Display format: 12-hour or 24-hour format

Co-Pilot settings, about tablet

The About screen contains:
- Software and firmware specifications
- Machine chassis ID and Volvo Co-Pilot serial number
- Network status
- Sensor information
- Software license information
- Version information for installed applications
- Access to the Information center

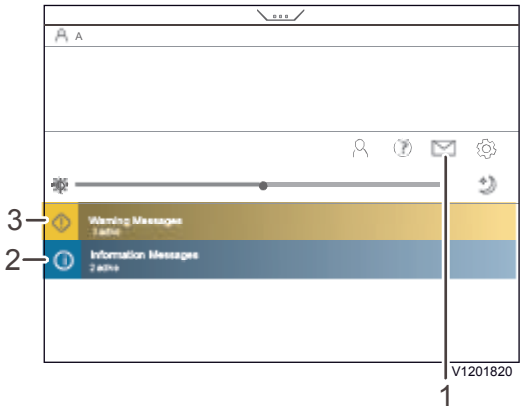
Logged machine data

The machine is equipped with software systems that can register, store, and send operating data.

1 Matris: Total load and fuel consumption can be read out from the machine.
2 CareTrack: Data regarding Haul Assist such as, e.g., fuel efficiency (ton/litre), average weight per cycle, etc., can be sent wireless from the machine and seen in CareTrack-portal.

Messages

Messages are shown on the main screen and in the message centre. Regardless of where one clicks on a message, it is opened in the message centre. The number by the message symbols indicate the number of unread messages since the last start. The number is reduced with every opened and closed message.



Action centre

1 Message centre
2 Information messages
3 Warning messages

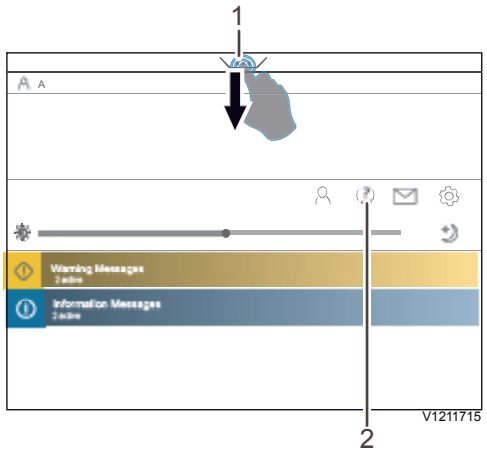
- Warning messages will be shown in yellow. They indicate malfunction of Volvo Co-Pilot or applications. Read the

message, take suitable action, and contact a qualified service technician.

- Information messages will be shown in blue. Information on Volvo Co-Pilot or applications is displayed. Read the message and take suitable action.

Help center

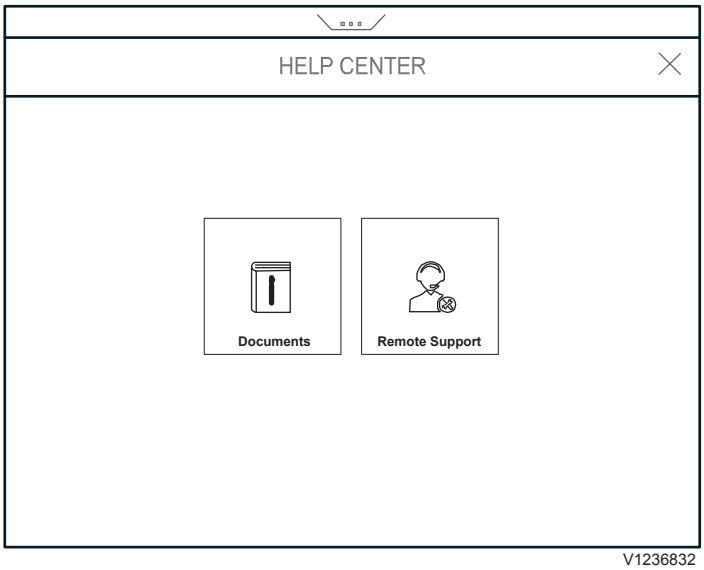
To access Help center open Action centre on the screen's Status bar click on (?).



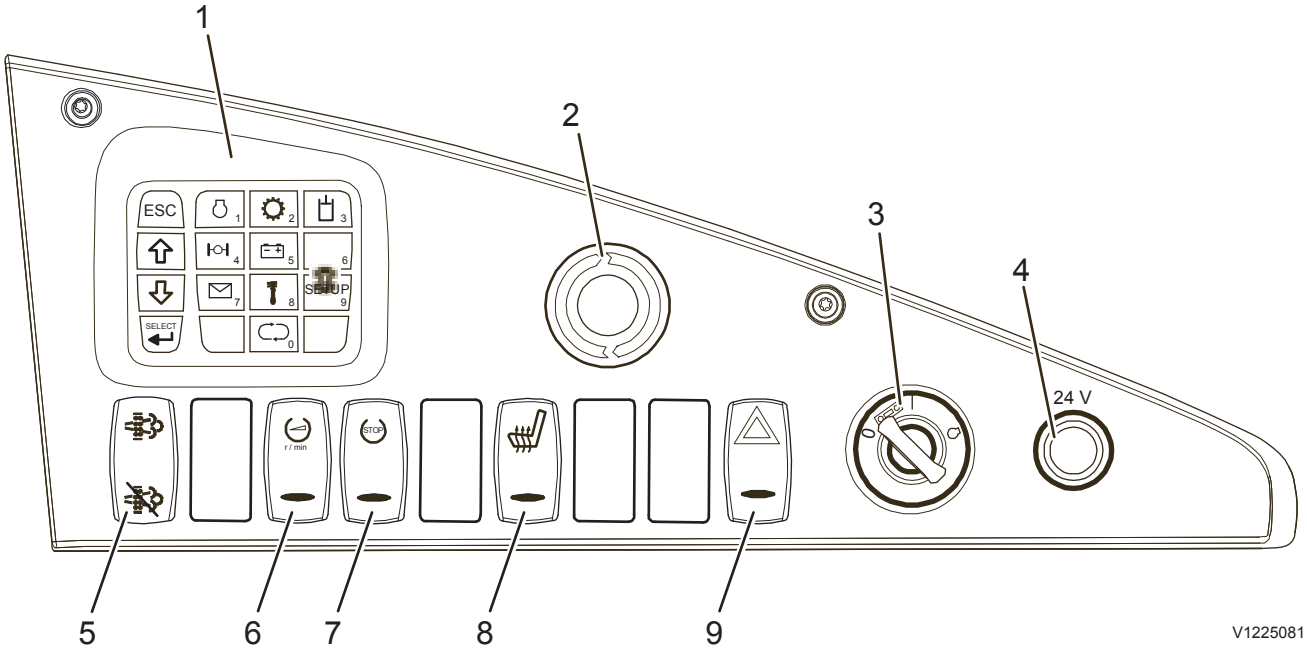
1 Action centre
2 Help center

Manuals

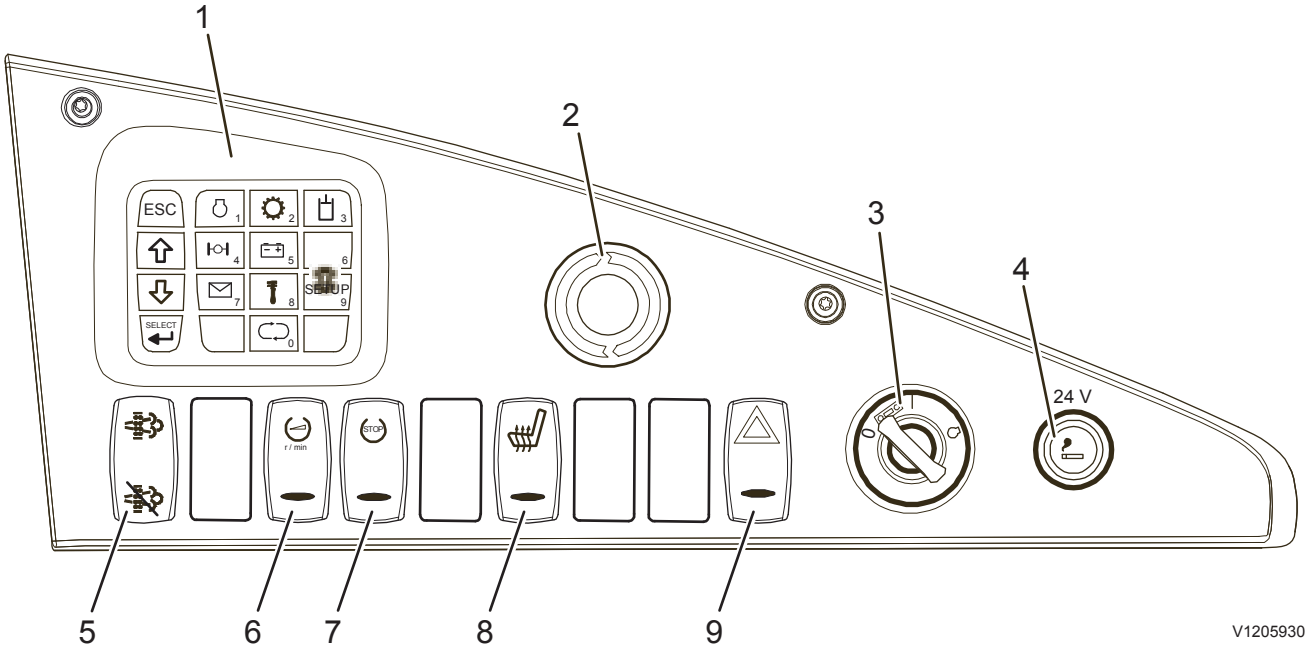
Digital Manuals are available in Volvo Co-Pilot Help center, which also contains tools for remote support (if applicable).



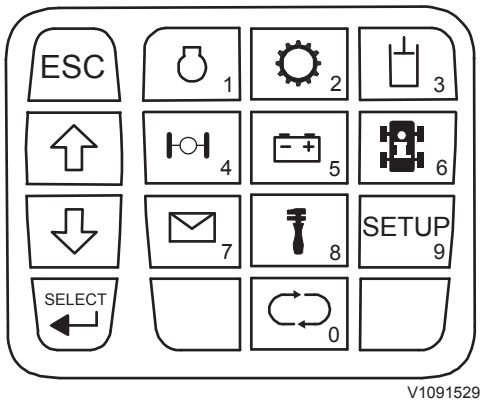
Instrument panel, right



New design

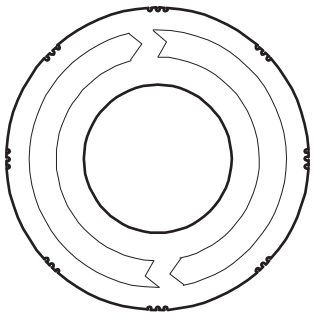


Previous design



1 Keypad for information display unit

With the keypad it is possible to choose the view or function desired on the information display unit on the middle instrument panel, see page *45*.
For more information on the information display unit, see page *51*.



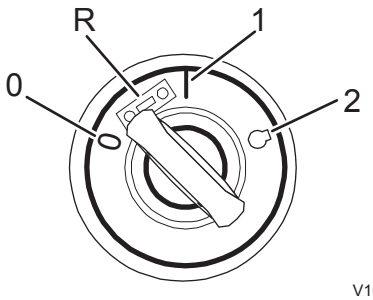
V1092144

2 Emergency stop

NOTICE

Risk of machine damage.
Using the emergency stop can damage the machine systems. Use the emergency stop only in emergency situations. In all other situations, use the ignition switch to stop the machine.

The emergency stop button stops the engine immediately when it is pressed in, see page *204*.



V1092158

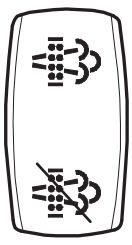
3 Ignition

The ignition has four positions, as shown in the figure.

Off position (0)	The battery disconnector (main switch) is off. In order to shut down various systems in a controlled way, voltage will remain for a certain time after the ignition has been turned to position 0. The engine stops immediately when the key is turned to this position, unless the function "Delayed engine shutdown" is activated, see below.
Radio position (R)	The battery disconnector (main switch) is on. Some electric equipment, e.g., the radio, is powered. The engine stops if the key is turned from running position (1), unless the function "Delayed engine shutdown" is activated, see below.
Operating position (1)	The electronics start up and are in operating mode. Theft protection, if installed, is engaged and a theft protection code must be entered to continue. Emergency stop can be activated.
Start position (2)	The starter motor will be engaged after a delay of a couple of seconds.

4 24 volt power socket (previously cigarette lighter socket)

Additional 24 VDC power socket (15 A). Previously used as a cigarette lighter socket.



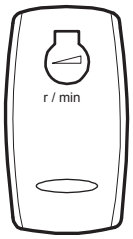
V1092165

5 Parked regeneration (Only applies to machines with engine option M)

For more information on regeneration, see page *193*.

Parked regeneration **is started** by pressing in the upper part of the button.

Parked regeneration is **cancelled** by pressing in the lower part of the button.



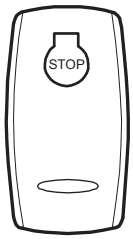
V1092170

6 Increased engine speed (optional equipment)

Switch, upper part pressed in = increased rpm on.

Switch, lower part pressed in = increased rpm off.

The operating (working) rpm control is engaged if the following conditions are met:
- The function operating (working) rpm is activated from the service display unit (service panel) or authorized service tool.
- No gear engaged (transmission in neutral).
- Switch, upper part pressed in.



V1092185

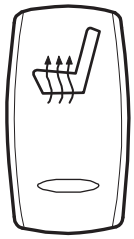
7 Delayed engine shut-down (optional equipment)

The button activates and deactivates delayed engine shut-down.

Switch, lower part pressed in = delayed engine shut-down deactivated.

Switch, upper part pressed in = delayed engine shut-down activated and the function is engaged if the following conditions are met as well:
- gear selector in neutral (N-position) and current gear is neutral gear
- ignition in position R or 0

For more information about delayed shut-down, see page *206*.


V1092188

8 Electrically heated seat (optional equipment)

Switch, upper part pressed in = heating on.

Switch, lower part pressed in = heating off.



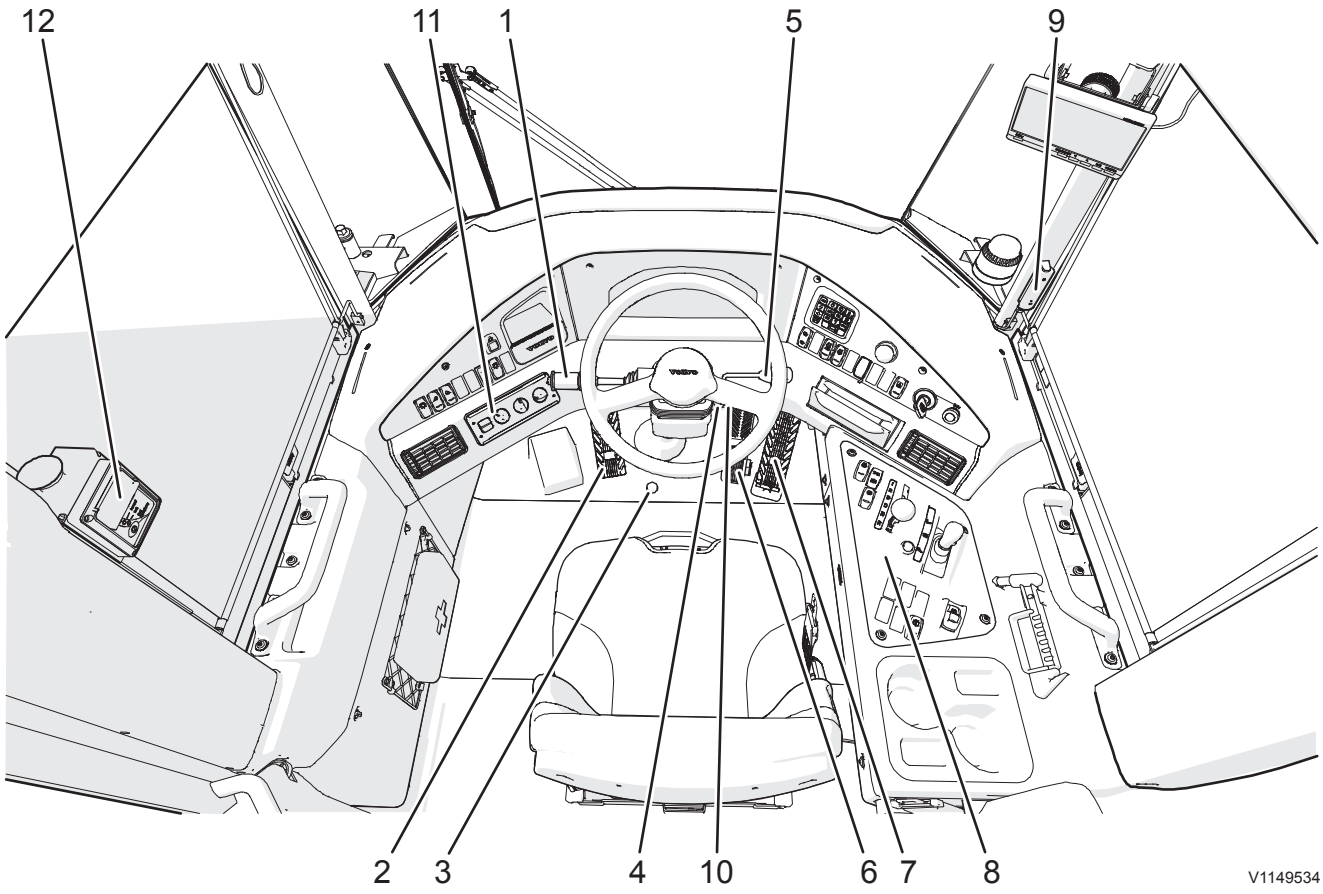
9 Flashing hazard lights

NOTE!
May only be used if you are forced to stop the machine in a way that constitutes a hazard or danger to other road users.

Switch, upper part pressed in = hazard flashers on. When the switch is on, the light on the button's lower part flashes red. On the outside, the direction indicators on the front, rear, and on both sides of the machine flash.

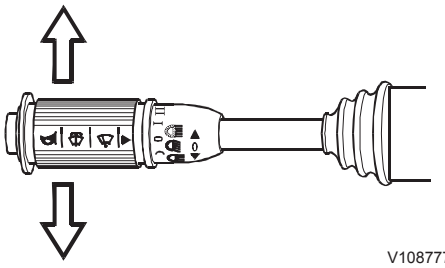
Switch, lower part pressed in = hazard flashers off.

Other controls
Controls

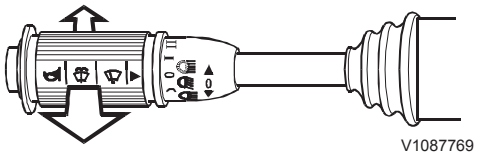


1	Controls, steering shaft	7	Accelerator pedal
2	Retarder pedal	8	Control panel
3	Differential locks and 6-wheel drive	9	Display, automatic greasing system (optional equipment) (See page *136*)
4	Service socket, authorized service tool	10	Service socket, automatic greasing system (optional equipment)
5	Steering wheel adjustment	11	Panel, climate control system (see **Climate control system** section on page *160*)
6	Brake pedal	12	Fire Suppression System, control panel and inner activation button (Optional equipment) (See page *138*)

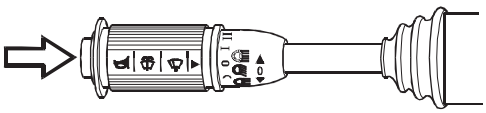
1 Controls, steering shaft


V1087772

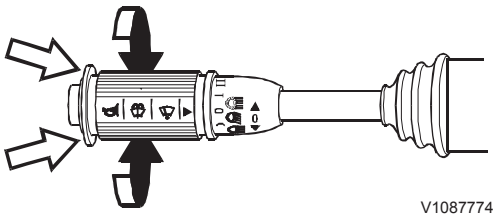
Headlight high-low beam switch
Control up = Headlight flasher
Middle position = Low beams
Control down = High beam


V1087769

Control, direction indicators
Lever forward = Right direction indicators
Lever backward = Left direction indicators


V1087771

Horn
The horn sounds when the button is pressed in.


V1087774

Windscreen wiper
Position J = Interval wiper (see below)
Position 0 = Neutral position, wiper off
Position I and II = Windscreen wiper (two speeds)
Ring pressed in = Washer with automatic wiping 3–4 strokes

Interval wiper:
It is possible to set the interval's time for interval wiping. The interval time can be set to between 5 and 25 seconds. Proceed as follows:

1 Turn the control to position J (interval wiper).

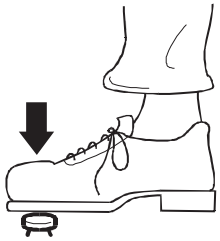
2 Turn back the control to position 0 (neutral position).

3 Wait the time that is desired as interval time, then turn the control to position J again.
The interval time is the time that has passed between deactivation of interval wiping until it was activated again, in the interval 5 to 25 seconds.
Between 25 to 60 seconds, the interval time becomes 25 seconds.
If more than 60 seconds have passed between deactivation and activation of interval wiping, the interval goes back to the latest set interval time.
When the machine starts the interval time is 7 seconds.

2 Retarder pedal

The retarder pedal has two functions, engine brake and wheel brake.

When the engine brake is activated, an **engine brake active** symbol appears on the information display, see page *51*.



V1087780

3 Differential locks and 6-wheel drive

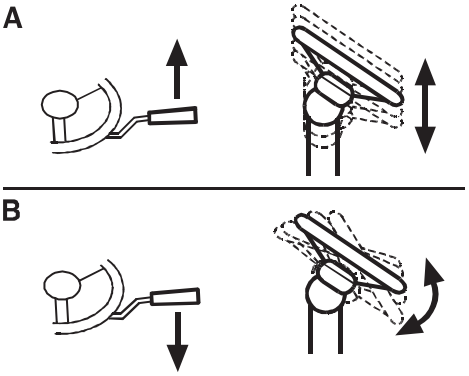
ATC (Automatic Traction Control) provides automatic control of the longitudinal differential locks' engagement and disengagement.

All differential locks and 6x6-drive are engaged by pressing and holding down the foot control (display is shown on the information display unit, middle instrument panel, see page *51*). Differential locks and 6x6-drive remain engaged for as long as the foot control is pressed down.

See also page *186*.

4 Service socket, authorized service tool

Service socket for connecting the authorized service tool is located in the cab below the instrument panel, to the right of the steering wheel. With the service tool service personnel can troubleshoot the machine, perform settings, and read out machine logs, etc.



V1087791

5 Steering wheel adjustment

The steering wheel's angle and height are adjustable.

Lever upward (A) = The steering wheel can be raised or lowered.

Lever downward (B) = The steering wheel can be angled to different positions.

6 Brake pedal

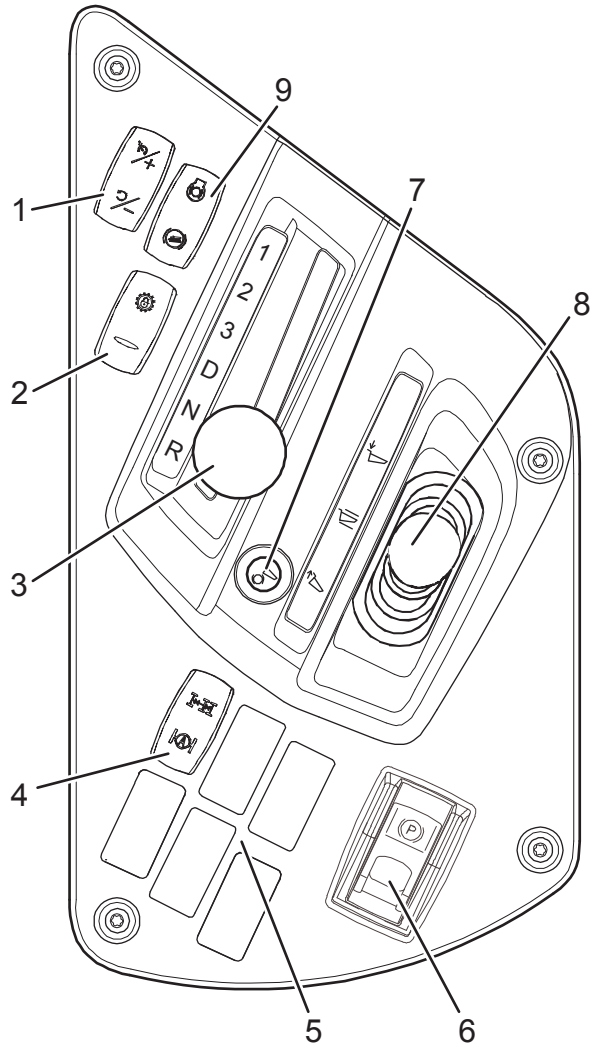
The brake pedal activates the service brake, see also page *190*.

When the service brakes are activated, a symbol for service brakes active is shown on the information display unit, see *45*.

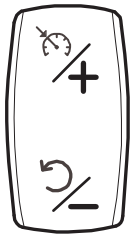
7 Accelerator pedal

If the switch for Engine brake/Downhill Speed Control is activated then the Engine brake or Downhill Speed Control engages when the accelerator pedal is released, see below under header **8.1 Engine brake** and on page *190*.

8 Control panel



1	Cruise Control	6	Parking brake
2	Gearshift lockout (shift inhibitor)	7	Load and dump brake
3	Gear selector	8	Hoist lever
4	ATC and longitudinal differential lock/6-wheel drive	9	Engine brake / Downhill Speed Control
5	Options		


V1200752

8.1 Cruise Control

The button activates and changes selected speed.

Press the upper part (+) of the switch to set the speed to the current speed.

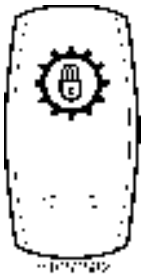
Adjusting the speed up in steps of 5 km is done with a quick click.

Fine-tuning of the speed in steps of 1 km is done by holding down the upper part of the switch for one second.
If the button is held down for longer than 1 second the speed is adjusted by 1 km per second that the switch is held down.

Pressing the lower part (-) of the switch adjusts the speed down by 5 km.

Fine-tuning of the speed in steps of 1 km is done by holding down the upper part of the switch for one second.
If the button is held down for longer than 1 second the speed is adjusted by 1 km per second that the switch is held down.

If Cruise Control has been activated but was deactivated, the speed set earlier can be recalled by pressing the lower part of the switch.
See page *248*

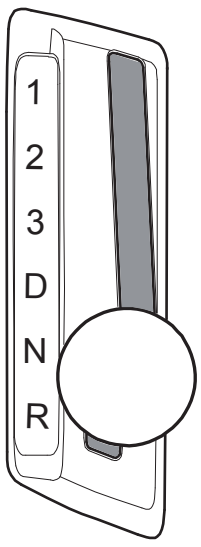


8.2 Gearshift lockout (shift inhibitor)

The shift lockout locks and holds the current gear and prevents the machine from 'gear-hunting'. See also page *184*.

Press the upper part of the switch to engage the gearshift lockout (shift inhibitor). The switch is a rocker switch (spring-return action). Press the switch a second time to disengage the gearshift lockout (shift inhibitor).

8.3 Gear selector



V1092472

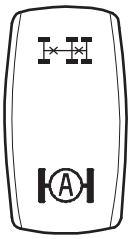
⚠ WARNING

Risk of fatal accident.
The machine can begin to move.
Never leave the machine with the engine running unless gear shift lever is in the N (neutral) position and the parking brake applied.

Gear positions

Position 1	1st gear
Position 2	Automatic shifting between 1st and 2nd gear
Position 3	Automatic shifting between 1st, 2nd, and 3rd gear
Position D	Automatic shifting between 1st, 2nd, 3rd , 4th, 5th, and 6th gear
Position N	Neutral position
Position R	Automatic shifting between 1st and 2nd reverse gear

See also page *183*.


V1130922

8.4 ATC (Automatic Traction Control) and longitudinal differential lock/6-wheel drive

See also ATC (Automatic Traction Control) on page *186*.

The upper part of the switch = longitudinal differential lock and 6-wheel drive, engagement and disengagement

The upper part of the switch is a 'rocker switch'. Press the switch to engage longitudinal differential lock and 6-wheel drive. Press the switch a second time to disengage longitudinal differential lock and 6-wheel drive.

Switch in the central position = ATC deactivated.

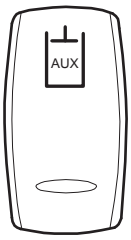
NOTE!
The switch may be in the middle position if the longitudinal differential lock and 6-wheel drive have been engaged with the upper 'rocker' part of the switch.

Lower part of the switch pressed = ATC activated.

8.5 Options

(Extra hydraulics)

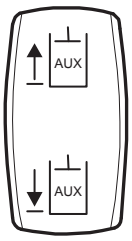
For machines equipped with Hauler Chassis (optional equipment).



V1092464

Alternative 1
Switch, upper part pressed in = function activated.

Switch, lower part pressed in = function deactivated.



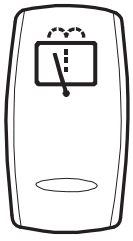
V1115353

Alternative 2
Switch, upper part pressed in (rocker switch) = function activated, hydraulic connection 1.

Switch in middle position = function deactivated

Switch, lower part pressed in (rocker switch) = function activated, hydraulic connection 2.

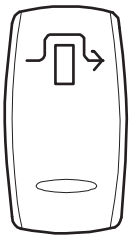
(Windscreen wiper, rear)


V1101279

Switch, upper part pressed in (rocker switch) = rear windscreen wiper and washer activated.

Switch in middle position = rear windscreen wiper activated.

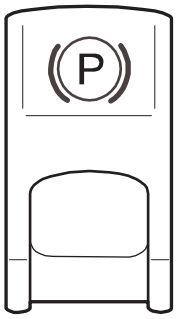
Switch, lower part pressed in = rear windscreen wiper off.



V1201818

(Proximity Detection System (PDS), interface)

Switch for disengaging Proximity Detection System (PDS), interface



V1115448

8.6 Parking brake

Switch, upper part pressed in = parking brake applied.

Switch, lower part pressed in = parking brake released.

Applying

1 Place the gear selector control to neutral.

2 Press in the upper part of the switch.

If the machine is turned off, the parking brake is applied automatically. This takes place regardless of the position of the switch.

The gear shifts to neutral position a few seconds after the parking brake has been applied, unless the brake pedal or accelerator pedal is activated.

When the parking brake is applied, the longitudinal differential lock is also engaged automatically. In addition, the transmission is locked in neutral – no gear can be selected.

NOTE!
If the parking brake is applied when the machine is moving it is subjected to abnormal wear. The parking brake must be checked if it has been used as emergency brake. Contact a qualified workshop.

Releasing

Slide down the catch on the switch, and press in the lower part of the switch.

Releasing (if the parking brake has been applied automatically)

Apply and then release the parking brake with the switch.

See also page *191*.



V1092566

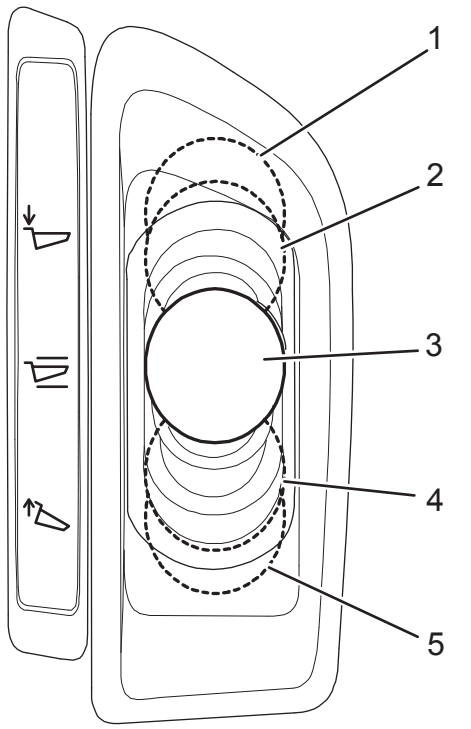
8.7 Load and dump brake

The load and dump brake is activated when loading and unloading the machine. When the load and dump brake is applied, the wheel brakes are also applied. This is to spare the parking brake from unnecessary loading. When the load and dump brake is engaged, the transmission is automatically shifted to neutral.

The load and dump brake is activated by pressing its switch.

The load and dump brake is deactivated when the gear selector control is moved from neutral position. If the gear selector control was in a gear position (1, 2, 3, D, or R) when the load and dump brake was activated, the gear selector control must first be moved to neutral position and then back to a gear position, to deactivate the load and dump brake.

See also the **Load and dump brake** heading in the **Braking** section on page *190*.



8.8 Dump lever

The tipper control has five positions:

Position 1 Lowering position with hold function

Position 2 Lowering position.
This position has a rocker function (spring-return action), must be held in position by hand

Position 3 Hold/float position

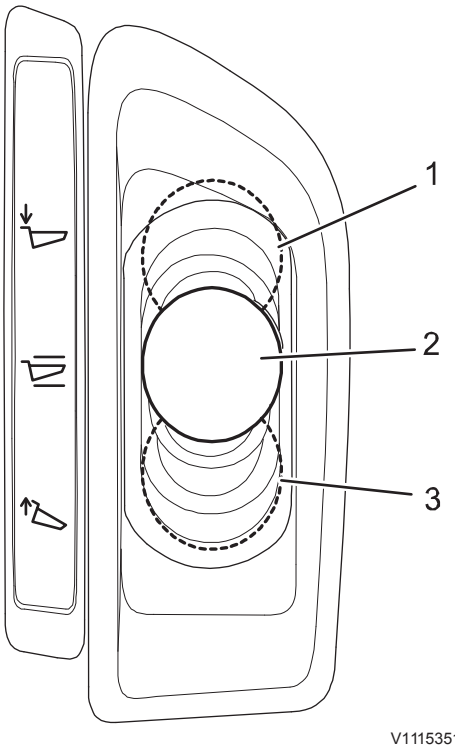
Position 4 Dumping position

Position 5 Dumping against hard stop

NOTE!
During loading and operation, the load body must be in float position. This mode is activated automatically when the load body has reached its lower position and the tipper control is in position 3 — hold position.

NOTE!
If the operator leaves the operator's seat when the load body is up and lowering is in progress, or if the machine is turned off, the tipper control automatically moves to hold position.

See also the **Dumping** section on page *217*.



Hauler chassis, tipper control

Hauler chassis, tipper control

For Hauler chassis-machines, for which the extra hydraulics are activated with the switch, the tipper control on the control panel is not enabled (not connected) and thus it has no function.

The tipper control has three positions:

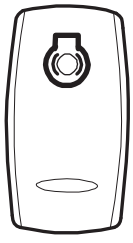
Position 1 Hydraulic connection 1
This position has a rocker function (spring-return action), must be held in place by hand

Position 2 Hold position

Position 3 Hydraulic connection 2
This position has a rocker function (spring-return action), must be held in place by hand

8.9 Engine brake / Downhill Speed Control

For machines without Downhill Speed Control

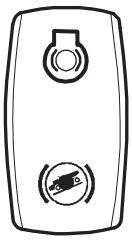


Switch, upper part pressed in = activates engine brake automatically when the accelerator pedal is let up

Switch, lower part pressed in = engine brake deactivated

When the engine brake is activated, an **engine brake active** symbol appears on the display panel.

NOTE!
The engine brake should not be activated in slippery road conditions.


V1200802

For machines with Downhill Speed Control

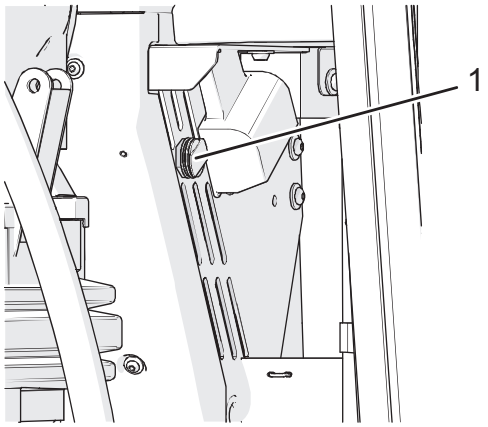
With Downhill Speed Control the switch has a rocker position.

By pressing the rocker switch it is possible to select which one of Engine brake and Downhill Speed Control that is active. The first time that the upper or lower part of the switch is pressed in, then that function is activated. The next time that the button is pressed in the same position, then that function is deactivated. If the other part of the button is selected, there is a change between the functions.
See page *252*

To deactivate Downhill Speed Control the lower part, with Downhill Speed Control the symbol, should be pressed in for more than 1 second. The long time for pressing in the button is for safety reasons, to prevent unintentional deactivation of the function.

Power socket

Under the instructor's seat there is a 24 V socket for voltage feed.

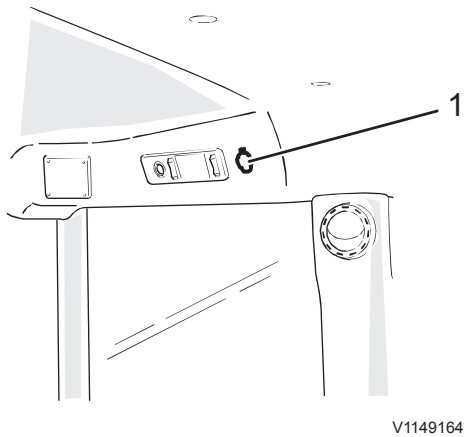


1 24 V socket

Voltage converter

(Additional options)

A 20 A voltage converter provides voltage feed to the radio and 12 V socket in the overhead panel.

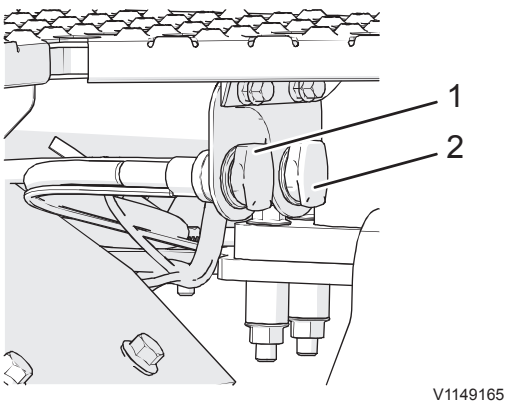


1 12 V socket

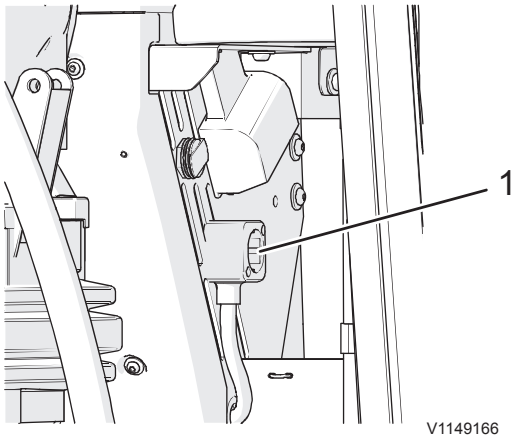
Electric engine heater and/or cab heater

(Additional options)

Connections for voltage feed to electric engine heater and/or cab heater are located under the cab steps.



1 Connection for engine heater
2 Connection for cab heater



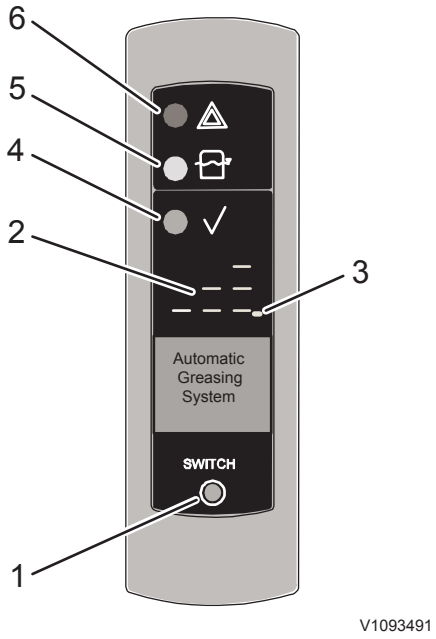
1 230 V socket

If the machine is equipped with inlet for cab heater, there is a 230 V socket under the instructor's seat.

Automatic lubrication system

(Optional equipment)

Display



The display for the automatic greasing system is located on the A-pillar to the right in the cab, see page *126*. The display gives the operator information such as system status, low grease level in the pump unit, error codes, and alarms. It also enables the operator to set the desired greasing intervals, for example.

The display has:

1 **Switch**
Selection of greasing interval or test mode and reset of error.

2 **Three-digit display**
Display of error codes, active greasing interval, and test mode. See below under heading **Codes on three-digit display**.

3 **Decimal point**
Indicates if the interval timer is active or in standby mode.

4 **System active**
Green light-emitting diode is on when the system is active.

5 **Low grease level**
Amber light-emitting diode is on when min. grease level has reached.

6 **Alarm**
Red light-emitting diode is on when there is a problem with the system.

Codes on three-digit display

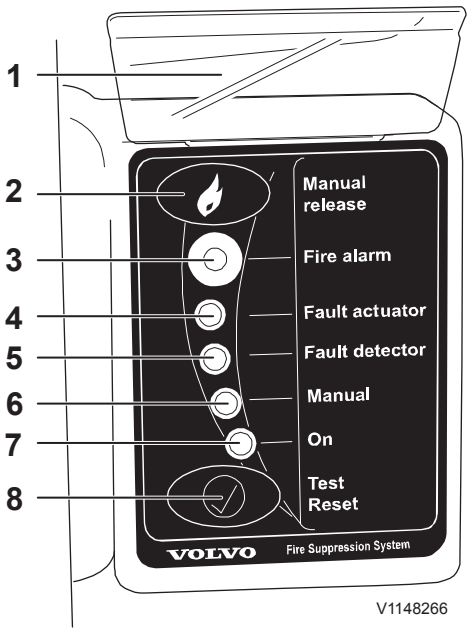
The following shows codes, and the combinations of code and activated light-emitting diode that may appear, as well as their meaning.

Display figure	Explanation
 V1095090	Shown when the ignition is turned on. The lines turn on and off, which gives the illusion that the figure rotates on the display. The symbol indicates that the display communicates with the pump control unit. After 10 seconds the pre-set greasing interval is shown at the same time as the green light-emitting diode (system active) is on.
 V1095091	Shown together with active green LED. Selection of greasing interval with average length intervals (normal grease output). The selections give the same greasing intervals.
 V1094492	
 V1095093	Shown together with active green LED. Selection of greasing interval with short intervals (high grease output).
 V1095099	Shown together with active green LED. Pre-set number of quick automatic cycles are run. This test mode cannot be selected on the display.
 V1095094	When the pump runs quick automatic cycles (without constant pressure, pressure reduction, and pause phase), changes (every 5 seconds) between showing T3 and number of remaining cycles (in this case "047").
 V1095100	Shown together with active amber and green LEDs. Min. level in grease reservoir has been reached. Amber LED turns off automatically when the reservoir has been topped up.
 V1094563	Shown together with active red LED. System failure. Selection of greasing interval is only possible after the problem has been resolved.
 V1095103	Decimal point lights up — interval timer stops Decimal point flashes — interval timer runs
 V1094594	Decimal point wanders. Pumping phase active (includes constant pressure and pressure reduction phase)

Error codes

 V1095109	The display shows E15 and activated red (alarm) and amber (low grease level) light-emitting diodes. Grease reservoir empty.

Other error codes appear. If **other error code** than above is shown on the display — **contact a qualified workshop.**



1 Plastic cover
2 Manual activation
3 Fire alarm
4 Fault actuator
5 Fault detector
6 Manual
7 ON
8 Test, reset

Fire suppression system

(Additional options)

Control panel

Plastic cover
Only open the plastic cover when there is a need for manual activation via the control panel, since the tamper seal will be broken.

Manual activation
Hold in the button for 2 seconds to activate the sprinkler system when fire is indicated. The engine is not turned off. Can be used when the machine has to be moved at the same time as the system is activated.

Fire alarm
The LED flashes red when fire is detected, and the siren and strobe light are activated at the same time. To activate the sprinkler system with manual activation button, see above.

Fault actuator
The light-emitting diode is yellow when there is a malfunction of the activation function. If the light-emitting diode is on, contact a qualified workshop.

Fault detector
The light-emitting diode is yellow when there is a malfunction of the detector circuit. If the light-emitting diode is on, contact a qualified workshop.

Manual
The light-emitting diode is yellow when the system is in manual mode, that is, the parking brake is released.

ON
The light-emitting diode is green when the machine is parked and when the system is in automatic mode. The system is supplied with electric power even if the engine is off.

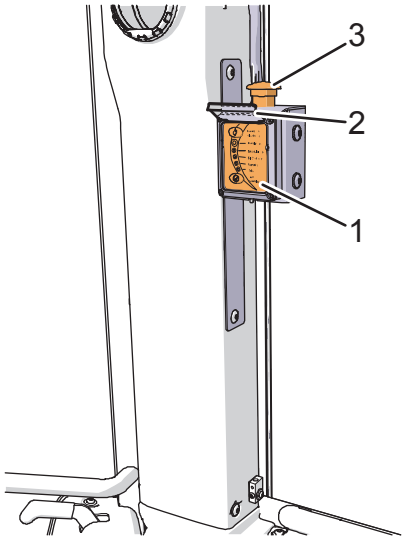
Test, reset
When the test button is pressed in, a function check takes place of the system and the light-emitting diodes. All light-emitting diodes, the siren, and strobe light are activated for approx. three seconds. Daily test is recommended.

NOTE!
When using the button Manual activation on the control panel, the engine is not turned off. The machine can be moved during the time that fire extinguishing is in progress (the system is activated). Operator's choice depending on the situation.

Function check

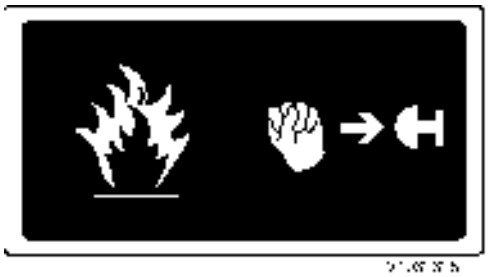
Perform a daily operating check on the system, see page *313*.

In case of error indication, contact a qualified workshop .



Cab, left pillar

1 Control panel
2 Plastic cover
3 Inner activation button (cuts off the main power, stops the engine and applies the parking brake. If fire is detected, activates the sprinkler system.)



In case of fire, activate the inner activation button.

Inner activation button

NOTE!
When the inner activation button is activated, the following steps 1–3 always take place. Step 4 only takes place if fire is detected.

The following takes place when the machine is being operated, the parking brake is released, and the inner activation button is activated:

1 The main electric power is turned off
2 The engine is turned off
3 The parking brake is applied.

If a fire has been detected:

4 The sprinkler system is activated.

NOTE!
Flashing hazard lights can be activated to bring attention to the situation.

For more information on the Fire Suppression System, see page *286*.

Engine- and cab heater, diesel-powered

(Optional equipment)

The diesel-powered engine and cab heater warms the engine and cab before the next work shift when the machine is off and stationary. Warming can be activated directly or pre-set with the timer function.
An extra module allows the engine and cab heater to be remotely controlled.

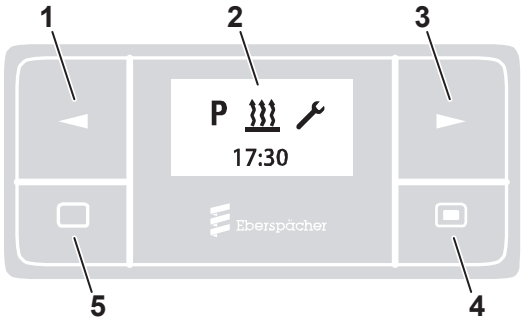
Using an engine and cab heater reduces fuel consumption, negative environmental impact, engine wear, and the operator gets a more comfortable work climate.

For information on maintenance of the engine and cab heater, see page *361*.

NOTE!
After a power failure the timer regains its basic settings and all settings have to be redone. However, brief power failures do not affect the timer.

If the ignition is in position OFF the display turns off 10 seconds after it has been used.

Timer function for engine and cab heater



V1162215

1 Reverse
2 Display
3 Forward
4 Confirm
5 Finish

Activate the display by pressing any one of the four keys.


V1162316


V1162317

Setting clock

1 Select the **Settings** option in the menu using the Back and Forward keys. Confirm with the Confirm key.

2 Select the **Clock** setting option using the Back and Forward keys. Confirm with the Confirm key.

3 Set the time with the Back and Forward keys. Confirm with the Confirm key.


V1162316



V1162318

Setting weekday

1 Select the **Settings** option in the menu using the Back and Forward keys. Confirm with the Confirm key.

2 Select the **Date** setting option using the Back and Forward keys. Confirm with the Confirm key.

3 Set the weekday with the Back and Forward keys. Confirm with the Confirm key.


V1162316



V1162319

Setting time format

1 Select the **Settings** option in the menu using the Back and Forward keys. Confirm with the Confirm key.

2 Select the **Time format** setting option using the Back and Forward keys. Confirm with the Confirm key.

3 Set the time format with the Back and Forward keys. Confirm with the Confirm key.

Fast heat

NOTE!
Fast heat activates the machine's battery disconnector (main switch), information display, and entrance lighting.

1 Press the Confirm key for more than 2 seconds to activate the heat.

2 Press the Finish key for more than 2 seconds to deactivate the function.

Heat ON

1 Press the Confirm key for less than 2 seconds.

2 Set the operating time with the Back and Forward keys. Confirm with the Confirm key.

3 Press the Finish key for less than 2 seconds to deactivate the function.


V1162315

Program pre-select times

1 Select the **Programming** option in the menu using the Back and Forward keys. Confirm with the Confirm key.


V1162316

2 Select the **P1, P2,** or **P3** setting option with the Back and Forward keys. Confirm with the Confirm key.

3 Select the **Settings** setting option using the Back and Forward keys. Confirm with the Confirm key.

4 Select weekday interval or a weekday with the Back and Forward keys. Confirm with the Confirm key.

5 Set start time with the Back and Forward keys. Confirm with the Confirm key.

6 Set the operating time with the Back and Forward keys. Confirm with the Confirm key.


V1162315

Select and activate/deactivate pre-select times

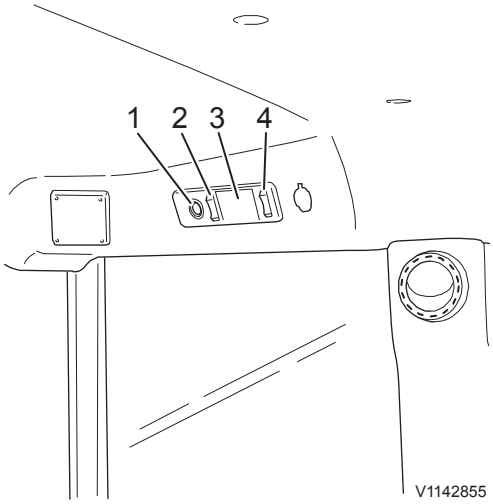
1 Select the **Programming** option in the menu using the Back and Forward keys. Confirm with the Confirm key.

2 Select the **P1, P2,** or **P3** setting option with the Back and Forward keys. Confirm with the Confirm key.

3 To activate/deactivate the selected option, select setting option **On** or **Off** with the Back and Forward keys. Confirm with the Confirm key.

Cab interior lighting

The cab lighting is located in the overhead panel on the cab's right side.



1 Reading light
2 Switch, reading light
3 Cab lighting
4 Switch, cab lighting

Reading light

- Switch, upper part pressed in – Light on
- Switch, lower part pressed in – Light off

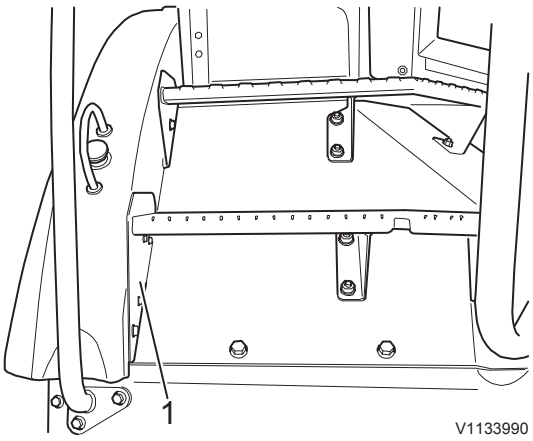
Cab lighting

- Switch, upper part pressed in – Light on
- Switch in middle position – Light off
- Switch, lower part pressed in – Automatic position

Entrance lighting

(Optional equipment)

The cab step (entrance) lighting is located on the hydraulic tank's framework and lights up the left side's cab steps as well as the ground underneath. This makes it easier for the operator to enter and exit the machine safely in the dark.



1 Position of switch for cab step lighting (entrance lighting)



Switch, cab step (entrance) lighting

The switch for the cab step (entrance) lighting is located on the outer part of the left fender by the cab steps.

When entering, the lighting is activated when the switch is pressed and then remains on for a short time. When exiting, the lighting is activated when the cab door is opened as long as the battery disconnector (main switch) is on, see page *123*.
If the battery disconnector (main switch) has been deactivated the cab step (entrance) lighting cannot be turned on. Then turn the ignition to position R and back to 0 to activate the cab step (entrance) lighting when the door opens.

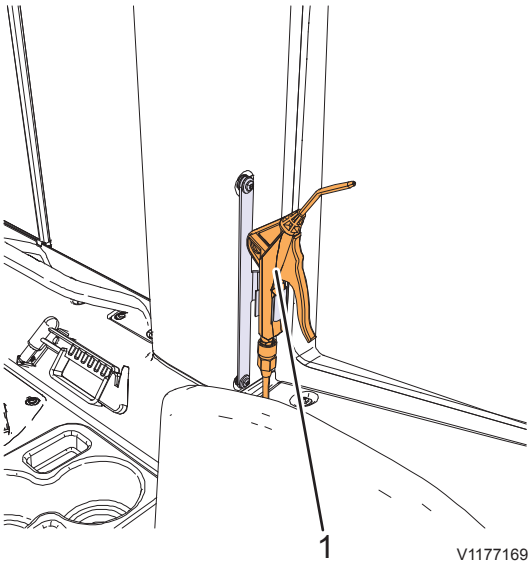
If the door has been opened and the cab step (entrance) lighting has been activated, it remains on according to a preset time.

The cab step (entrance) lighting turns off when the machine starts to roll.

Air blow gun

(optional equipment)

On the B-pillar to the right in the cab, there is an air gun for cleaning.



1 Air gun

Cab

Rear vision system

(Standard or optional equipment depending on market)

The camera, located on the back of the machine, together with the monitor in the cab give the operator good visibility to the rear when, e.g., reversing the machine, dumping the load, etc. There are two versions of the monitor/display available. Monitor with Rear vision system or Volvo Co-Pilot display as part of Haul Assist.

Maintenance

NOTE!
Aggressive chemicals or abrasive cleaners may absolutely not be used on the lens or screen.

The only maintenance needed on the camera is cleaning:
- Clean the lens on the back-up camera as needed with a moist (water) cloth. To avoid scratches on the lens, first spray the lens with water so that dirt and other impurities run off before cleaning with a damp rag, use water for the rag.

Functions

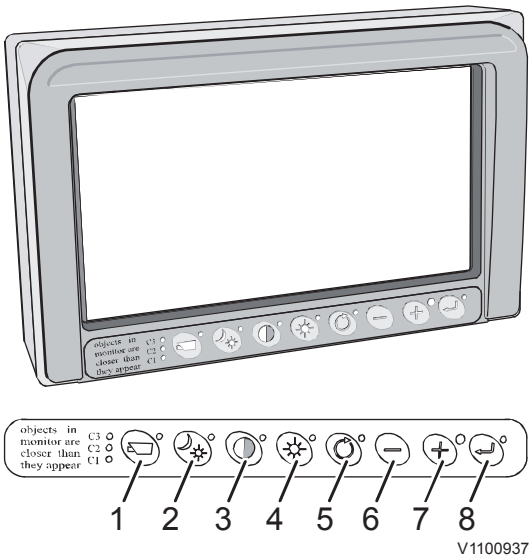
The back-up camera is activated when the ignition is in position 1. When any of the adjusting positions is activated, a red LED-light is on up to the right of the adjusting position (or button) that is activated.

Rear vision monitor

NOTE!
Do not touch the screen with your fingers. Avoid pressing hard on the screen, the screen's pixels may be damaged.

The only maintenance needed on the monitor is cleaning:
- Clean the monitor's screen in the cab using a high-quality cleaning foam.

Functions



The following explains the function of the buttons on the monitor:

1. Camera select
The system only has one camera, the function is not applicable. The LED-light up to the right of the button flashes when the button has been pressed once. Press in the button one more time to turn the light off.

2. Setting of background lighting on LCD-screen
This button enables changing between the following positions (press repeatedly until desired alternative below lights up):

Automatic control (ABC) — in this position the background lighting on the screen is controlled automatically between min. and max. brightness, depending on the intensity of the surrounding light.

Day setting (Day) — setting of the brightness for background lighting on the screen is adjusted by pressing the plus and minus buttons. The setting is saved.

Night setting (NIT) — setting of the brightness for background lighting on the screen is adjusted by pressing the plus and minus buttons. The setting is saved.

When this setting menu is activated, an LED-light is on up to the right of button 2 except when setting ABC is shown. To exit the adjusting position, press in button 5.

3. Contrast
Press the button once to enter contrast adjustment mode. Use the plus and minus buttons to adjust the contrast.
To exit the contrast adjusting position, press in button 3 one more time. The LED-light up to the right of button 3 turns off.

3. and 4. Colour saturation
To enter mode for setting colour saturation, press button 3 and 4 at the same time. Use the plus and minus buttons to adjust the image's colour saturation.
To exit colour saturation adjusting position; press twice on one of the buttons 3 or 4, or press button 5.

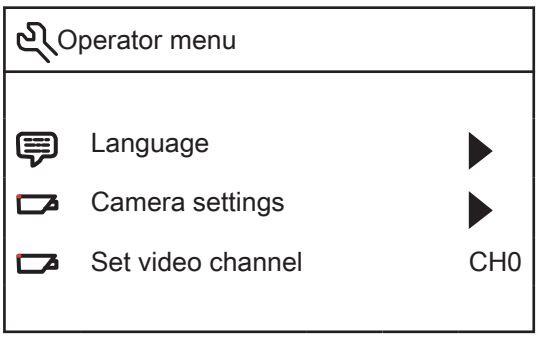
4. Light intensity
Press the button once to enter adjustment mode for light intensity. Use the plus and minus buttons to adjust the light intensity.
To exit the adjusting position, press in button 4 one more time.

5. Alternative
When button 5 "Alternative" is pressed, a picture (still image) is generated from the connected camera. It is possible to adjust the time for which the still image is to be shown (contact a qualified workshop).

6. Select / setting – minus

7. Select / setting – plus

8. Standby menu
If button 8 is pressed the screen skips to the Standby menu where it is possible to select that camera and screen only should be active when reverse gear is engaged.
Scroll in the menu with the plus and minus buttons and highlight the alternative **Standby**. Press in button 8 to activate Standby mode, and the camera and screen will only be activated when reverse gear is engaged. When Standby mode is activated, exit the mode by pressing button 8 one time.
Under the other alternative, Info, in the Standby menu information is shown about the system, e.g., which version of software is downloaded.
Exit the Standby menu by pressing button 5 once or several times.

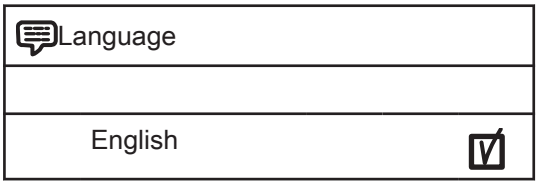


Operator's menu (Operator menu)

To make settings for language, cursor's position on the screen, and video channel, you must enter the monitor's operator's menu.
To enter the operator's menu, press button **6 (select/setting – minus)** and **7 (select/setting – plus)** at the same time.
The buttons on the monitor that are used and how they are used, see the following:

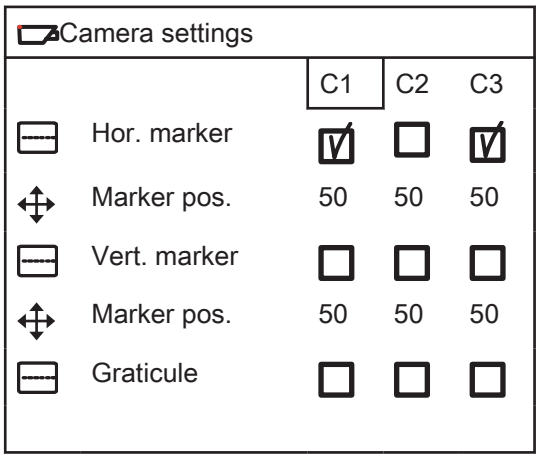
- **5 – Alternative** used to go back to the previous menu
- **6 – Minus** used to scroll down in the menu selections
- **7 – Plus** used to scroll up in the menu selections
- **8 – Enter** Used to select or activate the selected alternative.

To exit sub-menus and the menu; press button 5 (Alternative).



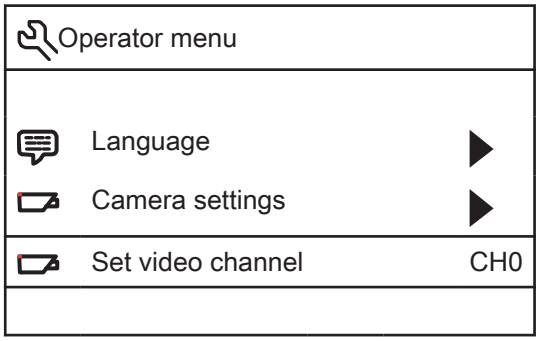
Language (Language) — this alternative opens the language selection menu. Selected language will be shown in all menus. The following language alternatives are available; English, Dutch, German, French, Czech, Italian, Polish, Portuguese, Spanish, Turkish, Swedish, Finnish, Danish, and Norwegian.





Camera settings (Camera settings) — press button 8 (Enter) to select camera; C1, C2, or C3. Then scroll in the menu with the plus and minus button.

Horizontal reference line (Hor. marker)	activates and deactivates a horizontal reference line on the monitor's screen.
Position, horizontal reference line (Marker pos.)	adjusts the position of the horizontal reference line on the monitor's screen. 0 is top of the screen and 100 is the bottom. Change by scrolling down in the menu until the numerical value is highlighted. Press in button 8 (Enter) and then adjust with the plus and minus buttons.
Vertical reference line (Vert. marker)	activates and deactivates a vertical reference line on the monitor's screen.
Position, vertical reference line (Marker pos.)	adjusts the position of the vertical reference line on the monitor's screen. Adjustable between 38 and 63. Left and right are changed with the camera's mirror function. Change by scrolling down in the menu until the numerical value is highlighted. Press in button 8 (Enter) and then adjust with the plus and minus buttons.
Graticule (Graticule)	this alternative activates a possible line of travel on the screen for the machine when reversing.

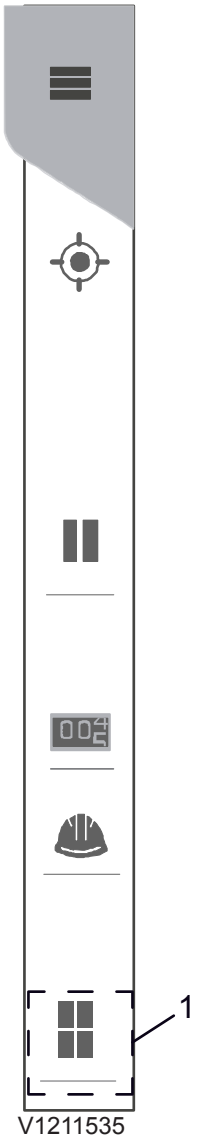


Video channel (Set video channel) — sets the video channel as it is used by the scanner. It is possible to select; CH0 = channel 0 to CH7 = channel 7, and AUT = automatic.

Rear vision display Volvo Co-pilot

If the machine is equipped with Volvo Co-Pilot the back-up camera image will be displayed on it.

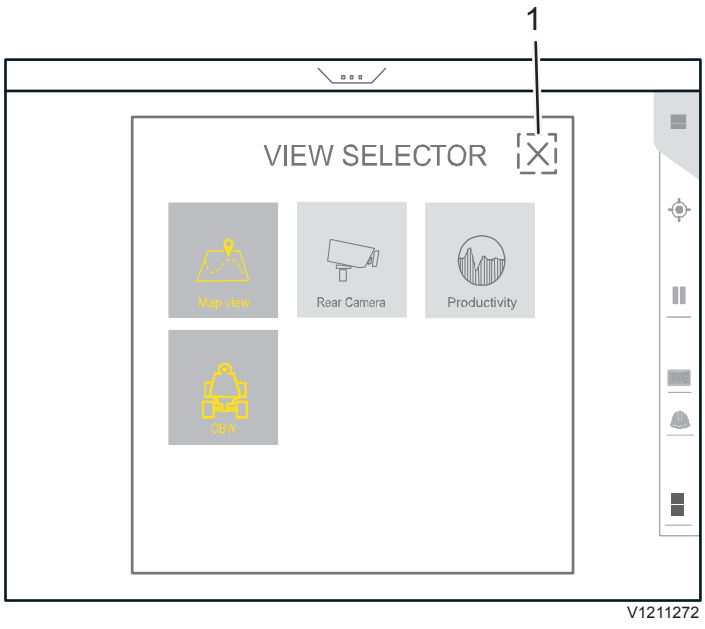
The back-up camera is activated automatically when reverse gear is engaged. It is also possible to choose to have the back-up camera on the screen without reverse gear being engaged. The back-up camera can be shown on full screen or half screen, which means that the screen can be split and shared with another function. The selection is made in the function's View selector.



1 Haul Assist, View selector

Haul Assist, View selector

Use the symbol View selector in the project list for Haul Assist to choose between different views:
- Full screen view for a function
- Two views side-by-side vertically with two selected functions



1 Closing symbol
- Select back-up camera. The selected function's symbol turns yellow.

- Close the menu: View selector with the closing symbol
- The back-up camera view is displayed

Display settings

For the setting procedure in Volvo Co-Pilot see pages *113* , *114* and *120*.

Tyre pressure monitoring system

(Additional options)

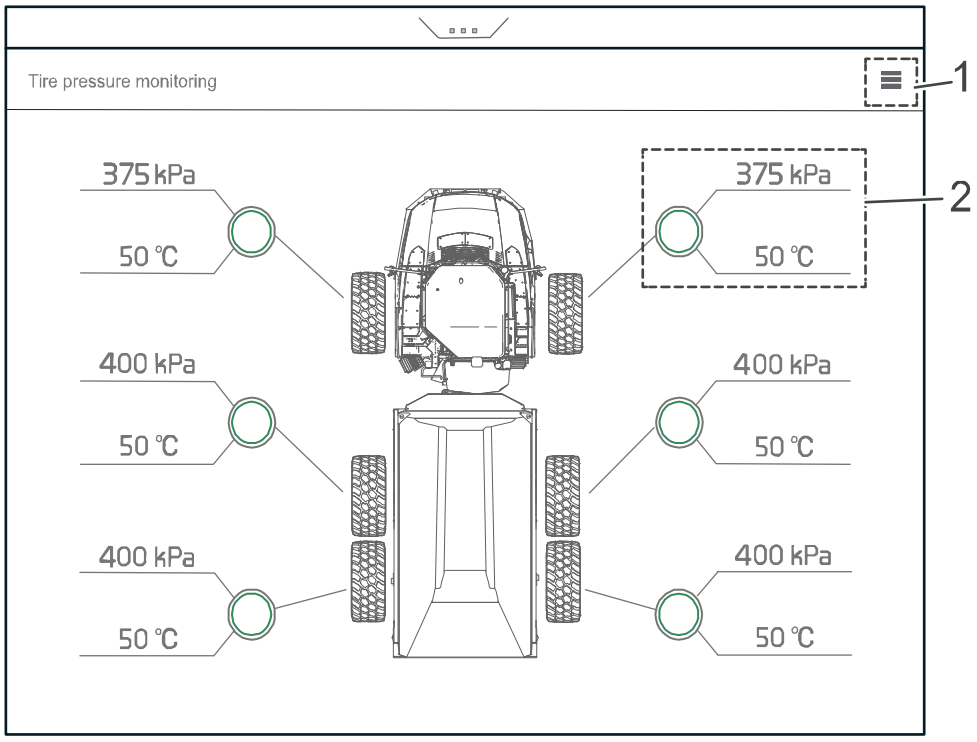
Volvo's Tyre pressure monitoring system (TPMS) is designed for use as an information system for tyre pressure and temperature.

Tyre pressure monitoring system, information

The tyre pressure monitoring system comprises a receiver located on the outside of the operator's cab and sensors on the tyre valves. The receiver is linked to the Volvo Co-Pilot connected sensor network which sends signals from the pressure sensors. The sensors are powered by an internal battery which limits the sensors' life. Depending on the environment, the life may vary from 1 to 5 years. The sensors must therefore be replaced periodically.

Tyre pressure monitoring system, main screen

NOTE!
The values shown in the image are for information only. For the correct values, see page *419*



1 Settings for the application, see *148*
2 Tyre status

Tyre status

If a status deviation occurs and Volvo Co-Pilot is used for another app, a warning message will appear.

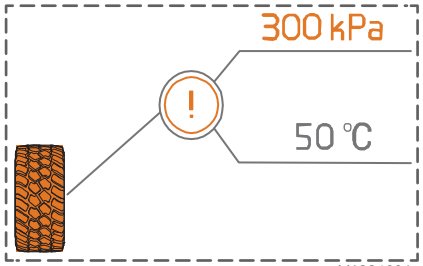


V1224613

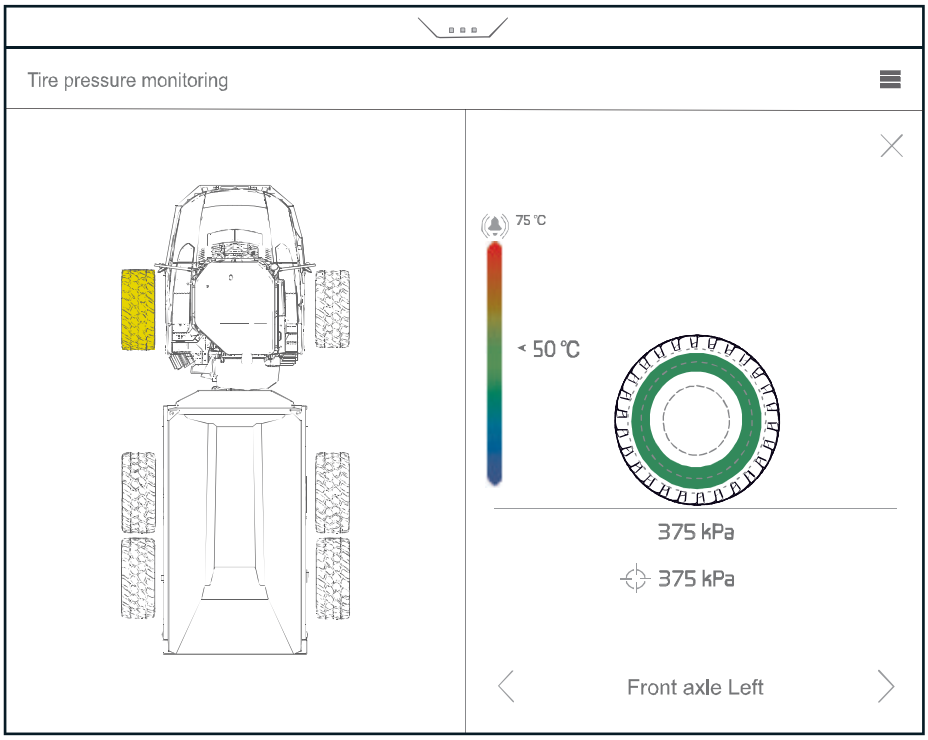
When the message from the tyre pressure monitoring system appears, open the app and check the values.

The current tyre pressure and temperature appear. If the temperature or pressure is outside the warning levels, a warning symbol appears and the incorrect value lights up red.

Press on a tyre symbol to open another menu for the tyre.

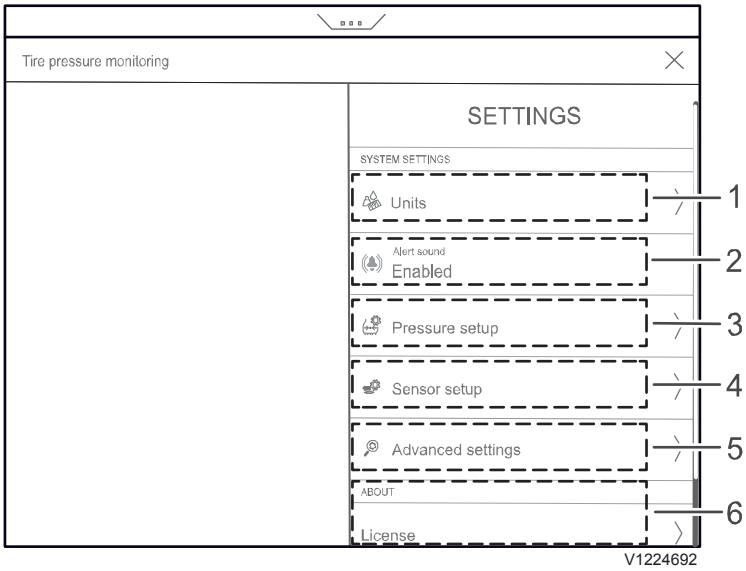


V1224631



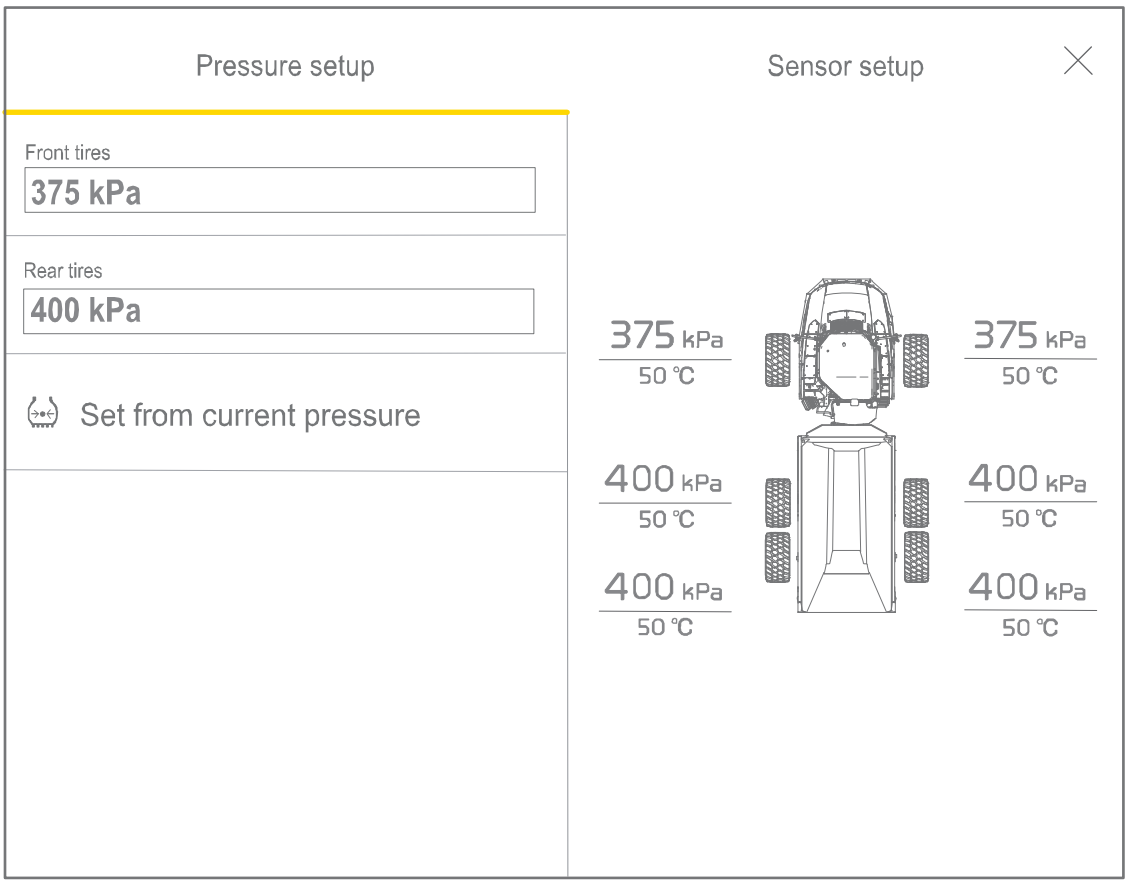
V1224660

Tyre pressure monitoring system, settings



1 Units, allows you to change the unit for the pressure and temperature.
2 Activate or disable audible warnings.
3 Menu for setting the recommended tyre pressure, see page *149*
4 Menu for linking the sensor ID to the tyre position, see page *150*
5 Advanced settings
6 Information about the software licences and application version.

Tyre pressure monitoring system, pressure setup



V1224715

The target value for the front or rear axle tyre pressure must be indicated in accordance with the tyre pressure table. See page *419* or in accordance with the tyre manufacturer's recommendations.

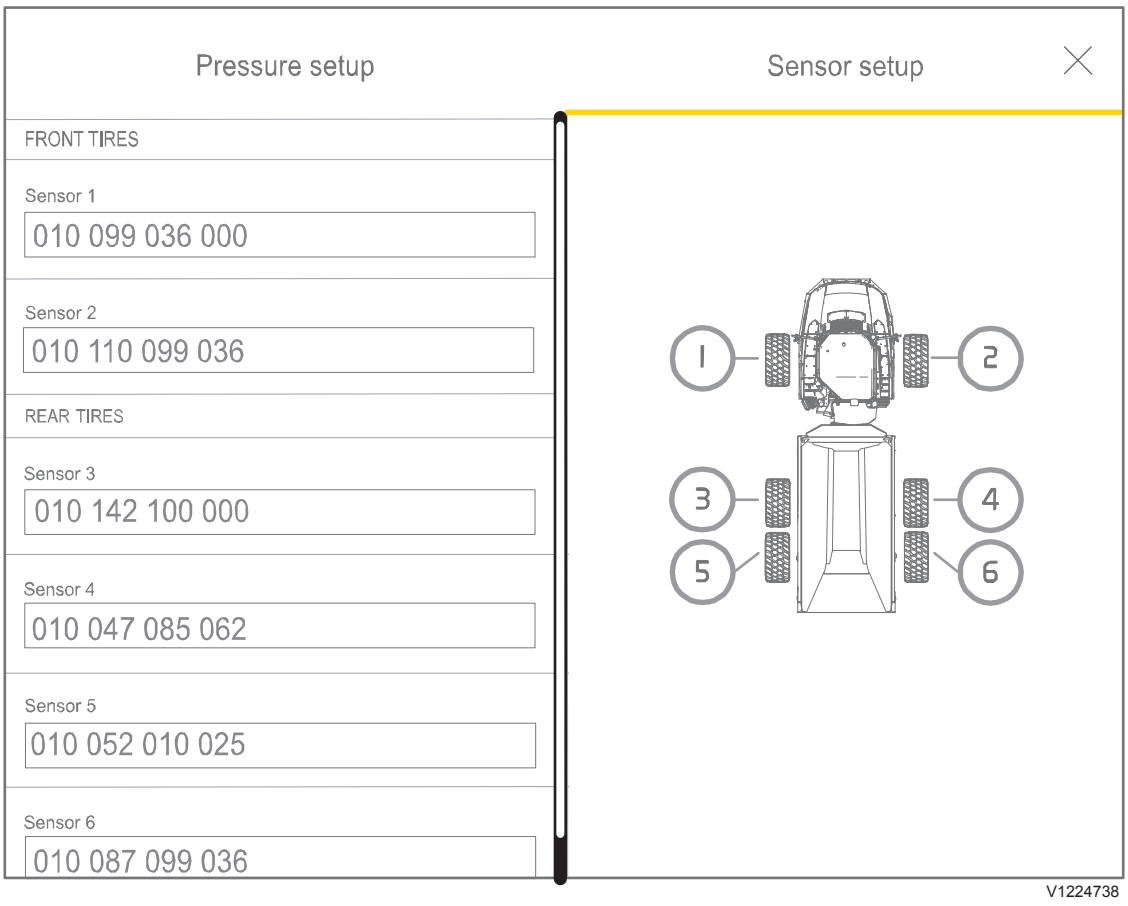
NOTE!
Make sure you select the correct tyre and pressure in the table.

The target value may be indicated in one of two ways:

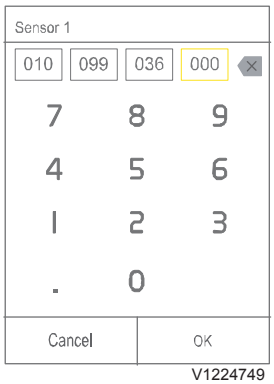
A The value is indicated based on the actual value read by the tyre pressure sensors for the current axle.

B The target value is indicated by manually entering the value for each axle.

Tyre pressure monitoring system, sensor setup



V1224738

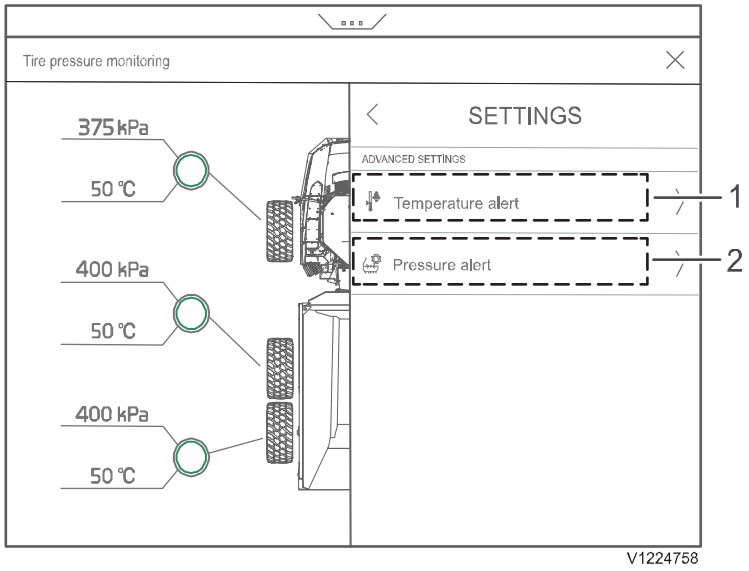


V1224749

For the system to operate correctly, the sensors must be linked to the correct position. This is done by programming the 12-digit number located on the sensor, in the position in which it is to be fitted.
If a sensor error occurs, the sensor can be disabled by deleting the 12-digit number in the input field.

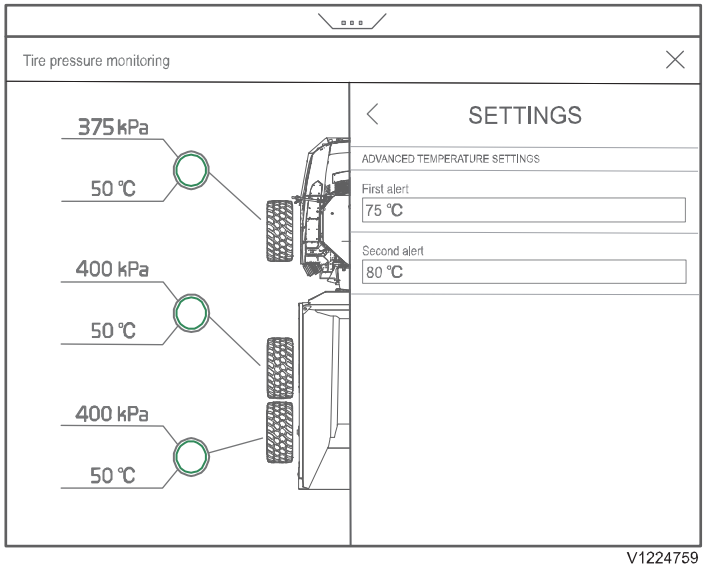
NOTE!
For the value to be correctly saved Volvo Co-Pilot must be restarted. This is done by switching off the machine using the key after entering the settings.

Tyre pressure monitoring system, advanced settings



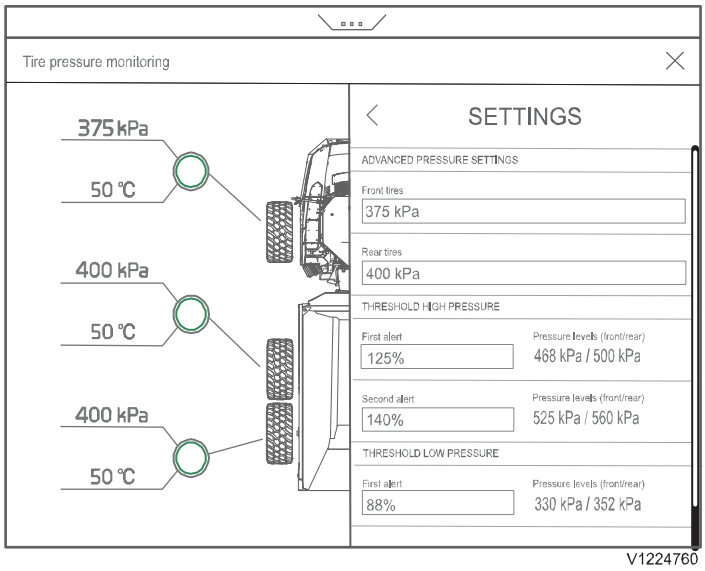
1 Temperature alert
2 Pressure alert setup

Temperature alert



The tyre temperature warnings have two alarm levels for high temperatures.

Pressure alert setup



V1224760

The tyre pressure warnings have two alarms levels for high and low pressure. The warning threshold values are set as a percentage of the tyre pressure's target value.

Operator comfort

Operator seat

The operator's seat meets the standards according to EN ISO 7096:2008. In brief, this means that the seat is designed in the best possible way to minimize the whole-body vibrations to which the operator is exposed when operating the machine. The amplitude (size) of the vibrations depends on different factors, many of which are not related to the machine's design, such as ground conditions, speed, and operating techniques. Keep the following in mind:

- adjust the seat according to the operator's weight and length
- keep the ground on the work site in good condition
- select the correct operating technique and speed in relation to existing conditions.

⚠ WARNING

Risk of serious accidents.
Sudden movement of operator's seat could cause loss of machine control. This could result in accidents with serious injuries.
Always stop the machine before adjusting the operator´s seat.

Correctly adjusted operator's seat increases operator comfort and safety. Incorrectly adjusted seat may lead to injuries.
The adjustments that should be made are:

- backrest inclination (angle)
- lumbar support
- inclination (angle) of and raising/lowering seat cushion
- fore-aft (leg room)
- operator's weight
- adjustment for seat depth (only applies to operator's seat Grammer)
- damping (only applies to operator's seat Grammer)

On operator's seat KAB the mounting bracket has several holes for fastening the seat. This means that the operator's seat can be moved on the mounting bracket, thus providing additional adjustment possibilities fore-aft. The seat shall be moved by a qualified service technician.

All versions of operator's seats are air-suspended and are available with electrically heated seat cushion (optional equipment).



V1092188

Switch electrically heated seat cushion

Changing operator's seat

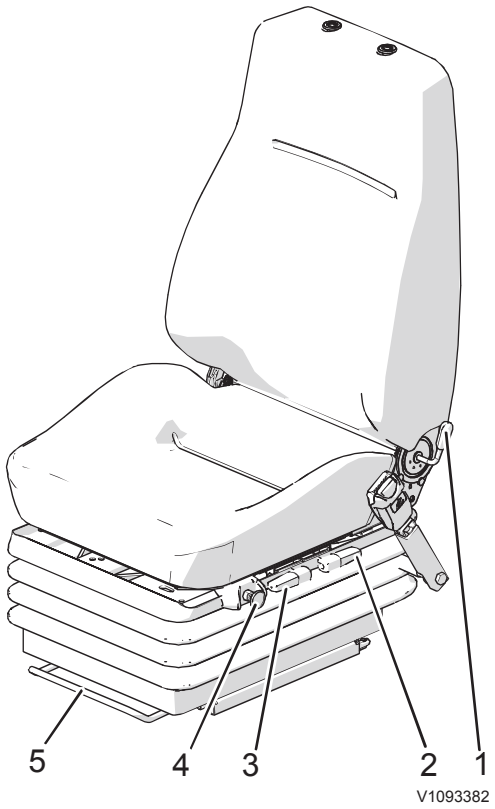
If the operator's seat has to be replaced, then the new seat must be tested according to ISO 7096:2008. This means that the seat

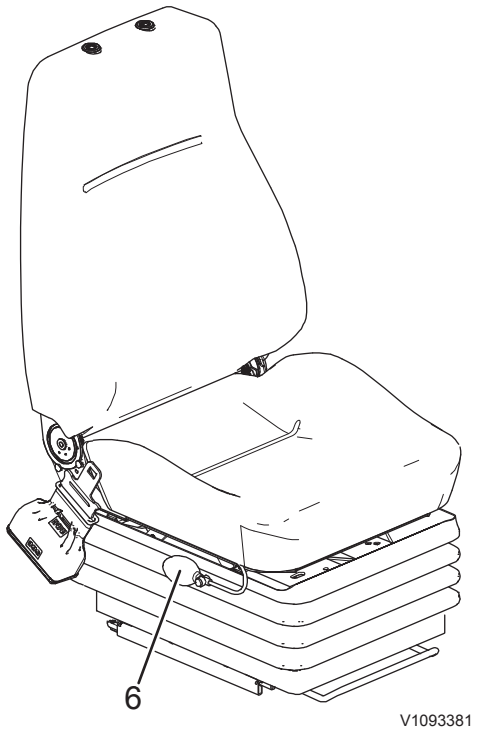
manufacturer has designed and adapted the seat's vibration-damping properties to the machine type in which the seat is to be installed.

NOTE!
The seat shall be marked with vibration-damping class EM1. When replacing the seat, the new seat has to have correct damping capacity and be approved by Volvo.

NOTE!
In order for Volvo to certify and guarantee the operator seat's and the floor's strength the prescribed holes in the floor plate must be used when installing the seat.

Operator' seat KAB, adjusting



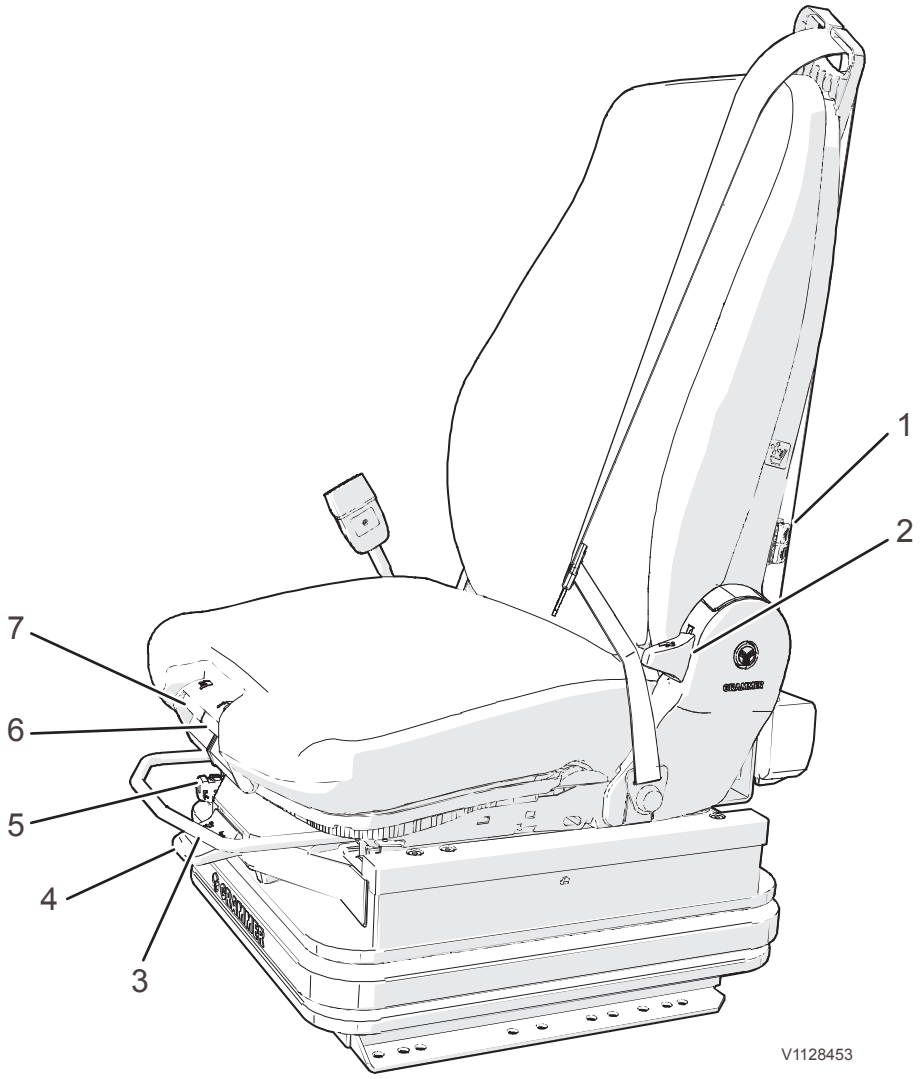


1 Backrest angle
2 Seat height at rear
3 Seat height at front
4 Weight adjustment **(should not be used for height adjustment)**
5 Fore-aft adjustment
6 Lumbar support

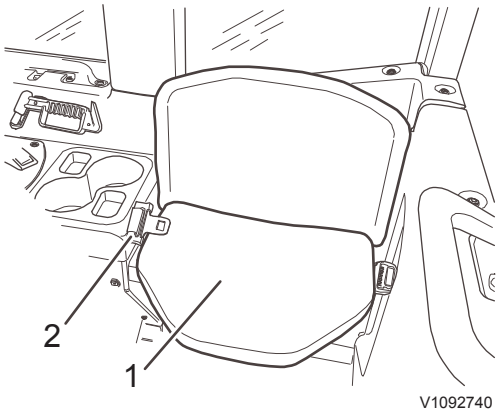
Operator' seat Grammer (optional equipment), adjusting

The operator's seat is available with a lap-type seatbelt or three-point seatbelt. The illustration shows the operator's seat with a three-point seatbelt.

Operator's seat Grammer is also available in a version used for certain special cabs. This seat is only available the lap-type seatbelt does not have controls for adjusting the seat depth and height at the front.



1 Lumbar support
2 Backrest angle
3 Fore-aft adjustment
4 Weight and height adjustment
Weight adjustment: By briefly pressing the control up or down the seat adjusts to the operator's weight.
Height adjustment: Press the control up or down until desired position is obtained.
5 Damping
6 Seat height at front
7 Adjustment for seat depth



1 Instructor's seat
2 Lap-type seat belt

Ride-on instructor

The instructor's seat is located on the right side in the cab, behind the operator's seat. It is intended to enable an instructor to ride temporarily in the machine to instruct and train the operator so that the operator can operate and handle the machine in an optimal way.

Training of operators by an onboard instructor should be done on level ground where the risk of machine rollover or being struck by falling objects is minimal.

Machine speed should be limited to 20 km/h (12.4 mph) and the instructor should use the lap-type seatbelt during operation.

It is recommended that the training area is levelled and smoothed off before training to avoid exposing the instructor to unnecessary jolts and sudden movements.



Seat belt

The symbol for seatbelt reminder is activated if the seatbelt is not buckled when the engine is running and a gear is activated (see also section **Middle instrument panel** on page *45*).

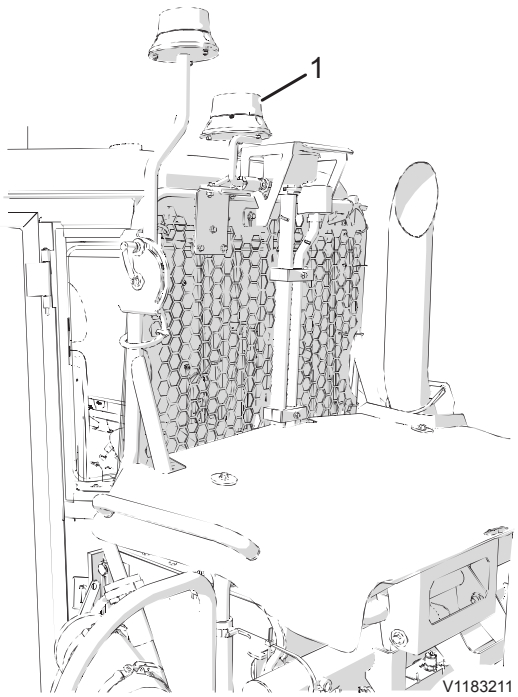
NOTE!
If the seat is equipped with seatbelt XXL (Additional options) the seatbelt reminder is disconnected.

The seatbelt is a supplement to the cab's safety design and must be used to prevent the operator from being ejected from the cab if the machine should roll over. A fastened seatbelt also helps the operator to maintain control of the machine if it should pitch, rock violently, or encounter other tough conditions.

- The seatbelt with associated parts must be inspected at regular intervals. Replace the entire seatbelt immediately if it is worn, has loose stitching, or if buckles or the seatbelt roller does not work.
- Replace the seatbelt if the machine has been involved in an accident where the belt has been subjected to high strain or loading.
- Changes to the belt or its mountings must never be made.
- The seat belt is intended for one adult only.
- Keep the belt rolled-up when not in use.
- Only clean with warm water, not soap or cleaners. Let the belt dry while it is fully pulled out, before rolling it up. Make sure that the seatbelt is installed correctly.

Seatbelt indicator, external

(Additional options)



1 Green light for the external seatbelt indicator

When the operator uses the setbelt a green light is activated on the roof.

NOTE!
The equipment cannot be combined with the optional equipment XXL.

Seatbelt XXL

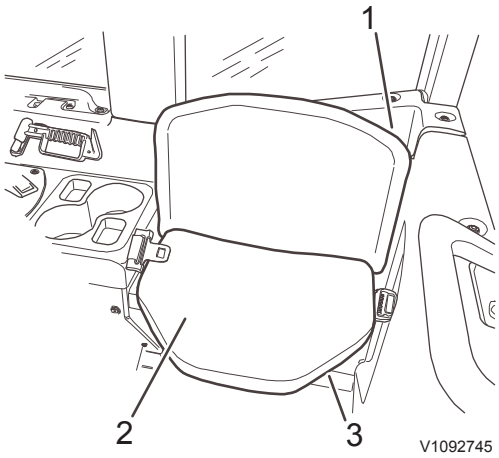
(Additional options)

Seatbelt XXL is a non-roller, extra long belt with the seatbelt buckle at the front.

NOTE!
The equipment cannot be combined with the external seatbelt indicator and the seatbelt reminder is disconnected for Seatbelt XXL (optional equipment).

Storage compartment

Behind the backrest of the instructor's seat there is a storage compartment, e.g., for storing the Operator's Manual. There is also a storage compartment under the seat of the instructor's seat.



1 Storage compartment
2 Instructor's seat
3 Storage compartment

Alternative exit



1 Alternative exit (right side of cab)
2 Hammer

Alternative exit from the machine is possible through the split side window in front of the B-pillar on both right and left side of the cab. Alternative exit is indicated by a decal. In an emergency, these windows can be broken with the hammer. When the window is broken, the moulding between the window's two parts falls away.

NOTE!
Only window panes for alternative exit (emergency exit) can be broken.



Decal, alternative exit

The hammer is used in emergencies to:

- break the window glass for alternative exit,
- cut the seatbelt with the knife located on the back of the hammer.

Climate control system

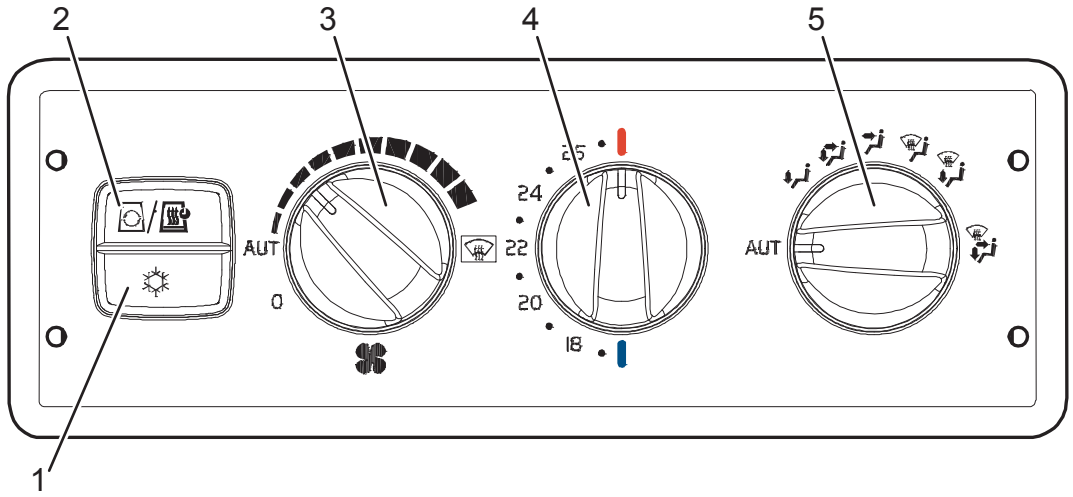
Heating and ventilation system

General

- Keep the door closed.
- Direct the air flow away from unprotected skin.

Panel, climate control system

The control panel for heating and ventilation is positioned under the left instrument panel.
The system is of the integrated type, i.e., filtered fresh air, heated air, or cooled air come out of the same nozzles.



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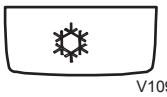
1 Air conditioning

2 Recirculation of air in cab, and cab heat timer/cab ventilation timer

3 Fan control

4 Temperature control

5 Air distribution control



V1093215

1. Air conditioning

1. Air conditioning

Air conditioning is activated by pressing in the switch, and it is deactivated by pressing in the switch a second time.

Activated air conditioning is indicated by a green light-emitting diode on the switch. If the air conditioning cuts out when it is activated, e.g., due to too high pressure in the air conditioning system, the light-emitting diode flashes.

The air conditioning does not operate if the fan is off (fan control is set to 0, see below).



V1093216

2. Recirculation of air in cab, and cab heat timer/cab ventilation timer

2. Recirculation of air in cab, and cab heat timer/cab ventilation timer

Recirculation

Gives recirculation of air in the cab with some mixture of fresh air to maintain the overpressure in the cab.

Recirculation is activated by pressing the switch (2), and is deactivated by pressing the switch once again.
Activated recirculation is indicated by a green light-emitting diode on the switch.

Cab heat timer/cab ventilation timer (optional equipment)

Cab heat timer/cab ventilation timer is a function that helps the operator to maintain a comfortable cab temperature when the machine is off.
The cab can be ventilated for max. two hours and heated for max. one hour.

If the outdoor temperature is below +17 °C the cab heat is activated, using heat from the engine's cooling system. If the outdoor temperature is above +17 °C the cab is ventilated with outside air. The system is limited in its function by the outdoor temperature (for ventilation of cab) and the temperature of the engine coolant (for heating). When cab heat is activated the system strives to maintain a temperature of +26 °C in the cab regardless of which temperature is set on the panel. (This temperature can be set in the interval +20–26 °C using the service tool.)

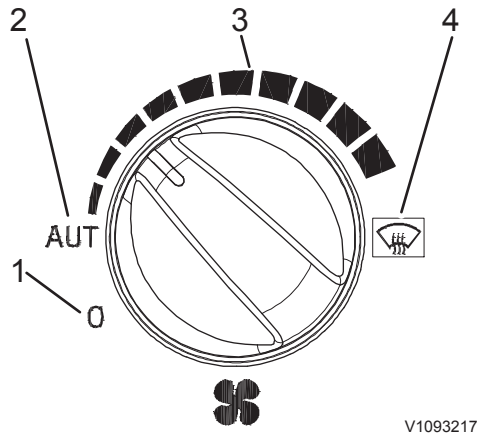
Cab heat timer/cab ventilation timer can be activated between 50 seconds before and 20 seconds after the ignition has been turned to the Off position. If cab heat has been activated it works even after the key is removed from the ignition.

Activation:

- press in switch (2) for two seconds. The light-emitting diode on the switch flashes for two seconds to indicate that the function is activated.

Deactivation:

- press in switch (2) for two seconds. The light-emitting diode on the switch flashes for two seconds to indicate that the function is deactivated.
- the engine is started
- if there is not enough heat in the engine's cooling system to maintain the cab temperature at +26 °C, the system is turned off automatically
- when time limits mentioned above have expired.



3. Fan control

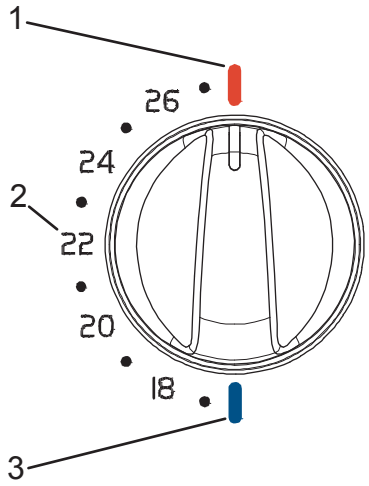
3. Fan control

1 Fan off

2 automatic control, endless variable fan speed

3 manual setting, ten positions for fan speed

4 defroster — gives full heat, air conditioning, and fan through the ventilation nozzles (vents) by the windows.



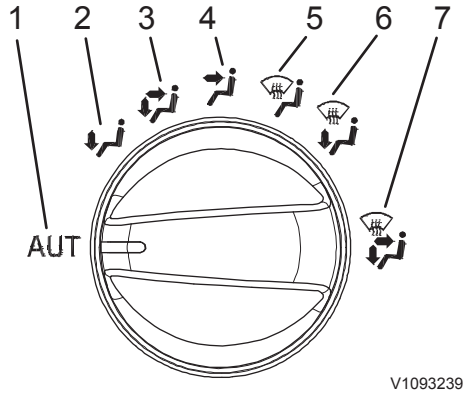
4. Temperature control

4. Temperature control

1 Max. heat

2 Selecting desired temperature

3 Max. cooling



5. Air distribution control

5. Air distribution control

1 automatic control,

2 air blown out through nozzles by the floor,

3 air blown out through nozzles by the floor and through the instrument panel's ventilation nozzles,

4 air blown out through the instrument panel's ventilation nozzles,

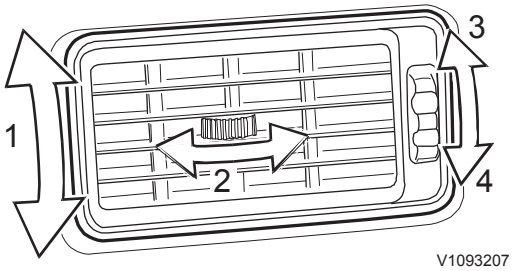
5 air blown at the windows,

6 air blown at the windows and through nozzles by the floor,

7 air blown at the windows, through the instrument panel's ventilation nozzles, and through nozzles by the floor.

Ventilation nozzle

Instrument panel



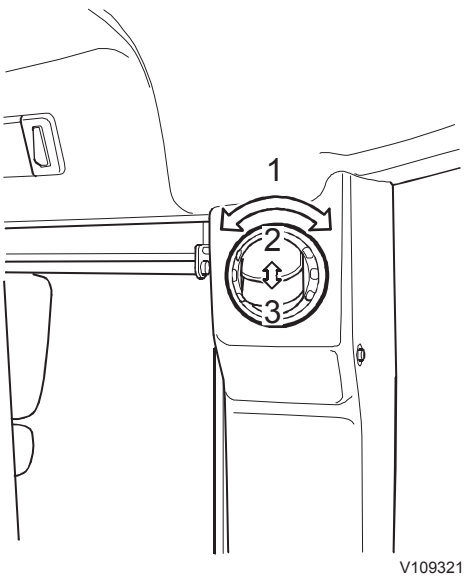
1 directing air flow vertically

2 directing air flow sideways

3 closed

4 open

B post (cab corner post)



1 directing air flow

2 open

3 closed

Climate control system, adjusting

The instructions below are basic recommendations. Experienced climate in the cab is individual. That is why every operator should learn to set and control the climate control system for the best possible work environment in the cab, i.e., the right temperature without a draught.

For the best temperature control in the cab try to have as many nozzles open as possible.

Recirculation on air distribution control

Recirculation may be used as a setting to reduce the intake of malodorous air. This also reduces the accumulation of dust in the cab ventilation filters.

If there is mist on the windows, turn the fan and air distribution control to **Defrost**. When needed, clean and check or replace the cab's ventilation filter, see page *370*.

This is how you adjust ...

... comfortable working temperature:

- All nozzles fully open.
- During warm outdoor climate – activate air conditioning.
- Fan control in position AUT.
- Temperature control set to required temperature.
- Air distribution control in position AUT.

... demisting all windows:

- Check that the recirculation is off.
- Nozzles on side pillars directed at rear window/side windows.
- The air distribution control in defroster position, which provides:
  - Maximum heating.
  - Maximum air conditioning.
  - Highest fan speed.
- To reduce the risk of mist on the inside of the windows, clean with common window cleaner.

When the required effect has been reached and the air distribution control is turned back to the required position, the climate control system returns to selected temperature and selected fan speed. Open the floor nozzles.

Provide for good ventilation:

Do not operate the machine for long periods without ventilation or with the cab fully closed without having the fan turned on.

Poorly ventilated air may cause tiredness, which results in reduced concentration.

Air conditioning

The compressor for the air conditioning starts when the machine starts and runs for a little while to lubricate its seals.

For health reasons you should not lower the temperature in the cab more than 6 °C (11 °F) below the outdoor temperature.

In damp weather

Start the air conditioning in humid weather to avoid mist on the windows.
Before turning off the air conditioning, increase the temperature slightly to prevent mists forming on the windows.

Short rain showers

Do not switch off the air conditioning during short rain showers, as the windows may mist up when the air conditioning stops. The air conditioning only works when the engine is running and performs best when the windows are closed.

Let a qualified service technician check the air conditioning every year.

Operating instructions

This chapter contains rules which must be followed in order to operate the machine safely. However, these rules are to be followed in conjunction with laws or other national regulations applicable to road safety and labour welfare.

Alertness, judgement and respect for applicable safety regulations are conditions for avoiding risk of accidents.

Running-in instructions

Operate the machine with due care during the first 100 hours.

Tighten the wheel nuts again after 3 hours of operation. This also applies after changing the wheels. For information on tightening torques, see page *382*.

The machine may be supplied with excess air pressure in the tyres. Check and adjust the air pressure before using the machine for the first time. For the correct air pressure, see page *419*.

First maintenance service

The machine must be serviced and maintained in accordance with the service program for the warranty to be valid. In addition to regular recurring intervals, there are also intervals after the first 500, 1000 and 6000 hours. For further information, see page *298*.

Speed limitation

At the request of the customer or due to market requirements, various levels can be set for the machine's travel speed.

These settings can only be performed by a qualified service technician with authorized service tool.

Rotating beacon

(Additional options)

The purpose of the rotating beacon is to indicate the prescence of a machine and to warn other road users or persons nearby.

NOTE!
During transport the rotating beacon should be lowered to prevent damage. This also applies when operating in/passing a location where the rotating beacon can be damged, e.g., doorway to service workshop, bridges, etc.

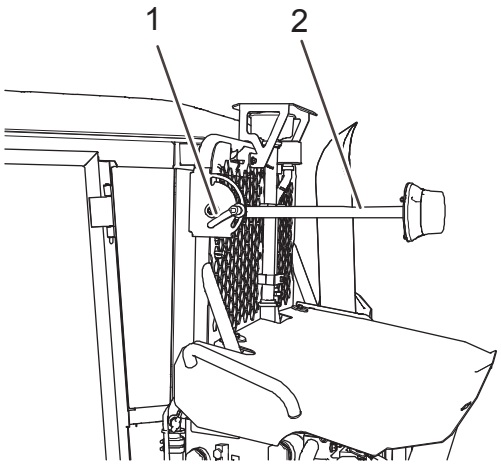
NOTE!
For other normal operation the rotating beacon should be in the raised position.

Lowering rotating beacon

Loosen the lock device and lift the light approx. 1 cm, lower the light to desired position, lock with the lock device.

Raising rotating beacon

Loosen the lock device, raise the light, let the light fall into the groove, lock with the lock device.



Rotating beacon in partially lowered position

1 Handle for lowering
2 Half-lowered rotating beacon

Mirrors

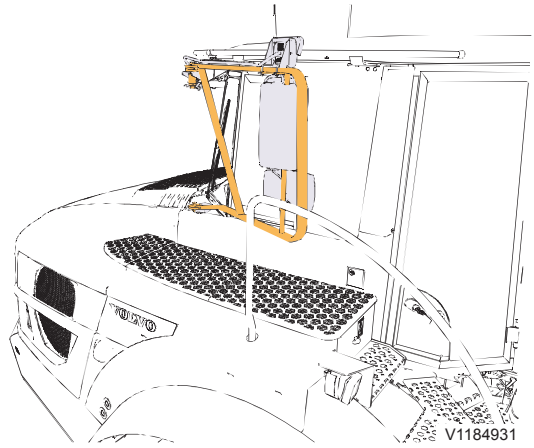
Mirrors, folding in and folding out

The machine's mirrors are important for safe operation. It is of the utmost importance that they are correctly adjusted and intact.

NOTE!
When the machine is transported the mirrors should be folded in to prevent damage.

When passing on the walkway, the rearview mirror bow should be folded in.

NOTE!
During normal operation the mirrors should be folded out to ensure good visibility.



Mirror folded in

Visibility

WARNING

Risk of serious accidents.
Machine parts, equipment or load could obstruct the operator‘s view. Operating or driving with obstructed operator‘s view could cause serious accidents.
Use a signal man if operator‘s view is obstructed.

It may be impossible to obtain visibility to all areas around the machine. Optional devices and equipment such as warning systems, mirrors, back-up alarm, and monitoring cameras (CCTV), etc., may be used to obtain acceptable visibility.

To minimize risks caused by restricted visibility, the management shall establish rules and procedures for the work site. For example:

- Make sure that operators, workers, and persons on the site have received thorough safety instructions.
- Control traffic flow for machines and other vehicles. If possible, avoid reversing.
- Restrict the machine's work area.
- When needed, use a signal man to assist the operator.
- Make available equipment for two-way communication when needed.
- Make sure that workers on the site communicate with the operator before approaching the machine.
- Use warning signs.

Visibility requirements

Machines intended for the EU meet the visibility requirements (field of view) needed for CE-marking, according to the machine directive 2006/42/EC.

Machines for other markets meet the standard ISO 5006 "Earthmoving machinery – Operator’s field of view".
The tests were conducted on stationary machines with standard equipment and standard attachments.

The method used to evaluate visibility cannot include all aspects of the operator's visibility, but gives information to determine if optional equipment for indirect visibility is necessary, e.g., warning systems.

The operator must be informed if other equipment and attachments are used and visibility has been reduced. According to the machine directive, if the machine has been permanently changed a new risk assessment must be performed, or tested according to ISO 5006.

Actions before and during operation

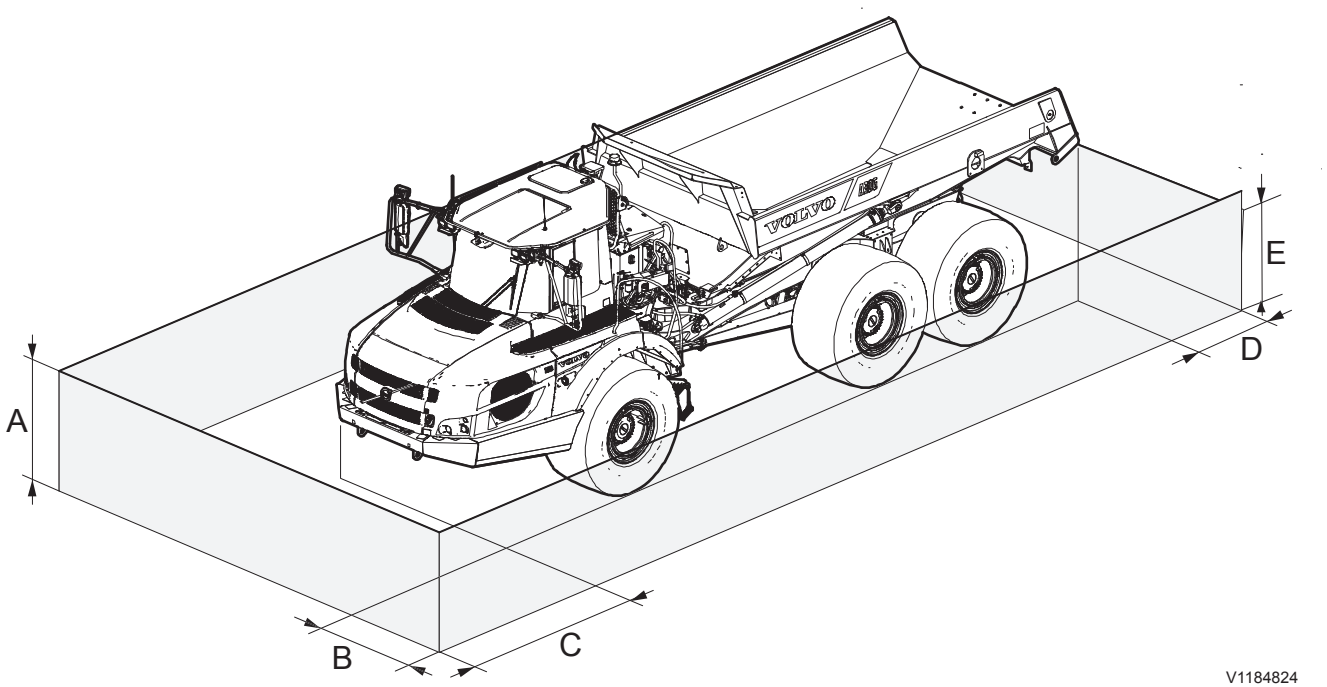
- Check that mirrors and other visibility-enhancing equipment is in good condition, clean, and properly adjusted.
- Check that the back-up camera (if installed) is clean and works as intended.
- Always keep a look-out and pay attention to the area around the machine so that any obstacles can be identified.

For adjusting mirrors and back-up camera, see the following section.

Mirrors and back-up camera, adjusting

ISO 5006 states that an imaginary boundary line around the machine must be visible to the operator.
Adjust mirrors and back-up camera (if installed) until the imaginary boundary line is visible to the operator, see table and figures below.

Stand the unloaded machine straight and on level ground. On machines with FS-system, the suspension system should be in normal position/operating position.

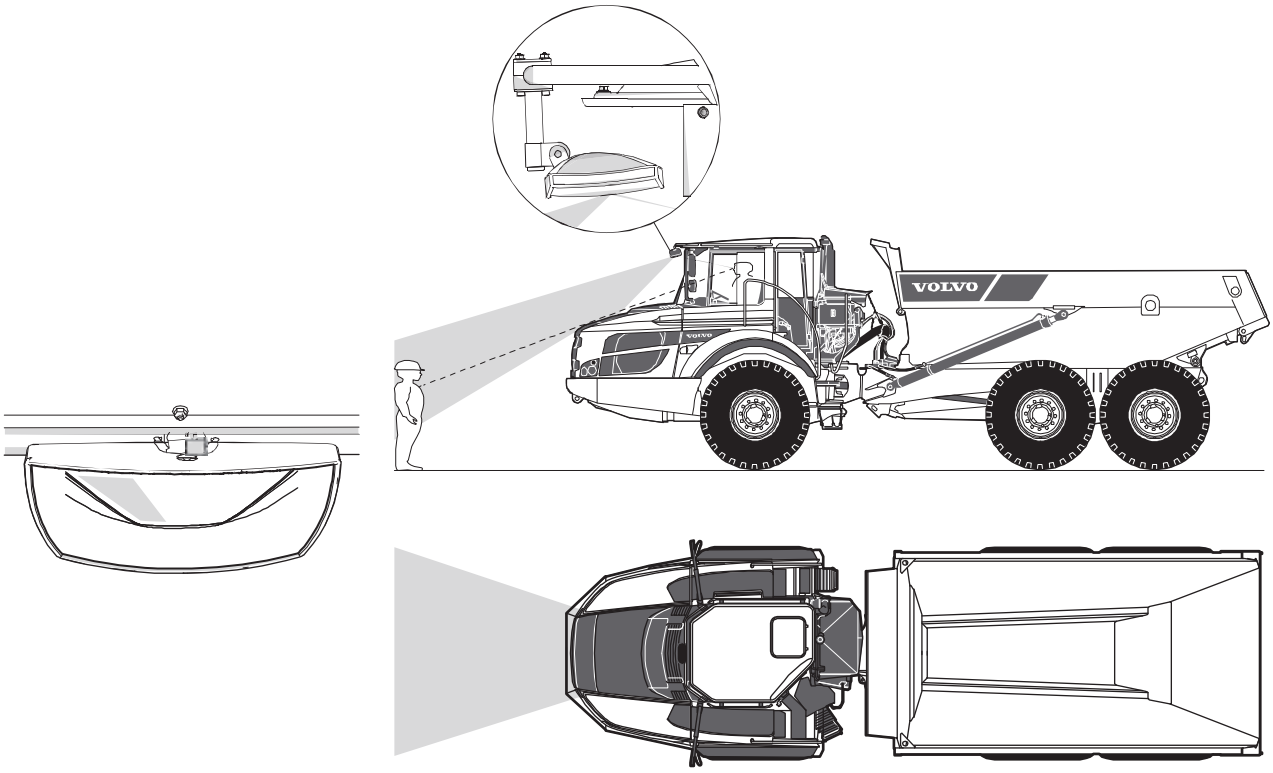


Close-up visibility boundary according to ISO 5006 (thick line)

	A25G/A30G	A35G/A40G/A45G
A	1.5 m (59.1 in)	1.5 m (59.1 in)
B	1.0 m (39.4 in)	1.0 m (39.4 in)
C	1.5 m (59.1 in)	2.5 m (98.4 in)
D	1.0 m (39.4 in)	1.0 m (39.4 in)
E	1.2 m (47.2 in)	1.2 m (47.2 in)

Front mirror

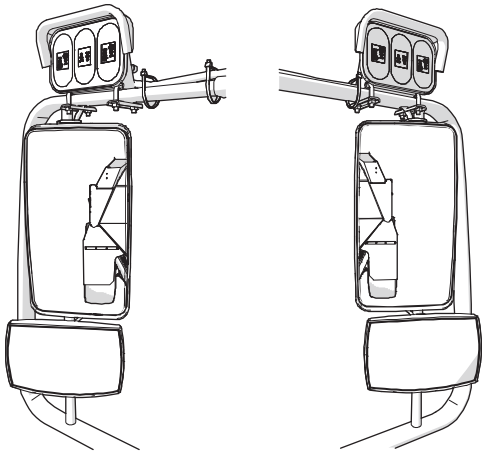
Using the front mirror, check that you have as good visibility as possible directly in front of the engine hood. If not, adjust the mirror until good visibility is obtained, see figures.



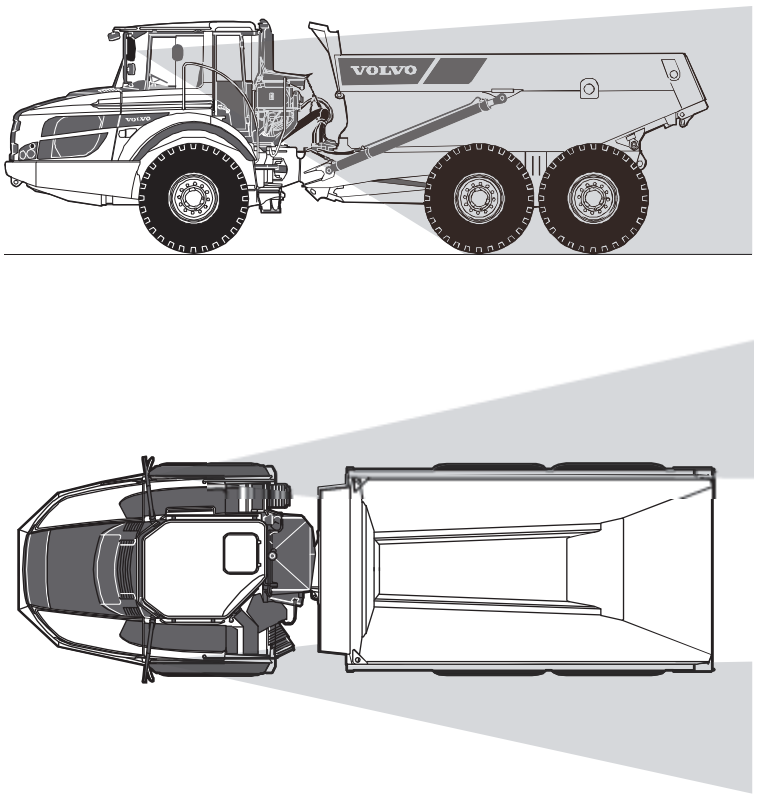
V1162851

Rear-view mirrors

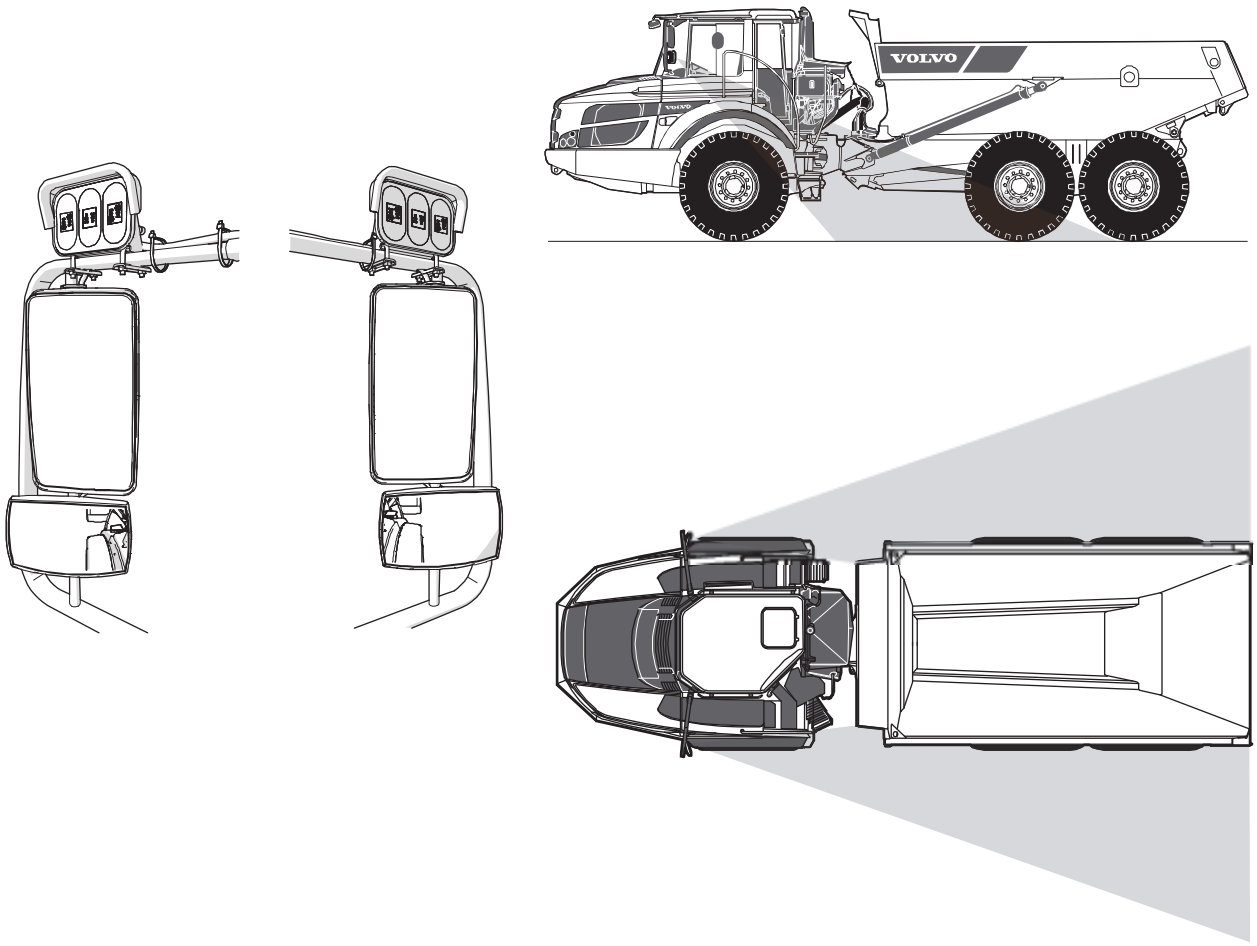
Using the rear-view mirrors, check that you have as good visibility as possible towards the machine's tires and load body sides, and with as wide angle as possible. If not, adjust the rear-view mirrors until good visibility is obtained, see figures.



Upper rear-view mirrors



V1162850

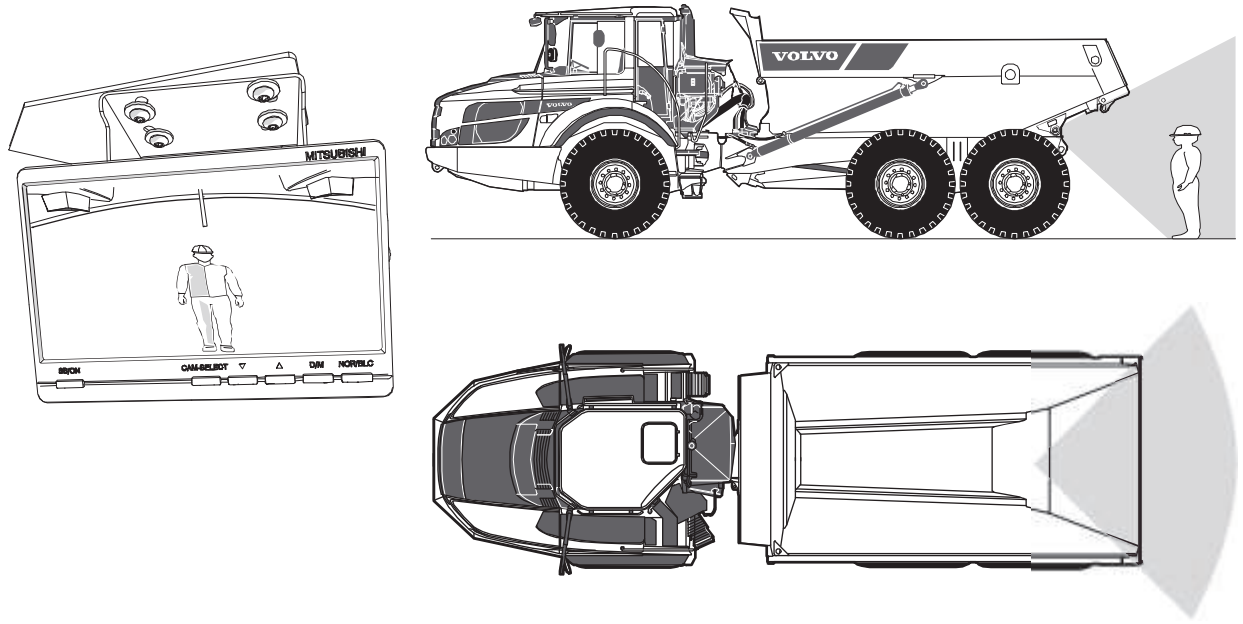


Lower wide-angle mirrors

Back-up (reverse) camera

(Standard or optional equipment depending on market)

Check in the back-up camera's display screen for good visibility backwards. The back-up camera should be centred sideways and be focused on the area closest under and behind the load body. The load body or tires should not restrict visibility. When needed, adjust the back-up camera until good visibility is obtained, see figures. For settings, see *143*.



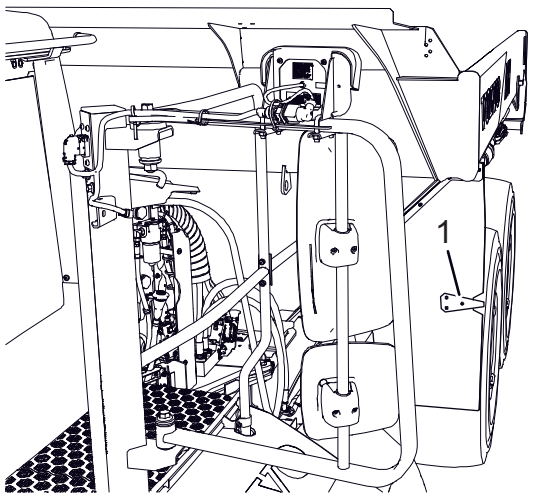
V1162849

Position indicator

The position indicator is a visual aid for easier assessment of the distance when reversing towards a dump hopper or dump edge or when parking.

NOTE!
The position indicator must only be used when reversing when the machine is straight and reversing perpendicular to the target.

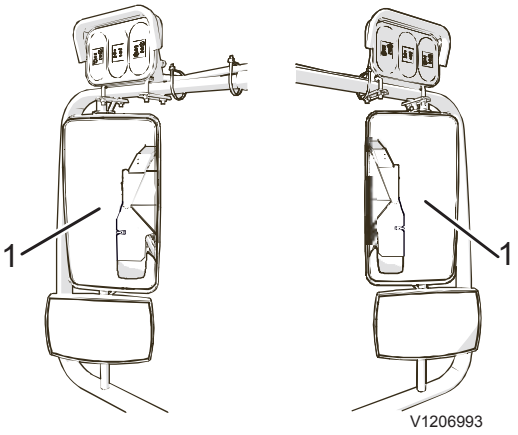
The position indicator is a recess on the splash guard, plus an arrow.



V1206984

The picture shows the indicator on an A60, but the function is the same no matter what the model

1 Position indicator on the fender



Mirrors

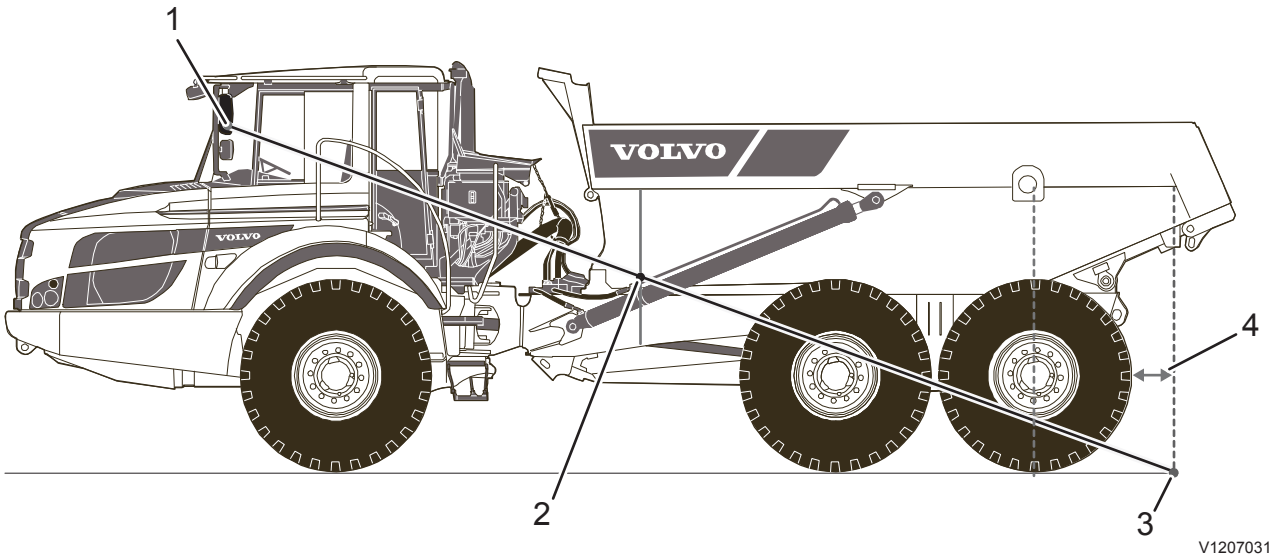
1 Upper rear-view mirrors; Used for correct use of the position indicator

Use of a position indicator

NOTE!
Before use, take care to check the function on level ground and with the machine straight.

When using, it is important to look in the upper rear-view mirrors in order to get the correct marking. If the wrong re-view mirror is used, the distance to the dump edge is increased.
Look in the rear-view mirrors on both sides in order to get a correct indication. If the dump edge is not straight, it is important to look in the rear-view mirror that is at the point where the edge is closest.

NOTE!
The position indicator shows the correct distance only when you look in the factory-fitted upper rear-view mirrors.
Looking in the lower wide-angle mirrors, self-fitted mirrors or through the door gives an incorrect distance.



1 Upper rear-view mirror
2 Position indicator
3 Target point, e.g. a dump edge
4 Distance between tyre and target point is approx. 20 cm.

Before the position indicator is used in the field, test it on level ground. Reverse towards a marker and check that the distance is correct. Test several times in order to get to know the function.

NOTE!
Use with caution, and be aware that the target point of the line will be completely different in terrain with slopes and clay.

Back-up alarm

(Additional options)

The machine emits a powerful, pulsating audible signal when the gear selector is moved to reverse gear in order to warn bystanders that the machine is reversing. If the back-up alarm is

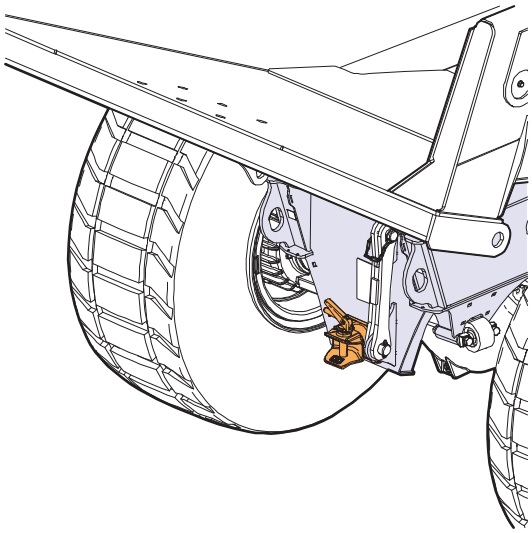
of the type 'white noise', the audible signal adapts to the ambient noise. Therefore the signal may be of varying loudness, depending on the noise level of the surroundings.

Trailer hitch

(Additional options)

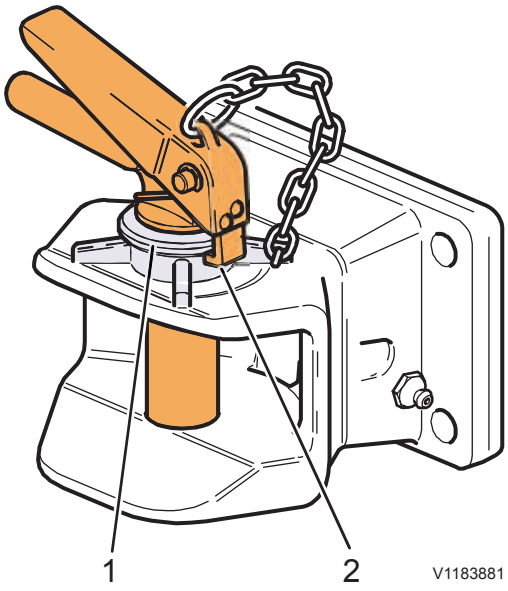
The trailer hitch is used to tow small trailers. For weight restrictions, see page *440*.

NOTE!
For recovering or towing another machine, use the intended eyes, see page *212*.



Position of trailer hitch

Check the trailer hitch before it is used to ensure that it is not damaged.
Before start, check that the coupling pin locks correctly with the pawl around the lock ring at the top.



1 Lock ring
2 Pawl

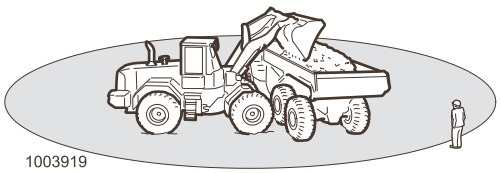
Safety rules when operating

Operator's obligations

⚠ WARNING

Risk of fatal accidents.
Unauthorised persons within the work area around the machine could lead to serious crushing injury.
• Clear all unauthorised personnel from the working area.
• Keep a lookout in all directions.
• Do not touch control levers or switches during start.
• Sound the horn before beginning operation.

- The operator must operate the machine in such a way that the risk of accidents is minimized for the operator, other road users, and persons present on the work site.
- The operator must be thoroughly familiar with how to operate and maintain the machine and should receive the required machine training.
- The operator must follow the rules and recommendations stated in the Operator's Manual, but must also follow any statutory and national regulations or applicable specific requirements or risks on the work site.
- Regardless of built-in or external assistance systems (such as Haul Assist MAP), the operator always has full responsibility for operation of the machine.
- The operator must be well-rested and must never operate the machine under the influence of alcohol, drugs or medication unsuitable for operating the machine.
- The operator is responsible for the load of the machine both when travelling on public roads as well as when working on site.
  - There must be no risk of the load falling off when operating.
  - Refuse to take a load that is an obvious safety risk.
  - Respect the machine's stated maximum load capacity. Note the effect of varying distances to the centre of gravity and the effect of additional units.
- Avoid operating with the load body raised on ground where there is a risk of overturning, for example on steep inclines or soft ground.
- The operator must be in charge of the working area of the machine.
  - Prevent persons from entering the risk zone, that is, stay at least 10 metres (33 ft) from the machine.
  - Make sure that there are no persons in the cab of a parked machine where there is a risk that the cab may be struck by attachments or falling objects, e.g. rocks or logs. Does not apply if the cab is sufficiently strong or protected to withstand the effects of such an object.
- The operator may only allow an instructor on board if there is an approved instructor's seat.



The risk zone around stationary and working machines is at least 10 metres (33 ft)

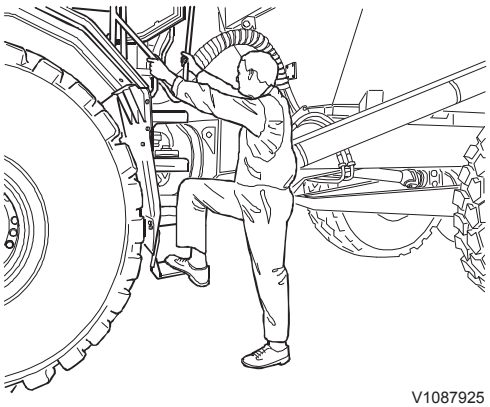
Accidents

- Accidents and also incidents should be reported to the site management immediately.

- If possible leave the machine in position.
- Only take necessary action so as to reduce the effect of damage, especially personal injuries. Avoid action which may make an investigation more difficult.
- Wait for further instructions from the site management.

Operator safety

- Always use the seatbelt.
- Always sit in the operator's seat when starting the machine (engine).
- Check that the seatbelt is not worn or damaged, see page *157*.
- The machine must be fully operational, i.e., defects that may cause accidents must be repaired before the machine is used.
- The machine's steps/walkways should be cleaned to minimize any risk of slipping.
- When working with the safety belt, secure the safety belt in one of the two anchoring eyes. For further information, see page*278*.
- Windshield/windows should be defrosted and clean to ensure good visibility.
- Wear suitable clothing for safe handling and a hard hat.



V1087925

- A handheld mobile phone, tablet or similar should not be used when operating the machine. Follow national regulations for use of these during operation!
- The door must be closed when the machine is moving.
- The vibrations that occur when operating may be harmful to the operator. Reduce this by:
  - adjusting the seat.
  - selecting the most even ground.
  - adapting the speed.
- Carelessness when climbing up on or down from the machine can cause fall accidents and injuries. Always use the three-point method to enter or to exit the cab, that is, use two hands and one foot, or one hand and both feet. Use available steps and handles. Always face the machine when climbing up on or down from the machine. Do not jump!
- The cab is also designed to meet the requirements for falling objects, with a weight less than that stated in the test methods (FOPS).
  - During loading, the operator should be in the cab or outside the risk zone. See *175*
- Only walk or stand on surfaces provided with anti-slip pads, see page *272*.
- Do not climb up on, enter, or leave the machine during a thunderstorm.
  - If you are outside the machine, keep a good distance away from the machine until the thunderstorm has passed.
  - If you are in the cab, remain seated with the machine stationary until the thunderstorm passes. Do not touch any controls or anything made of metal.
- The cab has three emergency exits; the door, the right and left side windows.

Travelling on public roads

As machine operator you are considered to be a road user. Therefore you are required to know and follow local regulations and national traffic rules.

Before any on-road operation, check the local regulations and national road legislation to ensure that the machine may be operated on public roads. Exemptions, special permission, and special equipment may also be required.

It is important to remember that the machine, compared to other traffic, is a slow-moving and wide vehicle that may cause obstruction. Keep this in mind and pay attention to the traffic behind you. Facilitate overtaking.

Work lights, rotating beacon, or hazard flashers should not to be used when operating on public roads unless permitted according to local regulations.

Road signs, barrier arrangements, and other safety devices that may be required when considering traffic speed, intensity, or other local conditions must be used.

Rotating beacon may be used:

- when the vehicle is an obstruction or danger to other traffic
- when working on or by the side of the road

Safety rules in case of fire

If your own safety is not immediately compromised, take the following actions.

In case of fire on the work site

1 If possible, move the machine away from the hazardous area.

2 Activate the parking brake.

3 Turn the ignition to position 0.

4 Leave the cab.

5 If possible, take active part in putting out the fire and call the fire department if needed.

In case of fire in the machine

If the machine is being operated:

1 If possible, park in a fireproof location.

2 Activate the parking brake.

3 Turn off the engine by pressing in the emergency stop.

4 Turn the ignition to position 0.

5 Leave the cab.

6 Set the emergency switch's rocker arm to position OFF.

7 Try to put out the fire.

8 Call the fire department if needed.

In case of fire in machine equipped with Fire Suppression System

Optional equipment

If the machine is operated (operator-dependent activation of sprinkler system):

1 If possible, park in a fireproof location.
As an alternative, raise the plastic cover for the Fire Suppression System's control panel and activate the system. Then move the machine to a fireproof location.

NOTE!
If the engine is running at the same time as the sprinkler system is activated, there is a risk of extinguishing agent blowing out from the engine compartment. This can reduce the performance of the extinguishing agent.

2 Press the inner activation button.

NOTE!
The sprinkler system is activated if fire is detected.

3 Leave the cab.

NOTE!
It is also possible to activate the sprinkler system with the manual activation button (outside the cab), see page *286*.

4 Be ready with the handheld fire extinguisher since there may still be fire deep inside the machine that could flare up.

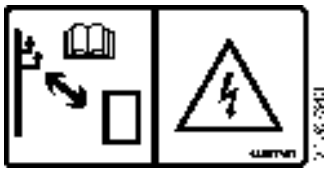
5 Call the fire department if needed.

NOTE!
If the machine is not operated or if the parking brake is applied, the sprinkler system is activated automatically.

Actions after a fire

When handling a machine that has been damaged by fire or has been exposed to intense heat, the following protective actions must be taken:

- Use thick rubber gloves and wear protective goggles.
- Never touch burned components with your bare hands in order to avoid contact with melted polymer materials. First wash thoroughly with plenty of lime water (a solution of calcium hydroxide, i.e., slaked lime in water).
- Handling heated fluor rubber, see page *291*.



Power lines, minimum clearance

DANGER

Risk of electrocution
Working near or making contact with overhead power lines may lead to electrical flashover and electrocution.
Always keep the minimum clearance from overhead power lines.

High voltage is lethal and could be powerful enough to destroy machine and attachments. Always contact the local authority before starting work near overhead power lines.

Operating the machine near overhead power lines requires special precautions.

- Consider all overhead power lines to be energised with electric power, even lines that are supposed to be without electric power.
- Contact with overhead power lines may cause a temporary power outage. The power may return automatically without any warning.
- There is a risk of electrocution if anyone touches both the machine and the ground at the same time.
- Always be aware of the very serious risk if the machine comes into contact with high voltage.
- Remember that the voltage in the power line determines the safety distance.
- Electrical flashovers may damage the machine and injure the operator at great distances from the power line.
- Always keep the minimum distance from overhead power lines.

Minimum distance from overhead power lines

Voltage of overhead power lines Volt (V)	Minimum distance	
	m	ft
up to 50,000	3	10
50,000 to 69,000	4	13
69,000 to 138,000	5	16.4
138,000 to 250,000	6	20
250,000 to 500,000	8	26
500,000 to 550,000	11	35
550,000 to 750,000	13	43
more than 750,000	14	46

Know the location and voltage of all overhead power lines on the work site before operating the machine.
Contact the local authority if there is any question about the power lines being energised or their voltage.

Keep the following in mind to ensure safety when operating:

- Know what to do if there is an electrical flashover that involves a person or machine.
- Operate the machine at slower than normal operation speed when working near power lines.
- Long-span power lines can sway and reduce the clearance.
- Be careful when travelling over uneven ground which could cause the machine to become unstable.

- Keep all persons away from the machine whenever it is close to power lines.
- Do not allow persons to touch the machine or its load before it is confirmed to be safe.
- When a machine is in contact with an overhead line, do not allow anyone to come near or touch the machine. Stay away from the machine and call for help.
- Never touch a person who is in contact with an energised power line.

If your machine comes into contact with overhead power lines:

- Stay in the operator seat while the machine is in contact with the power line.
- Warn personnel outside the machine to not touch any part of the machine and to stay away.
- Stay in the operator seat and lower any raised parts in contact with the overhead power lines, or drive the machine away from the overhead power lines if it is possible.
- If contact cannot be broken, stay in the operator seat until you know that the power is off.
- If you need to get out of the machine to call for help or because of fire, jump out as far as you can without touching any wires or the machine, stay upright, keep your feet together and hop to safety.

Failure to follow this instruction could result in electrocution or death!

Working near railway lines

Particular care is necessary when working in the track area. There is a risk of fatal accidents during rail operations.
Work may commence in the track area only when the supervisors have consented to this and all necessary safety measures have been put in place.

Always pay attention to any railway operations and follow instructions of the railway staff so that in the event of danger you can remove the machine and people from the danger area immediately.

Railroad overhead contact lines (power lines)

⚠ DANGER

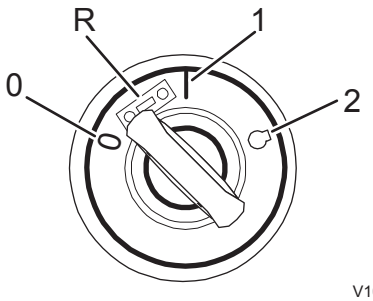
Risk of electrocution
Working near or making contact with overhead power lines may lead to electrical flashover and electrocution.
Always keep the minimum clearance from overhead power lines.

Loading and unloading is only permitted between the posted signs. Signs may hang from the contact line or may be located on special posts.

- Contact authorised railroad personnel for permission to load or unload.
- After a break in the work, always take new contact with railroad personnel.

Measures before operating

The daily machine check should be done before operating, see *313*.



V1092158

0 Off position
R Radio position
1 Operating position
2 Start position

Starting engine

NOTE!
The machine's battery disconnector (main switch) is activated when the ignition is turned from position 0.

NOTICE

Run the engine at low idling speed for at least half a minute after start. This is to ensure the lubrication of the turbocharger.

If the machine is equipped with theft protection, see page *105*.

NOTE!
The engine can only be started with the gear selector in neutral position.

1 Place the gear selector in neutral.

2 Turn the key in the ignition to position 1 (operating position) so that the system test is run.

3 At the same time, check that all symbols in the symbol row turn on and that the gauges show readings.

4 **At temperatures below 0 °C (32 °F):**
If the symbol for preheating flashes, leave the ignition in position 1 (operating position) until the symbol turns off (see section **Information display unit** under the heading **Symbol fields** on page *53*).

NOTICE

Do not use starting aids (ether, etc.). Serious engine damage could result.

NOTE!
Never rev a cold engine, risk of serious machine damage.

5 Turn the key to position 2 (start position). If the engine does not start, turn back the key to position 0 before attempting to start again.

6 Check that all control and warning lights turn off.

7 Press down the brake pedal and release the parking brake.

8 Select gear position.

NOTE!
Sound the horn before moving the machine forward.

9 Let up the brake pedal and increase engine rpm with the gas pedal (accelerator).

Speed limitation with open door

If the door is open the machine speed is limited to 8 km/h (5 mph). If the door is opened and the machine speed exceeds 8 km/h (5 mph), the speed is limited to the current speed and then the speed limitation drops with the machine speed down to 8 km/h (5 mph).

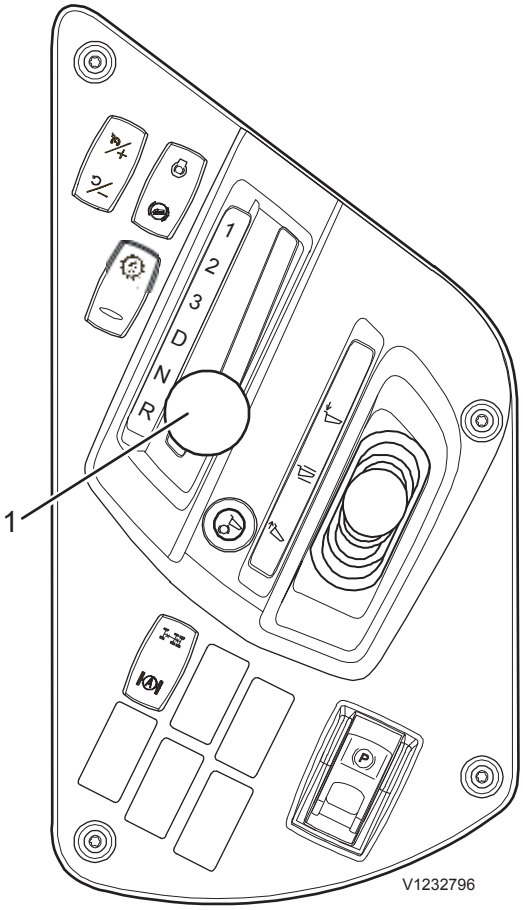
For information on alarm display figures, see page *84* and *98*.



V1088300

Door open

Gear shifting



1 Gear selector

WARNING

Risk of fatal accident.
The machine can begin to move.
Never leave the machine with the engine running unless gear shift lever is in the N (neutral) position and the parking brake applied.

The transmission has six forward gears with automatic direct drive clutch (lock-up), neutral position, and two reverse gears.

The gearshifting system is fully automatic, but the automatic function can be limited by the operator via the gear selector.

The transmission electronics sense the machine speed, acceleration, and engine loading. Based on these parameters the electronics control gearshifting automatically for optimal comfort, fuel consumption, and performance.

Gear position D
Normal gear position for operating forward.

Gear positions 1, 2 and 3
Limits upshifting from gears 1, 2, and 3. However, upshifting is permitted to prevent overspeeding.

Gear position N
Neutral position

Gear position R
Reverse gear. (When reverse gear is selected, 6–wheel drive is engaged automatically.)

Safety functions during gearshifting

The machine features safety functions that protect the engine and transmission via the transmission's electronic control unit in case of an operator error.
- When the parking brake is applied, no gear will be engaged.
- When delayed stop (optional equipment) has been engaged, no gear is engaged
- The gear selector can be moved from the N-position to different gear positions, but no gear will be engaged if the engine speed exceeds 1,100 rpm (18.3 r/s) (stationary machine). If the engine speed exceeds 1,100 rpm (18.3 r/s), it is reduced automatically to 1,100 rpm (18.3 r/s) before a gear is engaged.

OptiShift

Applies to machines with the function OptiShift

OptiShift is a function for quick and smooth direction changes. Intended for use at low speed and on level ground.

Activation of OptiShift

OptiShift is activated when the gear selector, during operation, is moved in the opposite travel direction. This results in the transmission shifting to neutral gear. Throttle application decreases and the machine brakes automatically. When the speed is almost zero, the start gear for the new travel direction is engaged. All to obtain smooth and comfortable direction changes.

Controlled braking

OptiShift controls braking as long as the braking force is greater than other active braking forces; brake pedal, retarder pedal, and Downhill Speed Control.

with OptiShift active, braking is controlled with the accelerator pedal. The braking force increases by pressing down the accelerator pedal more.

Speed range

OptiShift works at all speeds above 1 km/h and both Forward - Reverse as well as Reverse - Forward. The braking action is the same for all speeds and is affected by the machine's load.

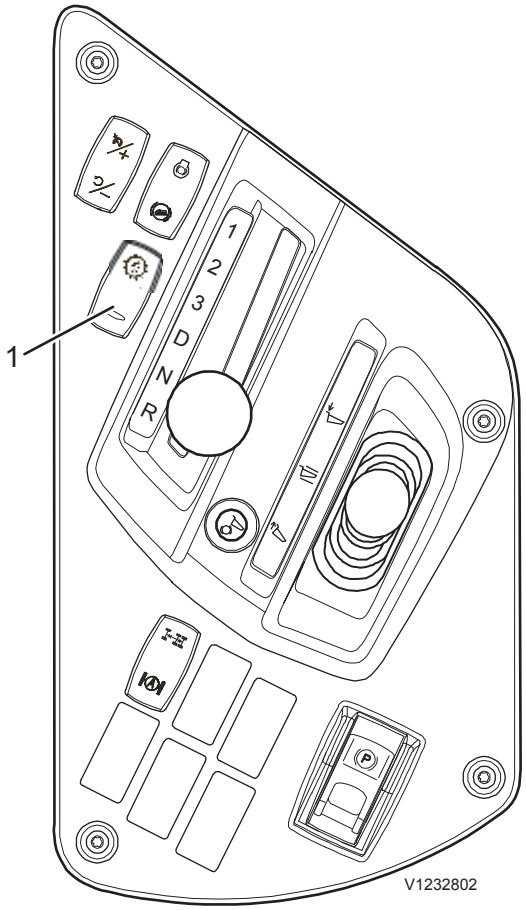
Inhibitor

The gearshift lockout (shift inhibitor) is activated manually with the rocker switch on the control panel.
The gearshift lockout function holds the current gear and prevents the machine from "gear-hunting".
When the software detects "gear-hunting", then gearshift lockout is activated and the gear position is locked to the lower of the two gears. Gearshift lockout is also activated by the software if shifting to neutral takes place to protect the transmission.

Gearshift lockout is deactivated when:
- the switch is deactivated manually
- gearshifting is performed manually
- the gear selector changes position

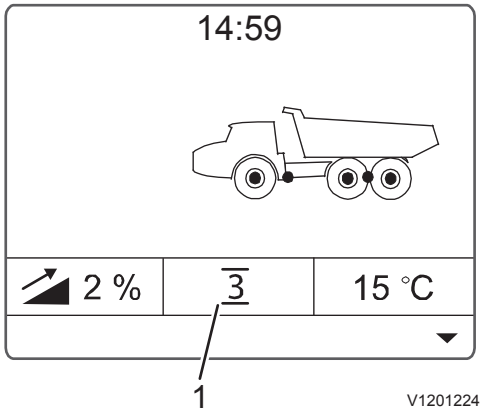
At risk of overspeed the gearshift lockout is disengaged automatically.

When the main oil pressure in the transmission is lower than 8 bar (116 psi) the transmission goes to a safety neutral mode, which means that:
- shifting from neutral gear to drive gear is prevented and gearshift lockout is activated, or
- gearshift lockout is activated 5 seconds after shifting from drive gear to neutral gear



1 Gearshift lockout (shift inhibitor)

When gearshift lockout is activated, this is shown on the information display by a line under and over the current gear.



1 Display, activated gearshift lockout

Engine Over-speed Protection

- If there is a risk of the engine overspeeding, an upshift is made to the next higher gear, regardless of the position of the gear selector and the gearshift inhibitor.

Differential locks

ATC (Automatic Traction Control)

The machine is equipped with ATC (Automatic Traction Control) which means that 4–wheel drive and 6-wheel drive are controlled automatically when the function is activated. ATC is the machine's basic mode and should be used as much as possible.

For machines manufactured at the end of quarter 2 of 2019, 6-wheel drive is engaged automatically in the following scenarios:

- after the load and dump brake has been activated and the machine is moving forwards. Can be changed in the display, see page *67* Activating/deactivating the differential lock from start.
- when using engine braking. Alternatively, can be set by a qualified service technician using service tools.

NOTICE

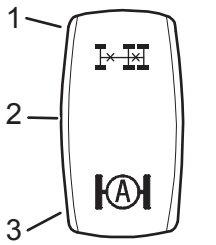
Do not use drive and differential locks on more wheels than what is required by the situation. Incorrect use can cause unnecessary tyre wear, increased fuel consumption and impaired manoeuvrability.

NOTE!
Never engage 6-wheel drive (6x6) when any drive wheel is spinning.

ATC Switch

Switch for ATC and 6-wheel drive (6x6)

The switch that controls activation and deactivation of ATC as well as engaging and disengaging 6–wheel drive has three positions.



V1129918

Switch

1 Switch, upper part (rocker switch): Engaging and disengaging 6-wheel drive (6x6)

2 Switch in middle position: ATC deactivated

NOTE!
The switch can also be in the middle position if 6-wheel drive has been engaged with the upper 'rocker' part of the switch. If this is the case, the control light for ATC and symbols for 6-wheel drive are lit on the instrument panel.

3 Switch, lower part pressed in: ATC activated

ATC Position 1: 6-wheel drive, engaging and disengaging

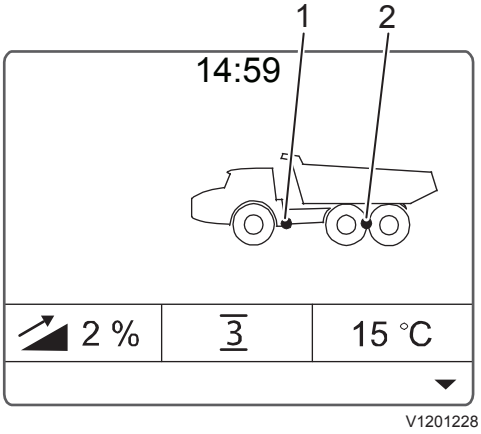
6-wheel drive is used when operating in soft and slippery ground conditions when ATC engages and disengages 4–wheel drive as well as 6-wheel drive at short intervals.

The upper part of the switch is a 'rocker switch'. Press the switch to engage 6-wheel drive. Press the switch a second time to disengage 6-wheel drive.
Engagement and disengagement can take place while operating regardless of travel speed.

Control light for ATC and symbols for 6-wheel drive are lit on the instrument panel when the permanent mode is engaged.



Control light ATC is lit when ATC is deactivated



1 4-wheel drive
2 6-wheel drive

ATC Position 2: deactivated



Control light ATC is lit when ATC is deactivated

ATC deactivated (position 2)

ATC can be deactivated to obtain better turning performance when operating on slippery ground and roads with lots of turns.

Disengaged ATC means that all differential locks are disengaged and the machine has drive on four wheels; the front axle and front bogie axle.

Control light for ATC is lit on the instrument panel when ATC is deactivated.

The switch's middle position is the starting point for engaging and disengaging 6–wheel drive. This means that with the switch in middle position, ATC is deactivated and 4–wheel drive or 6–wheel drive is engaged. (Selection performed earlier with the switch's upper rocker part.)

NOTE!
If 6-wheel drive has been engaged with the switch's upper rocker return, the control light for ATC **and** symbols for 6-wheel drive are lit on the instrument panel.

For machines with software before January 2018:
If the machine is started with the switch in middle position, then 6-wheel drive is always disengaged.
For machines with software after January 2018:
If the machine is started with the switch in middle position, the machine starts with the latest selected alternative. (4–wheel drive or 6–wheel drive)

For machines with software after December 2019:

The system can be set up for connection of the last axle for reversing, even if ATC is disabled. Otherwise, only applies in ATC position 3.
The setup can only be modified by an authorized service technician.

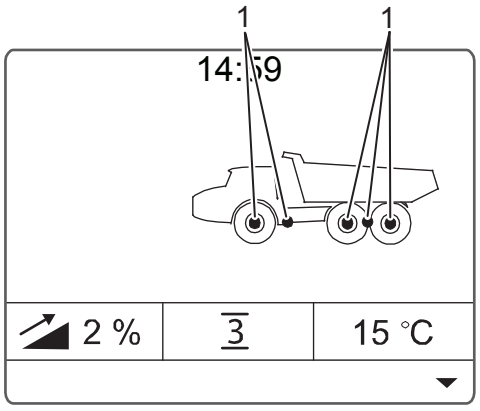
ATC Position 3: activated

Is used for all types of operating conditions. This is the basic mode and should be used as much as possible.

The machine senses wheel speed and steering angle. 4–wheel drive and 6-wheel drive are controlled automatically and independent of each other.

NOTE!
The machine's steering performance is reduced when using all differential locks.

Symbols for all differential locks and 6-wheel drive are activated on the instrument panel.



1 All differential locks and 6-wheel drive

Foot control 6-wheel drive

Is used when operating where maximum drive is required. Pressing the foot control activates 6-wheel drive. The differential locks in all three axles are also activated. All wheels rotate at the same speed. When the control is let up, drive reverts to the previous mode.



Foot control, all differential locks and 6-wheel drive

Snow chains

NOTE!
When operating with anti-slip devices (snow chains), 6-wheel drive should not be engaged.

NOTE!
Volvo does not recommend use of snow chains. If snow chains are still installed despite this, it shall be done in consultation with the snow chain's manufacturer. It is important that snow chains are installed correctly since the space is limited and the machine can be damaged in case of incorrect installation. Snow chains can only be installed if the tyre dimension 23.5 R25 is used on the machine.



V1092474

Warning low steering pressure

Steering

The steering system is a self-compensating, hydromechanical system.

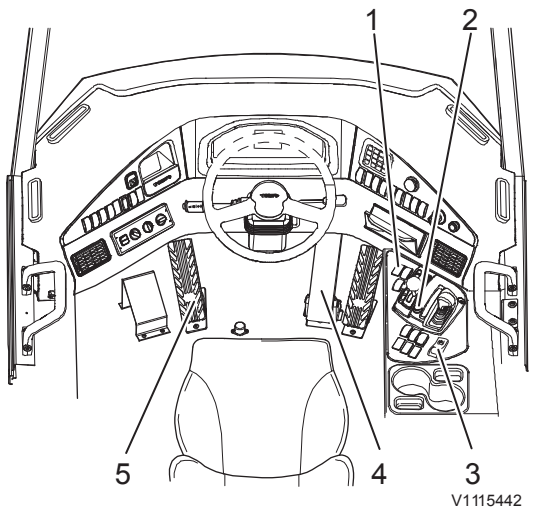
NOTE!
If warning low steering pressure appears in the information display, stop the machine immediately and contact a qualified workshop.

Secondary steering

The machine features secondary steering via a ground-dependent pump located on the dropbox, which ensures steering down to approx. 3 km/h (1.9 mph) even in case of, e.g., engine failure.

For function check of secondary steering, see page *346*.

Braking



1 Switch for engine brake
2 Button for load & dump brake
3 Switch for parking brake
4 Brake pedal
5 Retarder pedal

NOTE!
The service brake's and retarder's performance can be reduced if the brake cooling oil temperature becomes too high.
If the machine generates a warning for high brake cooling oil temperature, reduce speed or stop the machine until the oil temperature is back to a normal value. Follow the instructions on the retarder diagram.

The machine's brake system consists of:

- Service brakes
- Engine brake
- Load and dump brake
- Parking brake
- Retarder

Service brake

When operating downhill, first use the engine brake to minimize wear of the wheel brakes.

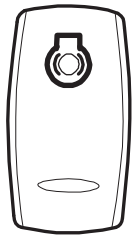
The service brakes are divided into two separate circuits. If a problem occurs in one of the circuits, the machine can still be braked with the intact circuit.
Warning appears in the information display if the pressure is incorrect in any circuit.

Brake smoothly. This is especially important in icy and slippery ground conditions.

NOTE!
In case of defective brakes, stop the machine immediately and contact a qualified workshop for action.

NOTE!
If brake action is lost in both brake circuits, the engine brake and the parking brake are applied automatically to stop the machine.

Engine retarding

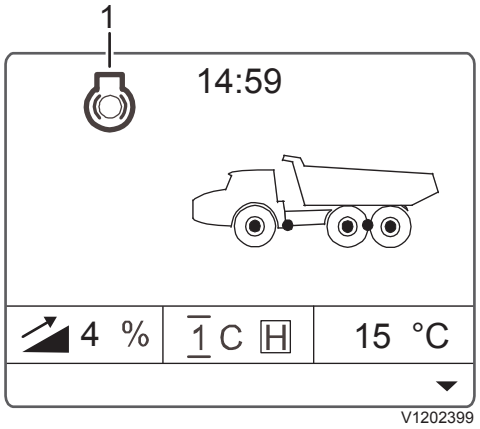


Switch for engine brake

NOTE!
The engine brake should not be activated in slippery road conditions.

The engine brake is activated and deactivated with the switch on the control panel. See page *126*.

Regardless of the position of the switch, the engine brake is active when the retarder pedal is pressed.



1 Symbol for engine brake

On the condition that the engine brake has been activated with the switch, the engine brake is engaged when the accelerator pedal is let up completely and it is disengaged if the accelerator pedal is pressed down.

The engine brake reinforces the engine's braking power by, among other things, restricting the exhausts, and gives good braking performance throughout the engine's entire rpm range. Braking power is slightly higher at high engine speeds.

The engine brake is used to achieve smooth and comfortable operation that reduces wear of the machine's brake system.

Retarder

The retarder pedal activates the wheel brake in combination with engine brake regardless of the position of the switch for engine brake. Retarder action increases when the retarder pedal is pressed down.
The retarder gives good braking performance throughout the engine's entire rpm range.

The retarder pedal is used for easier control of braking power and thus obtain more even machine speed when operating on long downhill grades.

The accelerator pedal is disengaged automatically when the retarder pedal is pressed down.

Braking with retarder pedal

1 Release the accelerator pedal.

2 Press down the retarder pedal and adjust the braking action with the pedal according to the operating conditions.

3 The retarder function ceases when the retarder pedal is let up or the machine speed is below 2 km/h (1.2 mph).

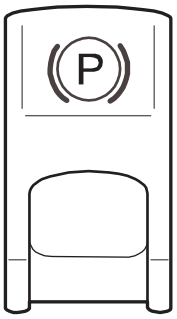
Load and dump brake



Button for engaging load and dump brake

The load and dump brake activates the service brake and shifts the transmission to neutral in order to avoid wear of the parking brake and drivetrain when loading and dumping.

The load and dump brake can only be activated when the machine is at a standstill or speeds below 6 km/h (3.7 mph). Deactivation takes place when the gear selector is moved from neutral position.



Switch parking brake

Parking brake

When the parking brake is applied, it is not possible to engage a gear.

The parking brake should be adjusted when needed. Contact an authorized workshop.

Emergency brake

NOTE!
If the parking brake is applied when the machine is moving it is subjected to abnormal wear. The parking brake must be checked if it has been used as emergency brake. Contact an authorized workshop.

- In an emergency situation the parking brake may be used as an emergency brake. If the parking brake is used as an emergency brake, the wheel brakes will be engaged automatically if the speed is above 2 km/h (1.2 mph).
- The parking brake will be applied automatically if the brake pressure is lost in both the front and rear circuits.

See also under the heading **8.6 Parking brake** in section **Controls** on page *126*.

Exhaust aftertreatment system

Regeneration

WARNING

Risk of burns.
Engine and exhaust system components get very hot and can cause severe burns.
Avoid contact with engine compartment covers, engine components and exhaust system until the engine is cooled down.

NOTE!
Some smoke may come out of the exhaust pipe during regeneration of the aftertreatment system.

The purpose of regeneration is to eliminate particles and sulphur in the aftertreatment system to restore full capacity in the system. In case of automatic and parked regeneration, these take place by a temperature increase in the aftertreatment system.

NOTE!
Engine speed increases during regeneration and with the transmission in neutral. The engine speed returns to normal after regeneration and when a gear is selected.

To prevent automatic regeneration and to run a parked regeneration instead, a setting can be performed using an authorized service tool.

Continuous regeneration

Regardless of if the machine has been set for automatic or parked regeneration, passive regeneration takes place continuously during normal operation.

Automatic regeneration

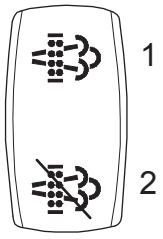
Regeneration starts automatically.

Machine speed must be above 10 km/h (preset value) for regeneration to start.

Parked regeneration

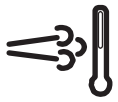
Parked regeneration may be necessary if too many particles or sulphur have been trapped and collected in the aftertreatment system due to earlier failed regenerations or multiple cancellations of regeneration.

Parked regeneration can only be started after request from the machine.
Parked regeneration requires that the operator stops the machine, applies the parking brake, and presses the upper part of the regeneration switch when alarm figure “Park soon Parked regeneration needed” is shown on the information display.



V1091833

Switch, regeneration
1 Start parked regeneration
2 Cancel on-going regeneration



V1083542

Control light HEST (High exhaust temperature), regeneration in progress

The control light for HEST (High exhaust temperature) is on during parked regeneration. The operator can cancel the regeneration by pressing the regeneration switch.



V1088 269

Alarm figure: Park soon Parked regeneration needed

The engine rpm increases during parked regeneration. No work can be done. Only cancel an on-going parked regeneration in an emergency.

Fuel consumption

Fuel consumption may increase during automatic and parked regeneration.

Delayed and cancelled regeneration

NOTE!
Do not delay regeneration unnecessarily.
Only cancel regeneration in an emergency. A cancelled regeneration must be started over from the beginning.

Parked regeneration can be cancelled by pressing the lower part of the switch.

Possible consequences of delayed or cancelled regeneration:

- limitation of engine performance
- higher fuel consumption
- shorter service life for the diesel particulate filter
- damage to the aftertreatment system

Regeneration is cancelled automatically when:

- a malfunction occurs.
- if the machine is turned off.
- the parking brake is released during parked regeneration



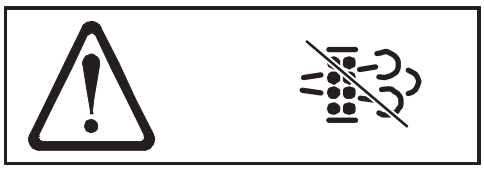
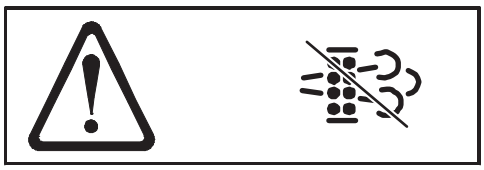
V1088268

Alarm figure: Regeneration cancelled

An alarm figure on the information display confirms that regeneration has been cancelled.

Alarms that require special actions

Alarms that require special actions		
Figure and text on information display	**Alarm level**	**Action**
Warning  V1088 269 Park safely Service regeneration needed Derate active	- buzzer sounds - red central warning - engine performance is reduced significantly (restored after regeneration)	1 Park the machine in a fireproof area. Apply the parking brake. 2 Turn off the engine. 3 Contact an authorized workshop for regeneration. **NOTE!** Regeneration is only possible with authorized service tool.
Warning  V1088 269 Park machine Service needed. Derate activ	- buzzer sounds - red central warning - engine performance is reduced significantly	1 Park the machine in a fireproof area. Apply the parking brake. 2 Turn off the engine. 3 Contact an authorized workshop for replacement of the diesel particulate filter. **NOTE!** The soot volume can only be reset by an authorized workshop.
Check  V1088 269 Park soon Parked regeneration needed	- buzzer sounds - amber central warning	1 Park the machine in a fireproof area. Apply the parking brake. 2 Start regeneration. **NOTE!** Regeneration is cancelled if the parking brake is released. **NOTE!** Idle rpm is increased during the entire regeneration process.
Check  V1088 269 Confirm action Parked regeneration possible	- buzzer sounds - amber central warning	1 Park the machine in a fireproof area. Apply the parking brake. 2 Start regeneration. **NOTE!** Regeneration is cancelled if the parking brake is released. **NOTE!** Idle rpm is increased during the entire regeneration process.
Check  V1088 269 Keep machine parked Regeneration ongoing.	- buzzer sounds - amber central warning	1 Keep the machine parked with applied parking brake until control light 'HEST' is off.

Alarms that require special actions		
Figure and text on information display	**Alarm level**	**Action**
Check  V1136475 Regeneration cancelled Derate soon	- buzzer sounds - amber central warning	1 Start regeneration at the earliest opportunity.
Check  V1088 269 Parked regeneration required. Derate active	- buzzer sounds - amber central warning - engine performance is reduced (restored after regeneration)	1 Park the machine. 2 Start regeneration.
Check  V1136475 Regeneration cancelled Derate active	- buzzer sounds - amber central warning - engine performance is reduced (restored after regeneration)	1 Start regeneration as soon as possible.
Check  V1088 269 Apply parking brake Regeneration needed	- buzzer sounds - amber central warning	1 Apply parking brake 2 Start regeneration.
Check  V1088 269 Service need. Regeneration not possible. System failure	- buzzer sounds - amber central warning	1 Service required. Contact an authorized workshop.
Inform  V1088268 Regeneration not needed	- green central warning	1 Continue normal use. Regeneration does not have to be started at this time.

Alarms that require special actions		
Figure and text on information display	**Alarm level**	**Action**
Inform  V1088268 Regeneration not possible System not warmed up	- green central warning	1 Continue normal use. 2 Start regeneration when the system is warmed up.
Inform  V1088268 Regeneration not possible Engine speed too high	- green central warning	1 Reduce engine speed. 2 Start regeneration when the engine speed has been reduced.

Emission compliance

The aftertreatment system is monitored by diagnostic systems in the control units to ensure reduced emissions. If the system does not meet the emission requirements, it should not be possible to use the machine for work as usual. This takes place by a reduction of engine power (derate).

Engine power is reduced if:

- The level in the AdBlue®/DEF tank is too low
- AdBlue®/DEF is of low quality
- There is a problem/malfunction with the aftertreatment system

There are two levels of engine power reduction (derate) that are activated after a certain time depending on the type of problem, as well as if the malfunction reoccurs or not.

Restoring engine function

If the engine is restarted (by turning the ignition off and on) when engine power has been reduced, then full engine power (called restored engine function) can be obtained twice during derate level 1. This can be done in case of a danger or hazard and, e.g., if the machine has to be moved. This will not extend the time for activation of derate level 2.

Exhaust aftertreatment system, alarms requiring special actions

NOTE!
The text on the information display unit will show ”AdBlue®” in machines for the European market and “DEF” in machines for the US market.

AdBlue®/DEF level, monitoring

Display figure	Alarm level	Action
–	- fixed symbol	1 Turn off the engine. 2 Top up with AdBlue®/DEF in the AdBlue®/DEF-tank.
Refill AdBlue  V1126376 AdBlue empty Derate active	- buzzer sounds 4 times - amber central warning activated - flashing symbol - reduction of torque	1 Turn off the engine. 2 Top up with AdBlue®/DEF in the AdBlue®/DEF-tank.
Park safely  V1126376 AdBlue empty Full derate soon	- buzzer sounds continuously - red central warning activated - flashing symbol - reduction of torque	1 Turn off the engine. 2 Top up with AdBlue®/DEF in the AdBlue®/DEF-tank.
Refill AdBlue  V1126376 AdBlue empty Full derate active	- buzzer sounds continuously - red central warning activated - flashing symbol - forced engine shutdown to idle or reduction of torque and rpm (depending on market)	1 Turn off the engine. 2 Top up with AdBlue®/DEF in the AdBlue®/DEF-tank.
 V1126376 Engine power temporarily restored	- green central warning	1 Restart of the machine can be used twice, to temporarily restore engine power, in case of danger and the machine has to be moved, for example (also see page *198*).

AdBlue®/DEF quality, monitoring

Display figure	Alarm level	Action
Replace AdBlue  V1126376 Wrong AdBlue quality Derate soon	- buzzer sounds - amber central warning activated - fixed symbol	1 Contact an authorized workshop.
Replace AdBlue  V1126376 Wrong AdBlue quality Derate active	- buzzer sounds - amber central warning activated - flashing symbol - reduction of torque	1 Contact an authorized workshop.
Park safely  V1126376 Wrong AdBlue quality Full derate soon	- buzzer sounds - red central warning activated - flashing symbol - reduction of torque	1 Contact an authorized workshop.
Replace AdBlue  V1126376 Wrong AdBlue quality Full derate active	- buzzer sounds - red central warning activated - flashing symbol - forced engine shutdown to idle or reduction of torque and rpm (depending on market)	1 Contact an authorized workshop.

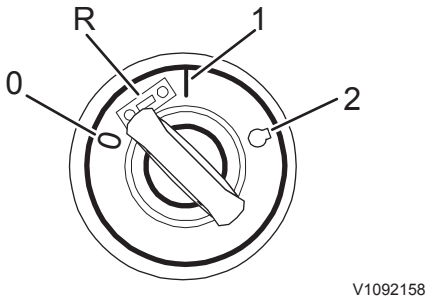
SCR system failure, monitoring

Display figure	Alarm level	Action
Check SCR-system  V1126376 SCR-system failure Derate soon	- buzzer sounds - amber central warning activated - fixed symbol	1 Contact an authorized workshop.
Check SCR-system  V1126376 SCR-system failure Derate active	- buzzer sounds - amber central warning activated - flashing symbol - reduction of torque	1 Contact an authorized workshop.
Park safely  V1126376 SCR-system failure Full derate soon	- buzzer sounds - red central warning activated - flashing symbol - reduction of torque	1 Contact an authorized workshop.
Check SCR-system  V1126376 SCR-system failure Full derate active	- buzzer sounds - red central warning activated - flashing symbol - forced engine shutdown to idle or reduction of torque and rpm (depending on market)	1 Contact an authorized workshop.

DPF system failure, monitoring

Display figure	Alarm level	Action
Park safely  V1201756 DPF-system failure Full derate soon	- buzzer sounds - red central warning activated - flashing symbol	1 Stop the machine safely in the nearest appropriate location. 2 Contact an authorized workshop
Park safely  V1201756 DPF-system missing Full derate soon	- buzzer sounds - red central warning activated - flashing symbol	1 Stop the machine safely in the nearest appropriate location. 2 Contact an authorized workshop
Park safely  V1201756 DPF-system deactivated Full derate soon	- buzzer sounds - red central warning activated - flashing symbol	1 Stop the machine safely in the nearest appropriate location. 2 Contact an authorized workshop
Check DPF-system  V1201756 DPF-system failure Full derate active	- buzzer sounds - red central warning activated - flashing symbol	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop
Check DPF-system  V1201756 DPF-system failure Full derate active	- buzzer sounds - red central warning activated - flashing symbol	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop
Check DPF-system  V1201756 DPF-system missing Full derate active	- buzzer sounds - red central warning activated - flashing symbol	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop
Check DPF-system  V1201756 DPF-system deactivated Full derate active	- buzzer sounds - red central warning activated - flashing symbol	1 Stop the machine immediately, safely and in the nearest appropriate location. 2 Contact an authorized workshop
Check DPF-system  V1201756 DPF-system deactivated	- buzzer sounds - amber central warning activated - fixed symbol	1 Contact an authorized workshop.
Check DPF-system  V1201756 DPF-system failure	- buzzer sounds - amber central warning activated - fixed symbol	1 Contact an authorized workshop.

Check DPF-system  V1201756 DPF-system missing	- buzzer sounds - amber central warning activated - fixed symbol	1 Contact an authorized workshop.
Check DPF-system  V1201756 DPF-system failure Derate soon	- buzzer sounds - amber central warning activated - fixed symbol	1 Contact an authorized workshop.
Check DPF-system  V1201756 DPF-system failure Derate active	- buzzer sounds - amber central warning activated - flashing symbol	1 Contact an authorized workshop.



V1092158

0 Off position
R Radio position
1 Operating position
2 Start position

Stopping

1 Release the accelerator pedal.

2 Brake and put the gear selector control in neutral, when the machine is stationary.

3 Apply the parking brake.

4 Make sure that the dump body is lowered.

5 Let the engine run at idle rpm at least for a few minutes before it is turned off to ensure lubrication and cooling of the turbocharger, as well as heat equalization in the engine.

6 Turn the ignition to position R or 0 (Off).

NOTE!
When the ignition is turned to position R, the engine is turned off and the machine's ECU is powered down. The battery disconnector (main switch) is still On.
When the ignition is turned to position 0, the battery disconnector (main switch) is deactivated. Voltage may remain for a certain time to shut down various systems in a controlled way.
The machine is supplied with voltage as long as the ignition is in position R or the information display is on.

Electric battery disconnector

NOTE!
The electric battery disconnector (main power switch) shall be used daily when turning off the machine. When the ignition is turned to position 0, the electric battery disconnector cuts of the machine's main electric power. Voltage may remain for some time to shut down various systems in a controlled way. However, a few minor power consumers are always supplied with voltage, e.g., the radio memory.

For daily shutdown of the machine, see page *204*.

Emergency switch

NOTE!
The emergency switch shall only be used in emergency situations. Do not confuse the emergency switch with the electric battery disconnector or the service switch. Do not use the emergency switch to cut off the machine's main power unnecessarily. The electrical system and other important functions may be damaged.

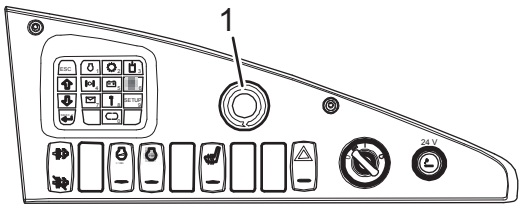
For use of the emergency switch, see page *206*.

Service switch

NOTE!
The service switch shall only be used for service actions. Do not confuse the service switch with the electric battery disconnector or emergency switch. The service switch disconnects all electric power (even minor power consumers, e.g., the radio memory, and can be locked in the OFF position using a pad lock.

For use of the service switch, see page *283*.

Emergency stop switch

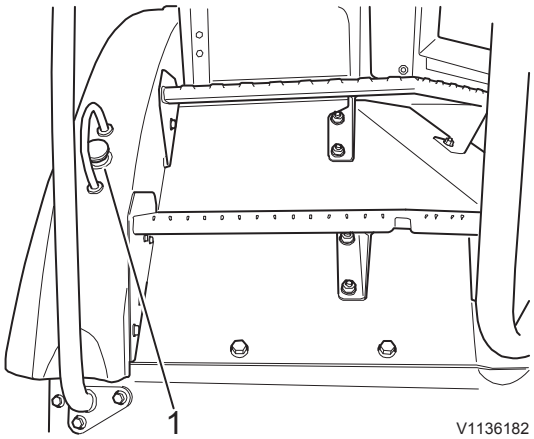


V1092149

1. Emergency button, position on instrument panel in cab

NOTICE

Risk of machine damage.
Using the emergency stop can damage the machine systems. Use the emergency stop only in emergency situations. In all other situations, use the ignition switch to stop the machine.



V1136182

1. Extra emergency stop button on left front fender (optional equipment)

There is an emergency stop button inside the cab (see page *123*) on the right instrument panel. When it is pressed, the machine's engine turns off immediately. Another emergency stop button is also available (optional equipment) for installation on the left front fender at the cab entrance. In such cases, both emergency stop buttons are connected in series, that is, only one of them has to be pressed to turn off the engine.

Restoring

To restore the emergency stops so that the machine can be operated again, turn the emergency stop button clockwise until it pops out.

Auto engine shutoff

(Optional equipment)

The machine may be equipped with automatic engine shut-down. This means that the engine is turned off automatically and the parking brake is activated if the engine has idled for four minutes and other conditions for automatic shut-down are fulfilled, see below. The time for idle before the engine is turned off can be changed with the authorized service tool.



V1088203

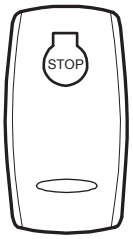
When 60 seconds of the time remains, the operator is informed by an amber alarm display figure and then the operator has the possibility to cancel the function by pressing the keypad's ESC-key.

The countdown starts if the following conditions are fulfilled:
- increased engine rpm is not activated
- accelerator pedal not pressed
- gear selector in neutral position (N-position)
- delayed shutdown is not activated
- brake test not in progress
- regeneration not in progress
- load body not being raised or lowered
- machine not moving
- machine longitudinal inclination is less than 7%
- control light for alternator charging failure not on
- hydraulic oil temperature above 20 °C (68 °F)
- transmission oil temperature above 20 °C (68 °F)
- ambient temperature above -10 °C (14 °F) and below 40 °C (104 °F)

If any condition ceases to be fulfilled or if the ESC-key is pressed, the countdown starts over.

Delayed stop

(Optional equipment)



V1092185

Delayed stop enables the operator to let the engine idle automatically for a certain time.
The switch should always be in active position.

When the switch "Delayed engine shut-down" (see *123*) is on and the start key is turned from position 1 to position R or 0, the engine runs for another three minutes. The time can be changed with Tech Tool.

The function will be activated if the following conditions are met:
- gear selector in neutral (N position)
- start key in position 0 (OFF)
- the switch is on.

When the function is activated it is not possible to:
- engage a gear
- change the engine speed (the accelerator pedal is disconnected)

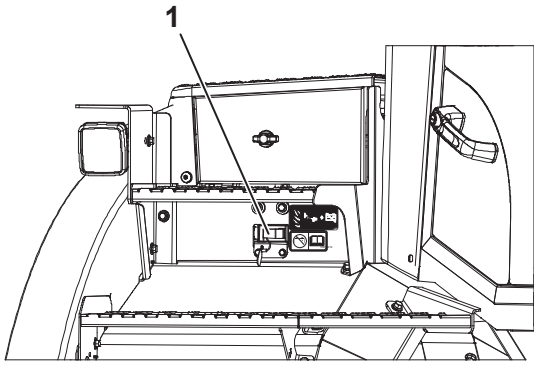


V1101673

During the time that delayed shut-down is active, the remaining time is shown on the information display unit.

If the operator has a change of mind and wants to continue operating, the start key should be turned back to position 1 before the electronics have closed down and the engine stops.
The engine stops if the switch for delayed shut-down is deactivated during the time that the function is active.

Emergency switch



V1156392

1 Emergency switch with tamper seal

NOTE!
The emergency switch shall only be used in emergency situations. Do not confuse the emergency switch with the electric battery disconnector (main power switch) or the service switch. Do not use the emergency switch to cut off the machine's main power unnecessarily. The electrical system and other important functions may be damaged.

Shutdown of machine in case of emergency

If the machine's engine is running:
1 Activate the parking brake.
2 Turn off the engine by pressing in the emergency stop.
3 Turn the ignition to position 0.
4 Leave the cab.
5 Break the tamper seal and open the protective cover over the emergency switch.
6 Turn off the main electric power by moving the rocker arm to the right, OFF position.

Restoring
1 Close the protective cover for the emergency switch. (The rocker arm is moved to the left automatically, ON position.)

2 If the emergency stop has been activated, restore it by turning the emergency stop switch clockwise.
3 If repair is needed, contact a qualified workshop.

Parking

Theft

Keep in mind that the risk of theft and break-in can be minimized by:

- avoiding parking the machine in places with high risk of theft, break-ins, and vandalism
- removing the start key when the machine is left unattended
- locking the door, grille, tank cover and AdBlue®/DEF tank cover, if present, at the end of the working day
- removing all valuable items from the cab, e.g., mobile telephone, computer, radio, and bags.

It is easier to identify stolen machines if the PIN-number or registration number is etched into the windows.

Parking

1 If possible, place the machine on level ground.

2 Apply the parking brake.

3 Block the wheels if there is a risk that the machine could roll, for example on slopes.

4 Make sure that the load body is lowered. Avoid parking a loaded machine.

5 Check that the switches and controls are in the neutral or "off" position.

6 Close windows, remove the start key, and lock the cab door.

Long-term parking

1 Take actions as described above.

2 Remember that the ground on which the machine is to stand may shift depending on the weather. Take suitable action.

3 Wash the machine and touch up any damaged paint finish to avoid rusting.

4 Rust-proof exposed components, grease/lubricate the machine thoroughly, grease all unpainted surfaces (hoist cylinders, steering cylinders).

5 Check the tire pressure and protect the tires from intense sunlight.

6 Fill the fuel, brake fluid and hydraulic oil tanks to the max. marks.

7 Make sure that there is enough anti-freeze in the cooling system (see page *397*) and in the washer fluid if the machine will be parked in temperatures below 0 ° C.

8 Drain the AdBlue®/DEF-tank, if applicable, see specifications on page *395*.

9 Drain water from the compressed air tank.

10 Cover the exhaust pipe.

11 Check that the batteries are fully charged.

NOTE!
The batteries must be kept charged to prevent shortening of the battery service life caused by sulfation during long periods without use. Because they self discharge, the voltage level of both batteries must be at least 12.65 V to enable a period without use of up to 30 days. If the batteries are stored with a low voltage level, it can shorten the service life of the batteries.

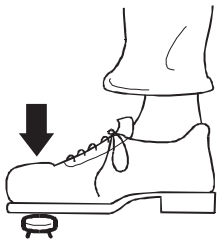
12 Disconnect the batteries, see page *283*. The service life of the batteries is extended, but they may still need to be maintenance-charged.
If the machine is equipped with the Fire Suppression System (optional equipment):
The system will run on the back-up battery. Its service life is approx. 2 months. After this period, the back-up battery must be changed by a qualified service technician.

After long-term parking, check:

- all oil and fluid levels
- all belt tensions
- tire pressure
- air cleaner
- batteries' status
- connect the batteries, see page *283*
- if the machine is equipped with the Fire Suppression System (optional equipment), the functional check should be performed by a qualified service technician.

NOTE!
If protective agents (rust-protection agents, etc.) have been used to prepare the machine for long-term parking, follow the manufacturer's safety precautions and methods for removing.

Measures when getting stuck



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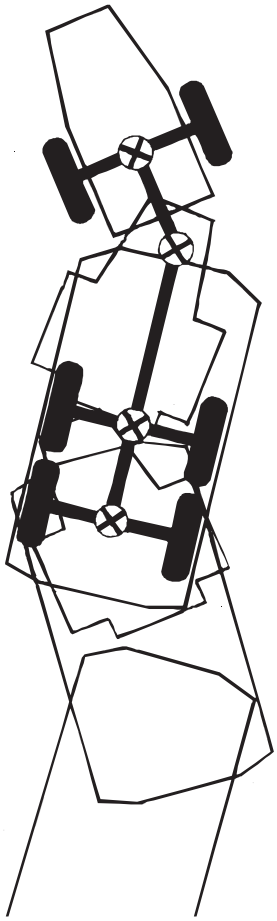
Step 1 (by operating zig zag/"duck walk")

1 Engage all differential locks with the foot button.

2 Keep an even engine speed and avoid wheel spin.

3 Steer alternately full lock to the right and full lock to the left. When you have reached full lock in one direction, continue operating in that direction until the machine is just about to stop, before turning to full lock in the other direction.

If the machine becomes stationary after 3–4 turns, or if it sinks deeper, abort and proceed to step 2.



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Step 2 (by rocking loose)

1 Release the accelerator to stop the wheels from spinning.

2 Engage the differential locks.

3 Select gear position D and accelerate.

4 Let up the accelerator and brake.

5 Select gear position R and accelerate again.

6 Repeat this procedure until the machine has “rocked” loose.

If the machine still is stuck, abort and proceed to step 3.

Step 3

1 Get towing assistance from a crawler tractor, a loader or an excavator.

2 If you do not succeed in dumping the load because of the risk of overturning, make use of a supporting machine during the dumping operation.

3 Remove the dumped material behind the load body using the supporting machine.

4 Lower the load body.

5 Allow the assisting machine to lift and push at the rear of the load body at the same time as the hauler is operated according to step 1 until it is free.

Step 4

Getting unstuck with recovery assistance

If the hauler has not bogged down but the wheels are spinning, it can be towed with a tow bar, wire cable, or chain connected to the towing eyes, or pushing by another machine.

Retrieving and towing

WARNING

Risk of runaway machine.
Improper recovering or towing methods or faulty equipment could cause the machine to break away from the towing vehicle, causing accidents, serious injury or death.
Always apply parking brake and block the wheels to prevent the machine from moving while attaching the towing equipment.

WARNING

Risk of fatal accidents by runaway machine.
Loss of braking function and steering function could cause serious injury or death by runaway machine.
If the engine cannot be started, towing must only be performed in an emergency situation by trained personnel and only the shortest possible distance with very low speed. If possible, transport the machine on a trailer.

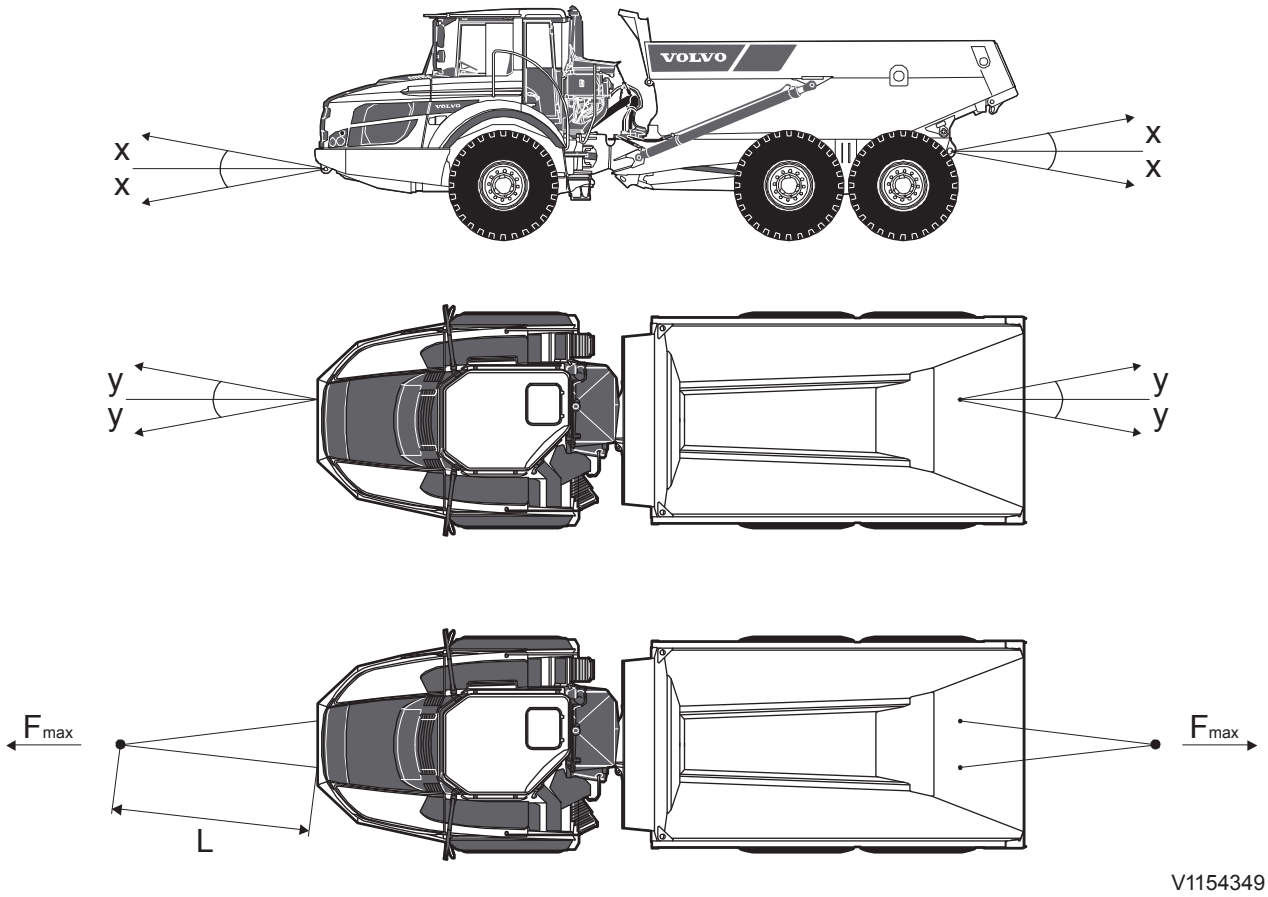
During recovering/towing the engine should be running, if possible, to provide braking and steering.

NOTE!
The machine shall be unloaded when recovering and towing. Otherwise there is a risk of frame joint failure.

Recovering

- Use a towbar, cable, or chain connected to the eyes at the front or rear on the machine to tow the machine to a suitable location or passable road.
- Towbar, cable, or chain that is connected should be dimensioned for the machine weight.
- Both eyes should be used to avoid shear loads on the frames.
- Tow the machine straight ahead or straight back, with a deviation of max. 10°.
- Make sure that no persons are in the danger zone.

Max. tow capacity, per pair (F_{max})	175 x 2 eyes = 350 kN (35,7 tonnes)
x and y	max. 10°
L	min. 3 m (118 in)



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Towing

NOTE!
It is not possible to start the engine by towing.

- If the machine has be towed to a workshop after recovering, use a towbar or cable connected to the front eyes.
- If there are no brakes on the machine to be towed, a towbar must always be used.
- The vehicle or machine which does the towing, must be at least as heavy as the towed machine, and have sufficient engine and braking capacity to be able to pull and stop both machines on any uphill or downhill slope.
- Towing should always be done over the shortest possible distance.
- Max. permitted speed for towing 10 km/h (6.2 mph).
- If possible, use a trailer.

Case 1 (with engine running)

The gear selector should be in neutral and the parking brake should be released. The machine can be towed 10 km (6.2 miles) without taking special action.

Case 2 (with engine not running)

NOTE!
Towbar shall always be used when towing without running engine, when the brake function cannot be ensured.

The following actions must be taken before towing without the engine running.
- Connect towbar. Chain or cable is not permitted.
- Parking brake is released mechanically.
- In relevant cases, the propeller shaft is removed between transmission and dropbox, contact a qualified workshop.

Connecting the towing vehicle

NOTE!
The towbar shall be dimensioned for the relevant machine weight.

NOTE!
Use both towing eyes to prevent shear loads on the frames.

1 Block the wheels or prevent the machine from rolling in another way.
2 Connect a towbar.
3 Release the parking brake mechanically, see below.
4 In relevant cases, the propeller shaft is removed between transmission and dropbox, contact a qualified workshop.
5 Remove the blocks from the wheels.

⚠ WARNING

Risk of fatal accidents.
The parking brake will not work after being released manually.
The towed machine may go faster than the towing vehicle. This may cause fatal accidents and may result in serious injuries or death.
Always use a towbar.
Make sure that the tow vehicle has sufficient braking to stop both the machine and the towed vehicle.

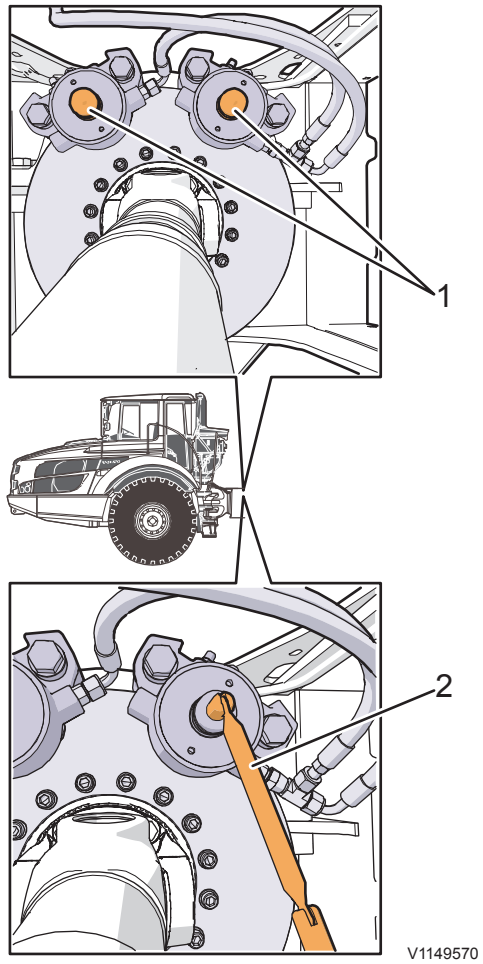
⚠ WARNING

Risk of serious injury or death by crushing.
To leave a machine without restoring the parking brake function could result in serious damage and fatal injuries.
Tag the steering wheel with information that the parking brake function has been disabled.
Do not operate the machine until the parking brake is restored.

The parking brake should be restored by a qualified service technician.

Mechanical release of parking brake

When towing over longer distances, the parking brake must always be released mechanically.



1 Protective cover
2 Tools

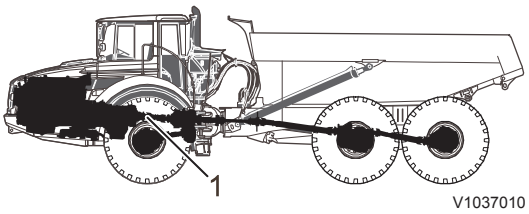
If the parking brake cannot be released with the switch due to missing electric power or accumulator pressure, the brake can be released manually.

Proceed as follows:

1 Place machine in the service position. Refer to page *270*.

NOTE!
Block the wheels to prevent the machine from rolling.

2 Remove the protective caps over the adjusting screws on the two parking brake calipers.
3 A 1/2-inch socket (incl. in the tool kit) is needed to loosen the adjusting screws, see *24*. Release the parking brake by turning the adjusting screws counter-clockwise, until the screws are level with the outer edge of the brake caliper.
4 Fasten a warning sign on the steering wheel with information that the parking brake is not working.



1 Propeller shaft, transmission - dropbox

Removing propeller shaft

Since the transmission does not receive any lubrication when the engine is not running, the propeller shaft between transmission and dropbox must be removed. Then lubrication to the dropbox is maintained, at the same time as the machine can be steered using the secondary steering. The propeller shaft should be removed by a qualified service technician.

After recovering / towing

The following safety precautions should be taken before the towbar, cable, or chain is disconnected after recovering / towing:

1 Place the machine on level ground.
2 Apply the parking brake, if possible.
3 Block the wheels to prevent the machine from rolling.

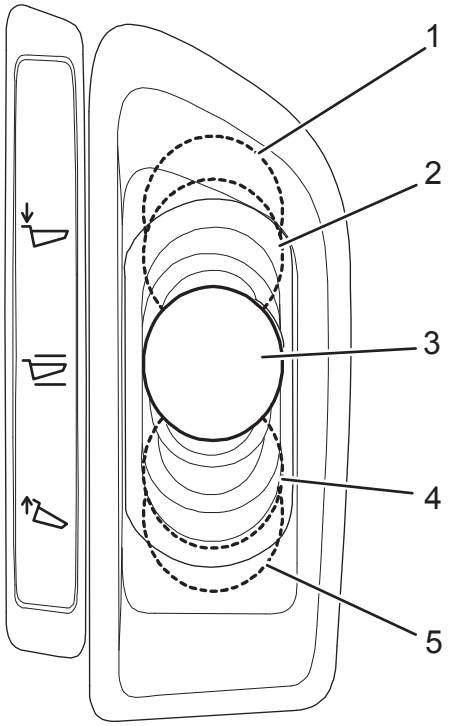
Restoring the parking brake after mechanical release

⚠ WARNING

Risk of serious injury or death by crushing.
To leave a machine without restoring the parking brake function could result in serious damage and fatal injuries.
Tag the steering wheel with information that the parking brake function has been disabled.
Do not operate the machine until the parking brake is restored.

The parking brake should be restored by a qualified service technician.

Tipping



1 Lowering position with hold function
2 Lowering position
3 Hold position/Float position
4 Dumping position
5 Dumping against hard stop

NOTE!
When dumping, machine speed should be below 10 km/h (6.2 mph). At higher speed the machine's load body cannot be elevated.

When dumping, the following points should be observed:
- stand the machine straight and with the load unit on a level, solid ground surface
- make sure that no persons are near the machine
- If conditions permit, dumping may be carried out on the move.

Lower position with hold function = position 1
Used when lowering the body. The position has hold function on the lever. When the body has reached its lowest position the lever goes automatically to position 3.
End-position damping makes the load body stop smoothly against the frame.

NOTE!
If the operator leaves the operator's seat, the dump lever automatically goes to hold position.

Lowering position = position 2
Lowering position without hold function.

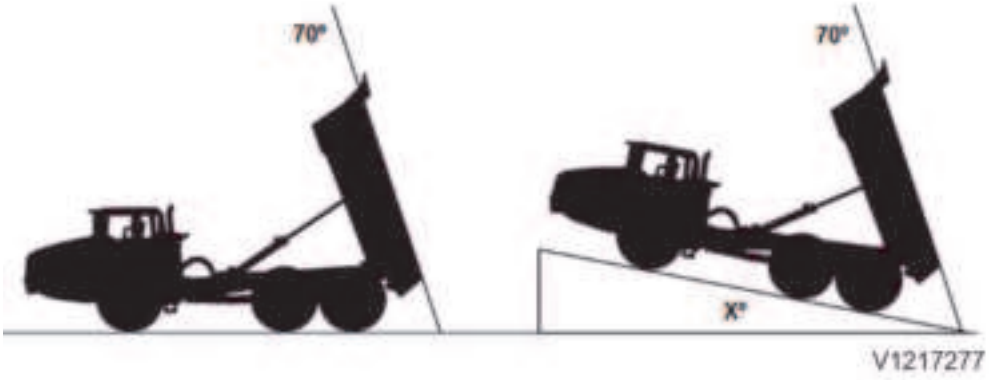
Hold position/Float position = position 3
Used to interrupt dumping or lowering movement. The load body stops in the reached position. Goes automatically to float position if the load body is in its lowest position. (See also position 1).
Float position shall be used for all operation with empty or loaded load body.
The dump lever goes to position 3 if the operator leaves the seat or turns off the machine with the ignition key.

Dumping position = position 4
Used when dumping. The load body has automatic end-position damping. Can be activated/deactivated via the information display unit, see page *62*.

Dumping against hard stop = position 5
End-position damping is deactivated if the lever is moved past the dumping position when the load body approaches the upper end-position. This is to enable shaking material loose from the load body.

Max. dump height
Max. dump height can be adjusted. Can be used when the machine is in areas with limited height. See page *52*.

Relative dump height
When dumping and the machine is leaning uphill, the max. dump height is adjusted in relation to the inclination.



Speed limitation with load body up

The speed is limited to max. 8 km/h (5 mph) when the load body is raised up off the frame. In exceptional cases, national regulations may permit other speeds. Changes can only be performed by a qualified workshop.

Warming of hydraulic oil

Used when the hydraulic oil needs to be warmed. Press the lever to lowering position and hold it there for 5 seconds to activate the warm-up position. It is activated until the lever is released.

Dump body

Exhaust heated dump body

(Additional options)

NOTE!
The shutter (damper) is factory-adjusted to give maximum heat to the load body.

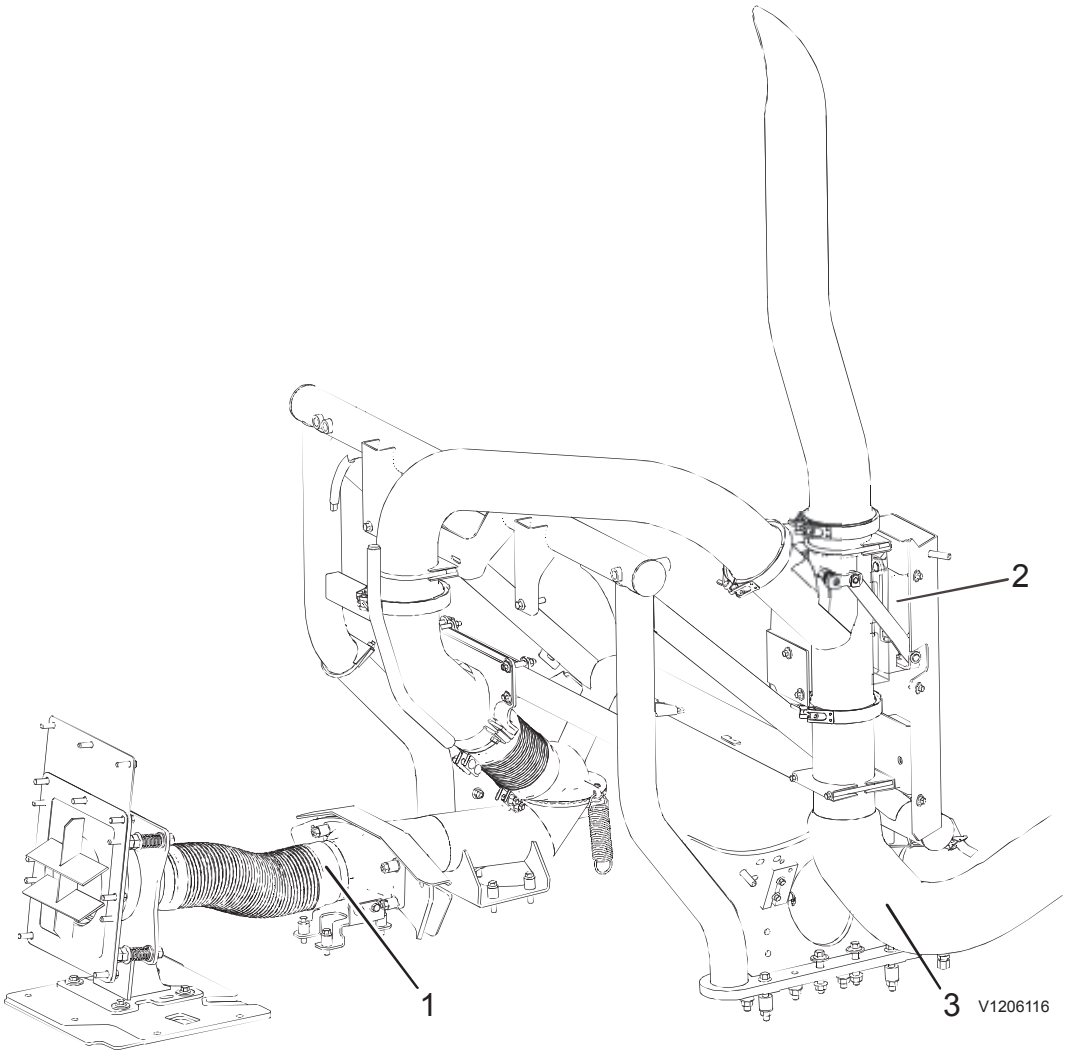
In order to prevent excavated material from freezing to the body, the machine can be equipped with a flexible tube between the tractor unit and the load body, so that exhausts from the engine are used to warm up the load body.

On the exhaust pipe there is a shutter that automatically controls the amounts of exhausts that are to pass through the load body's channels. The shutter is controlled by a compressed air cylinder.

The shutter opens when:

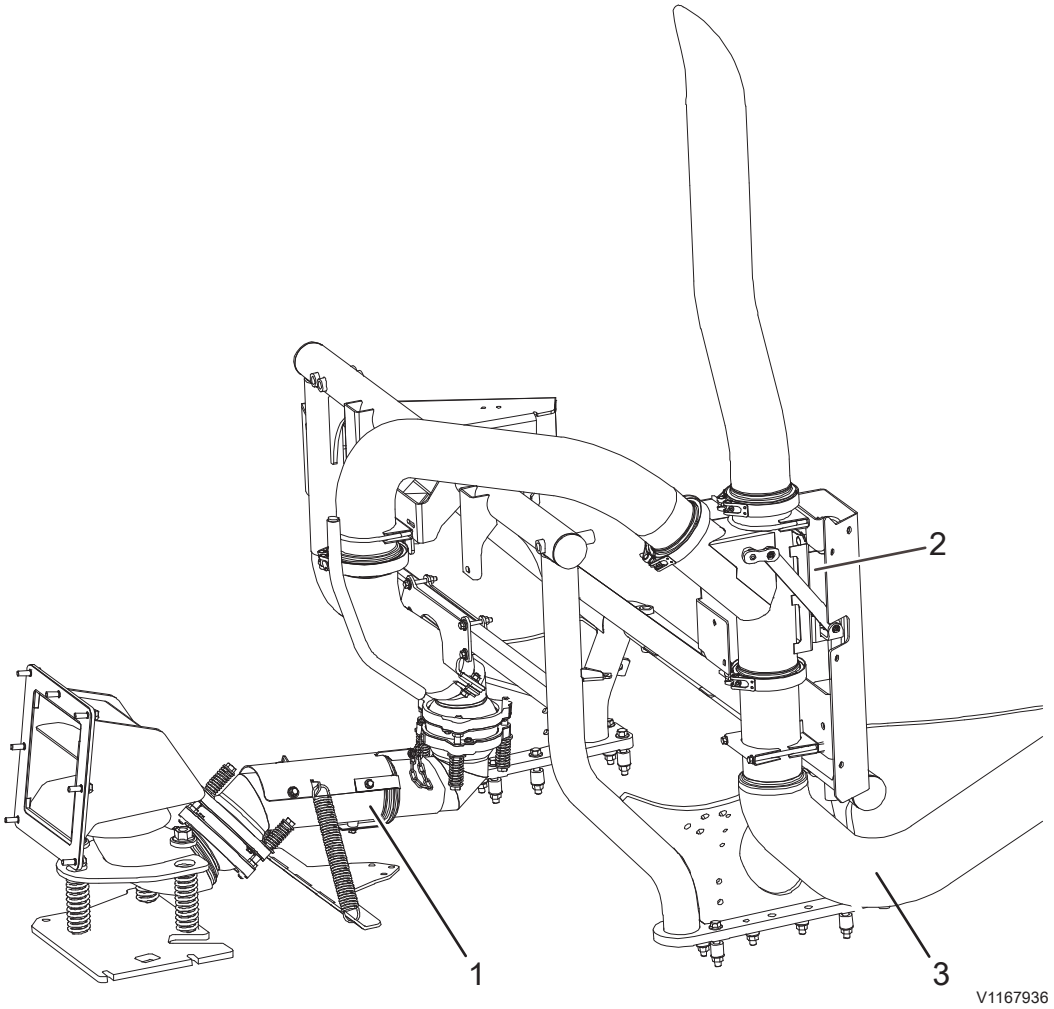
- reverse gear is engaged (to improve visibility when reversing).
- load and dump brake is activated (to avoid the loader operator being subjected to exhausts).

The functions for 'shutter open when reversing' and 'activated Load & Dump brake' can be turned off independent of each other in the information display unit, see page *67*.



New exhaust-heated dumper body design

1 Exhaust pipe to load body
2 Compressed air cylinder for shutter control
3 Exhaust pipe from engine



Previous exhaust-heated dumper body design

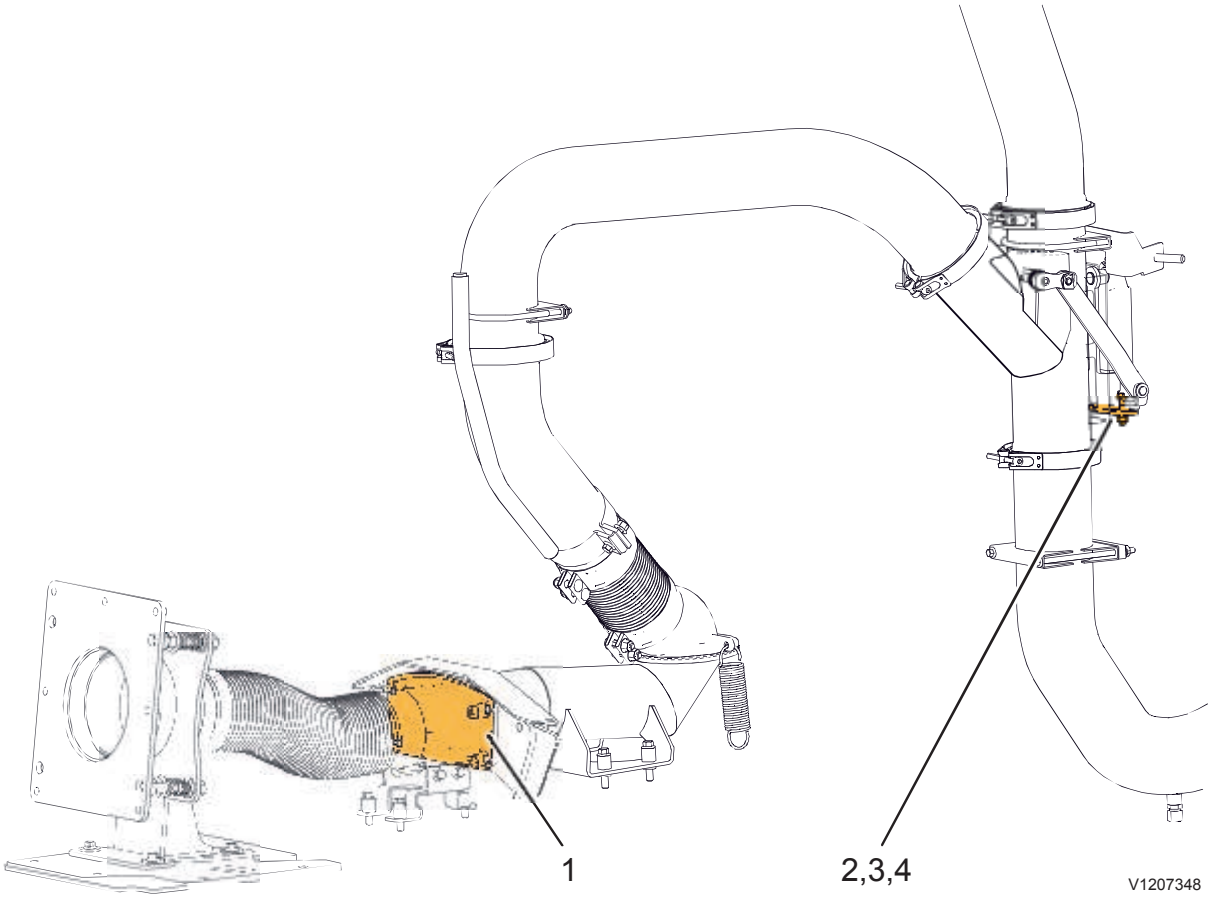
1 Exhaust pipe to load body
2 Compressed air cylinder for shutter control
3 Exhaust pipe from engine

The flexible tube is provided with overload protection which can be activated if the trailer overturns.

Exhaust heated dump body deactivation

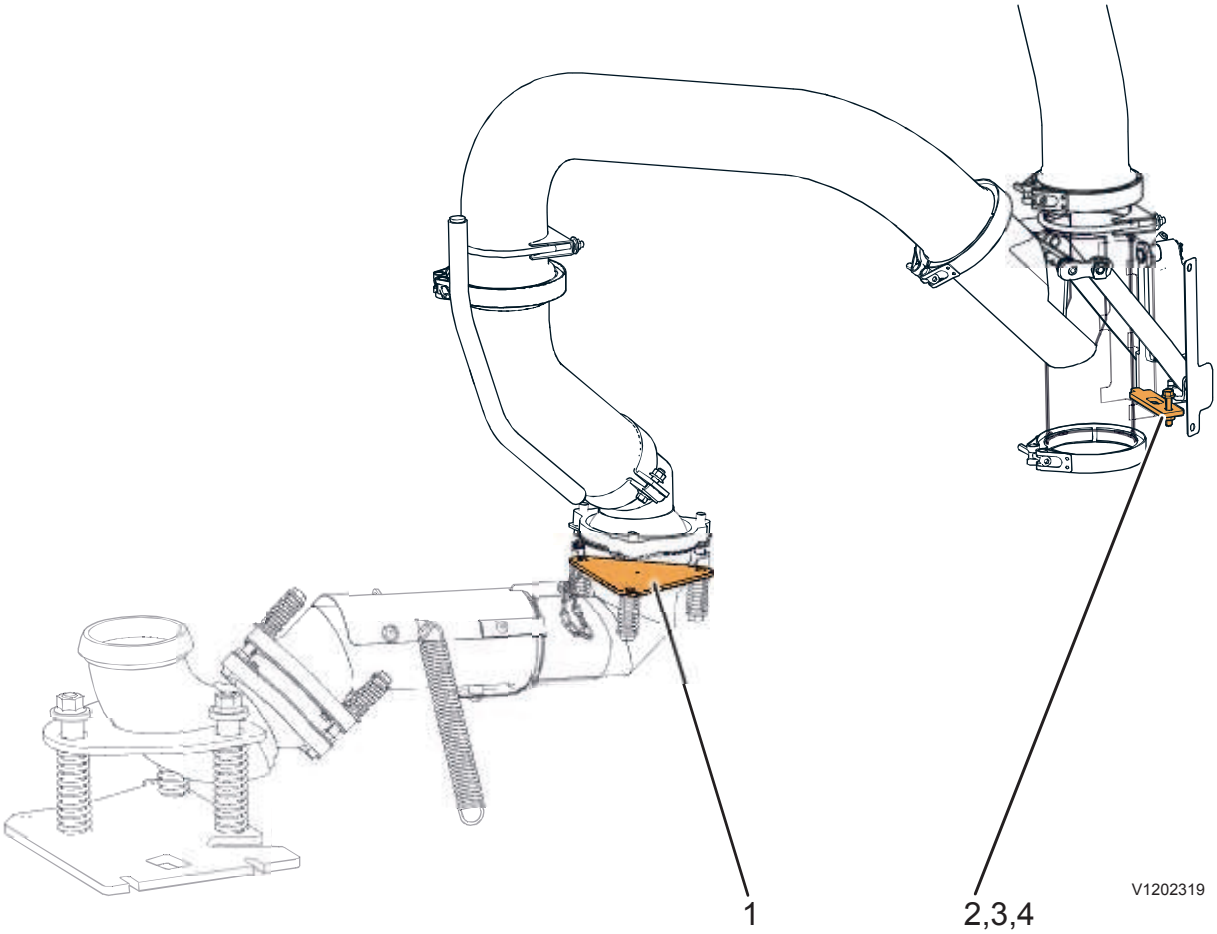
The following parts are supplied from the factory. When the parts are not used, it is suitable to store them in the cab. The parts are used to temporarily deactivate Exhaust heated dump body

NOTE!
Applies to new exhaust-heated dumper body design.



1 Locking plate with fastening screws.
Positioning behind the front slide plate.
2 Plate
3 Flange bolt
4 Flange lock nut

NOTE!
Applies to the previous exhaust-heated dumper body design.



1 Lock plate
2 Plate
3 Flange bolt
4 Flange lock nut

Dump body, alternative lowering

The dump lever, which is electric, controls a PWM-valve which converts the electric signal to a hydraulic servo pressure that acts on the dumping slide.
In case of a machine malfunction that disables lowering of the load body, then manual lowering of the load body is possible using a screw on the dumping valve, which acts on the dumping slide.

WARNING

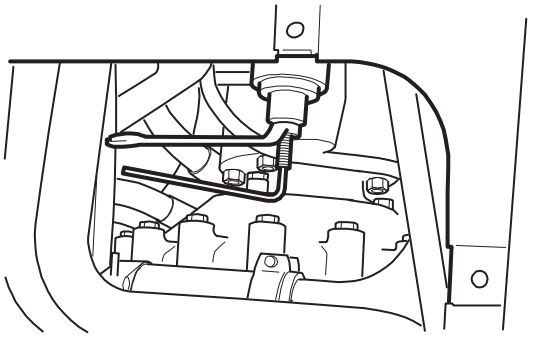
Risk of crushing.
An unlocked raised dump body could fall down. Personnel standing under a falling dump body could be seriously injured, including death.
Always lock the dump body before entering under it.

WARNING

Risk of serious injury or death.
Lowering the dump body when persons are in the danger zone could cause fatal injuries.
Where direct sight in the danger zone can not be arranged, cordon off the area around the machine or contact a colleague who can oversee the lowering of the dump body.

The load body can be lowered in the following way:

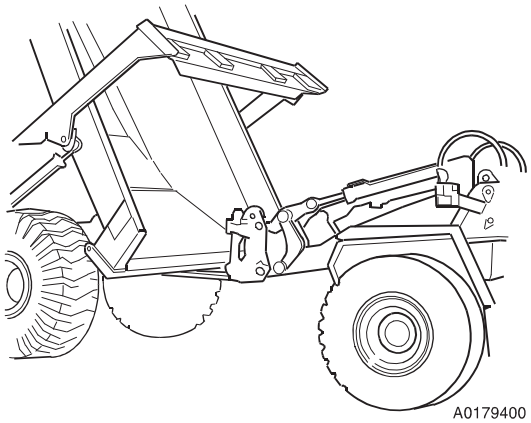
1 Open the service cover under the mat behind the operator's seat.
2 Loosen the lock nut and slightly screw in the screw on the dumping valve.
Ring (box-end) wrench and Allen key are included in the tool set for the machine.


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Screw and lock nut on the dumping valve

NOTE!
The screw can be turned approx. 8–9 turns before acting on the dumping valve's slide (count the number of turns). Continue to turn the screw so that it displaces the valve slide to the float position (lowering without pressure).

3 Then the load body lowers slowly. If the load body is in top position or is leaning back, the load body needs assistance by lifting with an excavator or wheel loader at the load body's rear edge.
4 Restore the screw to its original position and lock with the lock nut.
5 Reinstall the service cover.


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Spillguard, folding down and up

(Additional options)

WARNING

Risk of serious injury or death.
During folding up or down, inappropriately secured spillguards can fall and cause serious injury or death.
Always use approved lifting device and appropriate tooling for folding up and down the spillguard. Keep area clear of unauthorized persons.

NOTE!
Raising and lowering of the front plate shall only be performed by trained personnel equipped with suitable tools, lifting devices, work platforms, and fall protection.

NOTE!
The front plate weighs approx. 200 kg (441 lbs).

Lowering

1 Use the lifting device and secure the front plate in the lifting eyes at the plate's edges.

2 Check that the front plate's hinges are intact and not damaged.

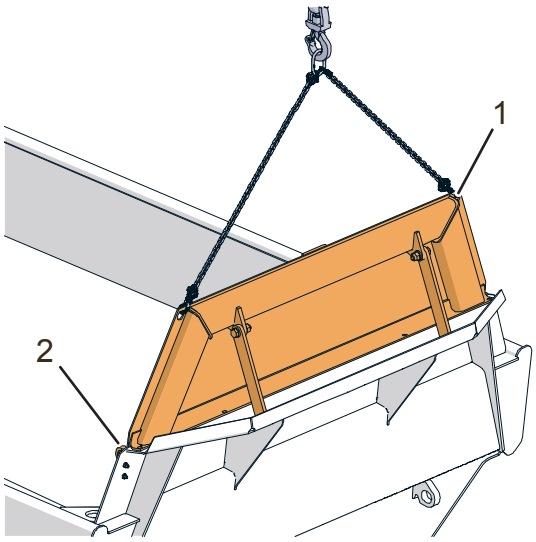


Figure 1
1 Lifting eye
2 Hinge

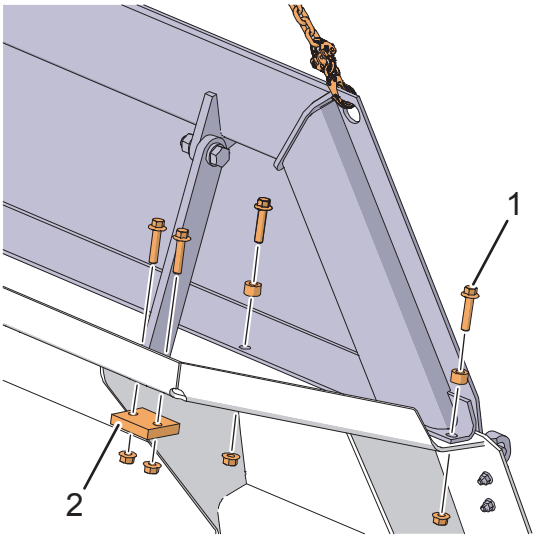


Figure 2

NOTE!
The figure shows the load body's right side.

1 Bolted joint for front plate's lower edge
2 Bolted joint for front plate's support stays

3 Loosen and remove the bolted joint at the load body's right and left front end, partly at the lower edge of the front plate, partly at the support stays for the front plate.

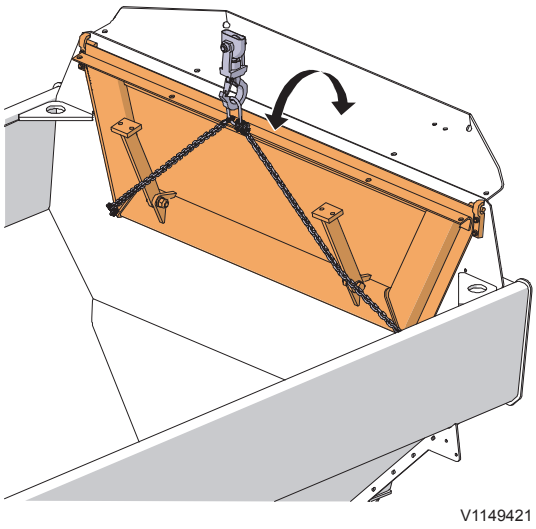


Figure 3

4 Use the lifting device to carefully lower the front plate into the load body.

5 Remove the lifting device.

Raising

1 Use the lifting device and secure the front plate in the lifting eyes at the plate's edges, see Fig. 1.

2 Use the lifting device to raise the front plate to correct position, see Fig. 3.

3 Install the bolted joints at the load body's right and left front end, partly at the lower edge of the front plate, partly at the support stays for the front plate, see Fig. 2.
Tightening torque: 220 Nm (162 lbf ft)

4 Remove the lifting device.

Transporting machine

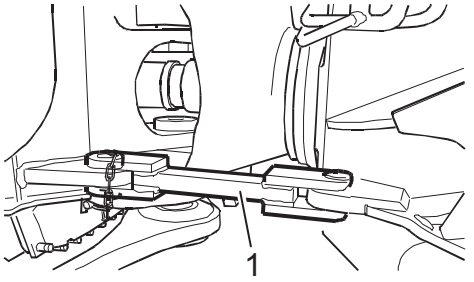
WARNING

Risk of crushing.
Anyone being trapped between the tractor unit and the frame could suffer severe or lethal injuries.
Beware of the frame joint when the engine is running.

WARNING

Risk of crushing.
The machine could turn and cause crushing injury.
Engage the steering lock before servicing or transporting the machine.

During service work, lifting and transporting the machine on another vehicle, the steering joint should be locked.



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1 Steering joint lock

Steering joint lock

1 Stand the machine completely straight.
2 Apply the parking brake.
3 Remove the pin from the transport bracket and swing over the steering joint lock.
4 Install and secure the pin.
5 Turn off the engine.

Do not forget to unlock the steering joint and secure the steering joint lock in the bracket intended for this purpose, before operating the machine again.

WARNING

Risk of overturning.
A machine can cause serious or fatal injuries if it rolls over while being driven onto the platform of a transport vehicle.
Make sure that the transport vehicle is braked with the wheels blocked. Secure the driving ramps steadily so that the machine cannot roll over or sway.

Transporting on another vehicle

- If the machine is driven up onto another vehicle, the steering joint must not be locked. Lock the steering joint when the machine is in position on the transport vehicle.
- The transport vehicle must be securely braked and the wheels blocked.
- If the machine is lifted, the steering joint must be locked.
- The mirrors should be folded in. *165*
- The rotating beacon should be lowered. **(Additional options)**, *165*

Over ramp

- First check that the ramp is wide enough and has the required strength and that it will not be displaced.

Otherwise, follow the national rules and regulations.

NOTE!
If the machine has a upper body plate/front cover (optional equipment), it shall always be lowered when transporting the machine.



Securing cargo (machine) that has been loaded

Securing of machine includes:
- Instructions for securing load
- Load-securing instruction, machine loaded with its front end forward
- Load-securing instruction, machine loaded with its rear end forward

Instructions for securing load

Instructions on the following pages apply only if the following conditions have been fulfilled:

Acceleration requirements(1)
- The machine is subjected to the following maximal accelerations; 0.8 g forward, 0.5 g backward, 0.5 g sideways, and 0.2 g upward.
- Accelerations forward, backward, and sideways occur separately and combined with 1 g downward.
- Acceleration upward is not combined with other accelerations.
- A safety factor of 1.25 has been used considering uneven load in the lashings. Without the safety factor the lashing arrangement can handle an acceleration of 1 g forward.

The machine
- The machine (with or without attachment) is manufactured by Volvo Construction Equipment.
- The machine's weight does not exceed 28,000 kg (61,730 lbs).
- The machine has new or normally used rubber tires or wood-covered rims of pine or birch. If the wood-covering is made of birch, then rubber spacers shall be used between wood-covering and ground surface to obtain the friction 0.5. If rubber spacers are not used the friction is only 0.2.

Loading and securing on the load carrier
- The machine stands centred sideways (± 5 cm (2 in)) on the load carrier and is supported on at least half of the tyres' width.
- The parking brake is applied and operational. For the parking brake test see page *313*.
- The steering joint lock is locked.
- The machine is loaded and secured in such a way that no parts, i.e., painted surfaces or tyres, can be damaged.

Load carrier
- The machine is loaded on a vehicle with trailer bed of wood, plyfa (plywood), grooved aluminium plates, unpainted or painted steel plates.
- The distance sideways between tie-down points is approx. 2,500 mm (100 in).
- The tie-down points on the trailer have at least the same breaking strength as the lashings.

Lashings
- The lashings are pre-loaded to at least 4,000 N (400 kg) during the whole transport.

1. Acceleration requirements fulfil the basic requirements in almost all countries' rules and standards for highway transport. However, in some countries there are national rules and guidelines that may require additional or blocking and/or lashing.

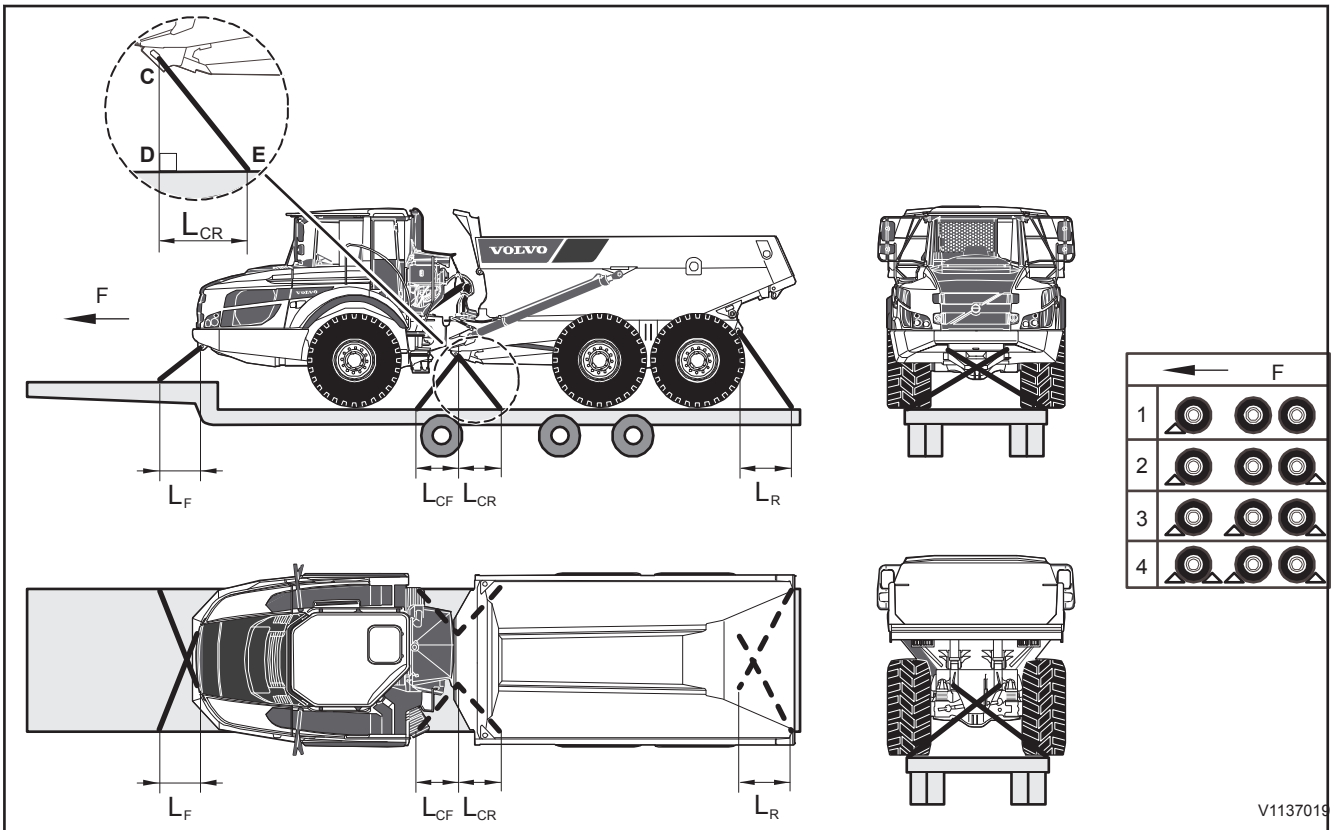
- The lashings are placed symmetrically in pairs and are fixed in the intended lashing eyes on the machine. Only one lashing may be secured to each lashing eye on the load carrier.
- It shall not be possible for the tie-down hooks to lose their grip if the lashings become slack.
- Dampers may be needed on lashings, especially for machines that are transported on rubber tyres, that are short and vertical to reduce the jerking and shocks to which the chains may be subjected.
- If lashings with differing breaking strength are used the instruction for lashing with the lowest breaking strength shall be used.

The following applies if blocks are used or the machine is blocked against the goose-neck:

- When using blocks, these must be well fastened, have an angle of approx. 37° (3:4:5), a height of at least 25 cm (10 in), and be located in pairs; 1, 2, 3, or 4 pairs according to tables with block placement.
- Placement of rubber tires/wood-covered rims against wheel slots corresponds to the use of blocks.
- Blocking of rear part of machine or of the wheel pairs in the travel direction up to at least half of the wheel radius against goose-neck or similar in the travel direction prevents forward movement.
- Blocking with sufficient height against the inside or outside of all wheels prevents sideways movements.

Load-securing instruction, machine loaded with its front end forward

Values and instructions in the following tables are only valid if the conditions described earlier in the section under the heading "Conditions for securing cargo" are fulfilled.



F = Travel direction
L_{CR} is the distance between points **D** and **E**.
D is the projected point straight sideways at right angles to the trailer edge from the tie-down point **C** on the machine.
E is the tie-down point on the trailer edge.
L_F, L_{CF} and L_R are the same as L_{CR}.

Friction surface: Rubber, pine, birch with rubber spacers (clean and dry or wet)					μ = 0.5			
	Lashings' permitted distance interval in metres (1 m = 39.4 in)							
Blocks or blocked against goose-neck [a]	Chain min. class 8 Ø10 mm MBL 12 ton, LC 60 kN (6 ton)				Chain min. class 8 Ø13 mm MBL 20 ton, LC 100 kN (10 ton)			
	L_F (crossed)	L_{CF}	L_{CR}	L_R (crossed)	L_F (crossed)	L_{CF}	L_{CR}	L_R (crossed)
No blocks	Not permissible lashing alternative				1,0–3,0	Not needed	0,8–1,8	1,5–3,0
1 pair	1,1–3,0	0,4–1,0	0,8–1,8	1,5–3,0	1,0–3,0		0,4–1,8	0,9–3,0
2 pairs	0,3–3,0	Not needed	0,8–1,8	1,5–3,0	0,3–3,0		0,4–1,8	0,9–3,0
3 pairs	0,3–3,0	Not needed	Not needed	0,9–3,0	0,3–3,0		Not needed	0,5–3,0
4 pairs								
Blocking forward	1,1–3,0	0,4–1,0	Not needed	0,3–3,0	1,0–3,0		Not needed	0,3–3,0
Blocking sideways	Not permissible lashing alternative				1,0–3,0		0,8–1,8	1,5–3,0
Blocking forward and sideways	1,1–3,0	0,4–1,0	Not needed	0,3–3,0	1,0–3,0		Not needed	0,3–3,0

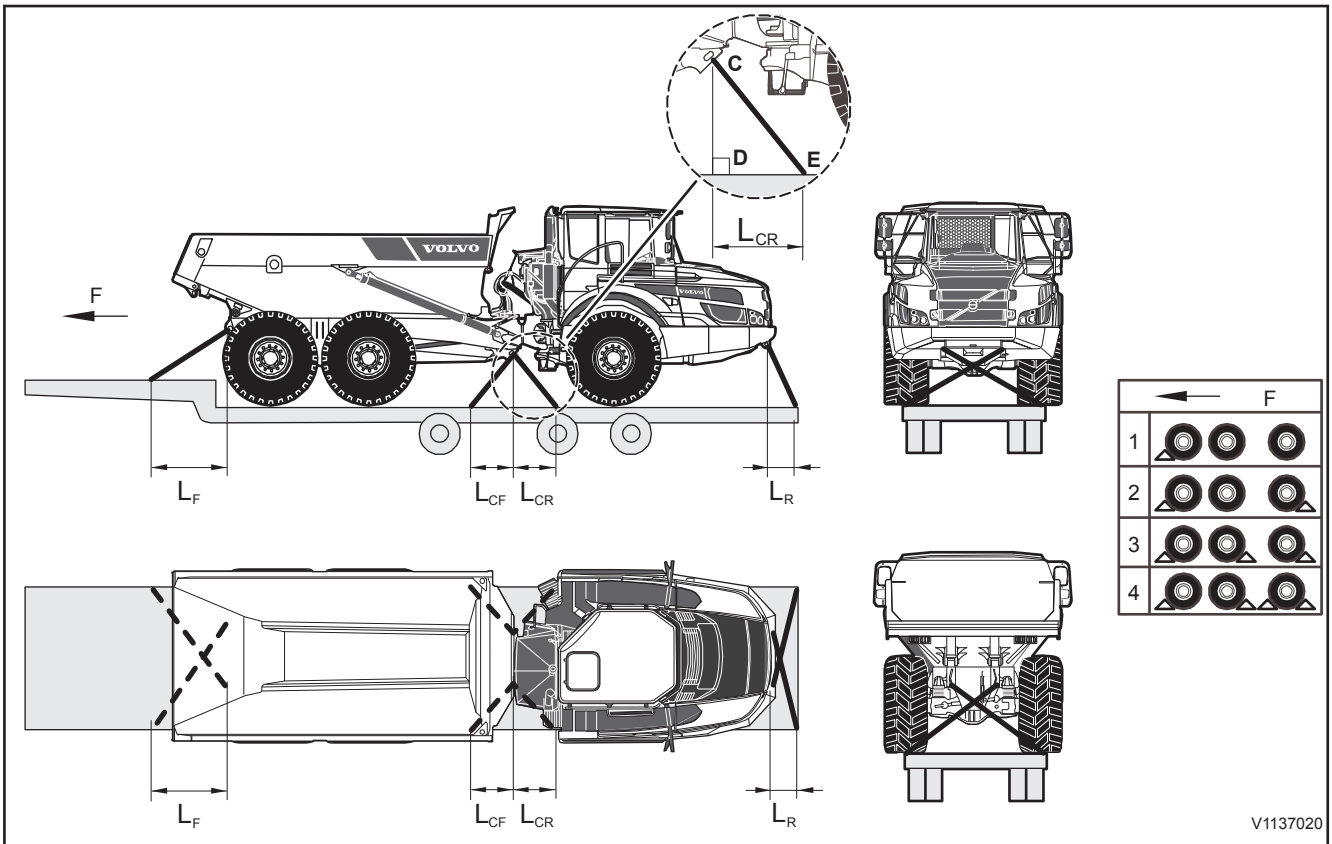
a)See also section "If blocks are used or machine is blocked against goose-neck the following also applies"

Friction surface: Frost, ice, snow, dirt, birch without rubber spacers					μ = 0.2			
	Lashings' permitted distance interval in metres (1 m = 39.4 in)							
Blocks or blocked against goose-neck [a]	Chain min. class 8 Ø10 mm MBL 12 ton, LC 60 kN (6 ton)				Chain min. class 8 Ø13 mm MBL 20 ton, LC 100 kN (10 ton)			
	L_F (crossed)	L_{CF}	L_{CR}	L_R (crossed)	L_F (crossed)	L_{CF}	L_{CR}	L_R (crossed)
No blocks	Not permitted lashing alternatives				1,2–3,0	0,2–1,0	0,9–1,8	1,9–3,0
1 pair					1,2–3,0	0,2–1,0	0,5–1,8	1,1–3,0
2 pairs	0,4–3,0	0,0–1,0	1,2–1,8	1,9–3,0	0,3–3,0	Not needed	0,5–1,8	1,1–3,0
3 pairs	0,4–3,0	0,0–1,0	0,3–1,8	0,9–3,0	0,3–3,0	Not needed	0,2–1,8	0,5–3,0
4 pairs	0,3–3,0	0,0–1,0	0,3–1,8	0,9–3,0				
Blocking forward	Not permitted lashing alternatives				1,2–3,0	0,2–1,0	Not needed	0,3–3,0
Blocking sideways					1,2–3,0	0,2–1,0	0,9–1,8	1,9–3,0
Blocking forward and sideways					1,2–3,0	0,2–1,0	Not needed	0,3–3,0

a)See also section "If blocks are used or machine is blocked against goose-neck the following also applies"

Load-securing instruction, machine loaded with its rear end forward

Values and instructions in the following tables are only valid if the conditions described earlier in the section under the heading "Conditions for securing cargo" are fulfilled.



F = Travel direction
L_{CR} is the distance between points **D** and **E**.
D is the projected point straight sideways at right angles to the trailer edge from the tie-down point **C** on the machine.
E is the tie-down point on the trailer edge.
L_F, L_{CF} and L_R are the same as L_{CR}.

Friction surface: Rubber, pine, birch with rubber spacers (clean and dry or wet)					μ = 0.5			
	Lashings' permitted distance interval in metres (1 m = 39.4 in)							
Blocks or blocked against goose-neck [a]	Chain min. class 8 Ø10 mm MBL 12 ton, LC 60 kN (6 ton)				Chain min. class 8 Ø13 mm MBL 20 ton, LC 100 kN (10 ton)			
	L_F (crossed)	L_{CF}	L_{CR}	L_R (crossed)	L_F (crossed)	L_{CF}	L_{CR}	L_R (crossed)
No blocks	Not permitted lashing alternatives				Not permissible lashing alternative			
1 pair					1,1–3,0	Not needed	0,2–1,0	1,2–3,0
2 pairs					0,3–3,0		0,2–1,0	1,2–3,0
3 pairs	0,3–3,0	Not needed	Not needed	0,8–3,0	0,3–3,0		Not needed	0,5–3,0
4 pairs								
Blocking forward	1,0–3,0	0,5–1,8	Not needed	0,3–3,0	1,1–3,0	Not needed	Not needed	0,3–3,0
Blocking sideways	Not permissible lashing alternative				Not permissible lashing alternative			
Blocking forward and sideways	1,0–3,0	0,5–1,8	Not needed	0,3–3,0	1,1–3,0	Not needed	Not needed	0,3–3,0

a)See also section "If blocks are used or machine is blocked against goose-neck the following also applies"

Friction surface: Frost, ice, snow, dirt, birch without rubber spacers					μ = 0.2			
	Lashings' permitted distance interval in metres (1 m = 39.4 in)							
Blocks or blocked against goose-neck [a]	Chain min. class 8 Ø10 mm MBL 12 ton, LC 60 kN (6 ton)				Chain min. class 8 Ø13 mm MBL 20 ton, LC 100 kN (10 ton)			
	L_F (crossed)	L_{CF}	L_{CR}	L_R (crossed)	L_F (crossed)	L_{CF}	L_{CR}	L_R (crossed)
No blocks	Not permitted lashing alternatives				Not permitted lashing alternative			
1 pair					1,0–3,0	0,3–1,8	0,4–1,0	1,2–3,0
2 pairs					0,3–3,0	Not needed	0,4–1,0	1,2–3,0
3 pairs	0,4–3,0	0,0–1,8	0,2–1,0	1,1–3,0	0,3–3,0		0,2–1,0	0,5–3,0
4 pairs	0,3–3,0							
Blocking forward	1,6–3,0	0,7–1,8	0,0–1,0	0,3–3,0	1,0–3,0	0,3–1,8	Not needed	0,3–3,0
Blocking sideways	Not permitted lashing alternative				Not permitted lashing alternative			
Blocking forward and sideways	1,6–3,0	0,7–1,8	0,0–1,0	0,3–3,0	1,0–3,0	0,3–1,8	Not needed	0,3–3,0

a)See also section "If blocks are used or machine is blocked against goose-neck the following also applies"

Lifting machine

DANGER

Risk of crushing.
A suspended machine could fall. A falling machine will cause fatal injury to persons below.
Never step under a suspended machine.

WARNING

Risk of crushing injury or death.
Unexpected machine movement could cause crushing injury.
Always use the proper lifting tools when you lift the complete machine.

Lifting tools

(Additional options)

Part number 16934018 and 16869171

NOTE!
Failure to follow instructions may result in disengagement of the tool and serious personal injuries.

Lifting tool and rim size

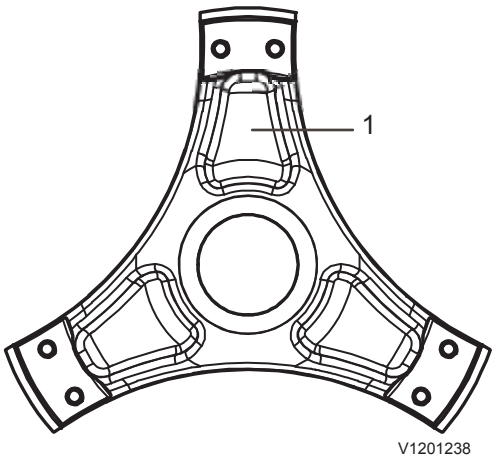
The lifting tools are optional equipment, only to be used when lifting the machine. They are intended for a machine weight of max. 48,000 kg (105,821 lbs).

The lifting tools are available in two versions, for different rim sizes.

NOTE!
Only used on original rims.

Rim size	Part number
25”	16934018
29”	16869171

NOTE!
The machine must be unloaded when lifting.



1 Part number location

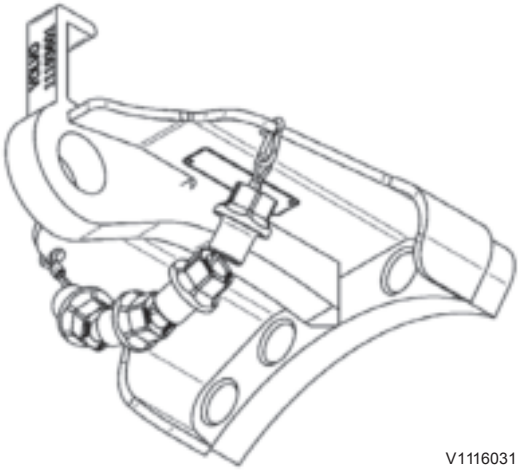
- It is important to use the correct lifting tools. Check with the table above and the marking on the tool.
  Contact an authorized dealer for the correct tools and method.
- It is important that the lifting tool is installed in a correct way.
- The lifting tool should only be installed on the machine for lifting and transporting. Remove the tool after use.
- The bolts and plates that belong to the lifting tool are easiest to store on the tool when they are not used.

Lifting tools

(Additional options)

Part number 11193598

The lifting tools are optional equipment to be used for lifting the machine. They are intended for a machine weight of max. 28,000 kg (61,730 lbs).



V1116031

Lifting tools with nuts

⚠ WARNING

Risk of crushing.
Falling load could cause serious injury.
Always fit the lifting tool with the special nuts supplied with the tool.

NOTE!
Failure to follow instructions may result in disengagement of the tool and serious personal injuries. After removing the tool, the ordinary wheel nuts must be reinstalled immediately.

- It is important that correct lifting tools and nuts are used. **Contact an authorized dealer for the correct tools and method.**
- It is important that the lifting tools are installed in the correct way.
- The lifting tools should only be installed on the machine for when lifting and transporting. Remove the tool after use. Reinstall the ordinary wheel nuts when the lifting tool has been removed.
- The nuts, which belong to the lifting tool, should preferably be stored on the tool, when they are not used.
- The ordinary wheel nuts should not be stored on the tool when the tool is installed on the machine.
- The lifting tool is marked with two decals that state which tool and nuts should be used in combination with a certain rim and tire. The part number is also stamped into the lifting tool itself.

Installing lifting tool

Part number 16934018 and 16869171

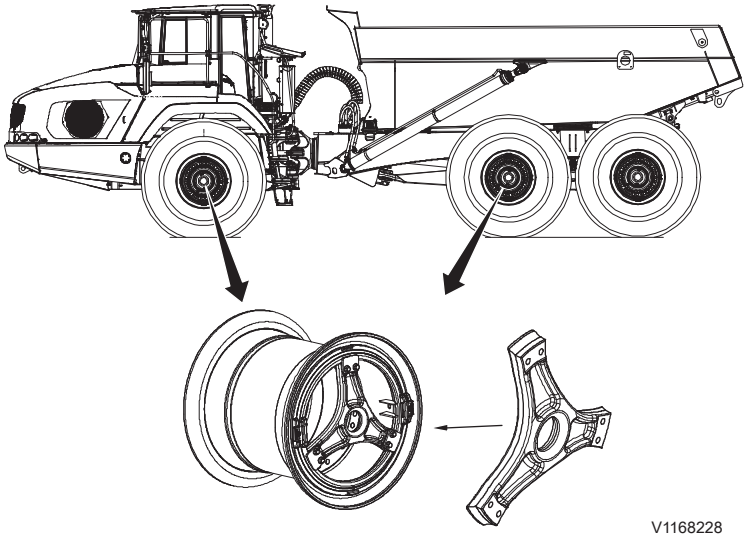
1 Stand the machine on level ground.

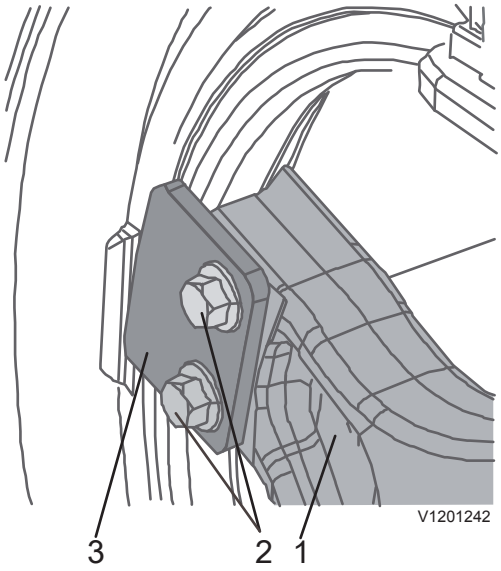
2 Lock the steering joint with the steering joint lock, see *279*.

3 The ignition must be Off, position (0).

4 Check that the tools are intact, in good repair, and undamaged, that there are no cracks, deformations, etc. **Damaged lifting tools must be disposed of.**

5 The lifting tools are installed on the front axle and front bogie axle.





1 Lifting tool
2 One of three metal plates for the lifting tool
3 M16 bolts for the lifting tool

6 Insert the lifting tool in the rim.
7 Pull back the tool against the inside of the rim.
8 Make sure that it has solid contact against the rim.
9 Bolt on the lifting tool's metal plates, that keep the tool in place.
10 Tighten the bolts (M16) crosswise to 207 Nm (153 lbf ft)

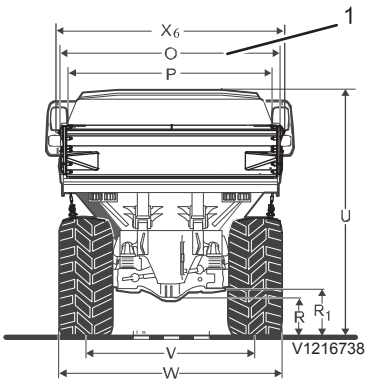
Installing lifting tool

Part number 11193598

1 Stand the machine on level ground.
2 Lock the steering joint with the steering joint lock, see page *279*.
3 The ignition must be in position 0.
4 Check that the tools are intact, in good repair, and undamaged, that there are no cracks, deformations, etc. **Damaged lifting tools must be discarded.**
5 Install the lifting tools on front axle and the front bogie axle and tighten the nuts crosswise to 200-350 Nm (148-258 lbf ft).
6 Make sure that the lifting tool's arm has solid contact against the inside of the rim's edge.

Actions when lifting the machine

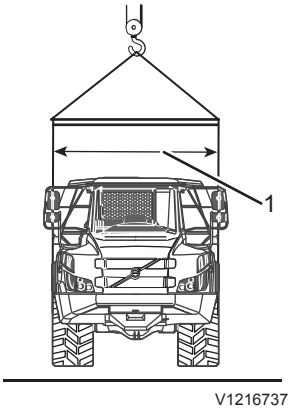
Part number 16934018 and 16869171



1 Baseline value for spreader. Value O

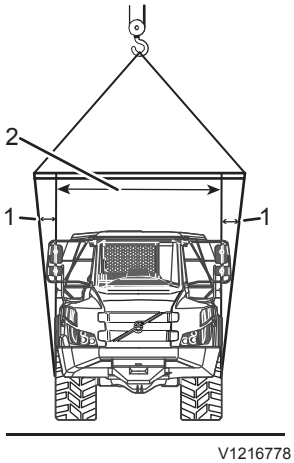
1 Stand the machine on level ground.

2 Lock the steering joint with the steering joint lock. See page *279*.



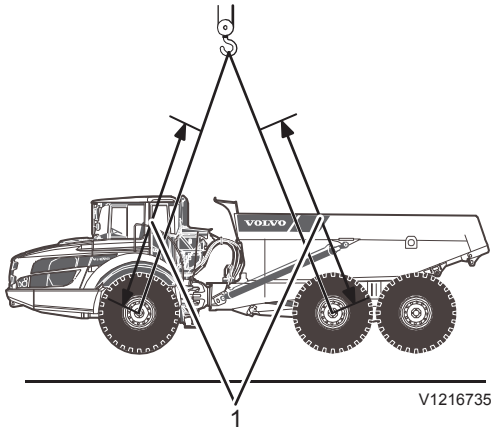
1 Spreader length

3 Apply the parking brake and turn the ignition to Off, position (0).



1 Max angle of 10 degrees
2 Baseline value for spreader. Value O

4 Choose a spreader length of at least O + the length when the lifting sling is free of the fenders and load body. For value O, see *430*. The maximum length of the spreader may not exeed an angle of 10 degrees on each side.



1 5.2 m (17.06 ft)

5 Connect four lifting slings to the lifting tools. All lifting slings should be the same length, at least 5.2 m (17.06 ft).

6 Lift the machine using the lifting tools' lifting eyes.

7 Lower the machine carefully.

8 Disconnect the steering joint lock before moving the machine.

9 Remove the lifting tools before the machine is used.

Actions when lifting the machine

Part number 11193598

1 Stand the machine on level ground.

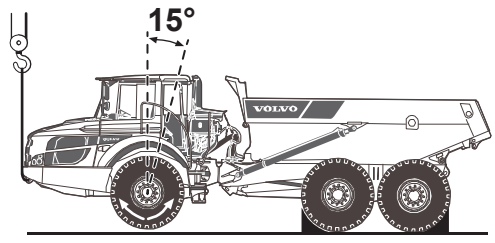
2 Lock the steering joint with the steering joint lock, see page *279*.

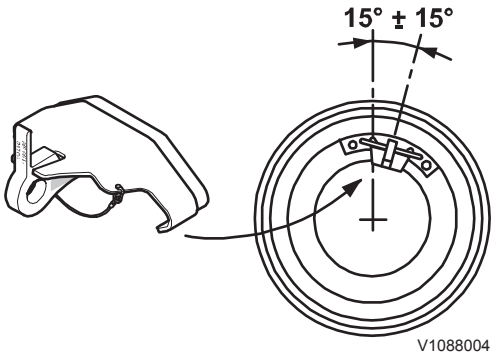
3 Block the rear wheels.

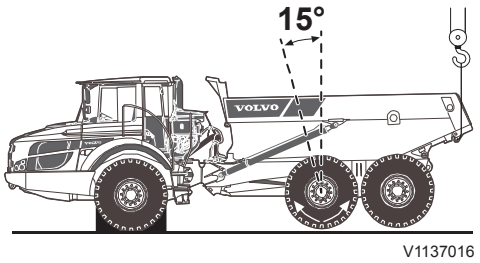
4 Start the engine. Wait until the accumulator pressure in both the trailer's and tractor's brake circuit is normal (gauges showing brake circuits' accumulator pressure, see page *45*). Then release the parking brake.

5 Lift the machine using the front lashing eyes of the frame.

6 Turn the front wheels so that the lifting tools are positioned as shown in the figure.

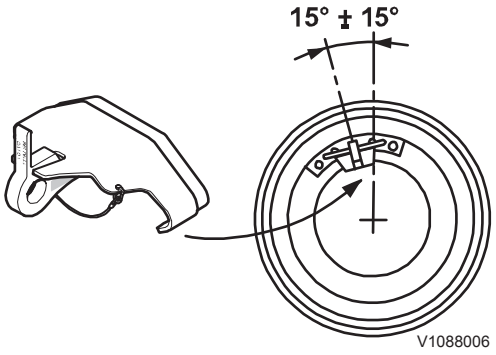






7 Block the front wheels.

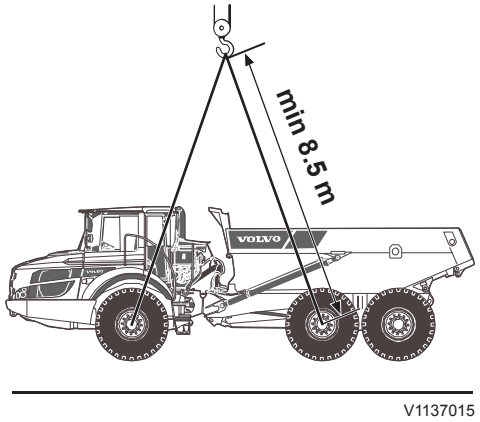
8 Place a lifting sling or strap under the load body's chute, and lift the machine until the bogie wheels can be turned.



9 Turn the front bogie wheels so that the lifting tools are positioned as shown in the figure.

10 Lower the machine.

11 Apply the parking brake and turn the ignition to position 0.



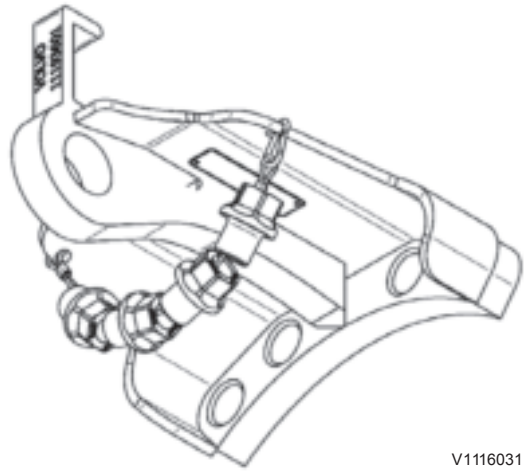
Lifting the machine

12 Connect four lifting slings to the lifting tools. All lifting slings should have the same length and be at least 8.5 m (27.9 ft).

13 Lift the machine using the lifting tools' lifting eyes.

14 Lower the machine carefully.

15 Disconnect the steering joint lock before moving the machine.



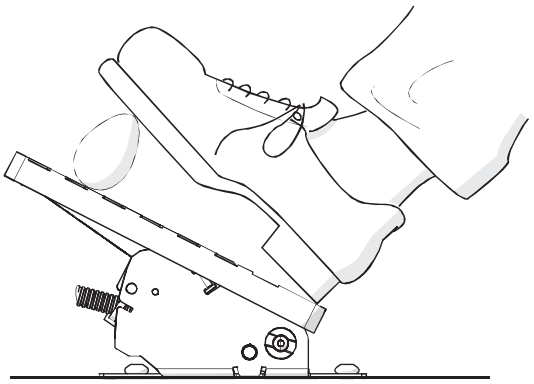
Storing wheel nuts on lifting tool

16 Remove the lifting tool before the machine is used. Store the special nuts on the lifting tool's wire. Reinstall the original nuts. Tightening torques, see *420*.

Operating techniques

The following pages contain advice and instructions on how to operate the machine and examples of how the most common attachments are used. It is important that the correct operating techniques are used to carry out the work in a safe and efficient way.

Eco driving

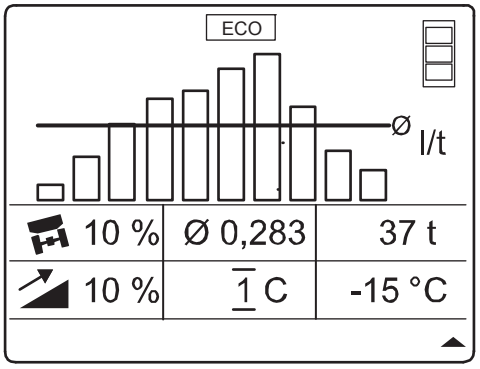

V1095509

Maintain lowest possible engine rpm in all operations in order to use the machine optimally and with minimal fuel consumption. The part of the fuel consumption that can be affected during operation is mostly related to the engine rpm.
Low engine rpm gives lower fuel consumption, lower noise level, and higher comfort.

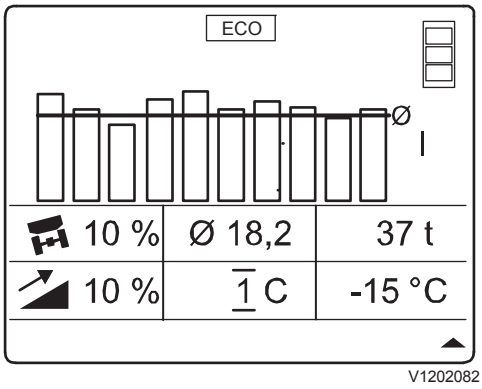
A fuel-saving way of operating also means less wear on the machine and less impact on the environment. Always strive to:

- **Plan the work site**
  Evaluate and plan your work area and its layout based on the machines that are going to work there, to make work more organized and effective.
- **Haul roads**
  Always strive for the shortest possible haul route. It gives both increased production and lower fuel consumption.
  Try to make sure that the haul roads are as smooth and even as possible, and without obstacles that result in unnecessary braking.
- **Plan machine operation**
  Plan machine operation and let up on the accelerator before you are going to stop and roll the last bit instead of braking away the kinetic energy. Do not use the engine brake function unnecessarily.
- **Cooperate**
  Cooperate and plan with other operators to enable as effective work as possible with the machines.
- **Stay within the economical rpm range**
  A high engine rpm rarely means higher productivity, but often higher fuel consumption.
- **Adapt machine operation to the application**
  Follow the recommendations for the different applications.
- **Service and maintenance**
  It is important to take care of the machines according to the service program.
- **Use correct tires**
  Use tires with the same rolling circumference to avoid stresses in the drivetrain.
  Use tires with adequate treads to avoid unnecessary wheel spinning.
- **Maintain correct inflation pressure in tires**
  On page *419* there are recommendations for air pressure in tires. Correct air pressure in the tires reduces fuel consumption and machine wear.
- **Use engine heater**
  use of an engine heater in cold weather (below 5 °C (41 °F), means lower impact on the environment, reduced fuel consumption, and less wear when starting.
- **No unnecessary idling**
  However, follow the recommendations for stopping the machine, see page *204* to ensure lubrication of the turbo.

Contact an authorized dealer for more information and for the possibility of participating in a Volvo course for the area.



Operating display 3 — litres per ton per work cycle



Operating display 4 — litres per work cycle

Econometer

Econometern shows the machine's fuel consumption per work cycle.

On machines with On-Board Weighing (optional equipment) the function also calculates fuel consumption per transported mass per work cycle.

The ten latest work cycles' fuel consumption is shown together with an average value on the information display.
- Fuel consumption per transported mass per work cycle is shown in operating display 3
- Fuel consumption per work cycle is shown in operating display 4

NOTE!
The first bar is shown after the second dumping after the cycle counter has been reset.

The information display shows one bar per work cycle.

New bars are added from the right, with the oldest work cycle at the far left.
When ten bars are shown the oldest one is removed and the earlier work cycles are moved one step to the left.

The average value is shown as a line over the bars. The positions for average value and the average value line are updated continuously as the work cycles are completed.

When the machine is turned off, current values are saved and displayed at next machine start.

For more information on operating display 3 and 4, as well as for reset of the work cycle, see page *53*.

Whole-body vibrations

Whole-body vibrations generated by construction machines are influenced by a number of factors, such as work methods, ground conditions, and travel speed, etc.

The operator can affect the actual vibration levels to a great extent, since it is the operator who controls the machine's speed, work method, haul route, etc.

Therefore, the result can be a range of different vibration levels for the same type of machine. For cab specifications, see *422*.

Guidelines for reducing vibration levels for construction machines

- Use the correct type and size of machine, with correct optional equipment and attachments for the application.
- Keep the ground and haul roads in good condition.
  - Remove any large rocks or obstacles.
  - Fill any ditches and holes.
  - Provide equipment and schedule time to maintain ground conditions.
- Adjust speed and haul route to minimize vibration levels.
  - Drive around obstacles and rough ground conditions.
  - Reduce the speed, if it is necessary to travel across uneven ground.
- Maintain machines according to the manufacturer's recommendations.
  - Tire pressure
  - Brake and steering systems.
  - Operating controls, hydraulic system, and link systems (linkages).
- Make sure that the operator's seat is maintained and correctly adjusted.
  - Adjust the seat and its suspension according to the operator's weight and length.
  - Check and maintain the operator seat's suspension and adjustment mechanisms.
  - Use the seatbelt and adjust it correctly.
- Minimize vibrations for long work cycles or when operating over long distances.
  - Transport the machine if it is a long distance between work sites.

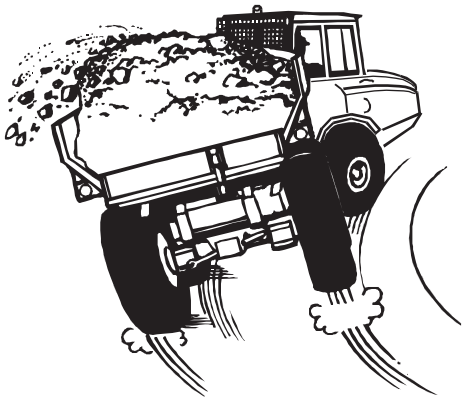
Backpain, suspected of originating from whole-body vibrations, may be caused by other risk factors.

The following guidelines can be effective in minimizing risks of backpain:

- Adjust the seat and operating controls so that good posture is obtained.
- Adjust the mirrors to minimize twisting of the body.

- Plan for and take breaks in order to avoid long periods of sitting still in one position.
- Do not jump down from the machine.
- Maintain your body weight and physical condition at a suitable level.

Transport operation



V1088013

WARNING

Risk of machine overturning.
High speed may cause fatal accidents with injury or death.
Always travel slowly

- **downhill**
- **in curves**
- **on uneven surfaces**
- **on slippery surfaces**

- For all operation on roads with moderate grades, select gear position D. Then the machine will shift gears automatically depending on the rimpull need.
- When operating downhill and if the machine is equipped with Downhill Speed Control, use the function for increased safety and comfort. See page *252*
- Use the machine's maximum speed with good judgement.
- Always adapt the speed to road conditions and the traffic situation in order to operate safely and comfortably.
- If the road conditions permit and the machine features such equipment, use the functions: Cruise Control, Downhill Speed Control, for increased safety and comfort. See pages *248* and *252*
- Pay attention to the trailer unit's movements while operating.
- There may not be any risk of the load falling off when transporting.
- In case all differential locks have been engaged with the foot control on the floor (see page *126*) or with the switch (see page *186*); do not forget to disengage these when operating on good roads (solid ground).
- Keep in mind that the machine may have an overall weight of up to 52 tons (57.3 sh tons). This requires longer braking distance, especially if the road is slippery or when operating at high speed.

Cruise Control

Cruise Control

For machines with the function Cruise Control

Cruise Control is a function for constant speed that uses the engine drive, engine brake, and wheel brake to maintain a desired and preselected speed. The function is intended to be used for comfort, and only in less challenging operating situations.

NOTE!
Do not use in wet and icy road conditions!

Speed range

The min. speed where Cruise Control can be used is 5 km/h. In general, the highest speed that can be set with Cruise Control is 50 km/h. The limit can be adjusted down using the service tool.

Cruise Control can only be used when operating forward.

Cruise Control, operation

NOTE!
Use only on sites with good road conditions!

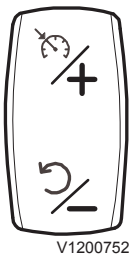
Cruise Control only used when driving forwards!

Functions

With Cruise Control it is possible to:
- Set fixed speed
- increase set speed
- decrease set speed
- re-engage set speed

Use

To use Cruise Control the following conditions must be met:
- The machine is operated Forward/gear selector in position D.
- The door is closed
- The seatbelt is used
- The load body is down
- The speed is above 5 km/h


V1200752

Setting speed

Press the upper part (+) of the switch to set the speed to the current speed.

Increasing set speed

The set speed can be increased in the following ways:
- Accelerate to desired speed using the accelerator pedal, press briefly on the upper part of the switch
- The selected speed can be adjusted in steps of 5 km/h with a quick click on the upper part of the switch
- The speed can be fine-tuned in steps of 1 km/h by holding down the upper part of the switch for one second

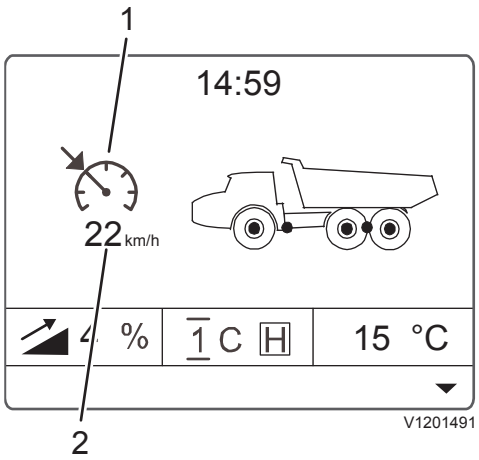
- If the button is held down for longer than 1 second, the speed is adjusted by 1 km/h for each second that the upper part of the switch is held down

Decreasing set speed

The set speed can be decreased in the following ways:
- Slow down to the desired speed using the brake pedal, press briefly on the upper part of the switch
- The selected speed can be adjusted in steps of 5 km/h with a quick click on the lower part of the switch
- The speed can be fine-tuned in steps of 1 km/h by holding down the lower part of the switch for one second
- If the button is held down for longer than 1 second the speed is adjusted by 1 km per second that the lower part of the switch is held down

Display of latest selected speed

The latest selected speed is shown on the information display unit under the symbol for Cruise Control.
If no speed has been selected or the function is inactive, the symbol is grey.



1 Symbol for Cruise Control
2 Latest selected speed

Temporary speed increase

Accelerate by pressing on the gas pedal. When the accelerator pedal is released and the speed has dropped below the set speed, the Cruise Control ensures that the set speed is maintained.

If the higher speed is maintained for more than 60 seconds, this disables Cruise Control.

Pressing the lower part of the switch will reactivate the speed that was set earlier.

Disabling Cruise Control

Cruise Control can be disabled as follows:
- By pressing the brake
- By pressing the retarder pedal
- Move the gear selector to another position than D
- The seatbelt is unbuckled
- The door is opened

Switching off Cruise Control

Cruise Control can be switched off as follows:
- Bring the vehicle to a complete halt
- Press the upper part of the switch (+)
- Once the speed is set to 0, the function is switched off and the Cruise Control symbol disappears.

Limitations

If engine power is not enough to maintain the selected speed due to, e.g., steep grade or high rolling resistance, the speed will drop. When the load is reduced, the actively set speed will be resumed in a controlled way.

Cover

In certain cases, the machine's systems can detect slippery roads. Cruise Control will be deactivated and a warning message is shown.
The operator must activate Cruise Control again.

Priority

If Cruise Control is active the function has priority over Downhill Speed Control and engine brake.

Operating up- or downhill

Operate the machine uphill

Normally the machine may be operated on uphill grades of up to 30%.
Factors such as available rimpull, braking capacity, and traction for the wheels have an impact on which grades the machine can be operated. Only in exceptional cases may the machine be operated on uphill grades of 30– 45%.

The machine features ATC (Automatic Traction Control), which minimizes slipping of the wheels.

The automatic transmission normally makes sure that correct rimpull is obtained on uphill grades.

Under certain conditions, the transmission may start "gear-hunting". This means that the transmission shifts up and down between two gears at short intervals.

Gear-hunting is caused by insufficient power for operating in the higher gear, but enough for upshifting from the lower gear.

It is possible to prevent gear-hunting in two ways:
1 Select the next lower gear
or
2 Activate the gearshift lock-out function with the switch on the control panel.

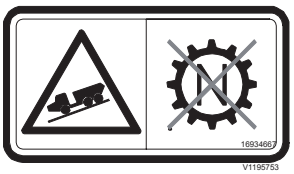
Operating across grades

Normally the machine may be operated on sideways slopes of up to 15% grade. Factors such as limited wheel traction and rough ground conditions on the haul route may result in the machine sliding or rolling over, even on less steep grades.

Operating downhill

WARNING

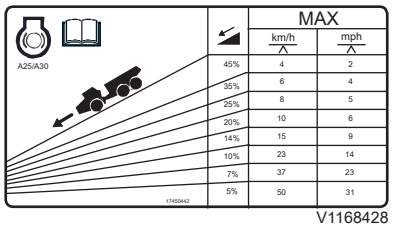
Risk of fatal accidents.
When operating downhill with a full load, the action of engine brake may provide insufficient braking. High travelling speed could result in accidents with serious injury or death.
Use the service brakes to reduce the speed.



WARNING

Risk of runaway machine.
Leaving the transmission in neutral when driving downhill could lead to loss of machine control and fatal accidents.
Always have a forward gear engaged when driving downhill.

Normally the machine may be operated on downhill grades of up to 30%.
Factors such as available rimpull, braking capacity, and traction for the wheels have an impact on which grades the machine can be operated. Only in exceptional cases may the machine be operated on downhill grades of 30–45%.
Never operate faster than the recommended speed on the retardation decal located on the windshield.



V1168428

Maximum permitted speed when operating downhill.

In order to avoid unnecessary transmission wear and stress, follow the operating instructions below:

- Reduce speed before the downhill.
- Select the same gear for operating downhill as you would for operating up the same hill.
- Activate the engine brake.
- Use the retarder pedal when operating on long downhill grades to obtain more even machine speed, see page *191*.

NOTE!
Do not let the engine rev higher than 2,300 rpm (38 r/s) when operating downhill.

When there is a risk of overspeeding of the engine, the operator is warned by the information display unit and the engine is protected by various automatic actions, such as:

- Upshifting to higher gear.
- Lock-up is disengaged.
- The machine is braked with the service brakes.

Downhill Speed Control

If the machine has the function Downhill Speed Control it increases both safety and comfort. See page *252*.

Downhill Speed Control

For machines with the function Downhill Speed Control

Downhill Speed Control is a function that prevents speed increase when operating downhill. The engine brake and wheel brake work to prevent speed increase.
The function is intended to be used both on long downhill runs and in rugged downhill operation. The main purpose of Downhill Speed Control is safety and comfort. The function works when operating both forward and in reverse.

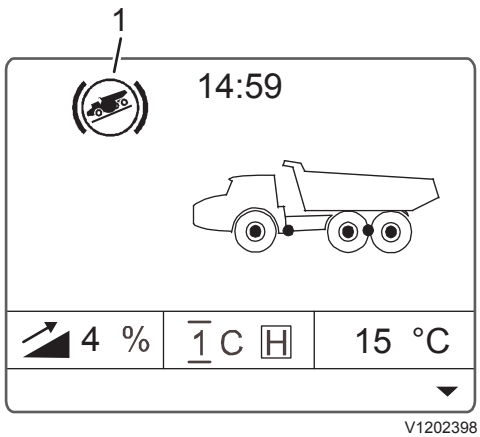
NOTE!
Do not use Downhill Speed Control in wet and icy road conditions!

Speed range

The lowest speed that can be set with Downhill Speed Control is 3 km/h.

Activation of Downhill Speed Control and Setting of speed

Pressing the lower part of the rocker-switch enables selection of Downhill Speed Control . See page *126*. When the gas pedal or brake pedal is let up and the machine accelerates without any drive torque, then Downhill Speed Control becomes active and maintains the speed that the machine had when the pedals were let up.



V1202398

1 Symbol for Downhill Speed Control

Increasing set speed

If higher speed is wanted, accelerate with the gas pedal to the desired speed, then let up the pedal.

Decreasing set speed

If lower speed is wanted, brake with the brake pedal or retarder pedal to the desired speed, then let up the pedal.

Deactivation of Downhill Speed Control

Downhill Speed Control is deactivated by pressing again on the lower part of the switch. Hold in the button for one second, see page *126*

The function can be active when operating on level ground or on an uphill grade, since then the function is passive and does not affect the speed.

Downhill Speed Control priority

If Cruise Control is active, the function is prioritised above the Downhill Speed Control and engine brake.

Hill assist

NOTE!
Hill assist-function (help when starting on a grade) is an assisting function and requires the operator's full attention when used. Hill assist does not relieve operators of the responsibility of operating the machine in a safe way. The operator may not leave the operator's seat with Hill assist applied.

At activation of Hill assist the wheel brakes are activated and enable the machine to stand still on an uphill grade, and then to continue or change travel direction.

To activate Hill assist the machine must be at a standstill and the grade of the hill has to exceed 10%. Hill assist can be activated regardless of if the machine is operated forward or is reversing up a grade.

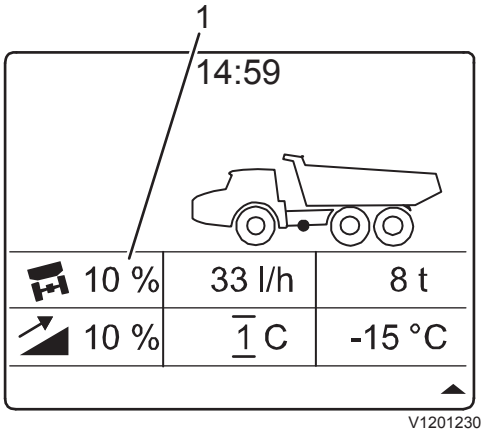
NOTE!
In case of malfunction of the Hill assist-function, stop the machine immediately and contact a qualified workshop.

Using Hill assist

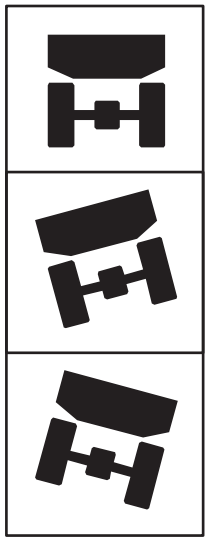
1 Release the accelerator pedal.
2 Brake the machine to a complete standstill.
3 Let up the brake.

The machine remains stationary until the gear selector is moved to neutral position or the accelerator pedal is pressed.

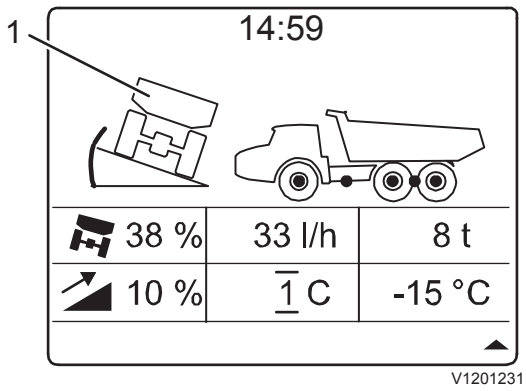
NOTE!
When changing travel direction, press the brake pedal before the gear selector is moved to neutral. Otherwise the machine may start to roll.



1 Angle indicator (inclination), sideways



Symbols for angle (inclination)



1 Symbol for angle (inclination)

Dump support

Dump support shows the load unit's sideways angle (inclination) and is a help when dumping, for example.

The value for sideways angle (inclination) (%) is shown in operating display 2.
The direction of the inclination is shown by three different symbols for inclination. The symbol changes depending on the machine's sideways angle in relation to the preset alarm value.

For more information the load unit's sideways angle (inclination), see page *53*.

The machine generates an alarm when the load unit's angle reaches a preset value and the body is up. Raising of the load body can be prevented in connection with this if preset.

The preset alarm level is 4% but should be adapted to existing conditions.
For setting the alarm value, contact a qualified workshop.

Animation of Dump support

The load unit's sideways angle is shown as an animation on the information display when the angle exceeds 33% of the alarm value, the body is up, or reverse gear is selected.

Raising
- 34–67% of alarm value, white symbol
- 68–100% of alarm value, yellow symbol

Lowering
- 30–63% of alarm value, white symbol
- 64–100% of alarm value, yellow symbol

The load unit's angle can be calibrated with the authorized service tool.

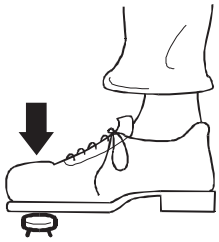
Off-road operating

Different types of ground conditions require different operating techniques. Check the ground conditions before operating in order to avoid getting the machine stuck.



V1088022

- Always use the longitudinal differential lock and 6-wheel drive when there is a risk of slipping, see page *186*.
- Always engage the transverse differential locks before any of the wheels begin to spin.
- In tough ground conditions where there is a risk of getting stuck, use the steering in combination with the transverse differential lock (foot control) in order to "renew" traction for the wheels, so-called DUCK WALK.

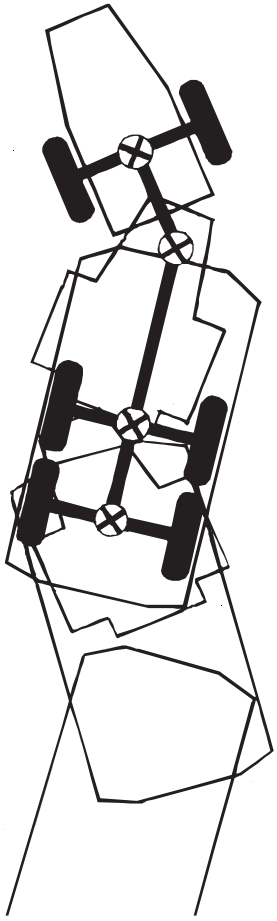


V1087780

Foot control, differential locks and 6-wheel drive

- Get permission from the management before operating outside the haul route.
- When operating in soft ground conditions and space allows, choose a new track for each run. This way you avoid making as well as running in deep ruts.

NOTE!
Avoid operating across steep slopes and over sharp stones and tree stumps.



V1087979

Duck walk

Working within dangerous areas

- Do not operate too close to the edge of a quay, dock, ramp, etc.
- Operate slowly where space is tight and check that there is enough room for the machine and load.
- When working under ground special equipment is required, e.g., certified engine, within the EU and in EEA countries. Contact your dealer.
- Use the machine's lights when working in poor light conditions, e.g., indoors and in tunnels.
- Do not work with or operate the machine when visibility is very poor, e.g., in thick fog, heavy snow, or heavy rain.
- The machine must be specially equipped when working in a contaminated environment or health-hazardous area. Contact your dealer. Also check the local regulations before entering the area with the machine.

Electrical magnetic field (EMF)



Working in areas exposed to electromagnetic fields, EMF

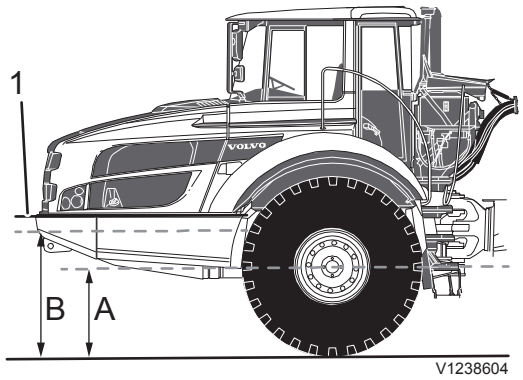
- The employer is obliged to know if there are areas where there are powerful electromagnetic fields and to inform the machine operator about these.
- The operator should seek information if the work site may be exposed to powerful electromagnetic fields.

Underground cables and pipes

Make sure that authorities or companies responsible for cables and pipes have been contacted and that their instructions are followed. Also check which rules apply to ground personnel regarding exposing cables and pipes. Normally only the service companies' own personnel may expose and arrange provisional suspension of cables.

Working on slopes

- Be careful when opening the door since it may swing open due to its dead weight. When you close it, make sure that it is completely closed.
- When reversing down a grade, keep in mind the center of gravity and use the same technique as in *251*, *251*, *251*.
- Operate slowly when approaching or running on a downhill grade.
- Do not change travel direction when operating on a grade, and do not operate across a grade.



1 Overrider/frame member top edge

A Maximum depth, continuous driving
B Maximum depth, non-continuous driving

Working in water and on boggy ground

Operate the machine carefully when crossing a stream or body of water if the water is cloudy or dark. There may be hidden underwater obstacles or dangerous deep holes in the bottom. Do not operate the machine in water if you are not sure that it is safe to do so.

- The machine can be continuously driven or parked in water that reaches the centre of the wheel hub. Distance A in the image.
- For shorter wading periods, the machine can handle deeper water that reaches 10 cm (4 in) below the top edge of the overrider/frame member on the tractor. Distance B in the image

  NOTE!
  Remember to keep the speed low to prevent swell waves or flowing water from entering the engine compartment and exceeding the permitted level.
- After working in water, all grease points that have been under water must be greased so that the water is forced out.
- When working in water/clay, dirt and clay can accumulate in the belly plates and increase their weight significantly. Open the belly plates and clean after working in water/clay, see page *274*, *318*.
- Water may collect in the fender when working in water and swampy areas. Drain the space in the right fender as needed, see page *369*.
- Large logs laid next to each other can be used to support the machine when operating in swampy ground conditions. The log matting should be kept as smooth and clean as possible.

Working in cold weather

WARNING

Risk of crushing injury.
The hydraulic system could respond slowly at low temperatures and could cause unexpected machine movements.
Operate carefully until the hydraulic system has reached operating temperature.

Read the advice for start, see page *182*.

The windows should be free from ice and snow before starting to use the machine.

- Watch out for slippery parts on the machine. Only step on slip-protected areas.
- Use an ice scraper to remove ice from the windows. If needed, use a scraper with a long handle or a ladder.

⚠ WARNING

Risk of frostbite.
Bare skin can freeze stuck to cold metal which could cause injury.
Use personal protective equipment when handling cold objects.

NOTICE

Risk of damage.
Moving the machine with the block heater cable connected could damage the connections and the cable.
Make sure the block heater is disconnected before moving the machine.

Working in environmentally contaminated areas

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

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

Asbestos filter

(Optional equipment)

⚠ WARNING

Risk of hazardous inhalation.
Working in environments containing dangerous dust can lead to serious health problems.
Wear personal protective equipment when working in dusty environments.

NOTE!
Special actions must be taken to prevent the spread of dust. Contact an authorized dealer for more information.

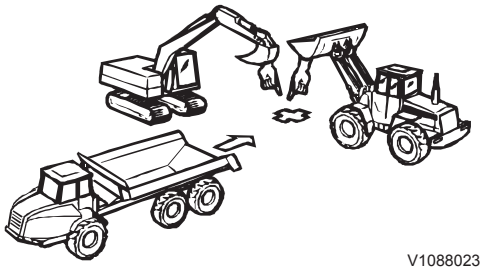
The asbestos filter is a main filter specially intended for use in conditions where there may be asbestos dust. Of course, the filter is effective against all other kinds of dust when the operator needs highly filtered air in the cab. The filter meets the requirements according to EN 1822:1 filter class H13. Pay attention to the national regulations for work in the relevant conditions.

Advice for operating in conditions where dust/asbestos dust is present

- Enter and leave the machine away from the asbestos-contaminated area to avoid asbestos dust being brought into the cab.
- Keep clothes and shoes as clean from dust as possible.
- Clean and vacuum the cab often and use personal protective equipment, for example, a dust mask intended for asbestos-contaminated areas.
- The cab door must be closed. It is particularly important that the tightness (the seals) of the cab is (are) preserved/maintained.

- The cab should be ventilated through its ventilation system, which also provides overpressure in the cab.

Loading



V1088023

1 Place the hauler in the indicated place. Make use of the advantages of the articulated steering and place the machine at the best angle for loading. Use the rear-view mirrors and maintain eye contact with the loader operator while reversing.

2 Apply the load and dump brake, see page *126*.

3 Always make sure that the load body is down when loading. If this is not the case, the whole load will rest on the hoist cylinders instead of on the frame.

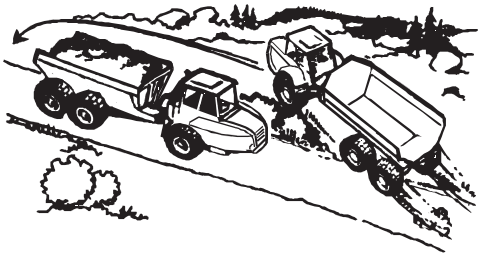
4 Make sure that no unprotected personnel is in the machine's risk zone. See *175*

5 During loading, the operator should be in the cab or outside the risk zone.

NOTE!
Remember that it is you as the operator, who is responsible for the size and weight of the load, see *175*.

Before moving off, make sure that no part of the load, e.g., stumps or stones, can fall off and cause injury or damage. Protruding objects must be removed.

Operating



V1087024

Volvo haulers have very good off-road characteristics that often can be used to shorten haul distances and to reduce haul times.

You must follow indicated haul roads. If you consider that it is possible to take cross-country shortcuts, or go off-road to facilitate meeting on-coming traffic, you must always obtain the management's permission to do so.

The condition of the haul road has a major impact on the hauler's capacity. If the haul road is long and poorly maintained, try to influence the management to maintain the road to a better standard, so that you can keep a higher speed, which means a higher capacity.

Body height extension for light material

(Optional equipment)

Machines equipped with body extensions for light material may only be used for light material. The stability of the machine may be jeopardized if other heavier material is loaded in the load body. Reduce speed when hauling since the centre of gravity is located higher than on machines without body extensions.
Decal for maximum load is located on a window in the cab.

Tailgate

(optional equipment)

WARNING

Risk of crushing.
Heavy material sticking to the tailgate could cause tipping of the tractor unit and could lead to accidents resulting in serious crushing injury.
Always remove the tailgate before transporting heavy sticky material.

Machines equipped with overhung tailgate or overhung tailgate in combination with underhung tailgate may only transport materials that can pass out through the tailgate when dumping. There is a risk that, e.g., stones can jam between the body and tailgate when dumping.

Onboard weighing (OBW)

Load weighing

(Optional equipment)

If the machine is equipped with on-board weighing, the operator receives continuous information about the load's weight on the information display unit during loading, operating, and unloading. The load's weight is indicated in tons or short tons.

NOTE!
The accuracy of the load weight increases with the length of the covered distance.

Proportion of the total load that is in the body is shown using load indicator lights and the animation. See also On-Board weighing (OBW) in section Information display unit on page *53*.

In the information display unit there is also information on total load since last reset, see under Cycle information in section Information on page *62*.

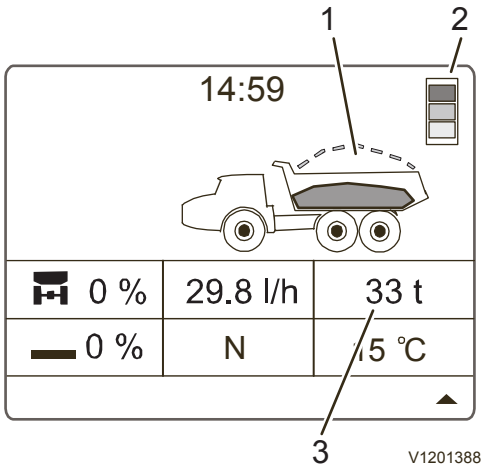
The operator of the loading machine receives information about the load's weight from the external load indicator lights.

Amber, red, or green load indicator light turns on in the information display unit and also externally depending on the load's weight.

- Amber light turns on when the machine is partially loaded (75-95% of max. load weight)
- Green light turns on when the machine is loaded with max. load weight (95-110% of max. load weight)
- Red light turns on in case of overloaded machine (more than 110% of max. load weight)

No light is on if the load is less than 75% of max. load weight.

The light turns off when the machine starts to roll. The machine can be adapted so that the light remains on when operating, contact a qualified workshop.



Information display unit
1 Animation
2 Load indicator lights
3 Load weight

Load cycle

A load cycle consists of a loaded phase and an unloaded phase. A new load cycle starts and the previous load cycle ends when the machine changes from loaded phase to unloaded phase.
For a load cycle and load weight to be registered, the machine must first be loaded so that the load weight has increased by trigger weight 1, and later unloaded so that the load weight has decreased by trigger weight 2.

Trigger weight 1 and 2:
- **A25** = 8 tonnes (8.96 short tonnes)
- **A30** = 10 tonnes (11.2 short tonnes)

To change the trigger weight, contact a qualified workshop.

Alarm in case of overloaded machine



V1136476

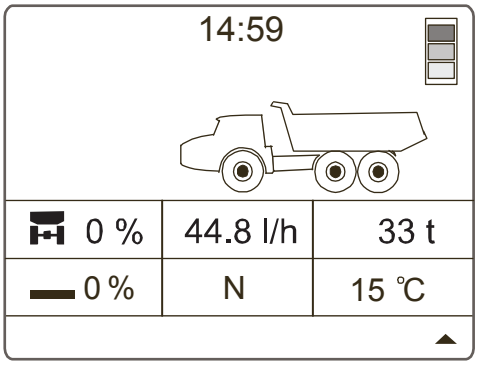
Amber alarm figure: Machine overloaded

The following reactions to overload appear depending on which setting has been selected with the authorized service tool:

- No alarm or speed limitation in case of overload.
- Amber alarm figure on the information panel (factory setting).
- Amber alarm figure on information display and speed limitation 8 km/h.

To change the alternative for your machine, contact a qualified workshop.

Incorrect display of load weight



V1201387

Conditions for load weighing are not fulfilled

In order for load weighing to be as accurate as possible, the trailer should be placed on level ground when loading and the load should be evenly distributed in the load body. Under such conditions the weighing system can attain an accuracy of ±5% for a load cycle and ±2% for a day's load cycles.

If all load indicator lights are on, this may be due to:

- The machine's trailer is standing on uneven ground. Try moving the machine.
- The load is distributed unevenly. The display will work better when the load gets bigger and heavier, and is distributed more evenly.

The operator can run a load calibration if the machine or ground surface on which the machine is operated changes, and the load weight on the information display unit no longer matches the load's weight, see page *371*.

Unloading

Dumping of load

WARNING

Risk of overturning.
Sloping ground may result in overturning. This may cause serious injury or death.
Before unloading check the ground's condition.

The dumping method depends on the condition of the dump site.

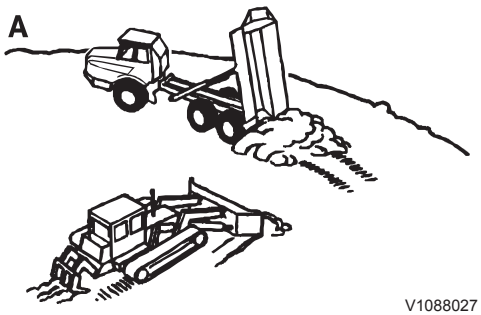
When dumping over an edge, do not reverse further out than the rear axle is still on firm ground. Check the firmness of the edge.

The following applies to all dumping:

- Before you run up the load body, make sure that no persons are close to the machine.
- Do not run up the load body while reversing if the ground is uneven.
- If the machine is placed across a steep grade, move the machine before dumping the load. Use Dump supportfunction to ensure that the machine stands straight, see page *253*.
- Place the machine so that it is straight. Apply the load and dump brake, see page *126*. Move the dump lever backwards to the dump position and increase engine speed.
- Reduce the engine speed just before the load body reaches its top position.
- Move the hauler forward a few metres, before you lower the load body. Move the dump lever to float position.

Never operate further than necessary with the load body up.
Never make steering movements with the machine if the entire load is stuck and the load body is up.

A

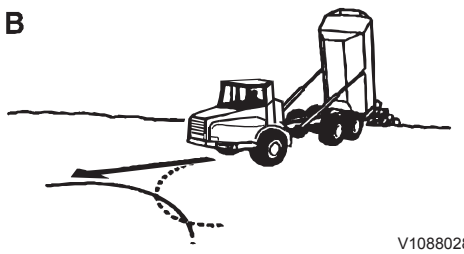


V1088027

Method A: This is the quickest way to unload where the site is large and the load is to be bulldozed over an edge.

Method B: Reverse out as close as possible to the edge so that most of the load falls over the edge. The saving is that one avoids having a dozer on the dump site.

B



V1088028

NOTE!
Do not reverse out more than you are sure that the rear axle is still on solid ground. Check the firmness of the edge.

Always use the rear-view mirrors when reversing. Do not stop until the wheels on the rear axle reach the dump edge. Avoid operating in the same tracks to reduce the risk of getting stuck. Save some of the load and dump it on the edge.

C



V1088029

Method C: When dumping in a stockpile Reverse to the pile and dump. Roll ahead slightly during the final phase of dumping.

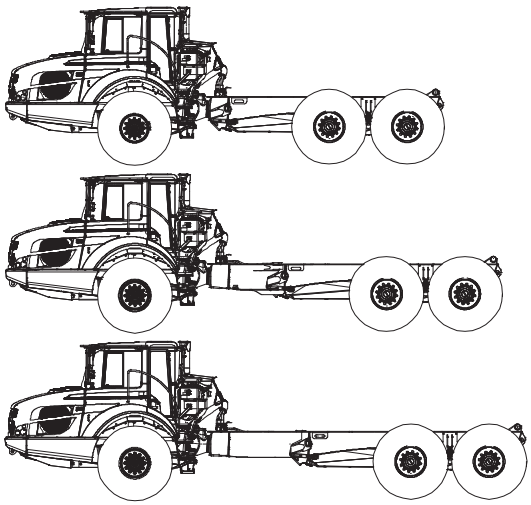
D



V1088030

Method D: If a road embankment or a slightly elevated surface is to be built up, make use of the machine's off-road capacity on the dump site.

Hauler chassis



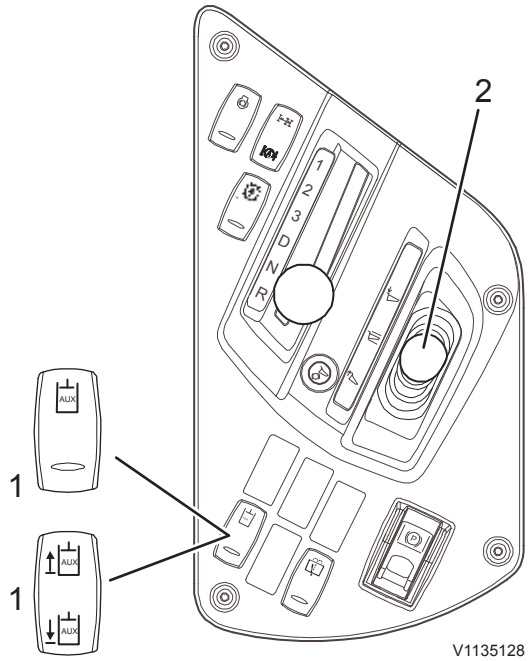
Hauler chassis, versions
1 HC42
2 HC54 (1,200 mm frame extension)
3 HC59 (1,700 mm frame extension)

In general, the operating instructions in this Operator's Manual also apply to Hauler chassis. However, instructions related to the load body may not be applicable, depending on if the hauler version is equipped with a dump body or not. Information about the retrofit (superstructure) is found in the manual provided by the body builder.

Always keep these documents in the cab and replace them if they are lost or become illegible.

Dimensions for the different versions are found on page *434*.

The retrofit shall be installed according to Volvo Construction Equipment's "Body builder instruction", see www.volvoce.com/dealers.



Control panel

1 Switch for extra hydraulics (two versions)

2 Dump lever

Hauler chassis, activating auxiliary hydraulics

Extra hydraulics are activated and deactivated with the switch for extra hydraulics or the dump lever on the control panel, see under heading **8.4 Extra hydraulics (optional equipment)** and **8.8 Dump lever** in section **Controls** starting on page *126*.

For Hauler chassis-machines, for which the extra hydraulics are activated with the switch, the dump lever on the control panel is not enabled (not connected) and thus it has no function.

NOTE!
Check the function of switches and controls in the Operator's Manual for the retrofit.

Signalling diagram

If the operator's visibility is restricted, e.g., due to a big load, use a signal man.

The faster lifting, lowering, or movement that is required, the livelier the signal man's movements should be. If two or several operators use the same signal man, determine ahead of time how the lift is to be done and how signals shall be given to each operator.



START
Arms extended horizontally with palms facing forward



STOP
Right arm pointing up with palm facing forward



END
Hands held together at chest height



RAISE
Right arm pointing up with palm facing forward and hand moving slowly in a circle



LOWER
Right arm pointing down with palm facing forward and hand moving slowly in a circle



VERTICAL DISTANCE
Hands indicate relevant distance



MOVE FORWARD
Both arms bent with palms facing up and underarms moving slowly and repeatedly up towards the body



MOVE BACK
Both arms bent with palms facing down and underarms moving slowly and repeatedly down away from the body



DANGER (EMERGENCY STOP)
Both arms up with palms facing forward



OPERATE IN INDICATED DIRECTION
Arm extended horizontally with palm facing down and small movements back and forth slowly to the right



OPERATE IN INDICATED DIRECTION
Arm extended horizontally with palm facing down and small movements back and forth slowly to the left



HORIZONTAL DISTANCE
Hands indicate relevant distance



Safety when servicing

This section deals with the safety rules that must be followed when performing checks and service work. Volvo Construction Equipment rejects all responsibility if other tools, lifting devices, or work methods than those described in this publication are used.

Other safety rules, information and warning texts are given in each section.

NOTE!
Lifting with a jack must only be performed by trained personnel.

DANGER

Risk of electrical shock.
Contact with electrically energised parts will cause personal injury.
Disconnect the electrical engine heater before service and repair work on the machine.

WARNING

Risk of burns!
Hot machine parts could cause burns.
Allow hot machine parts to cool before performing adjustments or service. Wear personal protective equipment.

WARNING

Risk of high pressure injection.
Residual pressure in the brake system could lead to oil under high pressure jetting out and cause serious injury, even if the engine has not been running for some time.
Always release the pressure before any kind of service of the brake system is carried out.

NOTICE

It is very important to keep the hydraulic system free from any contaminants, as these can cause abnormal wear and may lead to expensive downtime. Greatest possible cleanliness should be maintained during all handling of hydraulic components and hydraulic oil.

Service position

Service position

Service position

WARNING

Risk of burns!
Hot machine parts could cause burns.
Allow hot machine parts to cool before performing adjustments or service. Wear personal protective equipment.

WARNING

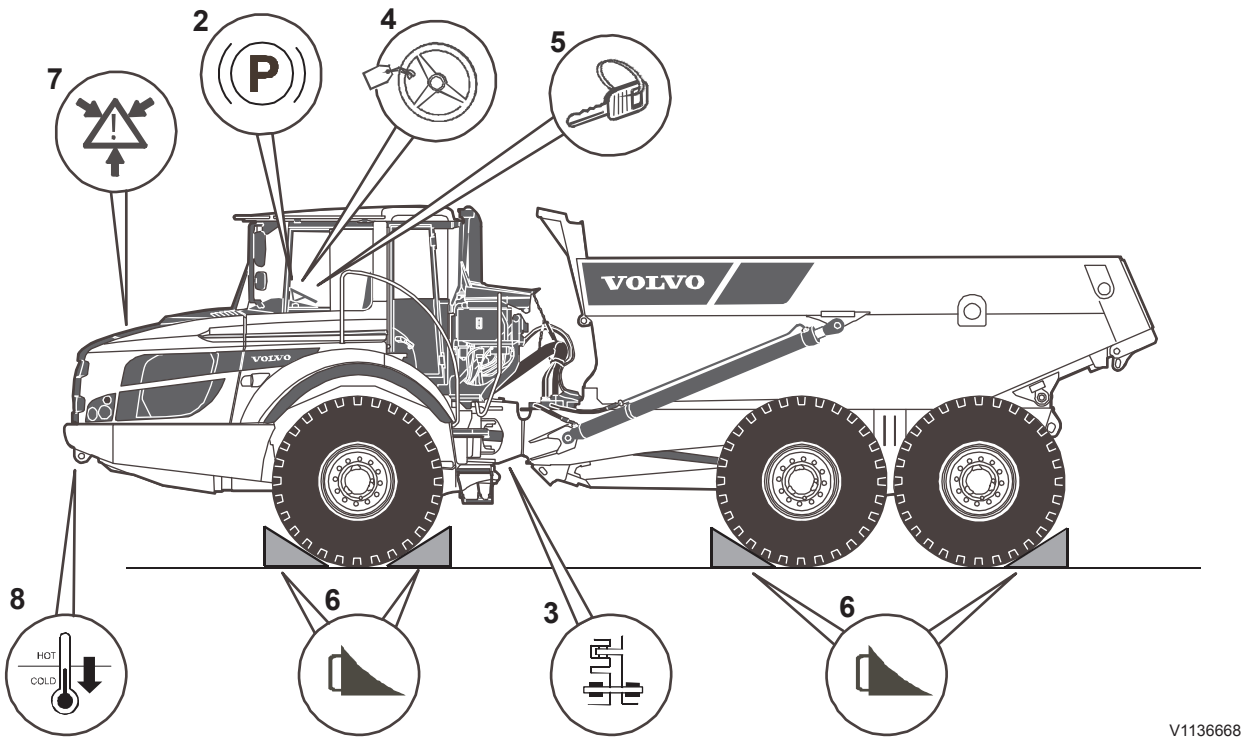
Risk of crushing.
The machine could turn and cause crushing injury.
Engage the steering lock before servicing or transporting the machine.

WARNING

Risk of crushing.
An unlocked raised dump body could fall down. Personnel standing under a falling dump body could be seriously injured, including death.
Always lock the dump body before entering under it.

NOTE!
In Lubrication and service chart on page *304* describes what service is to be done by a qualified service technician and what maintenance can be done by the operator.

Before starting any service or maintenance work, the machine should be prepared for service as follows.



1 Park the machine on solid and level ground.

2 Apply the parking brake.

3 Lock the steering joint with the steering joint lock, see page *279*. Lower the load body on the frame. If service is to be performed with the load body up, secure with the load body lock, see page *279*.

4 Fasten a warning tag or a red flag on the steering wheel during any service, with information that service work is in progress.

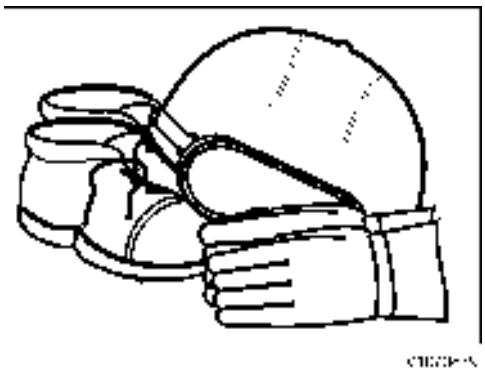
5 Stop the engine and remove the start key.

6 Block the wheels in a suitable way, for example, with wedges.

7 Depressurize (release pressure) all pressurized lines and pressure tanks, see page *279*.

8 Let the machine cool down.

Before service, read



Prevent personal injuries

- Read the instructions in the operator’s manual before starting any work on the machine. It is also important to read and follow the information and instructions given on plates and decals.
- Do not wear loose-fitting clothing or jewellery that may get caught and cause injuries.
- Always use a hard hat, safety glasses, breathing protection, work gloves, and protective footwear when required by the job.
- Make sure that ventilation is adequate if the engine is going to be started indoors.
- Do not stand in front of or behind the machine while the engine is running.
- Turn off the engine before you remove any protective covers or open the engine hood.
- There remains an accumulated pressure in the system, even when the engine has been turned off. If a system is opened without first being depressurized, high-pressure fluid may jet out.
- Use a piece of paper or cardboard when checking for leaks, never use your hand.
- Make sure that stepping surfaces, handholds and slip protected surfaces are free from oil, diesel fuel, dirt and ice.
- Only step on machine parts that are provided with slip-protection.
- When working with the safety belt, only use the anchoring eyes provided, for more information see page *278*.
- It is important that correct tools and equipment are used. Faulty tools or defective equipment must be repaired or replaced.
- If service work has to be performed with the load body up, make sure that it is secured before starting any work. Apply the parking brake and secure the load body with the load body lock.

Prevent machine damage

- Use equipment with adequate lifting capacity when lifting or supporting the machine or parts of the machine.
- Volvo Construction Equipment will not accept any responsibility if lifting devices, tools, work methods, lubricants, and parts other than those described in this operator’s manual are used.
- Make sure that no tools or other objects that can cause damage have been forgotten in or on the machine.
- Release the pressure in the hydraulic system before starting the service work.
- Never adjust a relief valve to a higher pressure than that recommended by the manufacturer.
- Machines used in contaminated conditions or health-hazardous areas must be equipped for such operations. Also, special safety rules apply when servicing such machines.
- When installing a two-way radio, mobile telephone, or similar equipment, the installation must be performed according to the manufacturer's instructions in order to eliminate interference with the electronic system and components intended for the machine's function, see page *27*.
- Actions to be taken in connection with electric welding, see page *282*.
- Make sure that all belly plates, guards, covers, and hoods on the machine are in place before starting the engine and using the machine.

- Use the three-point method (two feet and one hand) when cleaning or scraping the windshield.

Prevent environmental impact

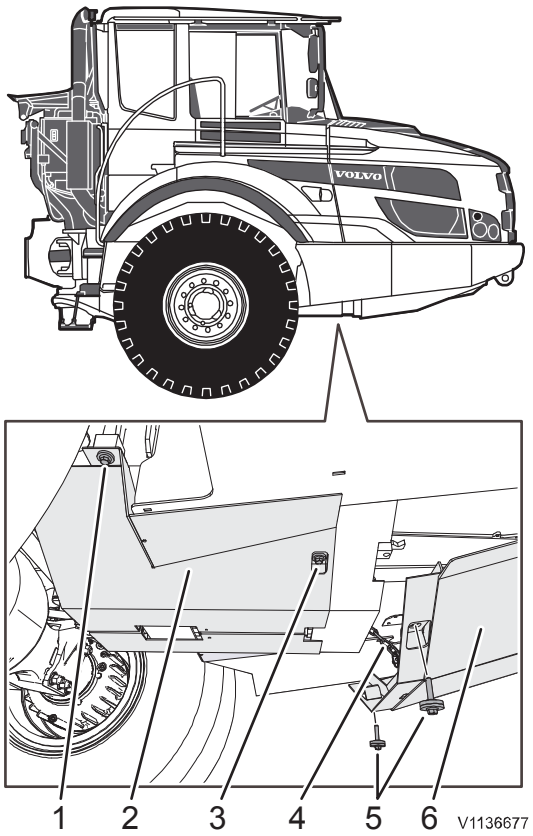
Keep in mind the environment when doing service and maintenance. Oils and other liquids hazardous to the environment and released into the environment will cause damage. Oil degrades very slowly in water and sediment. One litre of oil can destroy millions of litres of drinking water.

NOTE!
In common for all points below is that all waste is to be deposited with and handled by a treatment and disposal company that is approved by the authorities.

- When draining, oils and liquids must be collected in suitable containers and actions must be taken to avoid spills.
- Used filters must be drained of all liquid before they are handled as waste. Used filters from machines that work in conditions with asbestos or other dangerous dust must be placed in the tight-sealing bag that is supplied with the new filter.
- Batteries contain substances that are hazardous to the environment and health. Therefore, used batteries must be handled as environmentally hazardous waste.
- Consumables, e.g. used rags, gloves, and bottles may also be contaminated with environmentally hazardous oils and liquids and must be treated as environmentally hazardous waste.

Preparations before service

Guard plates



1 Upper bolt
2 Rear underbody skid plate
3 Lower bolt
4 Chain
5 Rear bolts
6 Front underbody skid plate

WARNING

Risk of serious injury.
The work involves handling heavy components which could result in severe crushing injuries.
Secure heavy components so they cannot drop uncontrollably before starting work on a machine. Make sure no one is underneath while working on heavy components.

For certain service work it is necessary to let down or remove the underbody skid plates.

Place the machine in service position, see *270*.

Front underbody skid plate, lowering

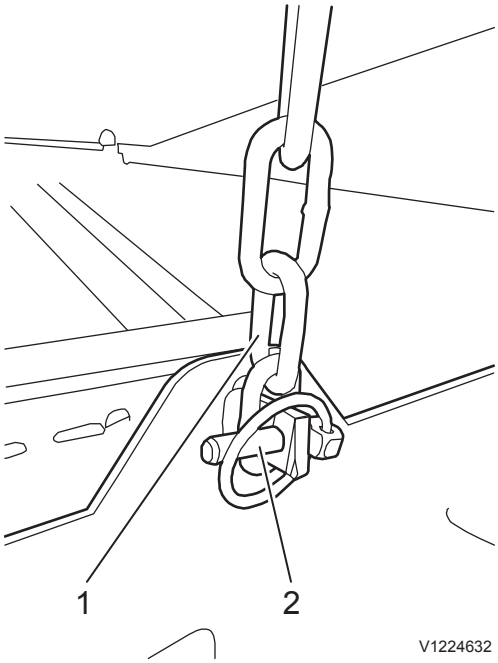
1 If possible, place a jack on wheels under the skid plate's trailing edge. Weight of clean skid plate (belly plate) at trailing edge approx. 25 kg (55.1 lbs).

NOTE!
Mud, dirt, etc., may collect in the skid plate, which means that its weight increases significantly.

2 Remove the bolts at the rear part of the plate (2 pcs.). The plate is heavy, therefore it is secured with a chain to prevent it from falling down.
3 Remove the pin for the chain and carefully let down the plate.

Front underbody skid plate, raising

If possible, use a jack, or get help from a co-worker.



1 Chain
2 Pin

1 Check if the chain is in place on the front cross member and that it is attached correctly.
2 Lift up the skid plate and, when possible, secure the skid plate with the chain and pin.
3 Align and install the skid plate, and tighten the bolts.
4 Make sure that the skid plate is installed correctly.

Rear underbody skid plates, lowering

Lower one plate at a time.

1 Remove the lower bolt.
2 Push and hold against the plate, and remove the upper bolt.
3 Swing down the plate.

Do the same work in the same way with the other skid plate.

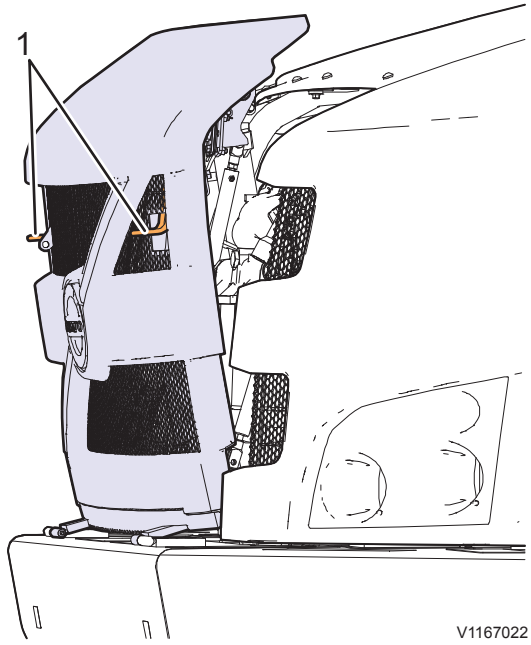
Rear underbody skid plates, raising

Raise one skid plate at a time.

1 Lift up the skid plate, align and install it in place.
2 Tighten the upper bolt.
3 Tighten the lower bolt.
4 Make sure that the skid plate is installed correctly.

Do the same work in the same way with the other skid plate.

Engine hood



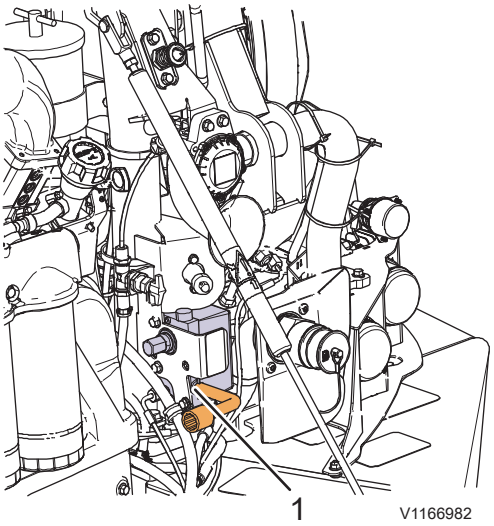
1 Catches, front grill

CAUTION

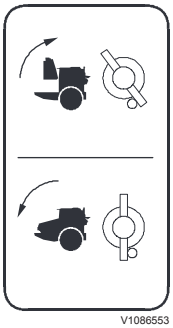
Risk of crushing. Moving engine hood can cause crushing injuries. Make sure that no person is near the engine hood before using the maneuvering switch.

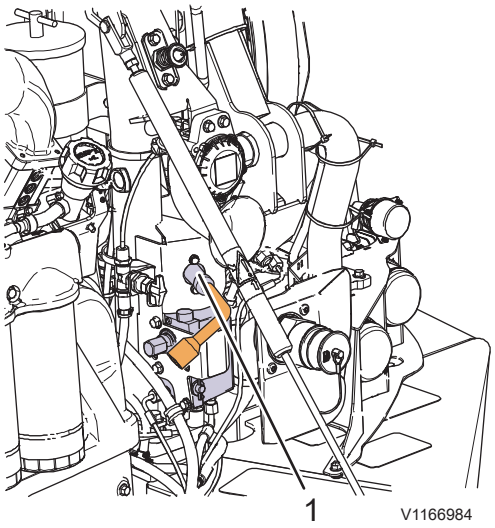
Opening

1 Pull down the catches.
2 Let down the front grill.
3 Lower the steps on the inside of the grill.
4 The socket wrench for operating the pump, valve, and switch is located in a holder above the pump.
5 Turn the hood pump's valve to position “lower” with the socket wrench, as shown on the decal.
6 Turn on the electric power by turning the ignition to position R.
7 Move the socket wrench to the switch and turn to start the pump. Pump until the engine hood has reached its upper end-position.

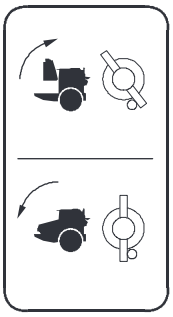


1 Valve





1 Switch



8 Turn the ignition to position 0.

For machines manufactured after April 2017:

If entrance lighting is installed (Optional equipment)

1 Turn on the electric power by pressing the button for entrance lighting. The electric power turns off automatically after approx. 3 minutes.
2 Move the socket wrench to the switch and turn to start the pump. Pump until the engine hood has reached its upper end-position.

Closing

1 Turn the hood pump's valve to position “close” with the socket wrench, as shown on the decal.
2 Turn on the electric power by turning the ignition to position R.
3 Move the socket wrench to the switch and turn to start the pump. Pump until the engine hood has reached its lower end-position.
4 Turn the ignition to position 0.

For machines manufactured after April 2017:

If entrance lighting is installed (Optional equipment)

1 Turn on the electric power by pressing the button for entrance lighting. The electric power turns off automatically after approx. 3 minutes.
2 Move the socket wrench to the switch and turn to start the pump. Pump until the engine hood has reached its lower end-position.

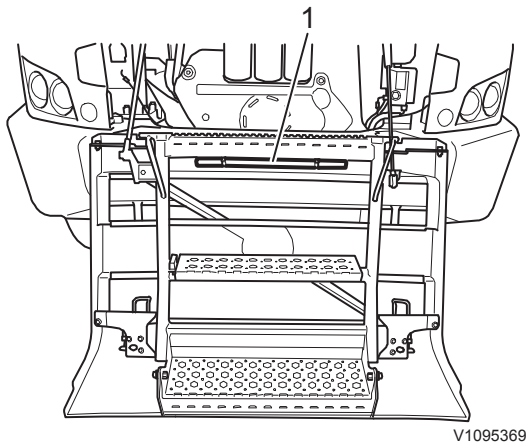
After closing

1 Put back the socket wrench.
2 Swing up the steps on the inside of the grill.
3 Swing up the front grill.
4 Check that the front's lock mechanism has engaged.

NOTE!
When the hood cylinder disengages, a small push down on the engine hood may be needed for it to lock.

Manual operation

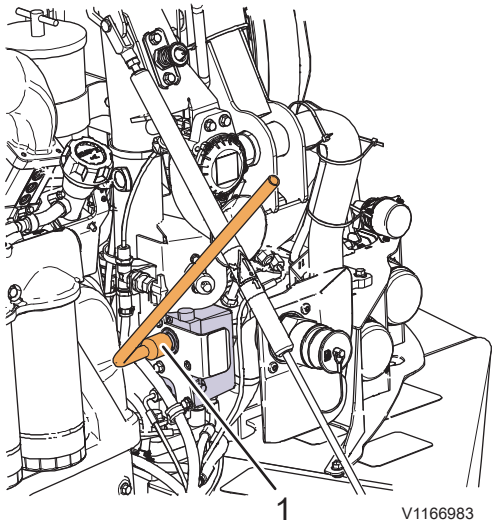
Manual opening and closing of the hood is possible if the electric hood opening does not work for some reason.
The following describes the points that differ. Besides these, follow the instructions above.



1 Extension

Opening

1 Get out the extension, which is located in the front, under the upper foot step, and assemble it with the socket wrench.



1 Hand pump

2 Place the socket wrench on the pump and pump until the engine hood has reached upper end-position.

Closing

1 Get out the extension, which is located in the front, under the upper foot step, and assemble it with the socket wrench.
2 Place the socket wrench on the pump and pump until the engine hood has reached lower end-position.

After closing

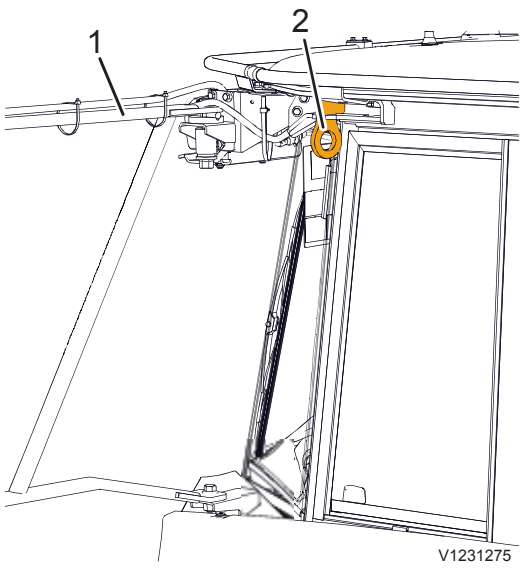
1 Put the socket wrench and extension back in their storage position.

Safety harness anchor points

(Optional equipment)

The machine may be equipped with safety belt attachment points. There is one on each side of the cab.

The attachment points are intended for use when the operator/ service technician is using the safety belt during maintenance work, and can withstand a tensile load of 22 kN (2270 kg/5000 lbs), in any fall direction. This meets the requirements of the following standards: WorkSafeBC OHS Regulation Part 11, ISO 14567:1999 and OSHA 1919.140(c).

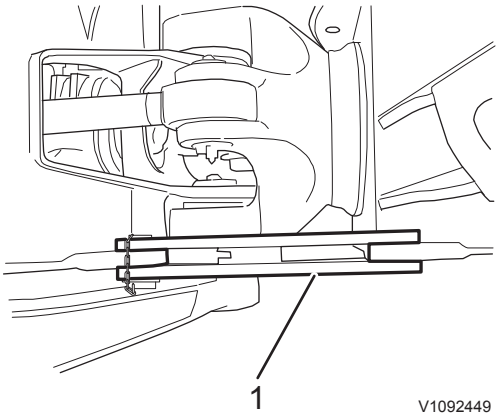


1 Rear-view mirror arch
2 Attachment point

Before use

Fold in the rear-view mirror, see page *165*.

Steering joint lock



1 Steering joint lock

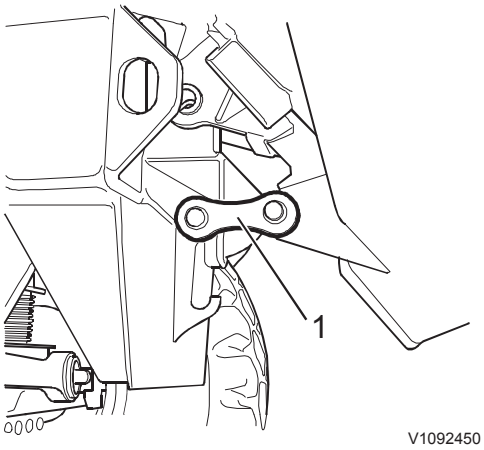
WARNING

Risk of crushing.
The machine could turn and cause crushing injury.
Engage the steering lock before servicing or transporting the machine.

1 Remove the pin from the transport bracket and swing over the steering joint lock.
2 Install and secure the pin.

NOTE!
The steering joint must not be locked when operating the machine.

Dump body lock



1 Load body lock

WARNING

Risk of crushing.
An unlocked raised dump body could fall down. Personnel standing under a falling dump body could be seriously injured, including death.
Always lock the dump body before entering under it.

WARNING

Risk of crushing injury.
Working under a falling dump body could cause serious crushing injury or death.
Approach the machine from the side when fitting or removing the dump body lock.

Secure the load body as follows:

1 Run up the load body to max. dumping angle.

2 Lock the load body with the body lock.

When work has been completed:

1 Disconnect the body lock.

2 Lower the load body.



V1187460

Warning symbol 'trapped pressure'

Pressure release

WARNING

Risk of high pressure injection.
Residual pressure in the hydraulic system could lead to serious injury. Oil under high pressure can jet out, even if the engine has not been running for some time.
Always release the pressure and ensure the ignition switch is in the off position before you perform any service of the hydraulic system.

WARNING

Risk of serious injury.
Accumulators are charged with highly pressured nitrogen. Improper handling could lead to an explosion causing serious injury.
Work on an accumulator must only be done by a qualified service technician.

NOTE!
High pressure can still remain after depressurizing.

Place machine in the service position. Refer to page *270*.

Hydraulic system

1 Start the engine.

2 Move the dump lever to lower/float position, see page *126*.

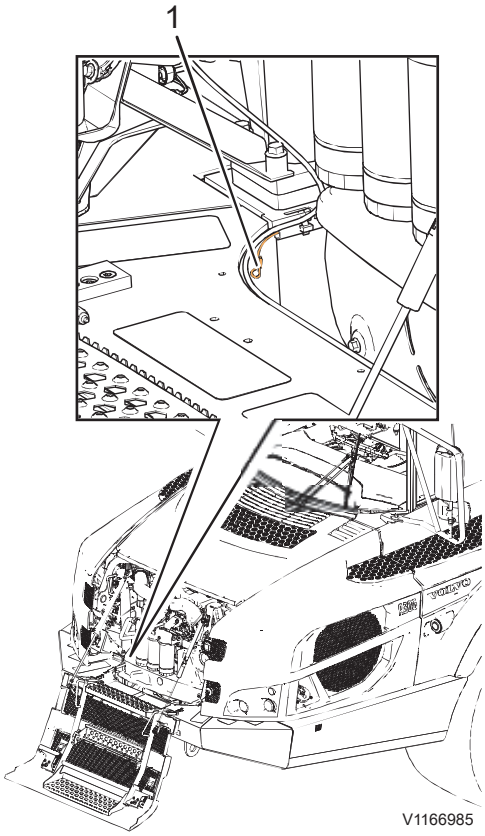
3 Turn off the engine.

4 Turn the steering wheel to the left and right.

Brake system

1 Turn off the engine.

2 Press down the brake pedal repeatedly (30–40 times) until the hissing sound stops and the pedal feels "soft" and "spongy".



1 Compressed air tank, drain point

Compressed air system

1 Turn off the engine.

2 Drain the compressed air tank.

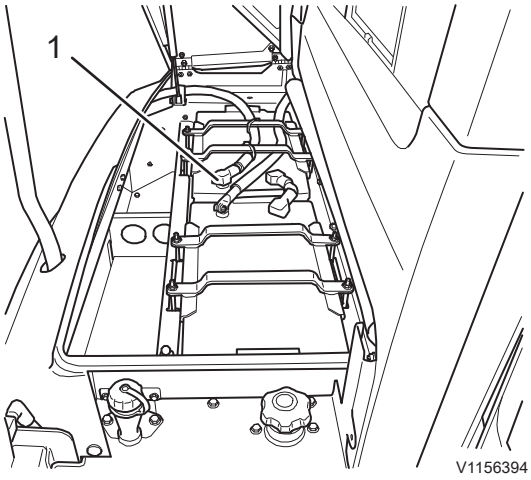
NOTE!
For work on the different systems, contact a qualified workshop.

NOTE!
Before working on the systems, connect a pressure gauge to check that the system is pressureless.

Alternator

The alternator unit is sensitive to incorrect connection. Always work according to the following instructions.

- Before the battery cables and alternator wiring can be disconnected, the ignition must be in position 0 and the information display unit be shut down and off. Otherwise the alternator and electronics may be damaged.
- Turn of the voltage before any work is done on the alternator equipment, see page *283*.
- The battery's terminals must never be mixed up or confused. Each terminal is clearly marked with a (+) or a (–) sign. If the cables are connected incorrectly, the alternator's rectifier is destroyed immediately.



1 Plus (positive) terminal

Battery, disconnecting and connecting

Disconnecting

1 Place machine in the service position. Refer to page *270*.

2 **NOTICE**

Risk of machine damage.
Incorrect handling of the electrical system can lead to machine damage.
Make sure that the machine is without electric power supply (voltage) by turning the ignition to position 0, the information display unit should also be off.

3 Make sure that the machine is without electric power supply (voltage) by disconnecting the cable from the battery's plus (positive) terminal. As an alternative, set the service switch to position OFF, see page *283*.

Connecting

1 **NOTICE**

Risk of machine damage.
Incorrect handling of the electrical system can lead to machine damage.
Ensure the ignition switch is in the “0” position before work is started.

2 Connect the cable to the battery's plus (positive) terminal. As an alternative, set the service switch to position ON, see page *283*.

3 Restore the machine from service position.

Welding

WARNING

Risk of toxin inhalation.
Burning of painted, plastic or rubber parts produces gases that could damage respiratory tracts.
Never burn painted or rubber parts or any plastics.

NOTICE

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

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 actions should be taken before starting electric welding on the machine or attachments connected to the machine.

1 Turn off the voltage, see page *281*.

2 Disconnect the electronic units: V-ECU, V2-ECU, W-ECU, HMIM, ECC.
Only applies to machines with engine alternative L and J: also ECM, ACM, and Engine Gateway.
Only applies to machines with engine alternative E: also ECM and Engine Gateway.
Only applies to machines with engine alternative F: the E-ECU as well.
For more information, contact an authorized dealer.

3 Connect the welding equipment’s ground connection as close as possible to the welding point and make sure that the current does not pass across a bearing.

4 Provide for good ventilation.

5 Remove all paint from an area at least 10 cm (4 in) around the welding point.

6 After welding is finished, disconnect the ground cable.

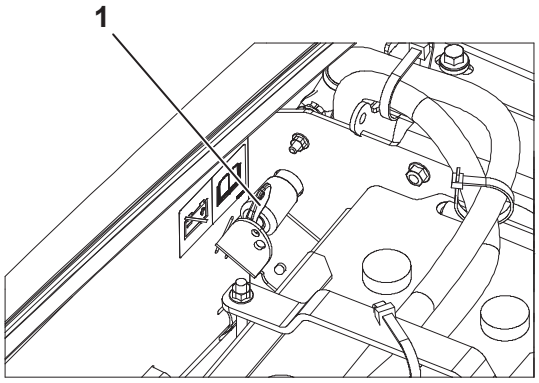
7 Plug in the electronic units.

8 Connect the batteries, see page *281*.

Service battery disconnect switch

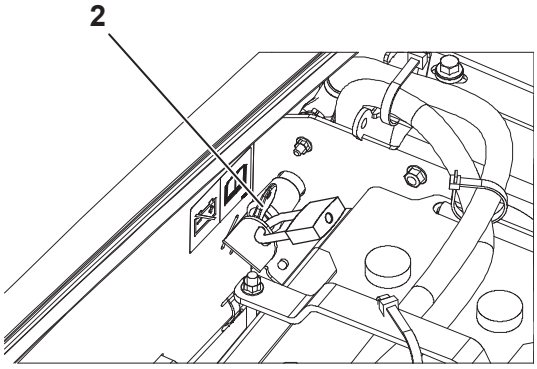
NOTE!
The service switch shall only be used for service actions. Do not confuse the service switch with the electric battery disconnector (main switch) or the emergency switch. The service switch disconnects all electric power (even minor power consumers, e.g., the radio memory, and can be locked in the OFF position using a pad lock.

The service switch cuts off electric power (current) to the battery's plus terminal and replaces the manual work of disconnecting the cable from the battery's plus terminal. See page *281*.



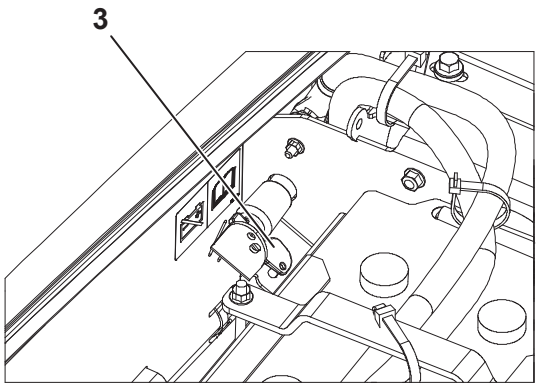
V1156386

1 Position OFF



V1156387

2 Position OFF — locked with pad lock



V1156388

3 Position ON

NOTICE

Risk of machine damage.
Incorrect handling of the electrical system can lead to machine damage.
Make sure that the machine is without electric power supply (voltage) by turning the ignition to position 0, the information display unit should also be off.

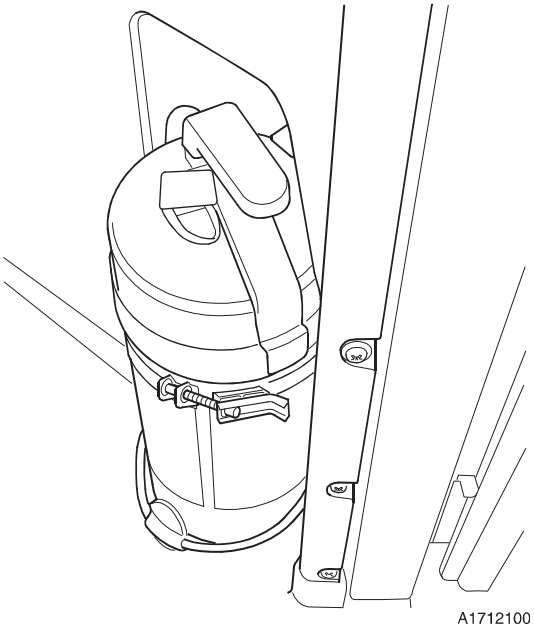
Shutdown of machine for service action

1 Turn the ignition to position 0.
2 Wait until the machine has shut down all systems in a controlled manner and check that the information display unit is off.
3 Turn off the main electric power by turning the service switch to the left, position OFF.

Restoring

1 Turn the service switch to the right, position ON.

Fire prevention


A1712100

There is always a risk of fire. Find out which type fire extinguisher that is used at your place of work and how it is used.

If the machine is equipped with a portable fire extinguisher it should be of the type ABE (ABC in North America). The designation ABE means that it can be used to put out fires in both solid organic materials and fluids, and that the fire extinguishing agent does not conduct electricity. Efficiency class I means that the fire extinguisher must operate effectively for at least 8 seconds, efficiency class II at least 11 seconds, efficiency class III at least 15 seconds.

In general, a portable fire extinguisher ABE I corresponds to an effective content of 4 kg (8.8 lbs) (EN-class 13A89BC), standard EN 3-1995 part 1, 2, 4, and 5.

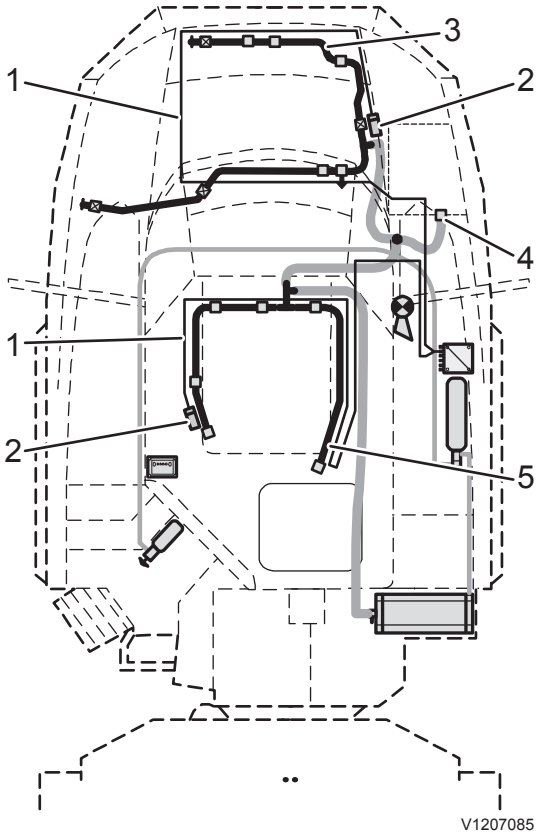
Fire prevention

- Smoking or open flames are forbidden near a machine when filling with fuel or when the fuel system has been opened and has contact with the surrounding air.
- Diesel fuel is flammable and must not be used for cleaning. Instead use car care products intended for cleaning or degreasing. Remember that certain solvents may cause skin rashes and may be flammable.
- Keep the place clean where service work is to be done. Oil and water can make floors and steps slippery. This may also be dangerous in connection with using electrical equipment or electrically powered tools. Oily clothes are a serious fire hazard.
- Check daily that the machine and equipment are free from dust and oil. This reduces the risk of fire and also makes it easier to detect loose or damaged parts.

NOTE!
Be very careful when using a high-pressure washer for cleaning since electrical components and cable insulation may be damaged at relatively low pressure and temperature. Protect electrical components and cables in an appropriate way.

- Be extra thorough when cleaning a machine that is operated in fire-hazardous environments, e.g., sawmill and landfill sites.
- The fire extinguisher must be maintained so that it works when it is needed. Shake the fire extinguisher to stir up the powder at least once a month.
- Check that fuel lines, hydraulic hoses, brake hoses, and electrical cables have not been damaged by chafing or are not at risk of being damaged in that way due to incorrect installation or clamping. This applies particularly to unfused cables, which are red and marked R (B+) and routed:

- between the batteries
- between battery and starter motor



Sprinkler and detector circuit for machines with engine alternative M

1 Detector circuit
2 End-resistor in detector circuit
3 Sprinkler circuit under hood
4 Sprinkler circuit in EATS-compartment
5 Sprinkler circuit under cab

- between alternator and starter motor

Electrical cables must not rest directly against oil or fuel lines.

- Do not weld or grind on components containing flammable liquids, e.g., tanks and hydraulic pipes. Work extremely carefully when doing 'Hot Jobs' near flammable liquids. A fire extinguisher should be kept nearby.

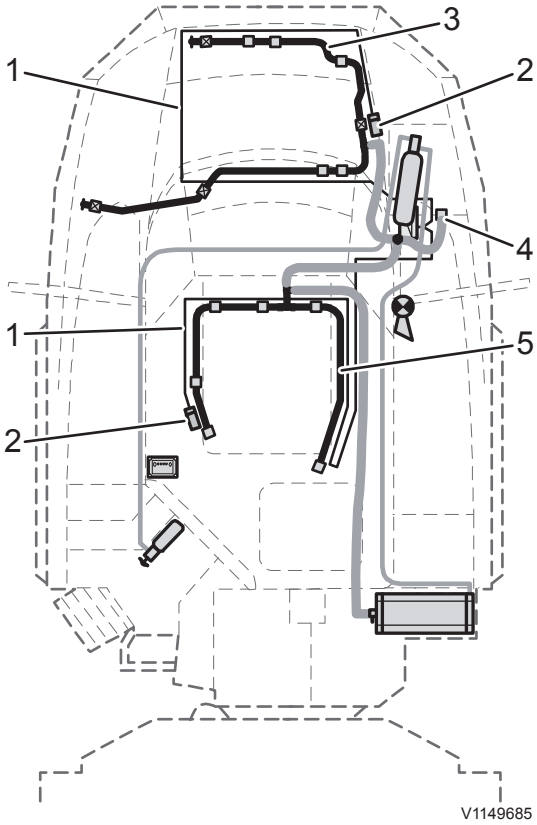
Actions in case of fire

For actions in case of fire, see page *177*.

Fire suppression system

(Optional equipment)

The Fire Suppression System is a sprinkler system for the engine compartment, the compartment under the cab, and the compartment for the aftertreatment system (if installed) with 16 sprinkler nozzles. The system is recommended for machines operating in fire-hazardous conditions.



Sprinkler and detector circuit for other machines

1 Detector circuit
2 End-resistor in detector circuit
3 Sprinkler circuit under hood
4 Sprinkler circuit in EATS-compartment
5 Sprinkler circuit under cab

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).

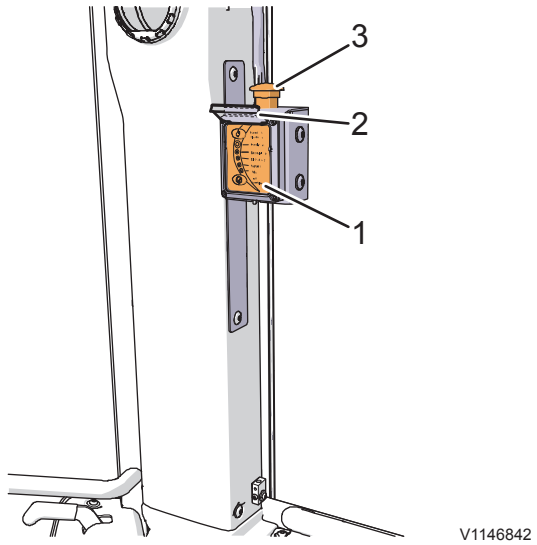
Automatic mode

In automatic mode only the green light emitting diode is activated ("On") on the control panel, see page *138*.

The sprinkler system is activated automatically in two modes:
- when the machine is not operated (e.g., when parked) with the engine off and also when the main electric power is off or
- when the parking brake is applied with the engine running.

In case of high temperatures, two detector circuits detect fire and the sprinkler system is activated automatically. After the system has been activated, there is enough extinguishing agent for approx. 20 seconds of operation. Then the extinguishing agent container is empty.

NOTE!
In automatic mode, the fire extinguishing system operates independently and does not impact any machine systems.



Cab, left pillar

1 Control panel
2 Plastic cover
3 Inner activation button (cuts off the main power, stops the engine and applies the parking brake. If fire is detected, activates the sprinkler system.)

Manual mode

In manual mode both the green light emitting diode ("On") and yellow light emitting diode ("Manual") are activated, see page *138*.

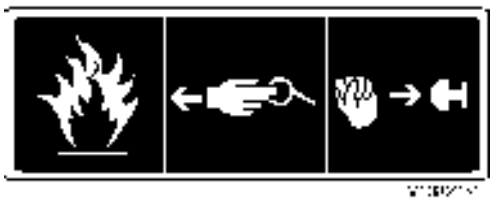
The sprinkler system is in manual mode (the operator activates the system) when the machine is operated and the parking brake is released.

When the machine being operated and a fire is detected, an alarm is triggered via a flashing red LED on the control panel ("Fire Alarm") and the siren and strobe light are activated. The system should be then activated manually with the inner activation button or via the control panel, see page *138*. The system can also be activated by pressing in the manual activation button (located by the cab steps), see below.

For the control panel's functions, see page *138*.

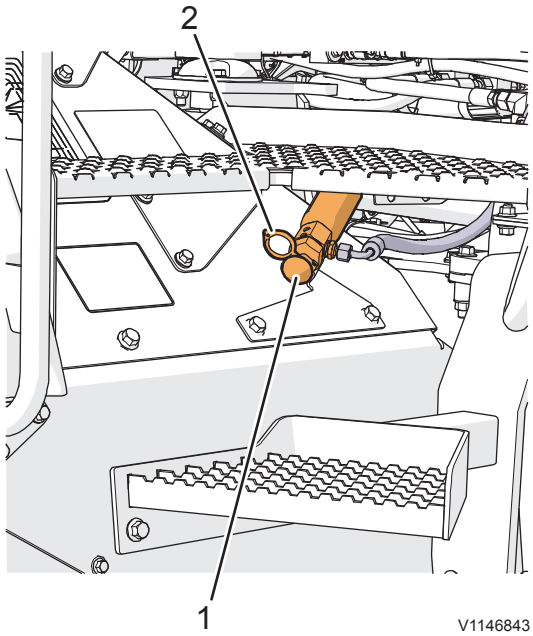
NOTE!
Only open the plastic cover when the control panel's activation button is used. The tamper seal is restored during service and maintenance.

For safety rules in case of fire, see page *177*.



Manual activation of the sprinkler system with the manual activation button

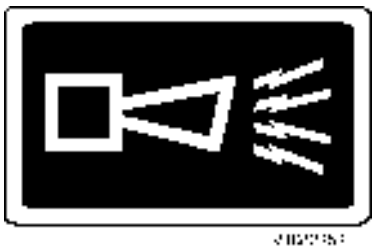
Manual activation button



1 Button to activate the system outside the cab (located by cab steps)
2 Fuse

The manual activation button (located by the cab steps) can be used at any time to activate the sprinkler system. even when the machine is not operated and if the machine is completely without electric power.

Activation takes place as follows:
1 Pull out the yellow tamper seal.
2 Press in the red button.



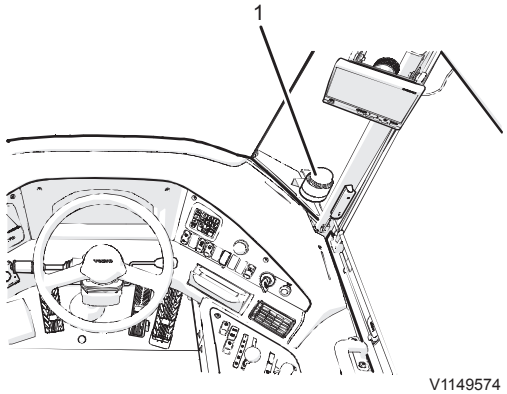
Decal for siren (located by siren and strobe light)

Siren and strobe light

Siren and strobe light are activated

- when fire is detected by the system
- when the sprinkler system is activated using the control panel
- when the test button on the control panel is pressed in.

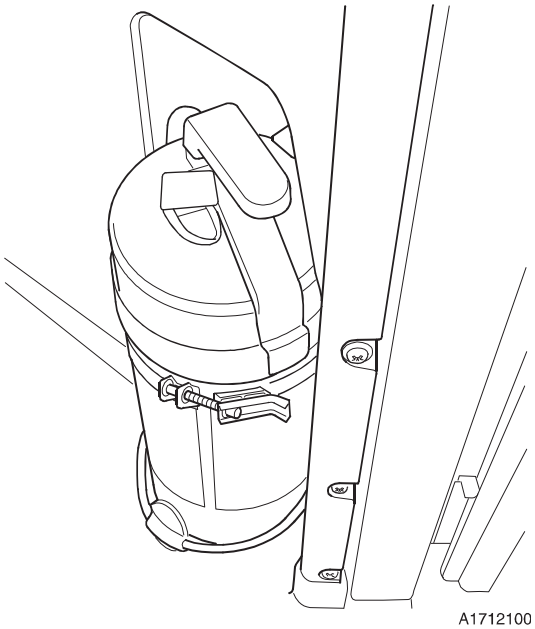
Siren and strobe light remain activated until the test button on the control panel is released. If there is still a fire indication, the siren and strobe light are activated again. Contact a qualified workshop.



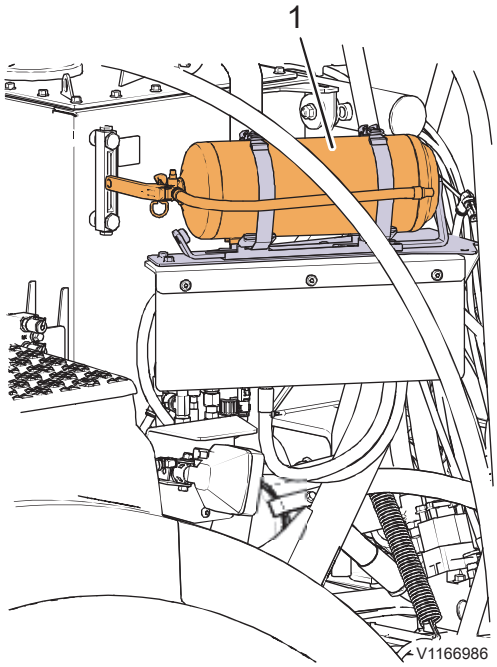
1 Strobe light



Decal for handheld fire extinguisher



Handheld fire extinguisher in cab (Optional equipment)



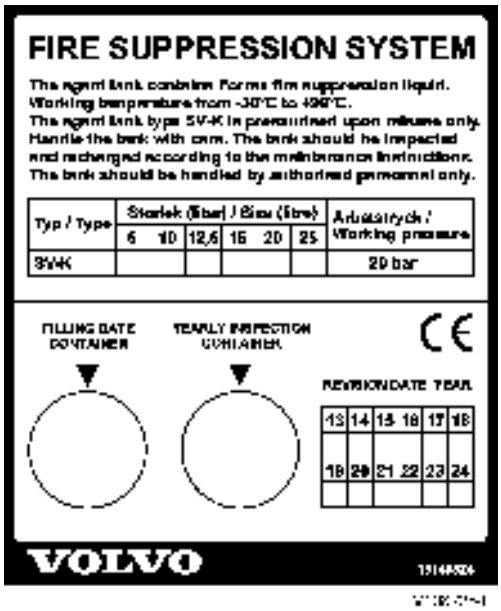
1 Handheld fire extinguisher outside cab (Optional equipment)

Position for handheld fire extinguisher (Additional options)

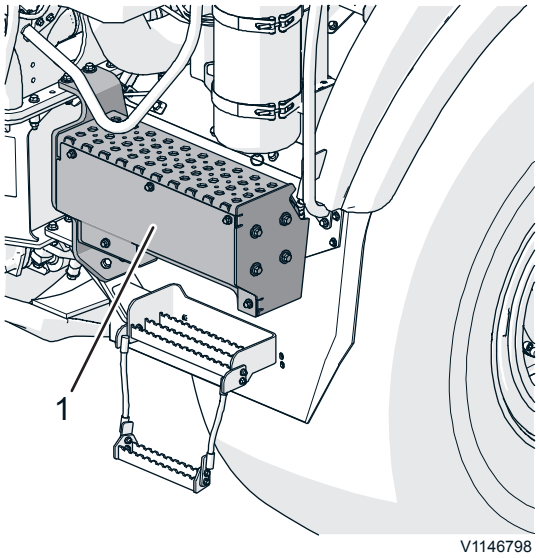
There is room for two handheld fire extinguishers, one in the cab and one outside by the cab door. These are a supplement to the permanent sprinkler system and the primary purpose is protecting the surrounding areas and any damping-down operations. According to Swedish Standard SBF 127, two fire extinguishers of 6 kg (13 lbs) each are required for work in fire-hazardous conditions.

To use a handheld fire extinguisher:

1 Hold the fire extinguisher upright, pull out and remove the safety pin.
2 Point the nozzle at the base of the flames, from a distance of at least 1 m (39.4 in).
3 Press the trigger.



Decal for fire extinguishing agent (located on tank for fire extinguishing agent)



1 Tank with fire extinguishing agent

Fire extinguishing agent

WARNING

Chemical hazard.
Contact with the extinguishing agent which contains glycol could cause personal injuries.
Use personal protective equipment and avoid contact.
In case of contact with the eyes, rinse with water. In case of skin contact, wash with soap and rinse with water. Always consult a doctor after contact with the extinguishing agent.

The fire extinguishing agent is a wet-chemical fluid and is easy to wash off after the system has been activated.

At activation of the sprinkler system, there is enough fire extinguishing agent for approx. 20 seconds of operation.

The fire extinguishing agent is protected against freezing down to -30 °C (-22 °F).

After activation of the sprinkler system

After activation of the sprinkler system, the engine compartment should be washed immediately and thoroughly with water. For cleaning the engine compartment, see *318*.
Thereafter, contact a qualified workshop as soon as possible for thorough cleaning, repair, and restoration of the Fire Suppression System.

Handling hazardous materials

Heated paint

⚠ WARNING

Risk of toxin inhalation.
Burning of painted, plastic or rubber parts produces gases that could damage respiratory tracts.
Never burn painted or rubber parts or any plastics.

When heated, paint gives off poisonous gases. Therefore, paint must be removed from an area with a radius of at least 10 cm (4 in) before carrying out welding, grinding, or cutting with a torch. In addition to the health hazard, the weld will be of inferior quality and strength, which may cause future failure of the weld.

Methods and protective actions when removing paint
- Blasting
- use breathing protection and protective goggles
- Paint remover or other chemicals
- use a portable air extractor, breathing protection, and protective gloves
- Grinding machine
- use a portable air extractor, breathing protection, protective gloves and protective goggles

Never burn discarded painted parts. They should be disposed of by a licensed waste handling plant.

Heated rubber and plastics

Polymer materials can, when heated, form compounds which are dangerous to health and environment and must therefore never be burned when scrapped.

If gas cutting or welding is to be carried out near such materials, the following safety instructions must be followed:
- Protect the material from heat.
- Use protective gloves, protective goggles, and approved breathing protection.

Heated fluor rubber

⚠ WARNING

Risk of toxin inhalation.
Fluoro rubber seals when heated beyond their rated limits will release a very toxic gas that is corrosive to respiratory tracts.
Move away from and do not inhale any smoke coming from the machine. Inhalation of toxic gas requires immediate medical attention.

When handling a machine that has been damaged by fire or has been exposed to intense heat, the following protective actions must be taken:
- Use thick gloves made of rubber and wear protective goggles.
- Discard gloves, rags, etc., that have been in contact with heated fluor rubber after first washing them in lime water (a solution of calcium hydroxide, i.e., slaked lime in water)
- The area around a part which has been very hot and which may be made of fluor rubber should be decontaminated by thorough and ample washing with lime water.

- As a precaution, all seals (O-rings and other oil seals) should be handled as if they were made of fluor rubber.
- The hydrofluoric acid may remain on the machine parts for several years after a fire.
- If there is swelling, redness, or a stinging feeling and one suspects that the cause may be contact with heated fluor rubber, contact a doctor immediately. Symptoms may not appear until after several hours without any previous warning.
- The acid cannot be rinsed or washed off the skin. Instead, treat the skin with Hydrofluoric Acid Burn Jelly or similar before contacting a doctor.

Batteries

WARNING

Risk of chemical burns.
The battery electrolyte contains corrosive sulphuric acid which could cause severe chemical burns.
If electrolyte spilled on your bare skin, remove it immediately and wash the affected area with soap and plenty of water. If it gets into your eyes or any other sensitive body part, rinse with plenty of water and seek immediate medical attention.

- Do not smoke near batteries since these give off explosive gases.
- Make sure that metal objects, e.g., tools, rings, and watch straps do not come into contact with the battery terminals.
- Make sure that the battery terminals' caps always are installed.
- Do not tilt a battery in any direction. Battery electrolyte may leak out.
- Do not connect a discharged battery in series with a fully charged battery. Risk of explosion.
- When removing a battery, disconnect the ground cable first and when installing, connect the ground cable last to reduce the risk of sparks.
- Discarded batteries must be handled according to governing national regulations.

Charging batteries, see page *362*.

Starting with booster batteries, see page *364*.

Dust of crystalline silicon dioxide (silica dust)

WARNING

Risk of hazardous inhalation.
Working in environments containing dangerous dust can lead to serious health problems.
Wear personal protective equipment when working in dusty environments.

NOTE!
Special actions must be taken to prevent the spread of dust. Contact an authorized dealer for more information.

Crystalline silicon dioxide is a basic component of sand and granite. Many activities at construction and mining sites, such as trenching, sawing and drilling, generate dust containing crystalline silicon dioxide. This dust can cause silicosis (miner's lung).

The employer or work site management should provide the operator with information about the presence of crystalline silica on the work site along with specific work instructions, safety actions, as well as necessary personal protective equipment.

Also check local and national regulations on silica and silicosis.

Refrigerant

Environmental precautions

The air conditioning system of the machine is filled with R134a refrigerant at the factory. R134a refrigerant is a flourinated greenhouse gas and contributes to global warming.

Do not release refrigerant into the environment. See page *422* for the amount of R134a refrigerant in your machine and its global warming potential.

Safety precautions

Work on the air conditioning system must only be performed by a qualified service technician. Do not attempt to perform work on the air conditioning system.

Wear safety goggles, chemical resistant gloves (e.g., neoprene or butyl rubber) and appropriate personal protective equipment to protect bare skin when there is a risk of contact with refrigerant.

Actions in case of exposure

Eye contact: Rinse with warm water and apply a light bandage. Seek medical attention immediately.

Limited skin contact: Rinse with warm water and apply a light bandage. Seek medical attention immediately.

Extensive skin contact: Rinse with warm water and carefully heat the area with warm water or warm clothing. Seek medical attention immediately.

Inhalation: Leave the area and find fresh air. Seek medical attention immediately.

End of life product dismantling

Core Values

Along with quality and safety, caring for the environment is one of Volvo's core values. This means that Volvo Construction Equipment works with an overall perspective of the products that extends throughout their entire lifecycle. This includes engineering and design, material selection, manufacturing processes, use, and recycling.

Producer responsibility

In most countries there is a producer responsibility for products that is applicable to components such as batteries, tyres and others. There are special regulations for these components. Contact an authorised dealer for more information.

Machine content

Thoroughly planned recycling of the machine is the foundation for ending the life cycle and for being able to recycle materials for use in new Volvo Construction Equipment products. According to calculations, Volvo Construction Equipment machines are up to 96% recyclable by weight. Refer to the Environmental Declaration for the machine or contact an authorised dealer for specific information regarding recyclable materials by weight for your machine.

Proper recycling and disposal

Proper safety and environmental precautions must be followed when dismantling the machine or machine components.

- Use proper tools and personal protective equipment.
- Place machine in a suitable service position. See page *270*.
- Release all stored pressure and disconnect the battery.
- Follow instructions for specialised components.
- Carefully drain all fluids and lines into appropriate containers.
- Recycle machine parts and components in accordance with applicable laws and regulations. Refer to the Environmental Declaration or contact an authorised dealer for specific information regarding recyclable materials by weight for your machine.
- Dispose of waste fluids, batteries, filters, filter ash and non-recycliable material in accordance with applicable laws and regulations.
- Dispose of air conditioning systems in accordance with applicable laws and regulations.

Handling line, tubes and hoses

WARNING

Risk of high pressure injection.
Oil or fuel leaks from high pressure hoses could cause serious injury caused by high pressure injection.
If oil or fuel leaks from high pressure hoses or loose screws are found, stop operations immediately and contact a qualified service technician.

- Do not bend high-pressure lines.
- Do not hammer on or strike high-pressure lines.
- Do not installed lines that are bent or damaged.
- Check lines, pipes, and hoses very thoroughly.
- Do not reuse hoses, pipes, or couplings.
- Do not check for leaks using only your hands.
- Tighten all couplings. Contact a qualified workshop for recommended tightening torques.

If any of the following are detected, change the parts. Contact a qualified workshop.

- End-connections are damaged or leaking.
- Outer casings are worn, chafed, or there are nicks in them.
- Reinforcement threads are visible.
- Outer casings have swelled.
- Hoses' moving parts are trapped and/or pinched.
- End-connections are missing.
- Foreign material has penetrated the casings.

NOTICE

Make sure that all clamps, guards and heat shields are correctly installed. This contributes to preventing vibrations, chafing against other parts and excessively strong generation of heat.

Maintenance



This section describes maintenance and service jobs that the operator can do. Other maintenance and service jobs should be performed by a qualified service technician.

The page *304* presents all the jobs and actions that are included in the machine's service program. This page also makes it clear which jobs in the service program can be done by the operator, and which ones should be performed by a qualified service technician.

Emission control system

The emission control systems for your new Volvo Construction Equipment engine have been designed, manufactured, and tested using genuine parts, and they have been certified according to American federal and California regulations on emission control. According to these all spare parts that are to be used for maintenance, repairs, or replacement of emission control systems shall be parts from Volvo Construction Equipment. The owner may let any qualified service technician perform maintenance, replacement, or repair of emission control components and systems that have been certified by the US Environmental Protection Agency. The owner may choose to use other parts than genuine Volvo Construction Equipment parts for such maintenance, replacement, or repair without the warranty becoming invalid, but the warranty does not cover the cost of such services or parts.

Service history

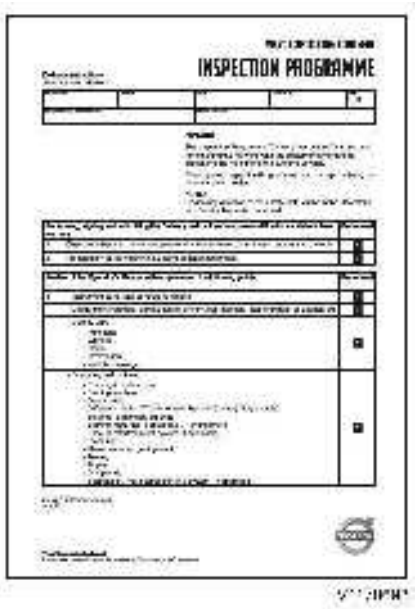
After each completed service by a qualified service technician, the service history should be filled in, see page *444*. Service history is a valuable document, which is referred to when selling the machine.

Arrival Inspection

Before the machine leaves the factory, it is tested and adjusted. The dealer or distributor must also carry out arrival inspections according to the applicable form.

Delivery Inspection

Before the machine leaves the factory, it is tested and adjusted. The dealer or distributor must also carry out delivery inspections according to the applicable form.



Delivery Instructions

When handing the machine over, the dealer shall review the machine and the Operator's Manual with the buyer/customer. This delivery instruction should be performed according to the applicable form, which is to be signed by the dealer for the warranty to be valid.

Service Programme

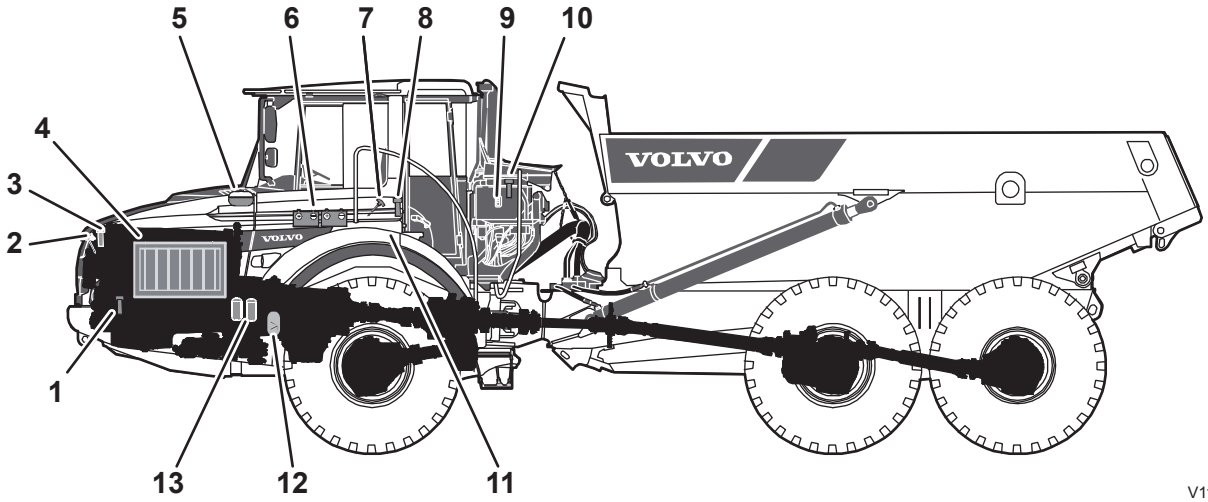
The Service Programme is a checklist of all scheduled maintenance intervals for a specific range of models under normal operating conditions. The Service Programme is available from an authorized dealer.

Volvo Construction Equipment continually strives to improve efficiency and serviceability through product design changes. These changes are not always added to Operator’s Manuals for products that have already been delivered. **Always refer to the Service Programme for the most accurate maintenance service intervals.**

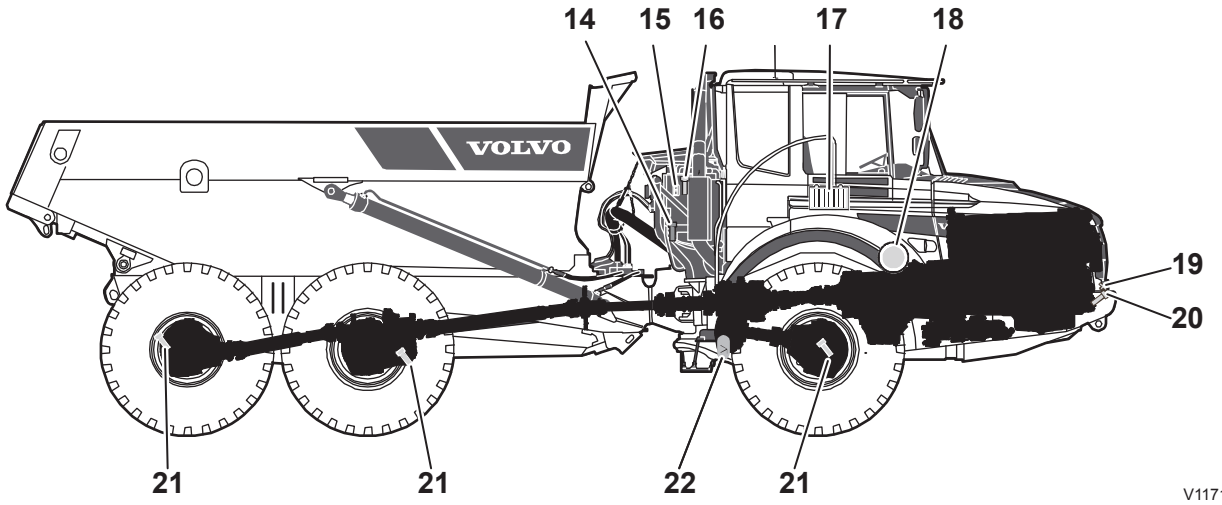
For any factory warranty to be valid, the machine must be maintained according to the Service Programme. The completed Service Programmes must be kept on file and provided to Volvo Construction Equipment upon request.

Service points

Engine alternative E, F and L



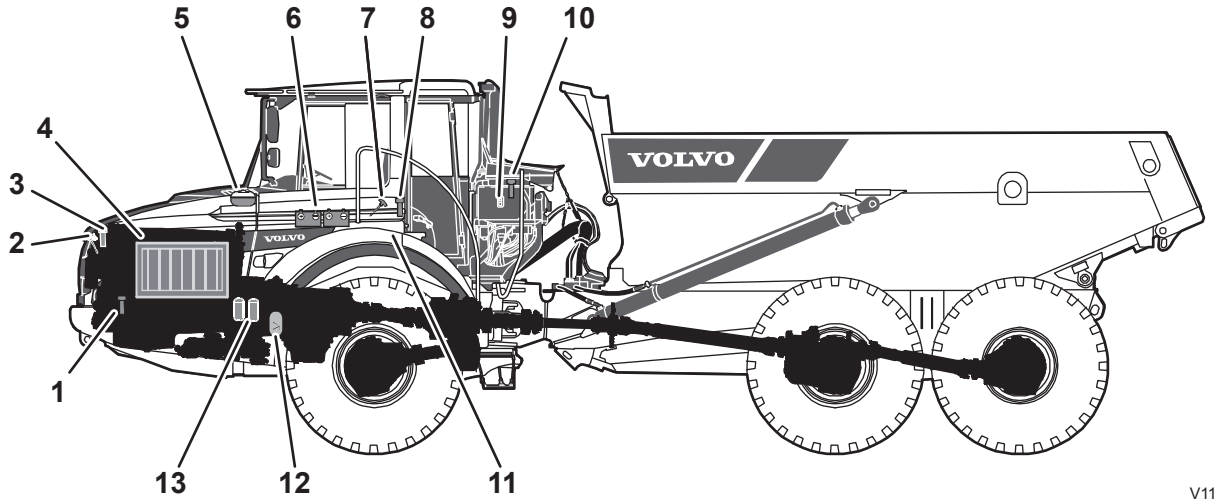
1	Fuel, fill point	8	Transmission, oil fill point
2	Engine, oil dipstick	9	Hydraulic system, oil level
3	Engine, oil fill point	10	Hydraulic system, oil fill point
4	Radiator and condenser	11	Washer fluid, fill point
5	Coolant, expansion tank and fill point	12	Washer fluid, level
6	Batteries	13	Fuel filter, water trap, drain point
7	Transmission, oil dipstick		



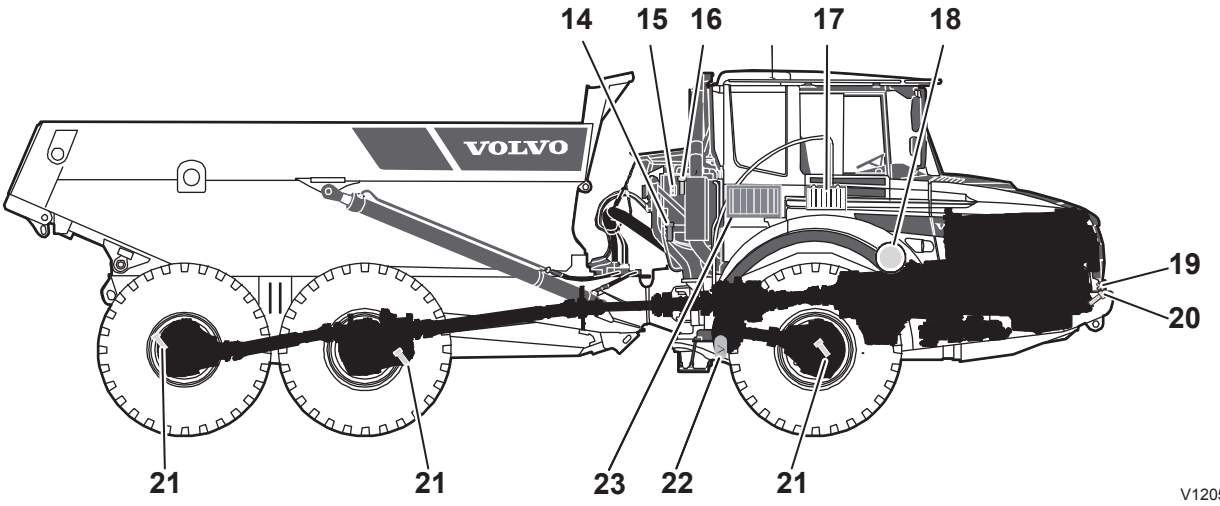
14	Dropbox, oil fill point	19	Compressed air tank, drain point
15	Brake cooling system, oil level	20	AdBlue®/DEF, fill point (1)
16	Brake cooling system, oil fill point	21	Drive axle, oil level
17	Cab, prefilter and main filter	21	Drive axle, fill point
18	Engine, air cleaner, primary filter	22	Dropbox, oil level

1. Only applies to machines with engine alternative L.

Engine alternative M



1	Fuel, fill point	8	Transmission, oil fill point
2	Engine, oil dipstick	9	Hydraulic system, oil level
3	Engine, oil fill point	10	Hydraulic system, oil fill point
4	Radiator	11	Washer fluid, fill point
5	Coolant, expansion tank and fill point	12	Washer fluid, level
6	Batteries	13	Fuel filter, water trap, drain point
7	Transmission, oil dipstick		



14	Dropbox, oil fill point	20	AdBlue®/DEF, fill point
15	Brake cooling system, oil level	21	Drive axle, oil level
16	Brake cooling system, oil fill point	21	Drive axle, fill point
17	Cab, prefilter and main filter	22	Dropbox, oil level
18	Engine, air cleaner, primary filter	23	Condenser
19	Compressed air tank, drain point		

General inspection of machine

All earthmoving machines are subjected to extreme stresses and wear. That is why it is essential that they are checked and inspected regularly for structural damage and that all systems function correctly.

Inspection intervals

It is important to perform regular inspections to minimize the risk of accidents and downtime. The intervals between these inspections depend on factors such as the age of the machine, type of application, retrofits, loading, the condition of the haul road, and what routine service has been done on the machine. Articulated haulers work under especially tough operating conditions and require more frequent, inspections. The recommendation is for the first inspection to be done at 6000 hours, after that every 2000 hours up to and incl. 12000 hours, and thereafter every 1000 hours.

It is advantageous to let a qualified service technician perform the inspections.

Cleaning before inspection

In order to be able to carry out a correct inspection, it is important that the hauler is thoroughly cleaned. See page *315*.

Inspection after incident/accident

If the machine has been involved in a collision or any kind of accident, is must be taken out of operation immediately and inspected thoroughly, regardless of when the last inspection was done.

Check hoses and cables routed across the hitch. Be especially thorough to ensure that nothing has become disconnected from its mounts, attachments, brackets, etc., is cracked, or parts of casings are worn off.
Make sure that there is no leakage.

In case of an incident, it is necessary to check the seatbelt to ensure the operator's safety. In case of an accident, seatbelt replacement is recommended. See page *157*.

In case the tractor has rolled over, check the cab's FOPS/ROPS-structure to ensure that it is intact and without any damage.

Inspection of structure

The front and rear frames, the hitch, and the load body must be inspected thoroughly for crack formations and defects, especially welded structures.

Early detection and repair of defects ensure continued function of the machine and improve its availability, and at the same time the risk of accidents is reduced.

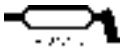
Correct repair of frames and other supporting structures requires knowledge of the materials, the design of the frame parts, and the manufacturer's recommended repair technique.

In case of a repair need, the recommendation is to contact a qualified workshop to have any repairs done.

Lubrication and service chart

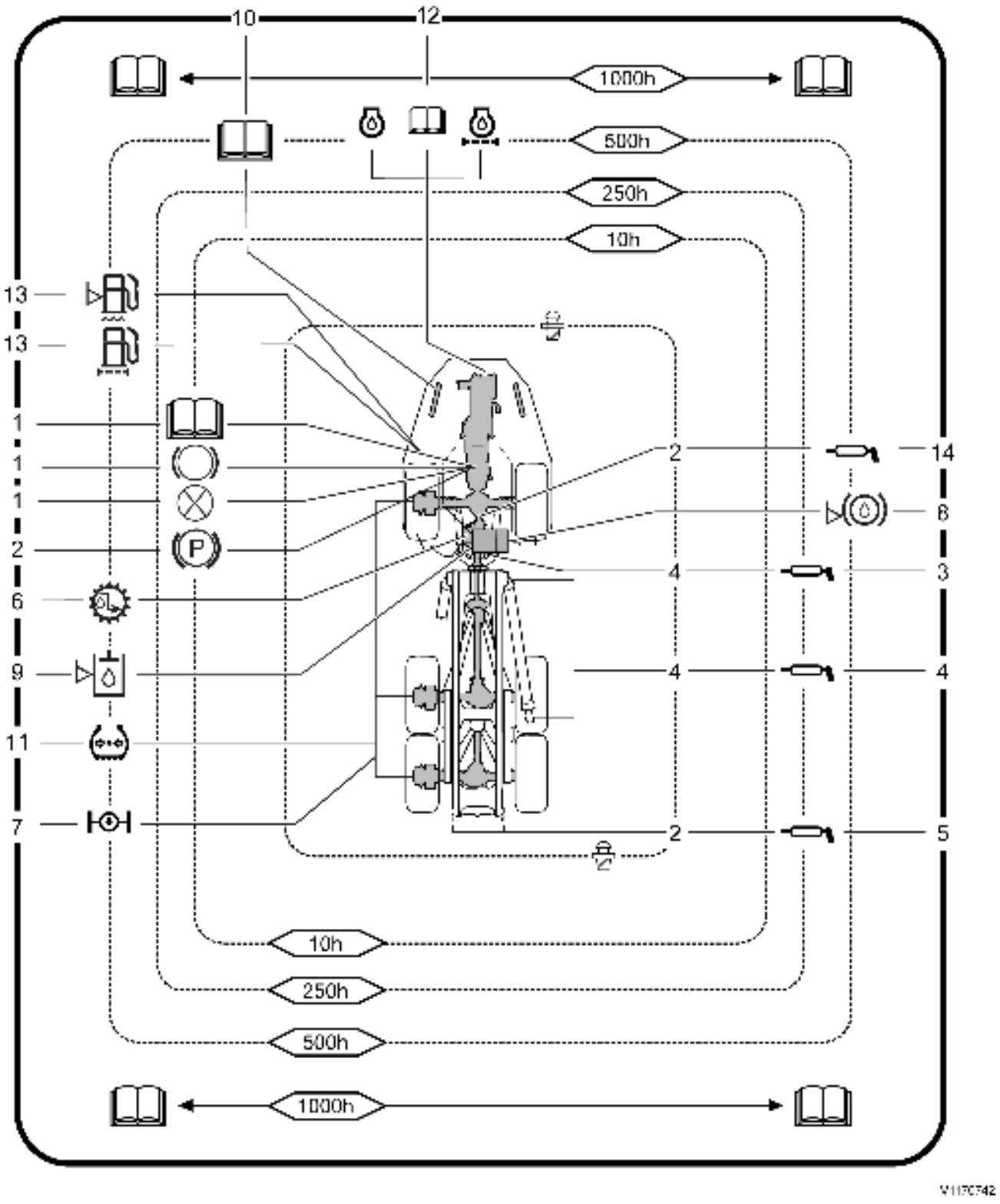
Symbol key

These standard symbols are used in the lubrication and service chart, see the adjacent table.

 V1095878	Read the Operator's Manual	 V1086041	Pressure	 V1086088	Tires
	Lubrication point, grease	 V1170659	Parking brake		Brake
	Oil/fluid	 V1094562	Dropbox	 V1086093	Hydraulic system
 V1095877	Grease nipple		Filter	 V1086094	Engine
 V1086042	Water		Control light	 V1086095	Differential and hub reduction
	Fuel	 V1086085	Level check		



Lubrication and service chart



Periodic maintenance table

The tables below show all the maintenance operation points to be used on the machine.

If the point is on the decal (see figure), the corresponding position is shown in the table. The table also shows a page view of the instructions contained in the manual.

Other maintenance operations should be performed by a qualified service technician.

Maintenance service, first 100 hours

Action	Page	Position in Lubrication and service chart
Frame extension, tightening torque for bolted joints, check (applies to Hauler chassis). First time at 100 hours after installation of the extension, then 2000 hours.		

Maintenance service, first 500 hours

Action	Page	Position in Lubrication and service chart
Drive axles and hubs, oil, change First time at 500 hours, then 4000 hours.(1)		

Maintenance service, first 1000 hours

Action	Page	Position in Lubrication and service chart
Power take-off suction strainer, clean Only at the first 1000 hours.		
Brake system, pressure oil filter, change First time at 1000 hours, then 2000 hours.		
Hydraulic system, return oil filter, change and magnetic rods, clean First time at 1000 hours, then 2000 hours.		

Maintenance service, first 6000 hours

Action	Page	Position in Lubrication and service chart
Engine and drop box attachments, check First time at 6000 hours, then 2000 hours.		
Steering linkage, check First time at 6000 hours, then 2000 hours.		
Steering link bearing, check First time at 6000 hours, then 2000 hours.		

1. Conditions for 4000-hour interval to apply, see table on page *387*.

Maintenance service, every 10 hours

Action	Page	Position in Lubrication and service chart
Check warning decals, external damage, leakage, bulbs/lights, instruments, brake system (service brakes and parking brake), steering system, dump function, and back-up alarm.	*313*	1
Parking brake, checking function	*313*	2
Extra fuel prefilter, draining (optional equipment)(1)	*322*	
Fire suppression system, check (Optional equipment)	*313*	

Maintenance service, every 50 hours

Action	Page	Position in Lubrication and service chart
Perform daily (10 hours) service	See relevant table.	
Oil-bath air cleaner reservoir, oil, check(optional equipment)(2)	*328*	

Maintenance service, every 250 hours

Action	Page	Position in Lubrication and service chart
Perform daily (10 hours) and 50 hour service	See relevant tables.	
Steering joints and steering cylinders, rear bearing, grease	*329* (See pos. 3 and 6)	3
Hoist cylinder bearing, lubrication	*329* (See pos. 2 and 5)	4
Dump joint bearing, lubrication	*329* (See pos. 4)	5
Overhung tailgate, lubrication (optional equipment)	*329* (See pos. 1)	
Oil-bath air cleaner reservoir, oil, change (optional equipment)(3)(4)		
Extra fuel prefilter, change(optional equipment)(5)(6)(7)		
Engine air precleaner, checking and cleaning(optional equipment)(8)	*330*	

1. Only applies to machines with engine alternative E and F.
2. Only applies to machines with engine alternative E and F.
3. Only applies to machines with engine options E and F.
4. Or in case of a signal for a clogged engine air filter.
5. Only applies to machines with engine option E or F.
6. More frequent changes may be necessary depending on the fuel consumption and fuel grade.
7. Must also be changed when the fuel filters are replaced after a clogged filter alarm.
8. Only applies to machines with engine alternative E and F.

Action	Page	Position in Lubrication and service chart
Exhaust-heated dump body, check, cleaning and lubrication (optional equipment)(1)	*331*	
Trailer hitch, lubrication (Optional equipment)	*332*	

Maintenance service, every 500 hours

Action	Page	Position in Lubrication and service chart
Perform daily (10 hours), 50 hour, and 250 hour services	See relevant tables.	
Drop box, leakage, check (visual check)	*343*	6
Drive axles, leakage, check (visual check)	*343*	7
Brake cooling oil level, check	*337*	8
Hydraulic oil level, check	*341*	9
Cooler and condenser, cleaning(2)	*333*	10
Tires, air pressure and wear, check	*339* *341*	11
Engine oil and oil filter (performance filter), change (3)(4)		12
Fuel filter (performance filter), change (5)(6)		13
Parking brake, checking function		
Propeller shaft, drop box — front axle, lubrication	*333*	14
Emergency stop button, test (including any optional equipment)		
Engine- and cab heater, fuel filter, replace(optional equipment)		
Load weighing, cable to load cell, check (Optional equipment)		
Exhaust-heated dump body check, cleaning and lubrication (Optional equipment)(7)		
Trailer hitch, check (Optional equipment)		

Maintenance service, every 1000 hours

Action	Page	Position in Lubrication and service chart
Perform daily (10 hours), 50 hour, 250 hour, and 500 hour services	See relevant tables.	
MATRIS and Tech Tool, read-out		
Software, update, check At least once a year.		

1. Only applies to previous designs.
2. Or if needed.
3. Conditions for 500-hour interval to apply, see table on page *384*.
4. Change engine oil at least once a year, regardless of number of operating hours.
5. Conditions for 500-hour interval to apply, see table on page *398*.
6. If the filter becomes clogged earlier, it must be changed.
7. Only applies to previous designs.

Action	Page	Position in Lubrication and service chart
Engine oil and oil filter (high performance filter), change (1)(2) Only applies to machines with engine alternative M under some conditions.		
Fuel filter (high performance filter), change (3)(4) Only applies to machines with engine option M manufactured from June 2020.		
Drive belts, check		
EATS heat protection, check(5)		
Propeller shafts, clearance, check		
Fuel tank sediment, draining		
Transmission oil filter, change		
Hydraulic oil tank sediment, draining		
Hydraulic oil tank, breather filter, change		
Load body, rubber cushions, clearance, check		
Dump body front side control, check		
Parking brake, check and adjustment		
Cab prefilter, change		
Brake cooling oil tank return oil filter, change and magnetic rods, cleaning		
Steering cylinder bearings, clearance, check		
Suspension cylinder (GHS), rubber bushings, check		
Propeller shaft, drop box — frame joint, lubrication	*345*	
Cab, asbestos filter, replacing(optional equipment)		
Fire suppression system, check (Optional equipment) At least once every 6th month.		

Maintenance service, every 2000 hours

Action	Page	Position in Lubrication and service chart
Perform daily (10 hours), 50 hour, 250 hour, 500 hour, and 1000 hour services	See relevant tables.	
Secondary steering, check	*346*	
Gearbox oil, change (6)		
Transmission breather filter, change		
Engine air cleaner, primary filter, change(7)		

1. Conditions for 1000-hour interval to apply, see table on page *384*.
2. Change engine oil at least once a year, regardless of number of operating hours.
3. Conditions for 1000-hour interval to apply, see table on page *398*.
4. If the filter becomes clogged earlier, it must be changed.
5. Only applies to machines with engine alternative M.
6. Conditions for 2000-hour interval to apply, see table on page *388*.
7. At least once a year or in case of signal for clogged engine air filter.

Action	Page	Position in Lubrication and service chart
Fuel tank, breather filter, change		
Brake system, pressure oil filter, change First time at 1000 hours.		
Engine and drop box attachments, check First time at 6000 hours.		
Steering linkage, check First time at 6000 hours.		
Steering link bearing, check First time at 6000 hours.		
Hydraulic oil tank, return oil filter, change and magnetic rods, cleaning First time at 1000 hours.		
Coolant freezing point, check At least once every year.		
Main cab filter, change		
Dropbox and front axle, breather filter, change		
Drive shafts, breather filters, change		
Service brake vanes, wear, check		
Brake cooling oil tank breather filter, change		
Suspension cylinder (GHS), check		
Frame joint bearings, clearance, check		
Cab door and hatches, hinges, lubrication	*346*	
Oil-bath air cleaner reservoir filter insert, cleaning (optional equipment)(1)(2)		
Frame extension, tightening torque for bolted joints, check (applies to Hauler chassis). First time at 100 hours after installation of the extension.		

Maintenance service, every 4000 hours

Action	Page	Position in Lubrication and service chart
Perform daily (10 hours), 50 hour, 250 hour, 500 hour, 1000 hour, and 2000 hour services	See relevant tables.	
Air dryer filter, change However, at least every other year.		
AdBlue®/DEF tank ventilation filter, change (applies to machines manufactured from and during September 2020)(3)		
Engine valves, adjustment		
Drop box oil, change (4)		

1. Or in case of signal for clogged engine air filter.
2. Only applies to machines with engine option E and F.
3. Only applies to machines with engine alternative M.
4. Conditions for 4000-hour interval to apply, see table on page *387*.

Action	Page	Position in Lubrication and service chart
Drive axles and hubs, oil, change[1] First time at 500 hours.		
Brake cooling oil, changing[2]		
Hydraulic oil, change [3]		
Suspension cylinder (ghs), oil, change		
Automatic greasing system filter, change (optional equipment)		

Maintenance service, every 4500 hours

Action	Page	Position in Lubrication and service chart
Perform daily (10 hours), 50 hour, 250 hour, 500 hour, 1000 hour, 2000 hour, and 4000 hour services	See relevant tables.	
Diesel particulate filter, check and cleaning[4][5]		

Maintenance service, every 6000 hours

Action	Page	Position in Lubrication and service chart
Perform daily (10 hours), 50 hour, 250 hour, 500 hour, 1000 hour, 2000 hour, 4000 hour, and 4500 hour services	See relevant tables.	
Coolant, changing However, at least every 4th year.		
Engine air cleaner, secondary filter, change However, every 3rd primary filter or at least every other year.		
AdBlue®/DEF tank ventilation filter, change (applies to machines manufactured prior to September 2020)[6] However, at least every 4th year.		
AdBlue®/DEF, pump unit, filter, change[7][8]		
EGR Venturi tube, cleaning[9]		

1. Conditions for 4000-hour interval to apply, see table on page *387*.
2. Conditions for 4000-hour interval to apply, see table on page *386*.
3. Conditions for 4000-hour interval to apply, see table on page *388*.
4. Cleaning is done using an exchange system.
5. Only applies to machines with engine alternative M.
6. Only applies to machines with engine alternative L and M.
7. Or in case of warning for high back-pressure.
8. Only applies to machines with engine alternative L.
9. Only applies to machines with engine alternative M.

Maintenance service, every 12000 hours

Action	Page	Position in Lubrication and service chart
Perform daily (10 hours), 50 hour, 250 hour, 500 hour, 1000 hour, 2000 hour, 4000 hour, 4500 hour, and 6000 hour services	See relevant tables.	
Drop box fast drainage valve, change		

Maintenance service, every 10 hours

Test-run and check

Performed daily.

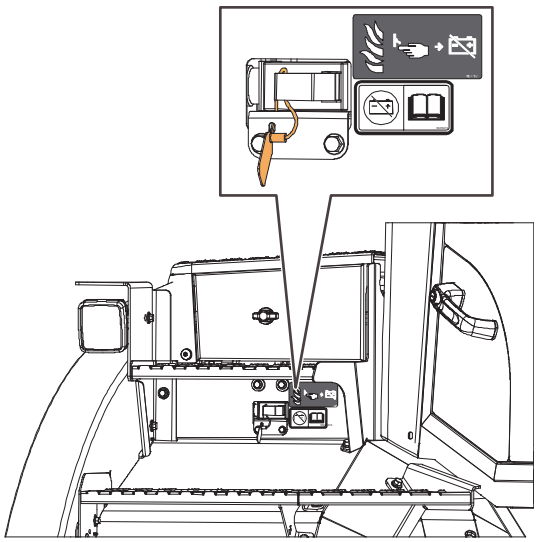
NOTE!
In case of malfunction, take the machine out of operation immediately and contact an authorized workshop.

Warning decals

1 Check that all warning decals are in place, legible and undamaged. Position, see page *32*.

Emergency switch sealing

1 Check that the emergency switch is sealed. Replace with a new one if the seal is missing.


V1231173

Emergency switch, sealing

External check

1 Check that the machine does not have any external damage or defective/loose parts. Especially tyres, hoses, and pipes.

2 Check that the wheels are not blocked.

3 Check that there are no visible leaks.

4 Clean/scrape windows and rear-view mirrors.

5 Check that the work lights and headlights are clean and intact.

6 Check that the back-up camera (optional equipment) is clean and intact.

7 Check that the steering joint lock is disconnected.

8 Check that engine hood, underbody skid plates, and protective plates are closed.

9 Check that tailgate and lock mechanism are not worn or damaged (optional equipment).

10 Check all reflectors.

External check, On-Board Weighing (optional equipment)

1 Check that the cable/hose pack is routed correctly, so that there is no risk of chafing. See also page *315*.

Lights, instruments, and controls

1 Adjust the operator's seat, see Operator's seat and steering wheel, see page *154*.

2 Turn the ignition to position 1 (operating position).

3 Check that all control lights turn on and that the gauges indicate readings.

4 Check that there is enough fuel and (if applicable) AdBlue®/DEF in the tanks.

5 Check function of the work lights and headlights.

6 Check that the seatbelt can be fastened and is not damaged.

7 Fasten the seatbelt.

8 Check that there are no persons near the machine, see page *175*.

9 Turn the ignition to position 2 (start position).

10 Check that all control and warning lights are off. When the parking brake is applied, the warning light for parking brake will be on.

11 Check that the horn works.

Brake system (service brake)

Select one of the alternatives below:

Stationary brake test (service brake)

1 By performing a stationary brake test, the operator can check the condition of the brakes, see page *323*.

2 Release the parking brake and move off carefully and test-brake. The brakes should be applied smoothly and not generate any noise.

Manual brake test (service brake)

1 Let the engine idle until the pressure has built up.

2 Check that the accumulated brake pressure in both circuits is normal.

3 Release the parking brake and press down the brake pedal all the way. Check that the machine does not activate an alarm.

4 Move off carefully and test-brake. The brakes should be applied smoothly and not generate any noise.

Manual parking brake test

NOTE!
The gear shifts to neutral position after a few seconds if the brake pedal or accelerator pedal is not activated.

1 **NOTE!**
Make sure that no persons are near the machine since it may start to roll.

2 Press down the brake pedal, so that the machine remains at a standstill.

3 Release the parking brake.

4 Move the gear selector to position “1” and feel that the machine engages the gear.

5 Apply the parking brake.

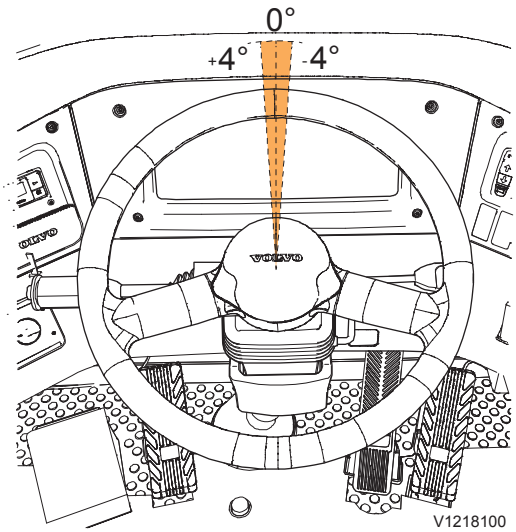
NOTE!
If the machine moves before 1,000 rpm (16.7 r/s), stop the test immediately.

NOTE!
To avoid unnecessary wear of the brake pads, stop the test when the specified rpm has been reached.

6 Let up the brake pedal and gradually press down the accelerator pedal. Check that the parking brake can hold the machine at a standstill with throttle application up to 1,000 rpm (16.7 r/s).

7 After finished test, move the gear selector to neutral position.

8 Check that there are no warnings or error messages.



Normal steering play

Retarder

1 Operate at a speed above 18 km/h (11.2 mph).

2 Let up the accelerator pedal and press down the retarder pedal.

3 The machine should slow down.

Steering system

1 Turn to steering lock both to the right and left.

2 Check that the steering is free from abnormal play and noise. Normal steering play/lock may be max ± 4°, i.e. ± 14 mm (0.551 in) from the outside of the steering wheel, before the machine starts to operate.

Dump function

1 Run up the load body. Check that it comes up normally.

2 Check that the stroke-end damping works.

3 Lower the load body. Check that it comes down normally.

4 Check that the function MAX. dump height works, if it is activated.

Back-up alarm/Back-up camera (optional equipment)

1 Move the gear selector to reverse position.

2 Check that the back-up (reverse) alarm works.

3 Check that the back-up camera (optional equipment) works, and that it is aimed and adjusted correctly.

4 Turn off the engine.

Fire Suppression System (Optional equipment)

NOTE!
The plastic cover should not be raised.

1 Check the system by pressing in the test button on the control panel for the Fire Suppression System.

2 The siren and strobe light should be activated for approx. two seconds. Check that the control panel does not give any error indication.

Actions after operating

Fill the fuel tank, as this will counteract the formation of condensation water.

Cleaning machine

The machine should be cleaned regularly with conventional car care products in order to eliminate the risk of damage to the paint finish and other surfaces on the machine.

Preferably, the machine should be cleaned at the end of the work shift before it is parked. Loose material is removed with compressed air, for example.

NOTE!
Perform daily cleaning of the areas on the machine where dust, chips, and similar may collect in order to minimize the risk of fire, see also pages *318* and *319*.

Cleaning with compressed air

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

WARNING

Risk of serious injury.
Compressed air, water jets or steam may cause damage to unprotected skin and eyes.
Always wear personal protective gloves, goggles and clothing when using compressed air, water jets or steam.

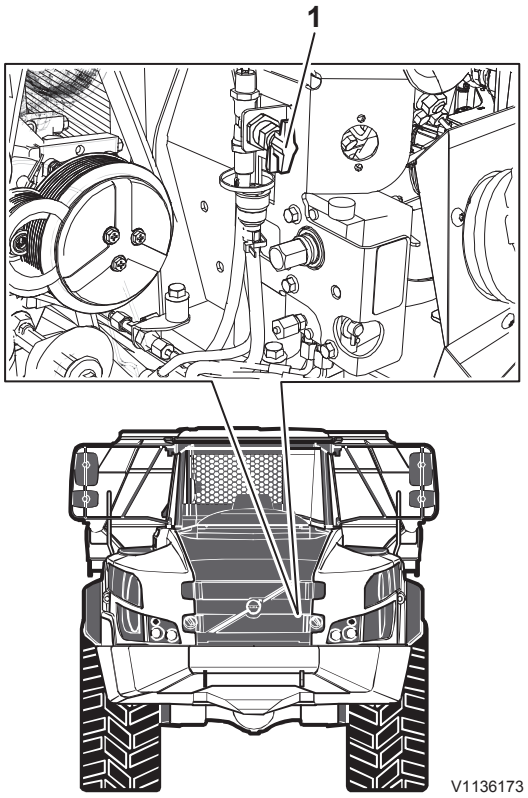
1 Place the machine in a place intended for cleaning.

2 Blow the machine to clean it, starting with the highest areas.

3 Finish at the bottom on top of the fuel tank and the areas adjacent to the fuel tank.

NOTE!
For more detailed instructions on important areas, see pages *318 - 322*.

When cleaning with compressed air, it is most convenient to use the compressed air connection by the hood opener.



1 Compressed air connection

Cleaning with water

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

WARNING

Risk of serious injury.
Compressed air, water jets or steam may cause damage to unprotected skin and eyes.
Always wear personal protective gloves, goggles and clothing when using compressed air, water jets or steam.

NOTICE

Avoid using strong cleaning agents or chemicals in order to minimise the risk of damage to the paint finish.

High-pressure washer

If a high-pressure washer is used, ensure the nozzle is at least 20 – 30 cm (8 – 12 in) from the machine. Too high push and too short distance may cause damage.

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.

NOTICE

If you are using a high-pressure wash, take care so that the decals do not loosen.

1 Place the machine in a place intended for cleaning.

2 Rinse the machine with water.

NOTE!
The water temperature may not exceed 60 °C (140 °F).

3 Wash the machine using a soft sponge and an appropriate car care product. Follow the product instructions.

4 Rinse the entire machine with just water.

After cleaning

1 Check if any paint finish areas are damaged. If needed, touch-up the paint finish in a professional manner.

2 Check and remedy any leaks.

3 Close all covers and hoods.

4 Always lubricate the machine after washing. See pages *329*, *333*, *345* and *346*.

Cleaning engine compartment

For general recommendations when cleaning the machine, see page *315*.

Machines working in dusty, fire-hazardous conditions such as the lumber industry, woodchip handling, and handling of other flammable materials, require daily checking and cleaning of the engine compartment and adjacent areas.

Areas that need to be checked and cleaned

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

WARNING

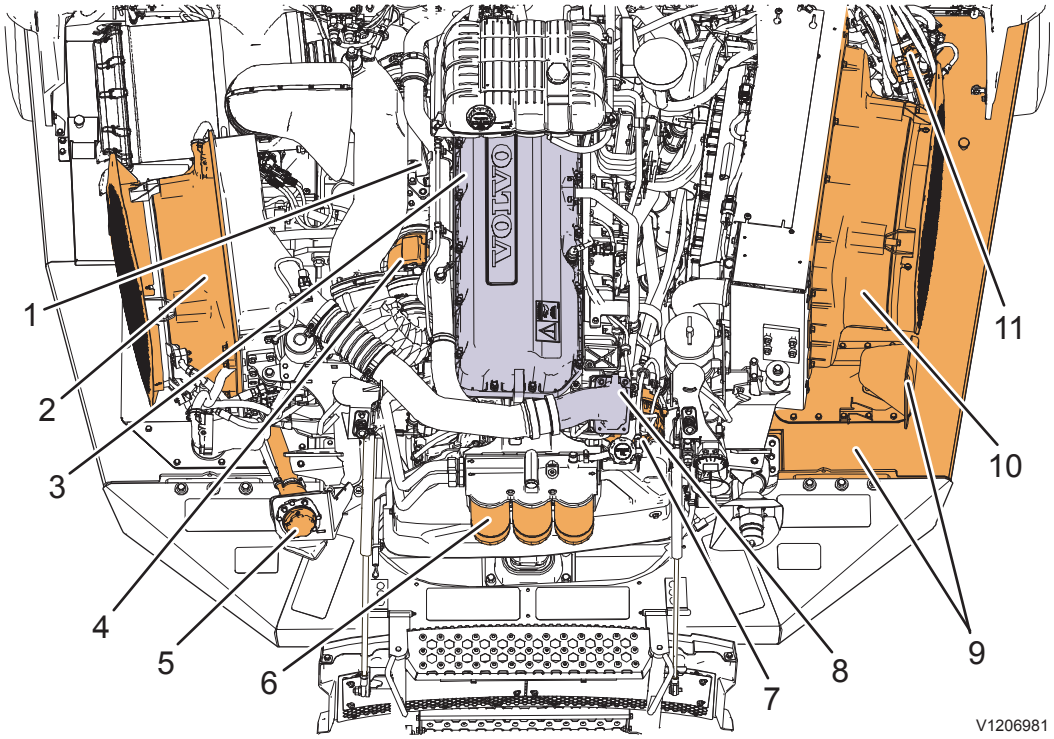
Risk of serious injury.
Compressed air, water jets or steam may cause damage to unprotected skin and eyes.
Always wear personal protective gloves, goggles and clothing when using compressed air, water jets or steam.

WARNING

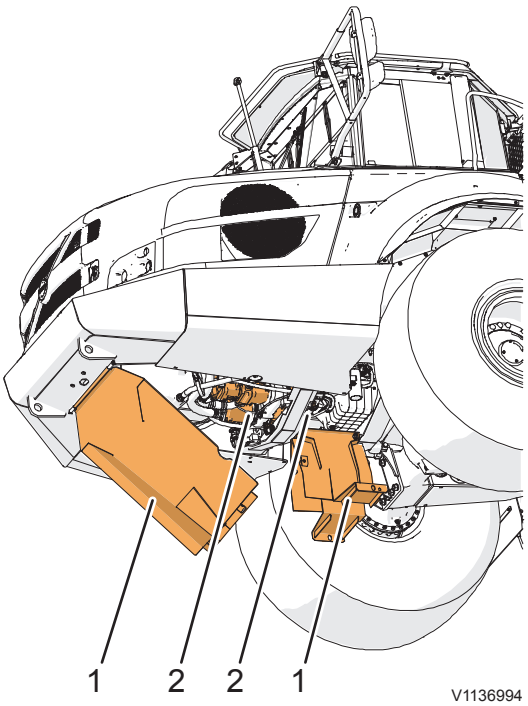
Risk of burns!
Hot liquids and machine parts can cause burns.
Allow the machine to cool before beginning any service.

When using a high-pressure washer; work extremely carefully when cleaning:

- starter motor
- turbo
- alternator
- radiator
- breather filter for the fuel tank and transmission
- connectors in general
- sound absorbents



1	Starter motor	7	Alternator
2	Fan shroud (intercooler)	8	Preheating coil
3	Exhaust manifold (hidden in illustration)	9	Fuel tank with fuel fill point
4	Turbocharger	10	Fan shroud (radiator)
5	AdBlue®/DEF fill point (only applies to machines with engine alternative L and M)	11	Fuel filter
6	Oil filter		



1 Protective plate
2 Hydraulic pump

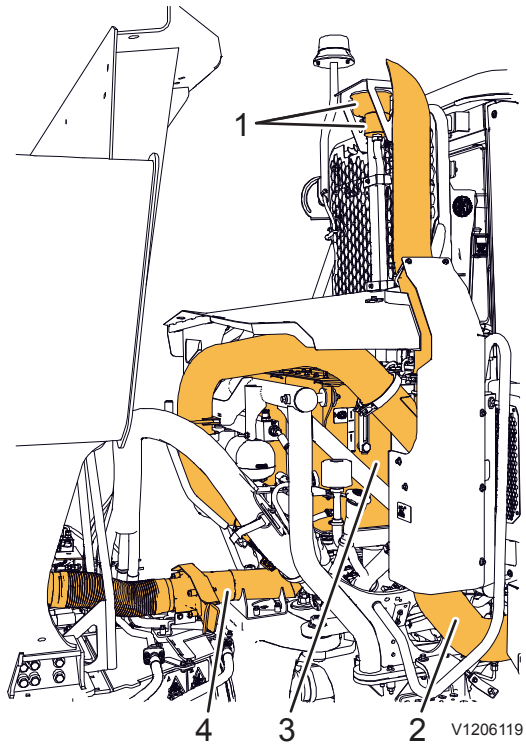
Areas to check and clean:

- Area/space above the right fender, air cleaner, charge-air cooler, turbo, as well as the exhaust pipe between the turbo and muffler.
- Air intake for engine.
- Top of fuel tank and area around the fuel fill point.
- Area around AdBlue®/DEF fill point (only applies to machines with engine alternative L and M).
- Preheater, alternator and starter motor.
- Inside radiator casing as well as cooler and condenser, see page *333*.
- Oil filter and fuel filter.
- In underbody skid plates under the machine and around hydraulic pumps.

Cleaning behind the cab

For general recommendations when cleaning the machine, see page *315*.

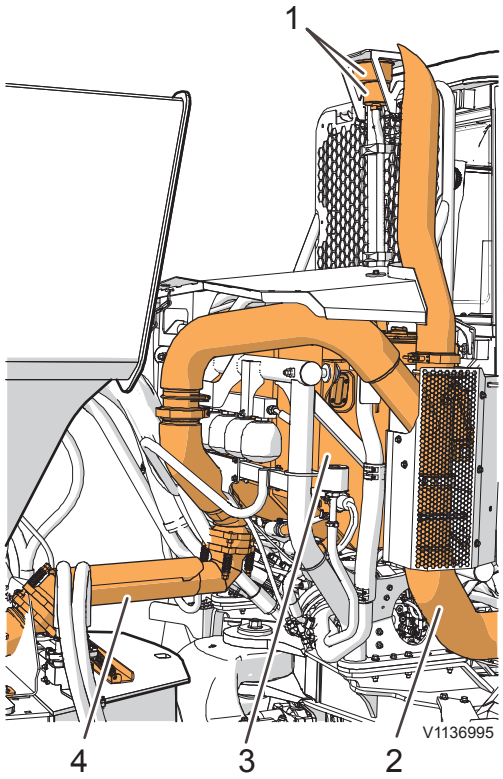
Machines working in dusty, fire-hazardous conditions such as the lumber industry, woodchip handling, and handling of other flammable materials, require daily checking and cleaning of areas that get hot.



New exhaust-heated dumper body design

1 Breather filter for hydraulic oil tank and breather filter for brake cooling oil tank
2 Exhaust pipe
3 Hydraulic oil tank
4 Exhaust pipe (exhaust-heated dump body)

Areas that need to be checked and cleaned



Previous exhaust-heated dumper body design

1 Breather filter for hydraulic oil tank and breather filter for brake cooling oil tank
2 Exhaust pipe
3 Hydraulic oil tank
4 Exhaust pipe (exhaust-heated dump body)

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

WARNING

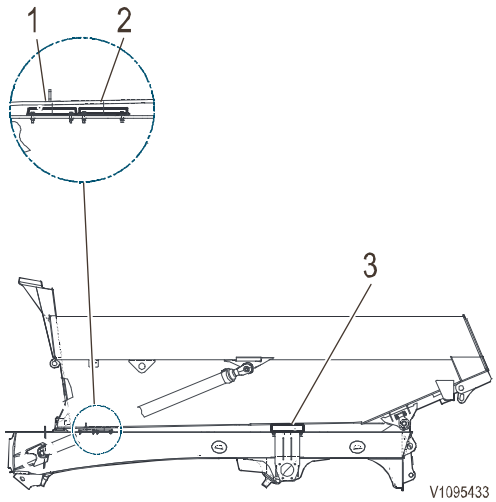
Risk of burns!
Hot liquids and machine parts can cause burns.
Allow the machine to cool before beginning any service.

Areas to check and clean:

- Breather filter for hydraulic oil tank and breather filter for brake cooling oil tank
- Exhaust pipe
- Hydraulic oil tank
- Exhaust pipe (exhaust-heated dump body)

Cleaning under the dump body

For general recommendations when cleaning the machine, see page *315*.



1 Front rubber cushion
2 Front rubber cushion
3 Rear rubber cushion

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

It is important that the area around and under the load body's rubber pads is kept clean. Dirt that collects there creates a considerably higher risk of machine damage, especially to the frame.

If the dump body is raised when cleaning:

WARNING

Risk of crushing.
An unlocked raised dump body could fall down. Personnel standing under a falling dump body could be seriously injured, including death.
Always lock the dump body before entering under it.

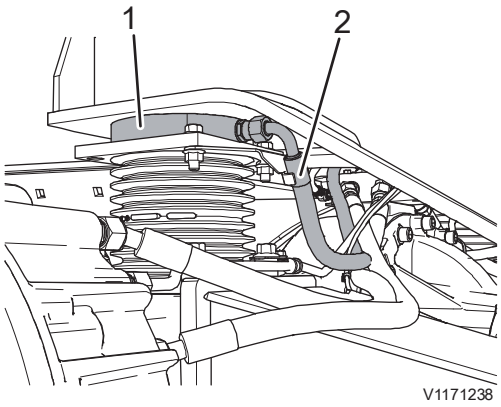
If the dump body is raised when cleaning, remember to use the body lock, see page *279*.

Cleaning of load cell

For general recommendations when cleaning the machine, see page *315*.

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.



Load weighing
1 Load cell
2 Cable

NOTE!
Machine with load weighing (optional equipment) shall be cleaned by the load cells and their cables with attaching points. This facilitates inspection, as well as preventing chafing of the cables.

The equipment for on-board weighing (load weighing) is located on the trailer unit inside of the left front wheel and the right rear wheel.

If the dump body is raised when cleaning:

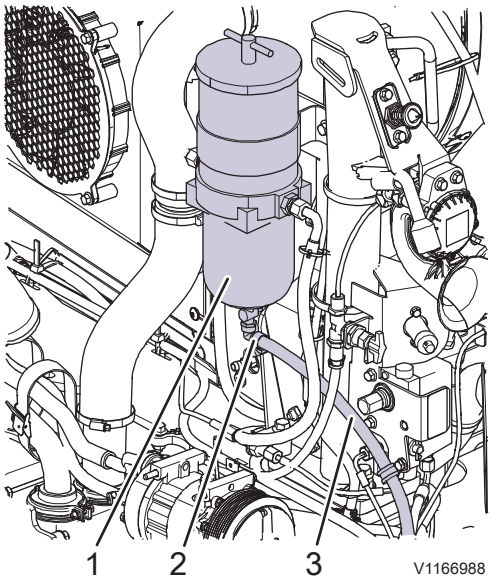
WARNING

Risk of crushing.
An unlocked raised dump body could fall down. Personnel standing under a falling dump body could be seriously injured, including death.
Always lock the dump body before entering under it.

If the dump body is raised when cleaning, remember to use the body lock, see page *279*.

Fuel prefilter, draining

(Optional equipment)



Extra fuel prefilter
1 Water bowl
2 Valve
3 Drain hose

Only applies to machines with engine alternative F.

Drain the fuel prefilter daily. Drain also when draining the water trap after an alarm for water in fuel, see page *352*.

1 Place machine in the service position. Refer to page *270*.
2 Empty the water bowl of water and any other impurities through the drain hose by turning the valve in the bottom of the filter. Collect the fluid in a container.
3 Close the valve when clean fuel runs out.
4 Restore the machine from service position.

Stationary brake test

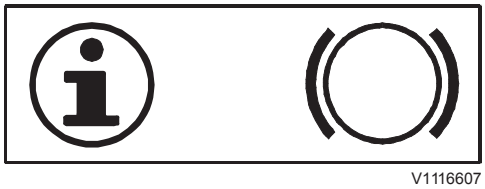
By performing a stationary brake test, the operator can check the condition of the foot brakes.
Brakes tests can be scheduled and the information display unit logs information about completed brake tests.

During the brake test the machine should be:
- parked on a hard surface that is level, smooth, and has no grade
- unloaded
- warmed up
- make sure that the machine stands straight
- make sure that the area around the machine is free from obstacles and personnel

NOTE!
Press the ESC-key on the information display unit to cancel the brake test at any time.

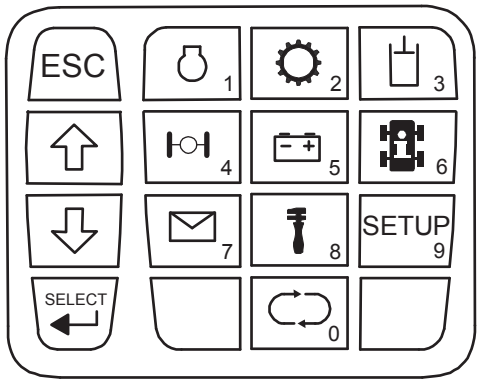
Scheduled brake test

The brake tests can be scheduled if this is preprogrammed.
If the brake test is scheduled, a reminder is shown in the information display unit when the operator should start the brake test.

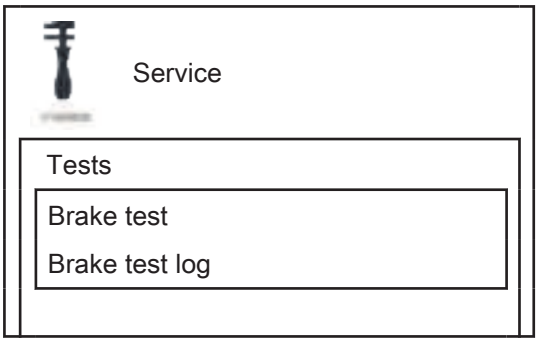


Reminder: Time for brake test

Reminder is shown:
- after a certain number of operating hours
  or
- at a certain time every day



8 Service menu

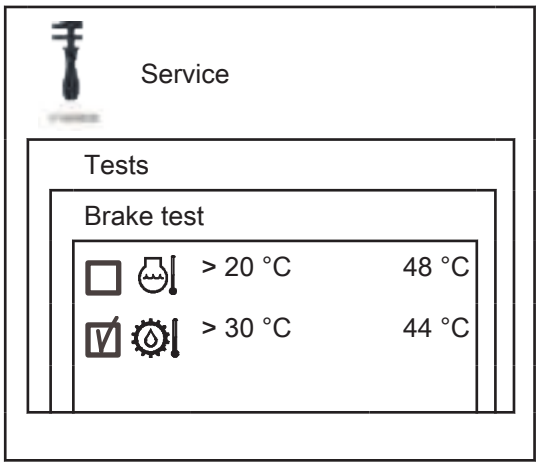


Start of brake test

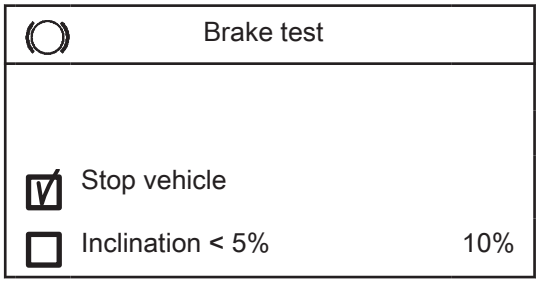
Start the brake test either by pressing in the SELECT-button on the information display unit when the reminder is shown or enter via the service menu, select Tests and thereafter Brake test. Press the SELECT-key.

Start conditions for brake test

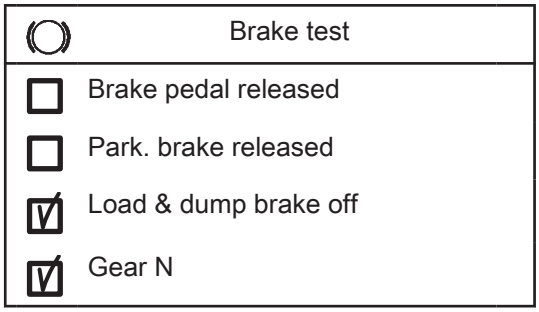
Certain conditions must be fulfilled in order for the brake test to start, see below.
If any of these is not fulfilled, this is shown on the information display unit with an empty check-box in front of the condition. The brake test is cancelled if any of the conditions becomes invalid when the test is in progress. The information display unit shows the condition that no longer is fulfilled. The test continues when the conditions are fulfilled.



1 **Temperature:** Engine temperature should be above 20 °C (68 °F) and temperature in transmission should be above 30 °C (86 °F). Current temperature is shown to the right.



2 **Position:** The machine must be at a standstill and the machine's longitudinal angle (inclination) may be max. 5%. Current inclination is shown to the right.



3 **Machine status:** Brake pedal, parking brake, load and dump brake shall not be applied and gear position N shall be selected.

If there is a problem with or malfunction of any function that affects the brake test, the brake test is cancelled and the information display unit shows an amber alarm figure with the text Brake test denied.

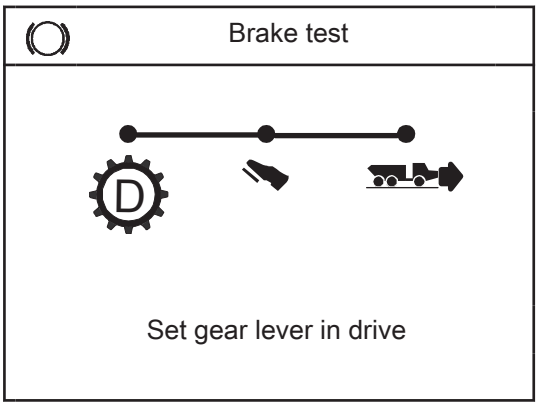


Alarm figure: Brake test denied

Brake test

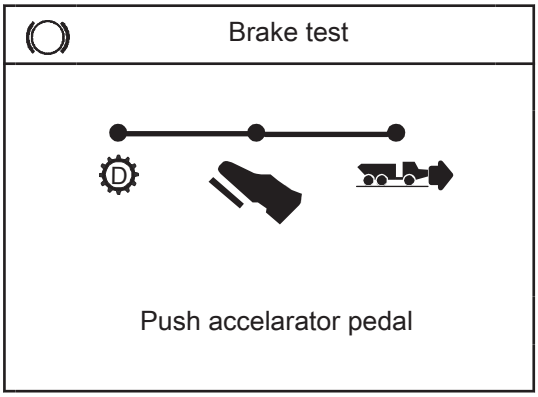
The brake test starts automatically when all conditions are fulfilled.

1 All differential locks are applied automatically.

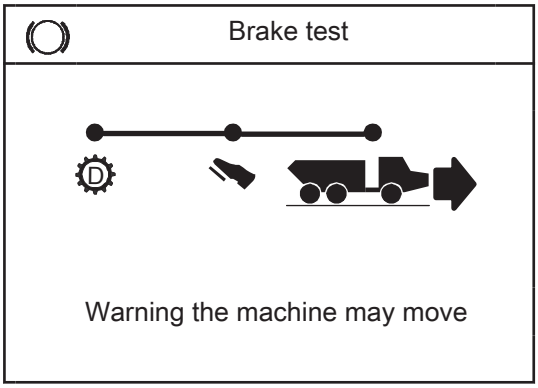


2 The operator is instructed to move the gear selector to position D.

3 1st gear is engaged automatically.

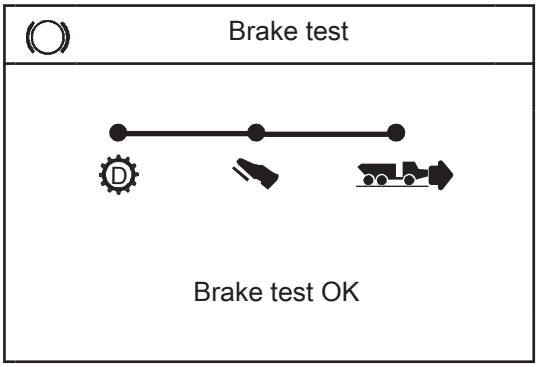


4 The operator is instructed to press down the accelerator pedal all the way.



5 The operator is warned that the machine may move forward.

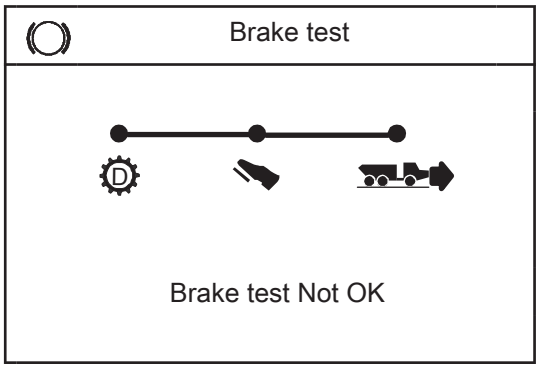
6 The engine rpm increases until the machine moves or until max. engine rpm for the brake test has been reached. When any of this occurs, throttle application is turned off automatically.



7 **Approved brake test:**
The brake test is approved if the machine remains stationary and max. rpm is reached. The information display unit shows the text Brake test OK.
The machine may move slightly during the brake test. This does not affect the results of the brake test.

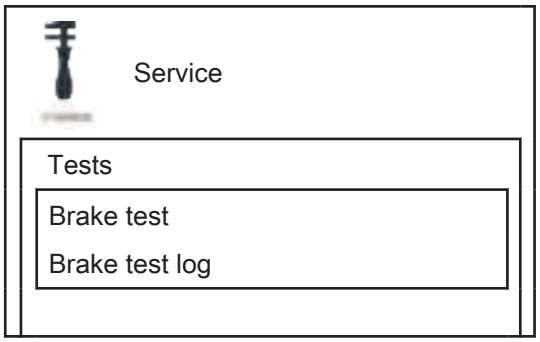
Failed brake test (not approved):
The brake test is failed if the machine moves before max. engine rpm has been reached. The information display unit shows the text Brake test Not OK.
If the brake test is not approved, park the machine and contact a qualified workshop.

After completed or cancelled brake test, the parking brake is applied and gear position is shifted to N.



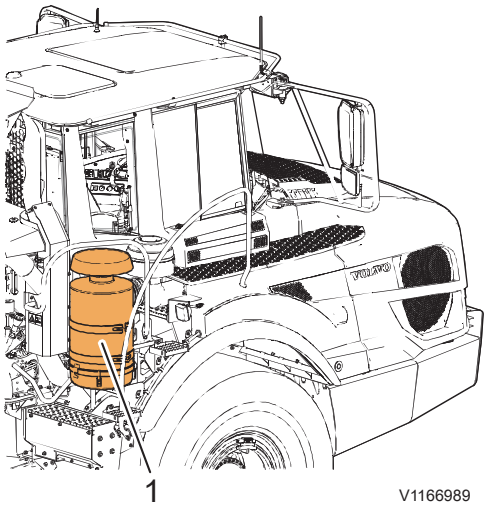
To enable operation of the machine after the brake test, first the operator has to release the parking brake and then move the gear selector first to position N and then to any drive position.

Logging of brake test



The information display unit logs machine time, date, time (clock), as well as test results for the four latest brake tests. Press the service menu button and then select Tests and Brake test log to see the logged information.

Maintenance service, every 50 hours



1 Oil-bath air cleaner

Oil bath air cleaner, checking

(Additional options)

Only applies to machines with engine alternative F.

The cleaning efficiency of the oil-bath cleaner is between 90 and 95%.

Oil-bath air cleaner, checking

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

Before working on the machine, see page *272*.

1 Place the machine in service position, see page *270*.

2 Wait 5 minutes so that the oil runs down into the oil reservoir.

3 Loosen the oil reservoir with the lower filter insert and remove it.

4 Check the oil quality. Change the oil if it contains sludge and is thick. Contact an authorized workshop.

5 Check the underside of the filter insert. If there are sludge deposits, change the oil and reservoir, and clean the lower filter insert. Contact an authorized workshop.

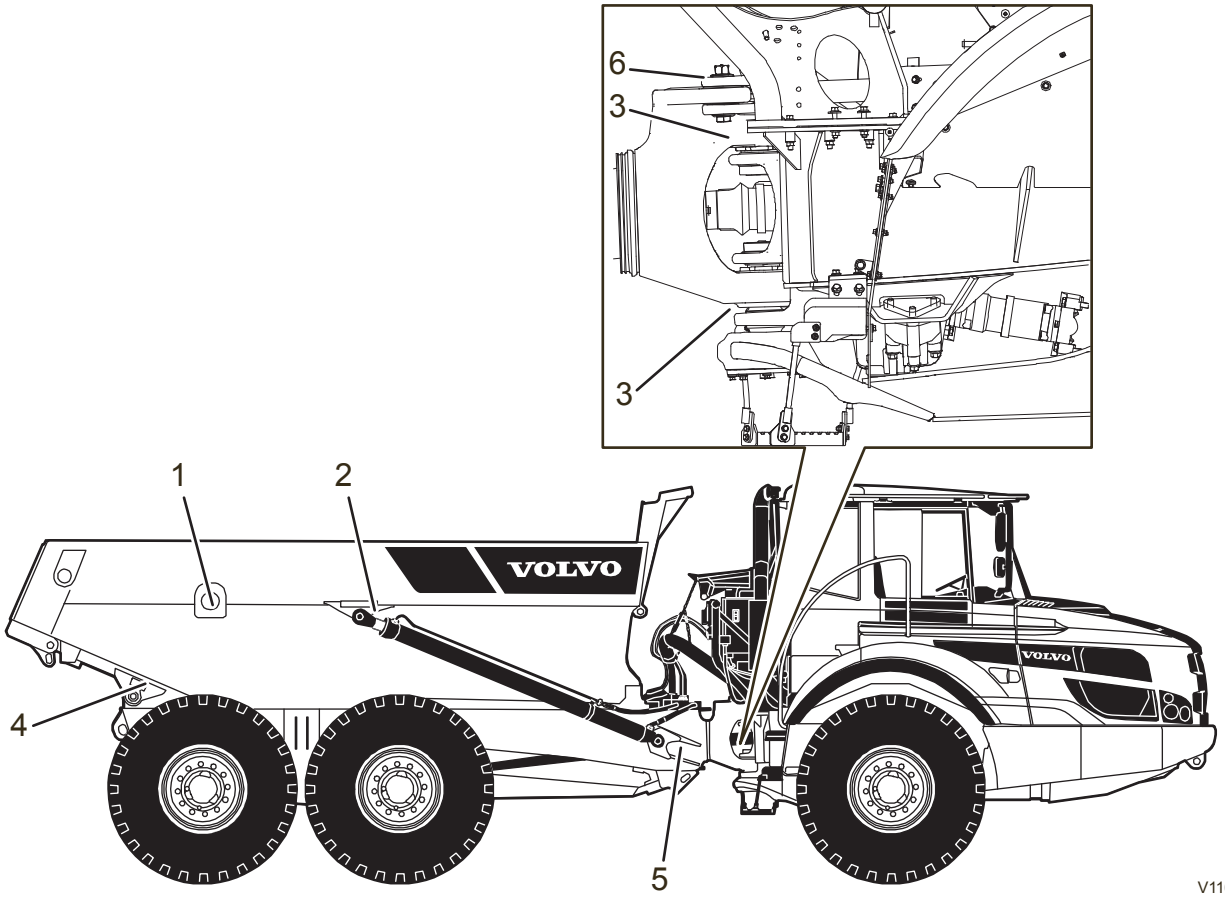
6 Reinstall the oil reservoir.

7 Restore the machine from service position.

Maintenance service, every 250 hours

Lubrication, every 250 hours

Grease points every 250 hours



Pos.	Grease point
1	Overhung tailgate (optional equipment)
2	Hoist cylinder bearing, upper
3	Steering joint
4	Dump joint bearing
5	Hoist cylinder bearing, lower
6	Steering cylinder, rear bearing
	Previous exhaust gas-heated dumper body design (optional equipment), see page *331*
	Trailer hitch (optional equipment), see page *332*.



Bearings, greasing

The service life of bushings and pivot pins can be extended considerably, if the machine is greased regularly and in a correct way.

The greasing of bearings has two main purposes:
- Add grease to the bearing to reduce friction between pin and bushing.
- To replace old grease that may contain dirt particles. The grease in the space inside the outer seal collects dirt and prevents dirt and also water from penetrating into the bearing.

Wipe off grease nipples and grease gun before greasing, so that dirt and sand is not introduced through the grease nipples.

Engine, air pre-cleaner, check/clean

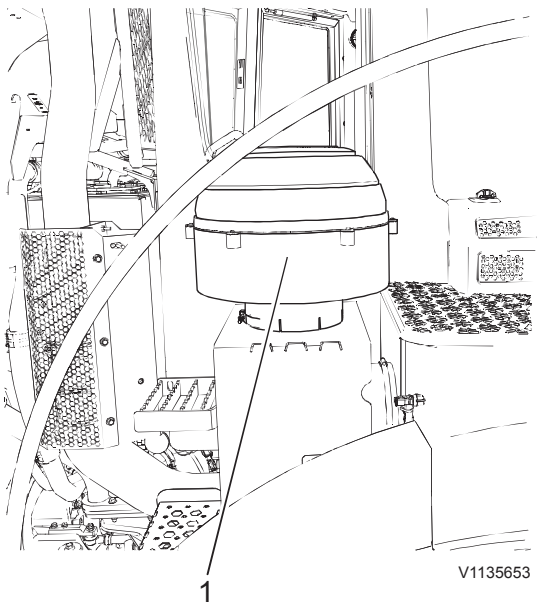
Valid for serial numbers		
Model version	**Serial number start**	**Serial number stop**
A25G	Braås 322001	Braås 329999
A25G	Braås 332001	Braås 339999
A25G	Braås 342001	Braås 349999
A25G	Pederneiras 722001	Pederneiras 729999
A25G	Pederneiras 732001	Pederneiras 739999
A25G	Pederneiras 742001	Pederneiras 749999
A30G	Braås 322001	Braås 329999
A30G	Braås 332001	Braås 339999
A30G	Braås 342001	Braås 349999
A30G	Pederneiras 722001	Pederneiras 729999
A30G	Pederneiras 732001	Pederneiras 739999
A30G	Pederneiras 742001	Pederneiras 749999

(Optional equipment)

Only applies to machines with engine alternative E and F.

If the engine air cleaner's primary filter needs to be cleaned or changed more often than every 1000 hours due to the machine's operating conditions, it is an indication that the air precleaner also needs to be cleaned more often.

The air precleaner is located on the right side on the back of the cab, on the end of the air intake pipe. It separates coarser impurities and returns them immediately to the ambient air.



1 Air precleaner

⚠ WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

⚠ WARNING

Risk of serious injury.
Compressed air, water jets or steam may cause damage to unprotected skin and eyes.
Always wear personal protective gloves, goggles and clothing when using compressed air, water jets or steam.

1 Place machine in the service position. Refer to page *270*.

2 Disconnect the air precleaner from the air cleaner’s air inlet pipe.

⚠ WARNING

Risk of cutting
The arresting plates inside the pre-cleaner could have sharp edges and the rotor could cause cutting or piercing injuries.
Use personal protective equipment. Do not use compressed air on the rotor.

3 Turn over the rotor, insert your hand, and check that the rotor spins freely. If the rotor does not spin, contact an authorised workshop.

4 Blow clean with compressed air.

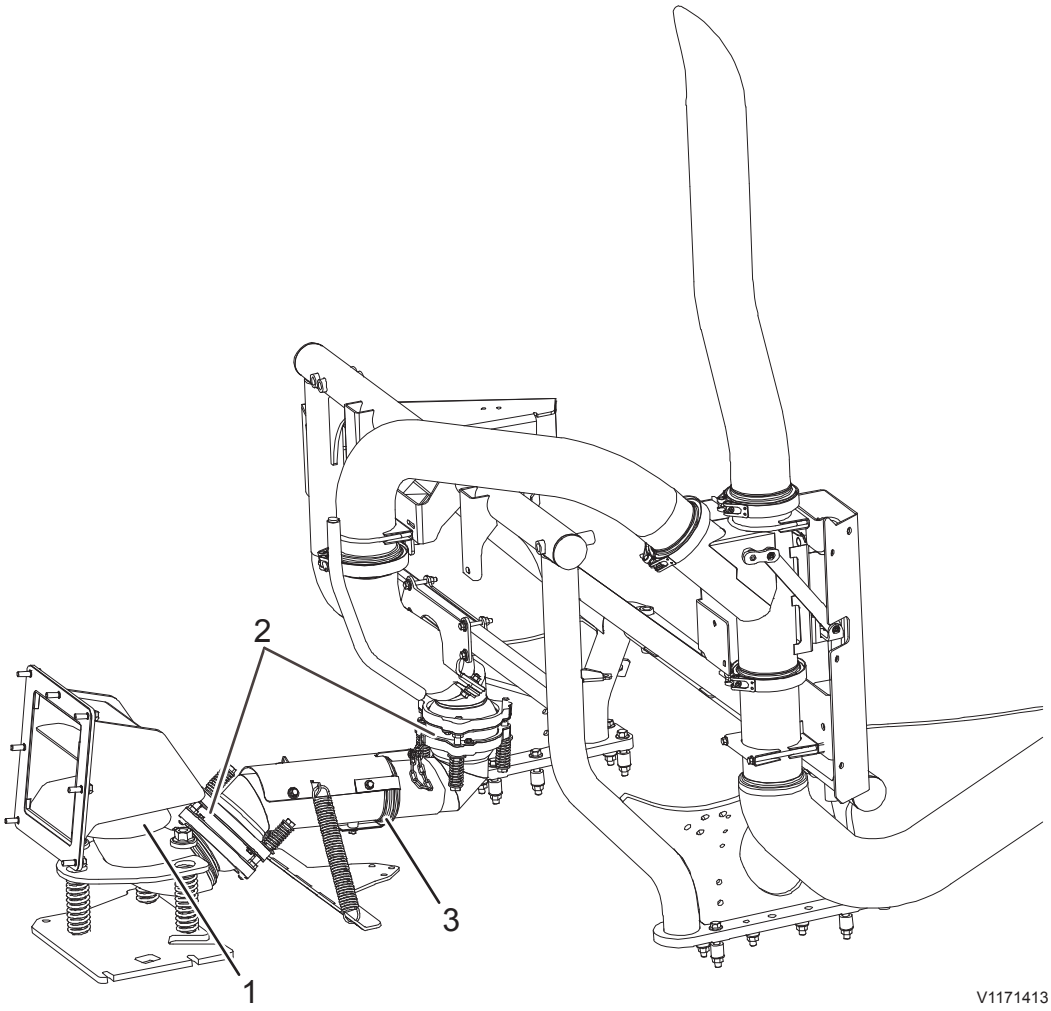
5 Reinstall the air precleaner.

6 Restore the machine from service position.

Exhaust heated load body, checking, cleaning and greasing

(Additional options)

Only applies to previous exhaust-heated dumper body design.



Previous exhaust-heated dumper body design
1 Connection for dump body's inlet sleeve
2 Balls to be cleaned and lubricated

3 Telescopic pipe to be cleaned and lubricated

1 Place machine in the service position. Refer to page *270*. Do not secure the load body, connect the load body lock, or block the front wheels.

2 Start the machine and elevate the load body.

3 Lower the load body and check that the dump body's inlet sleeve connects centred over the exhaust pipe. If needed, contact a qualified workshop.

4 Turn the steering wheel to the right.

5 Clean and lubricate the pipe, that runs into the telescopic pipe, with lubricant.

6 Turn back the steering wheel and turn off the engine.

7 Clean and lubricate the balls with lubricant.

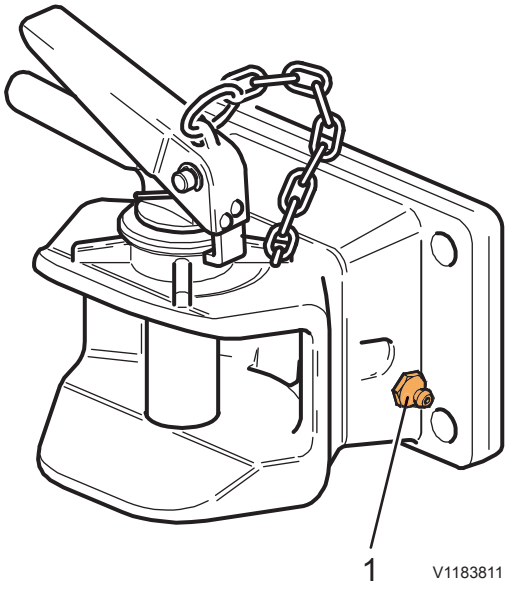
8 Restore the machine from service position.

For information on type of lubricant, see page *389*.

Trailer hitch

(Additional options)

1 Grease through the grease nipple.

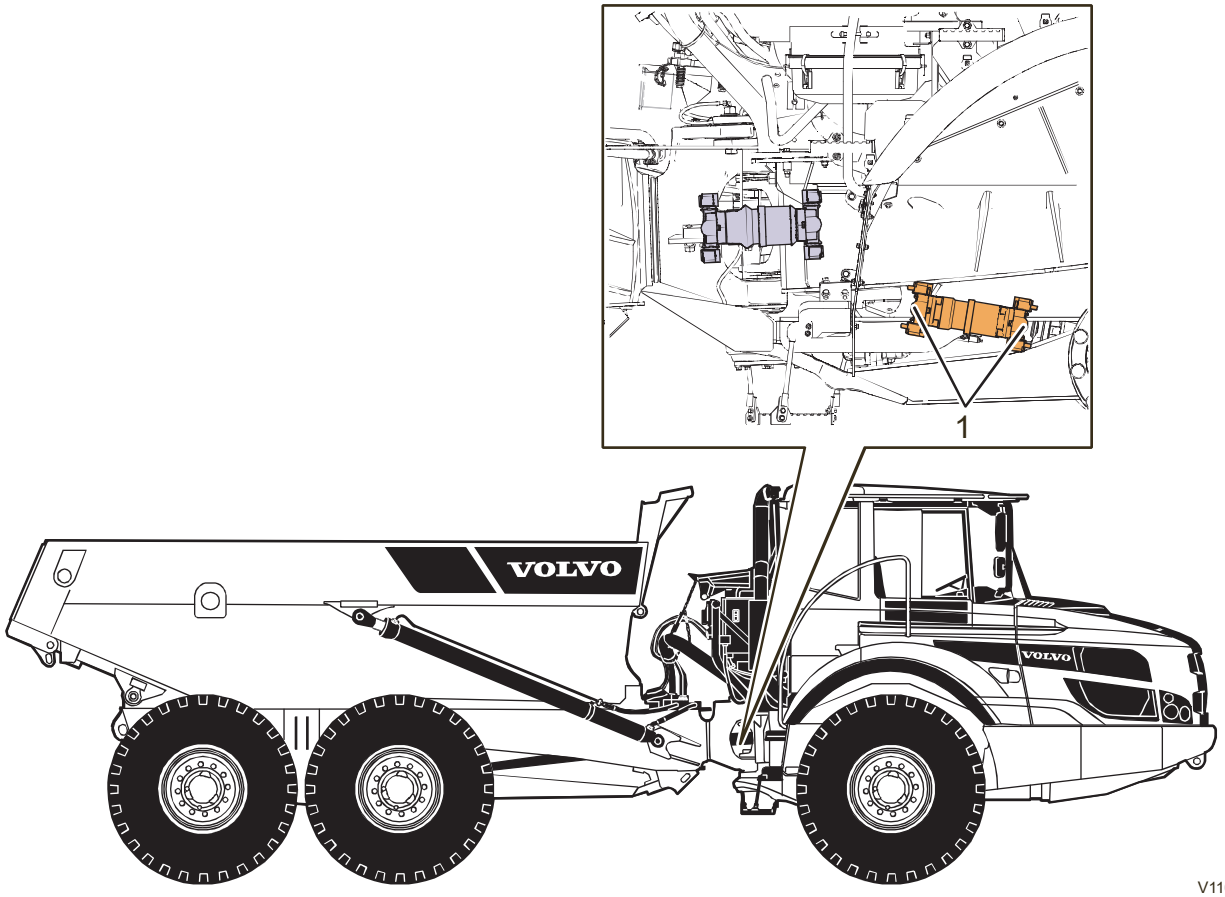


1 Grease nipple

Maintenance service, every 500 hours

Lubrication, every 500 hours

Grease points every 500 hours



V1166991

Pos.	Grease point
1	Propeller shaft, dropbox — front axle

Cooler and condenser, cleaning

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

WARNING

Risk of crushing and cutting.
Rotating parts could cause serious injury.
Shut down the machine before cleaning the machine or any component of the machine.

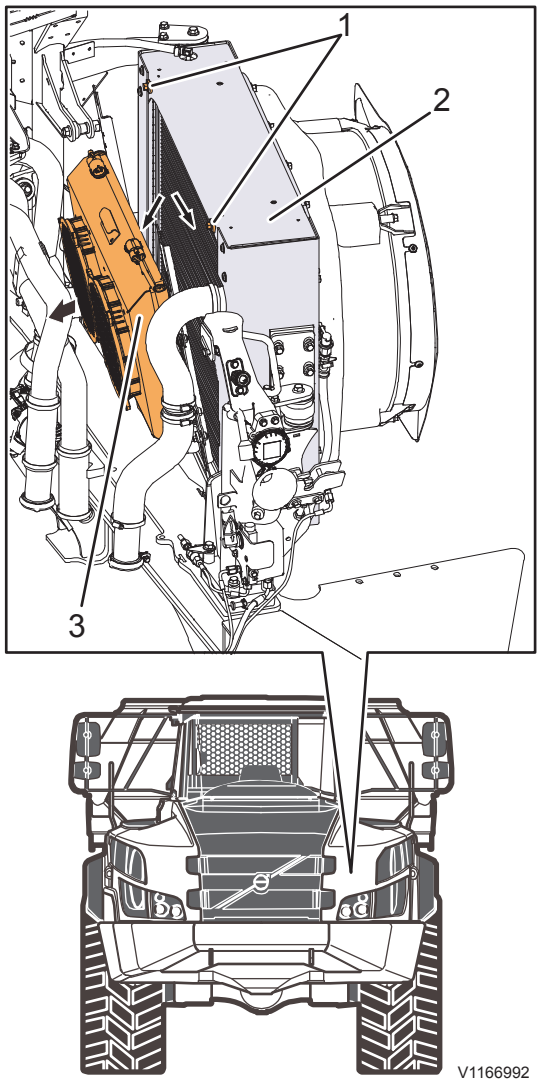
WARNING

Risk of serious injury.
Compressed air, water jets or steam may cause damage to unprotected skin and eyes.
Always wear personal protective gloves, goggles and clothing when using compressed air, water jets or steam.

NOTICE

When using compressed air, keep the nozzle at a distance from the fins to prevent damage. Damaged fins may cause leakage or overheating.

NOTE!
Be careful with the hoses between compressor, condenser, and evaporator. There is always a certain overpressure in the system.

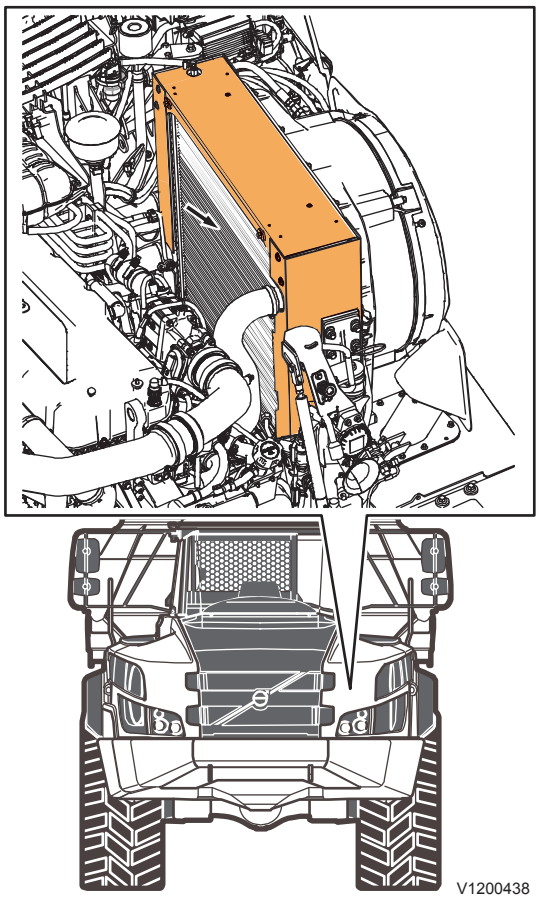


Radiator and condenser for machines with engine alternative E, F and L

1 Brackets for condenser
2 Radiator
3 Condenser

Cleaning radiator and condenser for machines with engine alternative E, F and L

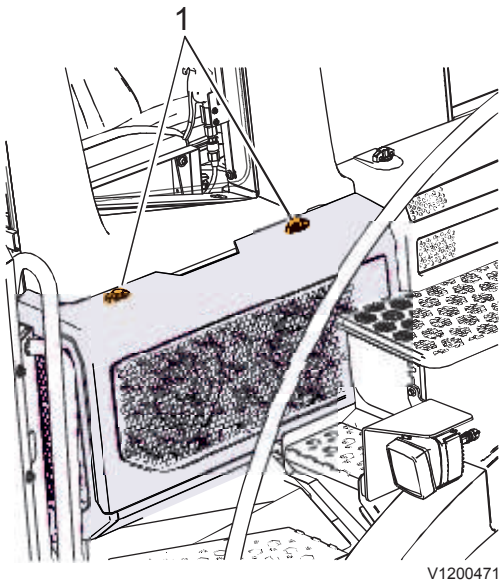
1 Place machine in the service position. Refer to page *270*.
2 Let down the front grill.
3 Open the engine hood.
4 Loosen the two brackets that fasten the condenser to the radiator. Swing out the condenser and blow clean with compressed air from the side of the condenser on which the radiator is located.
5 Blow the radiator clean with compressed air from the inside.
6 Clean the engine compartment if needed.
7 Swing the condenser back into place.
8 Close the engine hood.
9 Swing up the front grill.
10 Restore the machine from service position.



Radiator for machines with engine alternative M

Cleaning of radiator for machines with engine alternative M

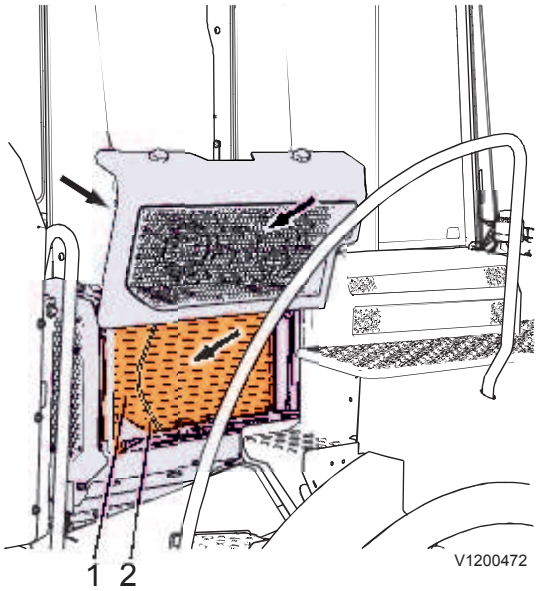
1 Place machine in the service position. Refer to page *270*.
2 Let down the front grill.
3 Open the engine hood.
4 Blow the radiator clean with compressed air from the inside.
5 Clean the engine compartment if needed.
6 Close the engine hood.
7 Swing up the front grill.
8 Restore the machine from service position.



1 Knob for condenser housing

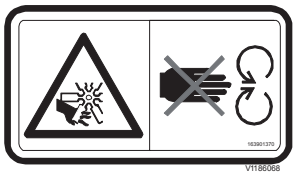
Cleaning of condenser for machines with engine alternative M

1 Place machine in the service position. Refer to page *270*.



1 Condenser
2 Cable harness

2 Open the two knobs that hold the casing with the electric fans in place on the condenser.



Rotating parts

3 Lift up the casing with the electric fans and angle it slightly outwards. Lower it and make sure it drops into the two recesses. Feel the casing to ensure it is locked in its service position.

4 **NOTE!**
The machine must be switched off, otherwise the rotating fan blades of the electric fans may cause injury.

Blow the electric fans with compressed air to clean them, from the inside and outside, and the condenser.

5 Lift up the casing with the electric fans so that the housing comes loose from the grooves.

6 **NOTE!**
Check that the wiring is not trapped when the casing is folded down.

Move the casing down and lock the two knobs.

7 Restore the machine from service position.

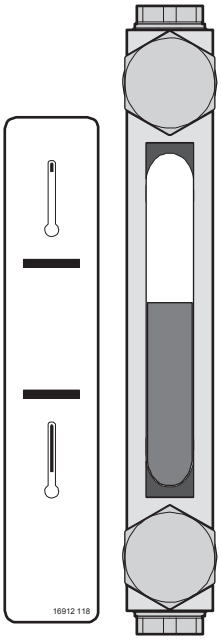
Brake cooling oil, checking level and refilling

Level check

Critical or normal level is shown on the information display, see page *62*. An alarm display is shown at critical level, see page *96*.



Brake cooling oil level low



V1170350

Level glass, level when ambient temperature and oil temperature are approx. 20 °C

The level glass is located behind the cab, on the machine's right side.
The brake cooling oil level is best to read off before the machine is used.
To enable read-off of correct value, the level glass should be located at eye level when reading off.

The level should be between the MIN. and MAX. lines in the measuring range when the ambient temperature and oil temperature are approx. 20 °C, otherwise top up according to below.

The level can be different under other conditions, but still be normal. For more information on this, see page *18*.

Filling

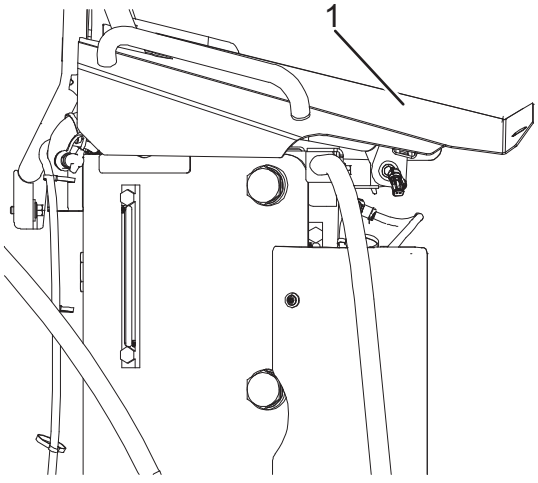
NOTICE

Observe the greatest possible cleanliness!

For oil quality grades, see page *384*.

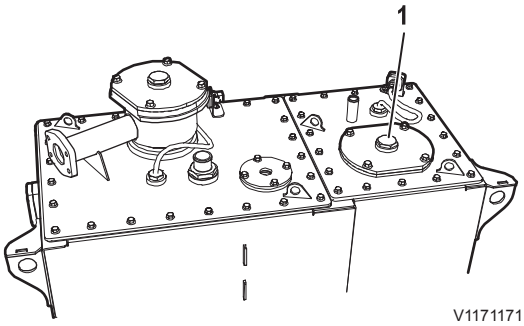
1 Place machine in the service position. Refer to *270*.

2 Loosen the bolts for the protective plate and raise it up.



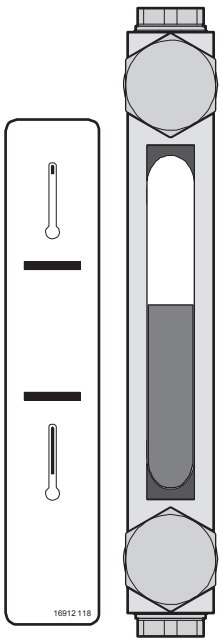
V1167030

1 Spill guard



1 Fill point, brake cooling oil

3 Remove the filler plug in the cover. The oil level will rise slightly in the level glass.



Fill oil to 3/4 up on the measuring range

4 Fill oil through the hole until it shows 3/4 up on the measuring range on the level glass.

5 Install the filler plug.

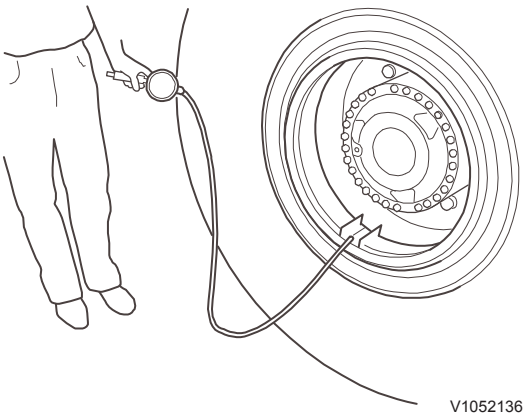
6 Lower the protective plate and tighten the bolts.

7 Check the oil level in the level glass once again.

8 Restore the machine from service position.

NOTE!
After some time, if the level drops despite topping up, contact a qualified workshop.

Tyres, checking air pressure



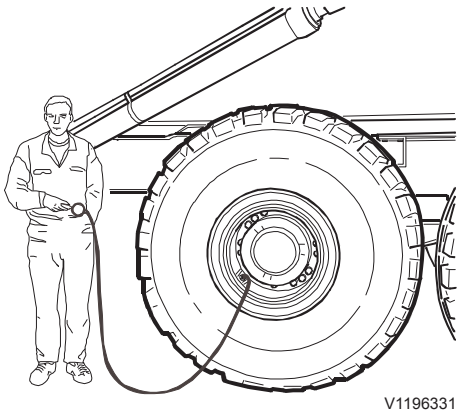
Long inflation hose

⚠ WARNING

Risk of explosion.
Inflating a tyre could cause it to explode. An exploding tyre could lead to lethal injuries.
Use a self-attaching air chuck with a hose long enough to enable the tyre to be inflated without standing in front of the rim and as far away as possible. Make sure no one stands in front of, or passes, the rim during inflation.

Check the tire pressure if needed.
Hose and air pressure gauge are included in the tool kit, see page *24*.

- When checking the air pressure, the tire should be cold and the machine without load.
- Recommended air pressure should normally be followed, see page *419*.
- Special ground conditions may require the air pressure to be adjusted.



Always stand by the side of the tire when inflating it

- Follow the tire manufacturer's instructions and do not exceed the maximum permitted air pressures.
- The machine may have been delivered from the factory with increased pressure in the tires. Therefore, check and adjust the tire pressure according to recommendations, before putting the machine to work for the first time.

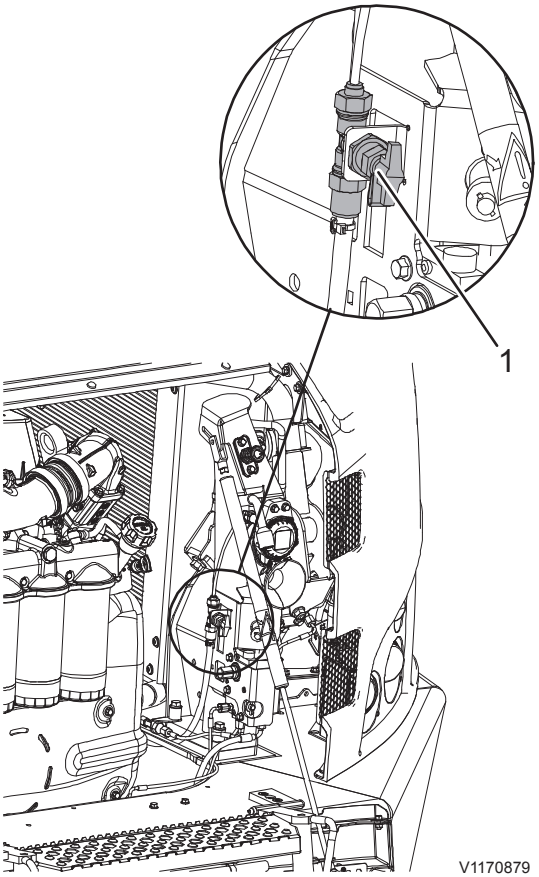
Tyres, inflating

⚠ WARNING

Risk of explosion.
Inflating a tyre could cause it to explode. An exploding tyre could lead to lethal injuries.
Use a self-attaching air chuck with a hose long enough to enable the tyre to be inflated without standing in front of the rim and as far away as possible. Make sure no one stands in front of, or passes, the rim during inflation.

The following instructions apply to an inflated tire where the pressure needs to be increased. If the tire has lost all air pressure, contact a qualified workshop.

- Ask all other persons to leave the danger area (in front of the rim).
- Stand by the tire's tread. Tires installed on a split rim may explode causing injury or in the worst case death.
- Tires on stored wheels (spare wheels) should be kept in a lying down position and only be inflated sufficiently to keep the rim parts in position.
- Do not reinflate a tire, if the machine has been operated with a tire pressure that has been below 80% of the lowest recommended tire pressure according to the specifications, or if the tire and/or rim are obviously damaged or are suspected of being damaged.



1 Compressed air tank, compressed air connection

The machine's compressed air connection can be used to inflate tires. The compressed air connection is located by the hood opener in the machine's left front part.

1 Let down the machine's front grill.
2 Remove the protective cap and connect the inflation hose to the compressed air connection.
3 Connect the inflation hose to the tire.

Tyres, checking wear

Check that:

- that there is enough tread on the tire.
- the tread, so the cord is not visible.
- the sides of the tires, so that there are no deep cuts in to the cord.

Tire, defective

WARNING

Risk of explosion.
Attempts to repair or weld a rim with an inflated tyre fitted could cause the rim to split or the tyre to explode. An exploding tyre could lead to lethal injuries.
Repair work on tyres and rims must be carried out by a qualified service technician.

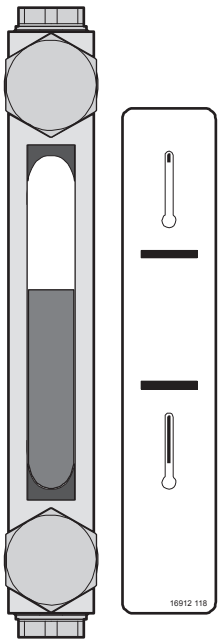
Hydraulic oil, checking level and refilling

Level check


V1087671

Low hydraulic oil level

Low or normal level is shown on the information display, see page *62*. An alarm display is shown in case of low level, see page *98*.



V1170349

Level glass, level when ambient temperature and oil temperature are approx. 20 °C

The level glass is located behind the cab, on the machine's right side.
The hydraulic oil level is best to read off before the machine is used.
To enable read-off of correct value, the level glass should be located at eye level when reading off.

To enable read-off of correct value, the load body must always be lowered.

The level should be between the MIN. and MAX. lines in the measuring range when the ambient temperature and oil temperature are approx. 20 °C, otherwise top up according to below.

The level can be different under other conditions, but still be normal. For more information on this, see page *18*.

Filling

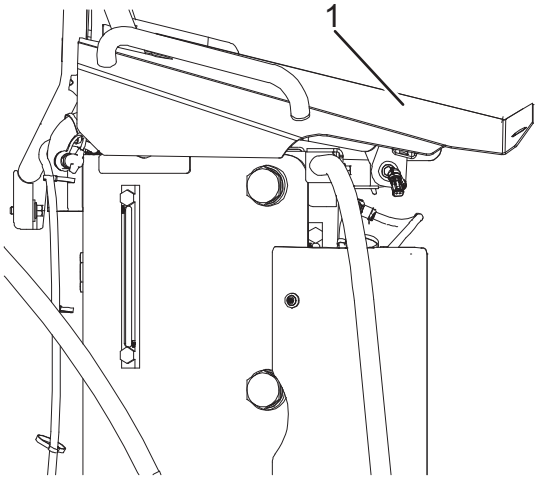
NOTICE

It is very important to keep the hydraulic system free from any contaminants, as these can cause abnormal wear and may lead to expensive downtime. Greatest possible cleanliness should be maintained during all handling of hydraulic components and hydraulic oil.

NOTE!
If the machine is filled with biologically degradable hydraulic oil, the same type of biological oil must be used when topping up and when changing hydraulic oil. Different types of biologically degradable hydraulic oils must not be mixed. Mineral oil may not be used together with biologically degradable hydraulic oil. When changing from mineral oil to biologically degradable hydraulic oil, contact a qualified workshop.

For oil quality grades, see page *384*.

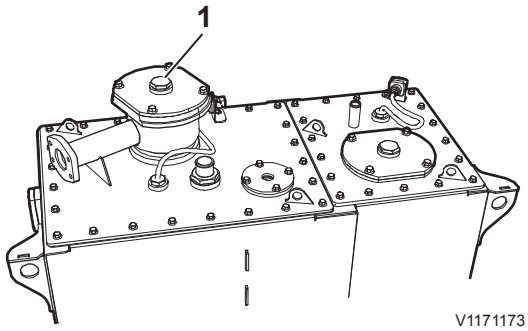
1 Place the machine in service position, see page *270*.



V1167030

1 Spill guard

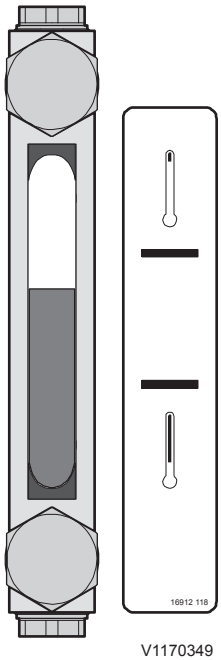
2 Loosen the bolts for the protective plate and raise it up.



V1171173

1 Fill point, hydraulic oil

3 Remove the filler plug in the cover. The oil level will rise slightly in the level glass.



V1170349

Fill oil to 3/4 up on the measuring range

4 Then fill oil through the hole until it shows 3/4 up on the measuring range on the level glass.

5 Install the filler plug.

6 Lower the protective plate and tighten the bolts.

7 Check the oil level in the level glass once again.

8 Restore the machine from service position.

NOTE!
After some time, if the level drops despite topping up, contact a qualified workshop.

Axles and dropbox, leaks, checking

1 Place the machine in service position, see page *270*.

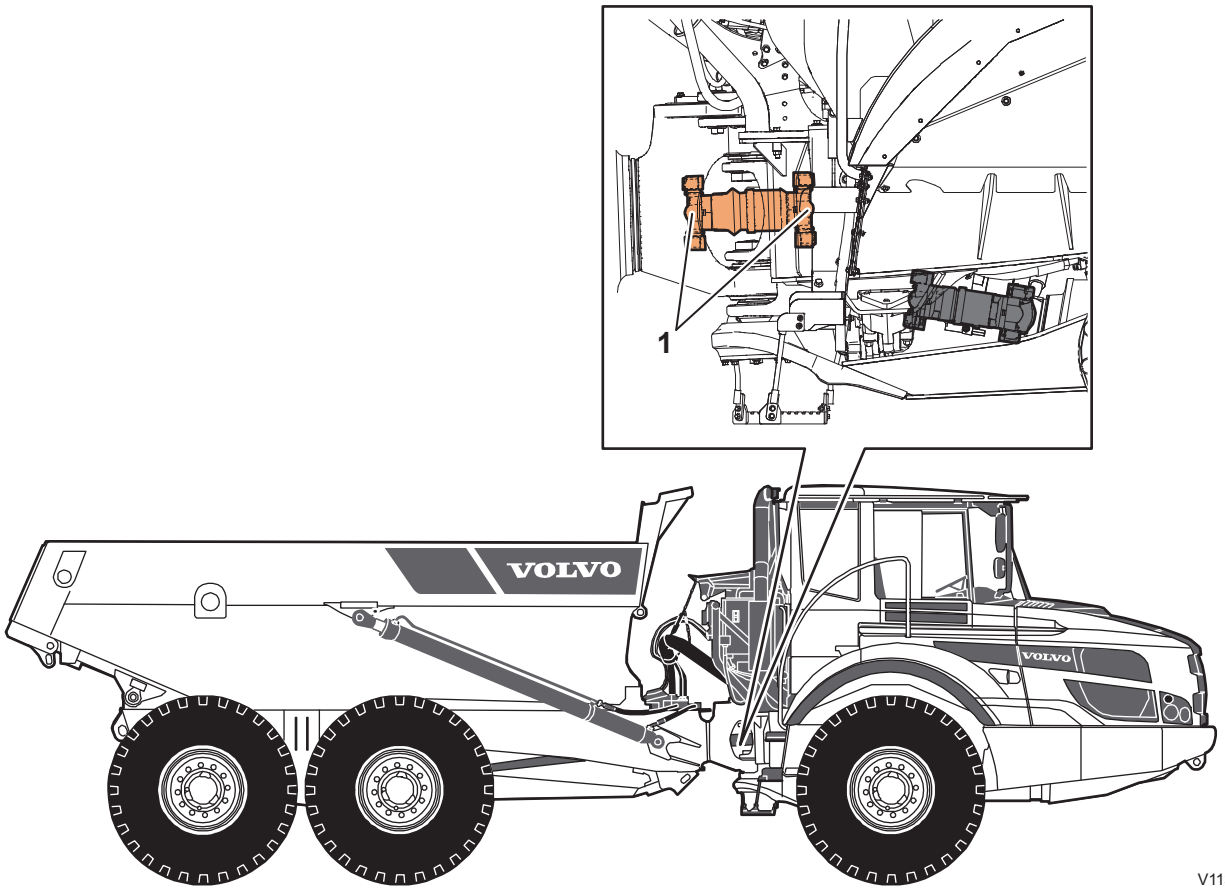
2 Visually check the axles and dropbox for any leaks.

3 Restore the machine from service position.

Maintenance service, every 1000 hours

Lubrication, every 1000 hours

Grease points every 1000 hours



V1137006

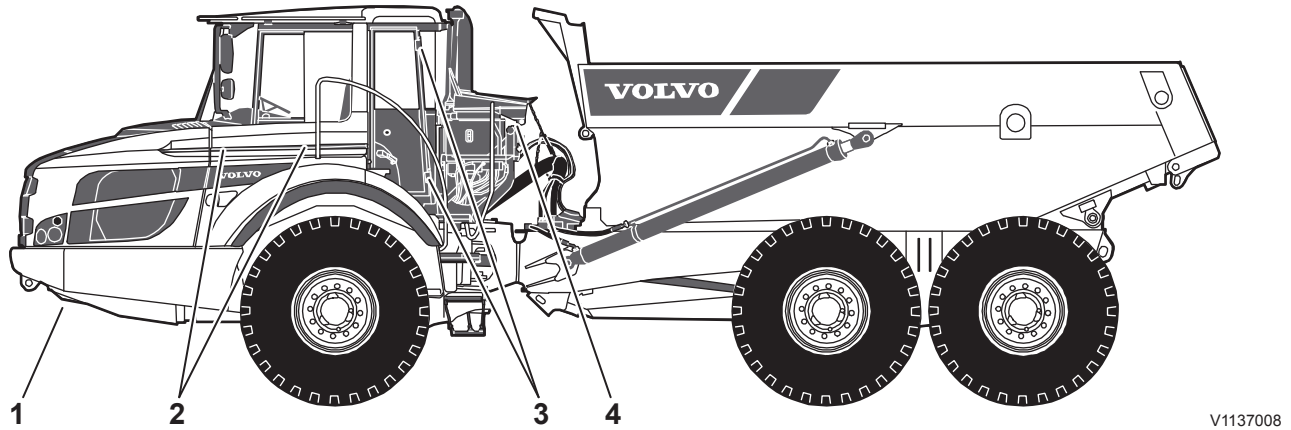
Grease points

Pos.	Grease point
1	Propeller shaft, dropbox — frame joint

Maintenance service, every 2000 hours

Lubrication, every 2000 hours

Grease points every 2000 hours



Grease points (for item 1 and 4, same grease points on both right and left side of the machine)

Pos.	Grease point
1	Underbody skid plate, hinge
2	Battery cover, hinges
3	Door, hinges
4	Spill guard, hinge

Secondary steering, checking function

NOTE!
The function test is only performed on an unloaded machine.

NOTE!
The pressure in the brake system should be at the maximum level before the test starts.

NOTE!
Keep in mind that manoeuvrability is limited when the engine is off.

1 Stand the machine on a downhill slope with the front facing down the hill in a separate location with plenty of space.

2 Hold the foot on the brake and move the gear selector to neutral position.

3 Turn off the engine by pressing in the emergency stop.

4 Release the brake pedal and let the machine roll forward at a speed of approx. 5 km/h (3.1 mph). Then it should be possible to steer the machine from turned machine back to straight ahead.

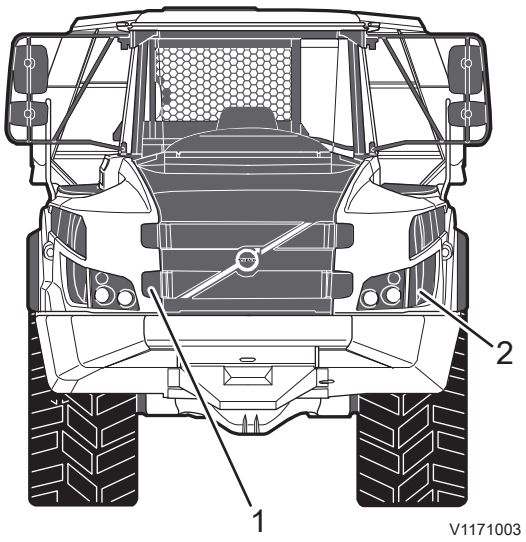
5 When the machine has stopped rolling, engage the parking brake.

6 Turn the ignition to position 0.

7 Pull out the emergency stop.

Maintenance service, when required

Fuel, filling



1 Fill point, AdBlue/DEF
2 Fill point, fuel

The fuel tank's fill volume is 380 litres (100.4 US gal).
Fuel quality, see page *390*.

Information about AdBlue®/DEF only applies to machines with engine alternative D11L and D11M.

WARNING

Risk of fire.
Burning fuel can cause fatal injuries.
Stop the engine before filling fuel.

WARNING

Risk of fatal accidents.
The machine can start to move and could cause serious injuries or death.
Apply the parking brake and turn off the engine before filling the tank.

NOTICE

Risk of machine damage.
Refueling of any other fluid but diesel in the fuel tank could cause machine damage.
Do not start the engine if you have filled other than pure diesel in the diesel tank.

NOTICE

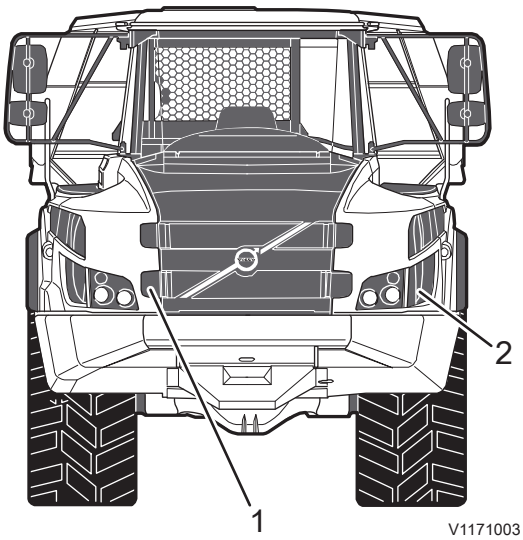
Risk of fuel tank contamination.
Accidental filling of AdBlue®/DEF in to the fuel tank causes fuel tank contamination.
Only use AdBlue®/DEF filling equipment that has a valve that opens only on machines equipped with a magnetic ring in the AdBlue®/DEF filler neck to avoid fuel tank contamination.



Fuel level low

If the fuel level is low, an alarm display is shown, see page *89*. Top up with fuel to prevent air from entering the system.

- Clean carefully around the fuel tank's cap before it is removed.
- Avoid spills when filling. Dust and dirt soaked in diesel are fire hazards!
- During winter, keep the fuel tank full to counteract condensation in the tank.
- If the tank is completely empty, fill with at least 20 litres (5.3 US gal) of fuel to ensure that the fuel reaches the suction line.
- AdBlue®/DEF may not be mixed in the fuel tank, and fuel may not be mixed in the AdBlue®/DEF tank.



1 Fill point, AdBlue®/DEF
2 Fill point, fuel

AdBlue®/DEF, filling

Information about AdBlue®/DEF only applies to machines with engine alternative D11L and D11M.

WARNING

Risk of fatal accidents.
The machine can start to move and could cause serious injuries or death.
Apply the parking brake and turn off the engine before filling the tank.

NOTICE

Risk of machine damage.
Refilling fluids with anything other than what is specified in this manual could cause permanent damage to the catalyst system. Only refill fluids with those specified in this procedure.

NOTICE

Risk of fuel tank contamination.
Accidental filling of AdBlue®/DEF in to the fuel tank causes fuel tank contamination.
Only use AdBlue®/DEF filling equipment that has a valve that opens only on machines equipped with a magnetic ring in the AdBlue®/DEF filler neck to avoid fuel tank contamination.

NOTICE

Risk of machine damage.
AdBlue®/DEF is highly corrosive. If the tank is overfilled, AdBlue®/DEF may leak out through the air vent pipe. If the tank is overfilled and the fluid in it freezes, the tank and hoses can be permanently damaged.
Do not overfill the tank. Always stop filling when the fluid level reaches the filling port or when an automatic filling nozzle shuts off.

NOTICE

Risk of machine damage.
A clogged AdBlue®/DEF filter can lead to difficulties filling the tank.
Filling AdBlue®/DEF in the tank with a damaged filter or without a filter in place can contaminate the AdBlue®/DEF fluid and seriously damage the aftertreatment system.
The filter might need to be removed, cleaned and put back in place before filling. Never damage the filter or fill AdBlue®/DEF without the filter in place. Turn to your local Volvo dealer for support.

Only fill fluid specified according to ISO 22241-1. We do not recommend reusing drained AdBlue®/DEF since there is a risk of impurities.

The AdBlue®/DEF tank's fill volume is 39 litres (10.3 US gal).

NOTE!
Clean carefully around the cap on the Adblue®/DEF-tank before it is removed. Avoid spills when filling.

The tank cap for the AdBlue®/DEF-tank is opened with the start key.

If the AdBlue®/DEF level is low, an alarm display is shown, see page *92*. Top up with AdBlue®/DEF in the AdBlue®/DEF tank.



V1132842

Refill AdBlueAdBlue emptyDerate active



V1132842

Park safelyAdBlue emptyFull derate soon



V1132842

Refill AdBlueAdBlue emptyFull derate active

If topping up is not performed, new alarm display figures will be displayed stating that the AdBlue®/DEF level is low, see page *79* and the engine output will be restricted. Top up the AdBlue®/DEF tank with AdBlue®/DEF.

NOTE!
Fill equipment for Adblue®/DEF must be manufactured for a flow of max. 40 l/minute or must be adjustable to a flow of less than 40 l/minute. In case of problems when filling, and the problems persist after cleaning the filler filter, read the manual for the fill equipment to take suitable actions.

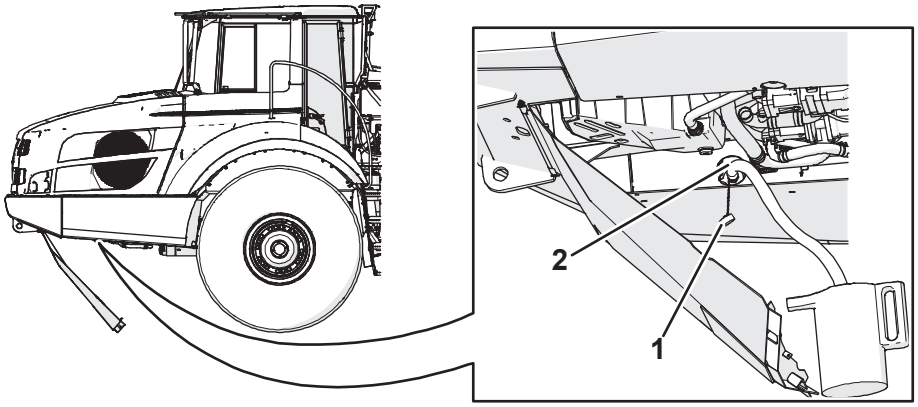
NOTE!
Wipe clean the spill cup after filling AdBlue®/DEF.

- AdBlue®/DEF is not classed as a hazardous fluid, but it should still be handled with care. It is very corrosive. Avoid spilling ADBlue®/DEF on electric cables and components.
- In case of skin contact, rinse thoroughly with water.
- In case of eye contact, rinse thoroughly for several minutes. Contact a doctor if needed.
- If inhaled, breathe fresh air and contact a doctor if needed.
- If swallowed, drink water and contact a doctor.
- AdBlue®/DEF should not come into contact with other chemicals.
- AdBlue®/DEF is not combustible. However, if AdBlue®/DEF is exposed to high temperatures it converts to ammonia and carbon dioxide. See also page *395*.
- AdBlue®/DEF may not be mixed in the fuel tank, and fuel may not be mixed in the AdBlue®/DEF tank.

For information on ordering AdBlue®/DEF (only applies to USA-market):
- **Volvo CE Customer Support: 1-877-823-1111 (office hours)**
- **www.volvoce.com (outside of office hours)**

For information on ordering AdBlue®/DEF (other markets), contact an authorized dealer.

AdBlue®/DEF tank, draining

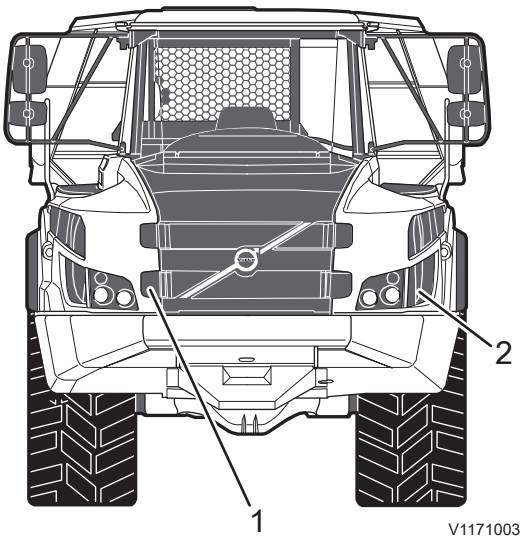


1 Metal cap
2 Draining

1 Place machine in the service position. Refer to page *270*.
2 Swing down the front underbody skid plate, see page *274*.
3 Remove the metal cap in front of the drain valve in the right fender.
4 Remove the protective cap for the drain valve.
5 Get the drain hose from the toolbox.
6 Connect the drain hose to the drain valve, place the end of hose in a container and drain AdBlue®/DEF from the tank.
7 Remove the drain hose and put it back in the toolbox.
8 Install the protective cap and the metal cap.
9 Swing up the underbody skid plate.
10 Restore the machine from service position.

Engine- and cab heater, extra fuel tank, filling

(Optional equipment)



1 Fuel fill point, extra fuel tank (only for machines with extra fuel tank for engine heater and cab heater)

2 Fuel fill point, standard fuel tank

Only applies to machines with engine alternative F.

WARNING

Risk of fatal accidents.
The machine can start to move and could cause serious injuries or death.
Apply the parking brake and turn off the engine before filling the tank.

The extra fuel tank's fill volume is 39 litres (10.3 US gal).

Some machines with the optional equipment engine heater and cab heater have an extra diesel fuel tank.

For service/maintenance instructions as well as draining the extra fuel tank, see page *361*.

Engine oil, checking level and refilling

Level check

The oil level is shown on the information display unit under Engine, see page *62*.



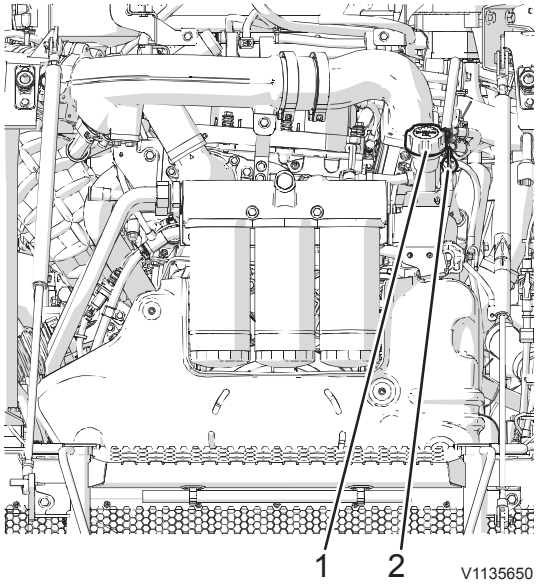
Low oil level engine

Electronic level check is performed when starting up.
An alarm display is shown on the information display unit in case of low engine oil level, see page *87*.

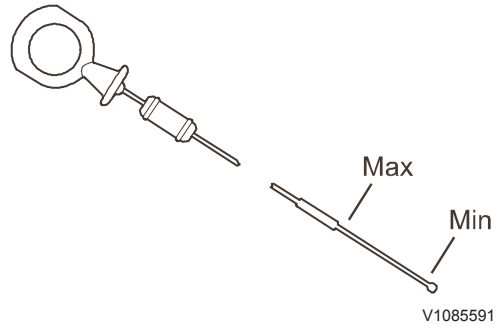
An alarm display is shown on the information display unit in case of critical engine oil level, see page *77*.

Filling and manual measurement

1 Place the machine in service position, see page *270*.



1 Filler pipe
2 Dipstick



Dipstick

2 Let down the front grill.

3 Pull out the dipstick. The oil level should be between the dipstick markings. Oil volume between min. and max. on the dipstick is approx. 6 litres (1.5 US gal).

4 If the level is low on the dipstick, top up with oil in the filler pipe. Use the same oil type that is already used in the engine. **Try to keep the level at maximum when topping up, but do not overfill.**

5 Swing up the front grill.

6 Restore the machine from service position.

Water separator, draining

If there is water in the fuel, an alarm display is shown, see page *89*. Drain the water trap according to the following.

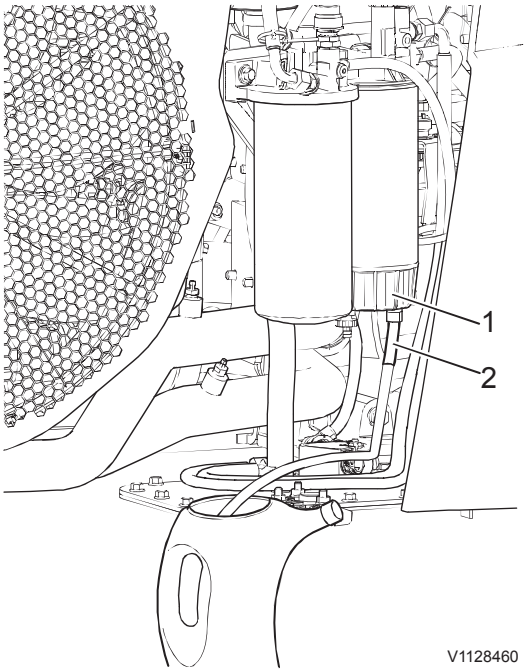


Water in fuel. Empty cup

NOTICE

Take care of filters, oils and liquids in an environmentally safe way.

See page *272*.



1 Water trap
2 Connecting drain hose

1 Place machine in the service position. Refer to page *270*.
2 Let down the front grill.
3 Open the engine hood.
4 Connect a drain hose to drain screw at the bottom of the water trap.
5 Loosen the drain screw.
6 Tighten the drain screw when only clean fuel runs out.
7 Close the engine hood.
8 Swing up the front grill.
9 Restore the machine from service position.

Fuel system, bleeding

⚠ CAUTION

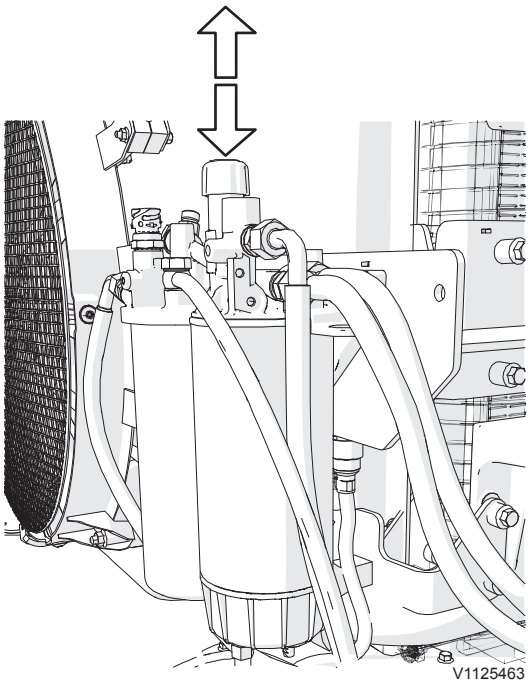
Risk of crushing.
Pushing down on the hand pump could cause crushing injury.
Keep fingers on top of the pump handle when bleeding the air.

If the tank has been run dry or if air has got into the system for other reasons, the system must be bled free from air.

NOTICE

Under no circumstances must starting attempts be made before the system has been bled. The fuel feed pump may be seriously damaged.

NOTE!
Do not use the starter to bleed air.



Using hand pump

NOTE!
Do not use the hand pump when the engine is running.

Before working on the machine, see page *272*.

1 Place machine in the service position. Refer to page *270*.

2 Let down the front grill.

3 Open the engine hood.

4 Press in and turn the hand pump counter-clockwise until it is in pumping position.

5 Pump 200–300 strokes until resistance builds up in the pump and a clicking sound is heard from the valve in the fuel filter bracket.

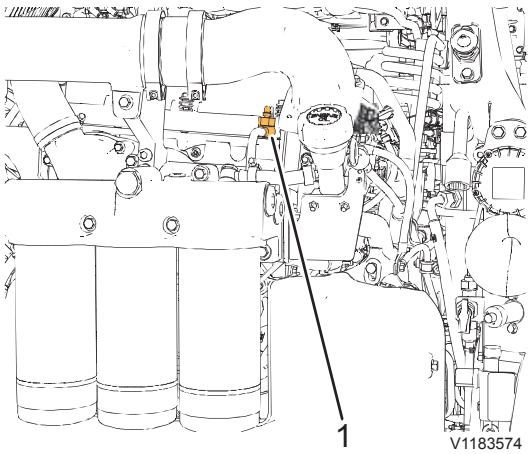
6 Lock the hand pump by pressing it down, and at the same time turn it clockwise until it stops.

7 Open and close the air bleed nipple.

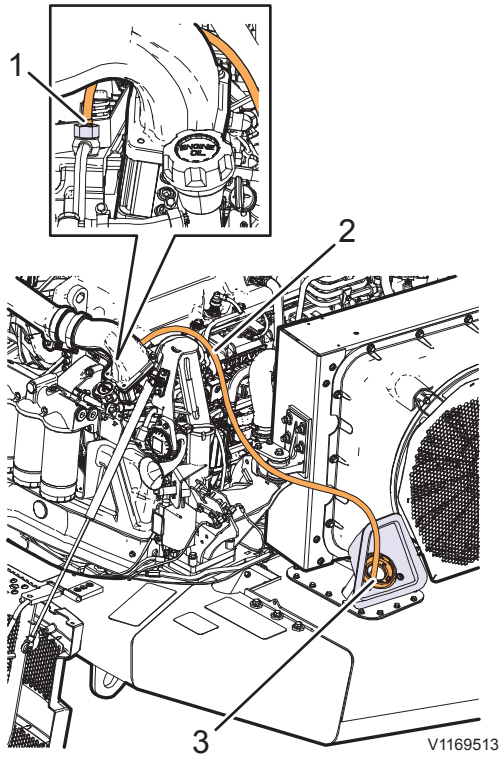
8 Start the engine and let it idle for five minutes.

NOTE!
The engine speed may not be increased since any air that is left in the system may be forced into the injectors, which results in misfiring.

If the engine does not start after 30 seconds, continue pumping with the hand pump until resistance builds up. Then try to start again.
Air may have entered the system if the engine does not start, or starts and then stops again. Proceed as follows:



1 Air bleed nipple



1 Breather nipple
2 Hose
3 Filler pipe, fuel

9 Connect a transparent hose to the bleeder nipple.

10 Open the tank cap and insert the hose in the filler pipe.

11 Open the bleeder nipple and pump with the hand pump until the fuel is free from air bubbles.

12 Close the bleeder nipple, remove the hose, and install the tank cap.

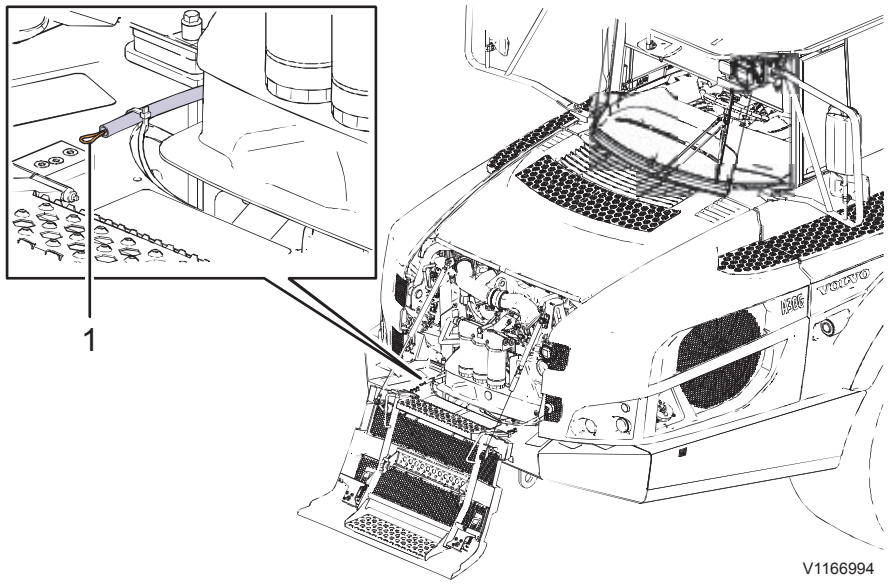
13 Lock the hand pump and try to start again.

14 Close the engine hood.

15 Swing up the front grill.

16 Restore the machine from service position.

Compressed-air reservoirs, draining



1 Draining 10-litre (2.6 US gal) compressed air tank

The machine has two compressed air tanks:

- A 4-litre (1.1 US gal) tank located between the front cab wall and the engine's back-end.
- A 10-litre (2.6 US gal) tank located on the right side under the cab.

The compressed air tanks are kept free from condensation water with an air drier.

When draining the 10-litre (2.6 US gal) tank, normally there should not be any condensation water.

Charge air cooler, cleaning

Valid for serial numbers		
Model version	**Serial number start**	**Serial number stop**
A25G	Braås 332001	Braås 339999
A25G	Braås 342001	Braås 349999
A25G	Braås 352001	Braås 359999
A25G	Pederneiras 722001	Pederneiras 729999
A25G	Pederneiras 732001	Pederneiras 739999
A25G	Pederneiras 742001	Pederneiras 749999
A25G	Pederneiras 752001	Pederneiras 759999

An alarm display is shown on the information display unit if the charge-air cooler is clogged, see page *90*.



V1087623

Clogged Charge-air cooler

Charge-air cooler, cleaning

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

WARNING

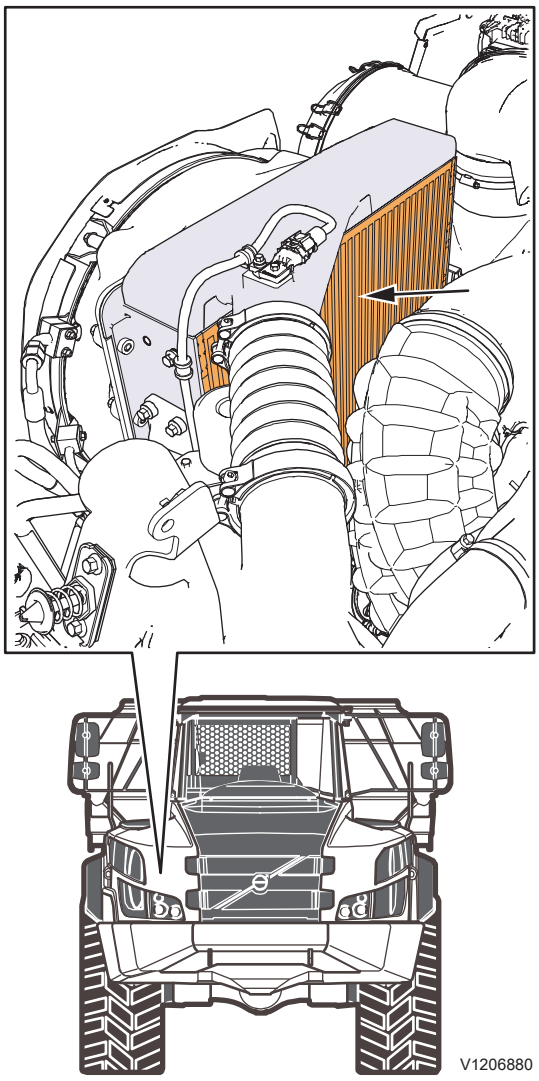
Risk of crushing and cutting.
Rotating parts could cause serious injury.
Shut down the machine before cleaning the machine or any component of the machine.

WARNING

Risk of serious injury.
Compressed air, water jets or steam may cause damage to unprotected skin and eyes.
Always wear personal protective gloves, goggles and clothing when using compressed air, water jets or steam.

NOTICE

When using compressed air, keep the nozzle at a distance from the fins to prevent damage. Damaged fins may cause leakage or overheating.



Cleaning, charge-air cooler

Before working on the machine, see page *272*.

1 Place the machine in service position, see page *270*.
2 Let down the front grill.
3 Open the engine hood.
4 Blow the charge-air cooler clean with compressed air from the inside.
5 Clean the engine compartment if needed.
6 Close the engine hood.
7 Swing up the front grill.
8 Restore the machine from service position.

Engine air cleaner primary filter, cleaning

The engine air cleaner prevents dust and other impurities from entering the engine. First the air passes through the primary filter and then the secondary filter. The secondary filter acts as a protective filter in case the primary filter is damaged.

Engine wear depends to a great extent on the cleanliness of the induction air. Therefore, it is very important that the engine air cleaner is checked regularly and is maintained correctly. Ensure the highest levels of cleanliness when working with the engine air cleaner and filters.

For machines that work in particularly dusty conditions, installation of an additional engine air cleaner is recommended. There are several different items of optional equipment that result in extended cleaning and replacement intervals.



Clogged air filter

If the control light turns on and an alarm display is shown, clean or change immediately. The time between cleaning/change depends entirely on the machine's operating conditions. See page *87*.

If the control light remains on after cleaning/change, the secondary filter must be changed. Contact an authorized workshop.

Primary filter, cleaning

The primary filter may be cleaned max. five times. Thereafter the filter must be changed. Change the filter if it is damaged. When changing, contact an authorized workshop.

NOTE!
Never remove the secondary filter. The secondary filter works as a protective filter if the primary filter should be damaged. The secondary filter should be replaced, not cleaned, according to specific intervals by an authorized workshop.

⚠ WARNING

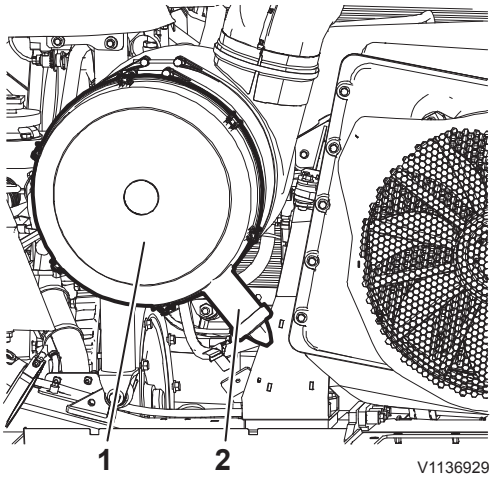
Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

NOTICE

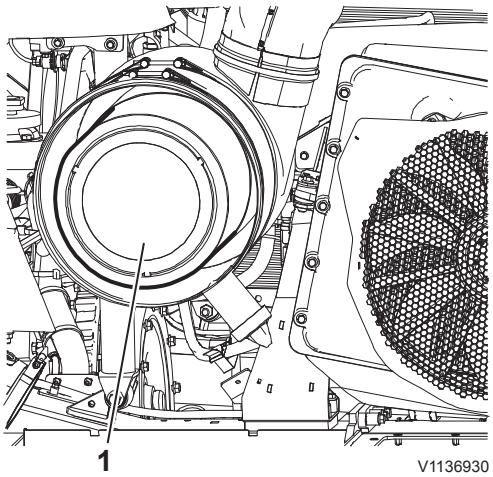
Risk of machine damage.
Starting the machine without the filters or with damaged filters could damage the engine.
Always have the filters in place. Always replace a damaged filter.

Before working on the machine, see page *272*.

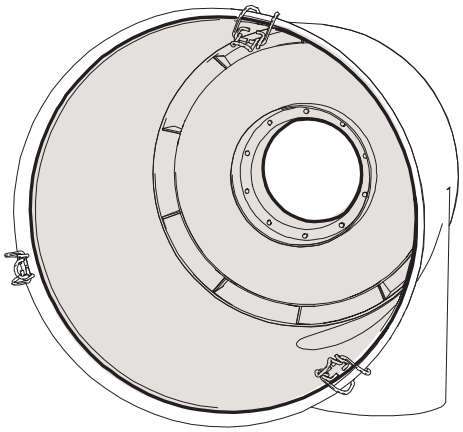
1 Place the machine in service position, see page *270*.
2 Let down the front grill.
3 Open the engine hood.
4 Remove the cover for the engine air cleaner.
5 Clean the cover and the valve.



1 Cover for engine air cleaner
2 Valve



1 Primary filter

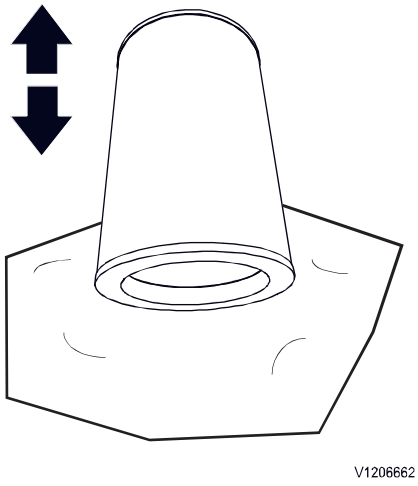


Area to clean

6 Remove the primary filter. Loosen the filter carefully, since the secondary filter inside easily comes off.
In case the secondary filter should come off, the following actions must be taken:

NOTICE

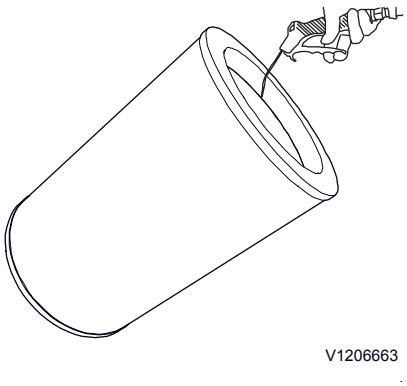
Risk of machine damage!
Dust could enter the air intake system if the secondary filter comes off.
If the secondary filter comes off, clean the air cleaner housing thoroughly and make sure no dust enters the air intake system before reinstalling the secondary filter.
Do not use compressed air.
Vacuum cleaning is recommended, because it minimizes the risk that dust enters the air intake system.
A wet cloth may be used but be careful not to push any dust into the air intake system.



Mechanical cleaning

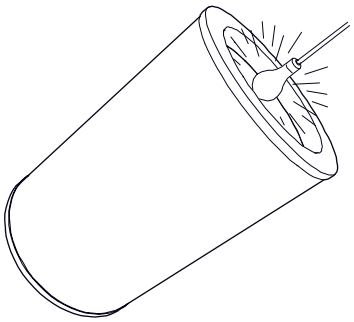
7 Carefully tap the end of the primary filter against a soft and clean surface.

NOTE!
Do not tap against a hard object.



Cleaning with compressed air

8 Clean the primary filter with compressed air. Use clean and dry compressed air with a max. pressure of 500 kPa (5 bar) (72.5 psi). Do not hold the nozzle closer than 3 – 5 cm (1 – 2 in). Blow the filter clean from the inside along the folds.


V1206664

Checking with light

9 Check the primary filter using a light. If there is the smallest hole, scratch, crack or other damage, the filter must be replaced. Contact an authorized workshop.

NOTE!
To discover damage more easily, this check should be done in a darkened room.

10 Reinstall the primary filter

11 Reinstall the cover.

12 Document that the primary filter has been cleaned, to track when the primary filter needs replacing (after cleaning five times).

13 Close the engine hood.

14 Swing up the front grill.

15 Restore the machine from service position.

EON-filter

(Optional equipment)

The EON filter is installed instead of the standard primary filter. Change the filter when the alarm display for clogged engine air filter is shown, see page *87*.

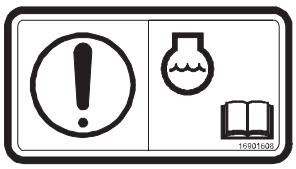
NOTE!
The filter should not be cleaned.


V1087629

Clogged air filter

Coolant, checking level and refilling

The cooling system is filled with Volvo Coolant VCS2, which complies with the most stringent requirements concerning anti-freeze, anti-corrosion and anti-cavitation properties. To avoid damage to the engine, is it very important that Volvo Coolant VCS2 is used when topping up or changing the coolant.
Volvo Coolant VCS2 is orange and a decal by the fill point shows that the system is filled with this coolant.


V1186007

Decal at the fill point location

The coolant level can be read off on the information display unit, see page *62*.

An alarm display is shown on the information display unit in case of low coolant level, see page *77*.


V1087634

Coolant level low

Coolant, filling

Information about coolant, see page *397*.

The expansion tank should be filled to the max. marking when the engine is cold.
The coolant level must never be below the min. marking.

WARNING

Risk of scalding and severe burns to unprotected skin. High-pressurised hot coolant may rush out of expansion tank and cause severe burns. Before removing the expansion tank pressure cap:

- **Shut down the engine.**
- **Allow the engine to cool**
- **Turn the pressure cap slowly to release any pressure.**

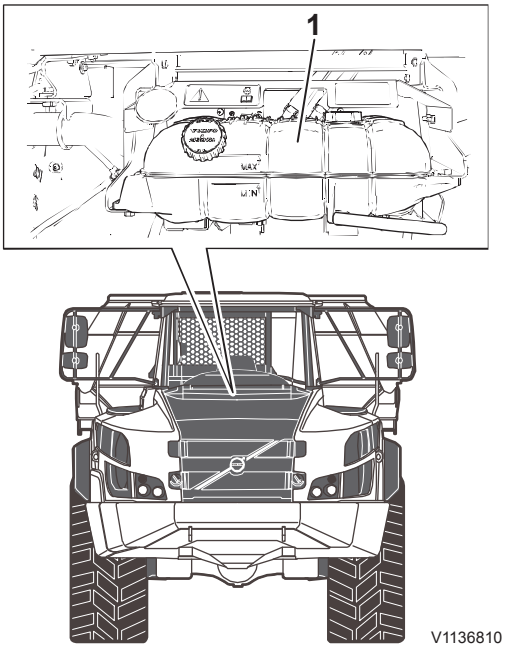
NOTICE

Volvo Coolant VCS must never be mixed with any other coolant or corrosion protection to avoid damage to the engine.

NOTICE

Never fill a hot engine with cold coolant, as this may cause the cylinder block or the cylinder head to crack. Failure to change coolant will cause clogging of the cooling system and the risk of engine damage.

Before working on the machine, see page *272*.



1 Coolant's expansion tank

1 Place machine in the service position. Refer to page *270*. Let the engine cool down.

2 Let down the front grill.

3 Open the engine hood.

4 Open the cap on the expansion tank carefully and remove it.

5 Fill coolant to the MAX. line on the expansion tank and install the cap.

6 Close the engine hood.

7 Let down the front grill.

8 Restore the machine from service position.

Engine- and cab heater, diesel-powered

(Additional options)

For information on the function of the engine and cab heater, see page *139*.

Some machines with the optional equipment engine and cab heater have an extra fuel tank. This only applies to machines with engine alternative F.

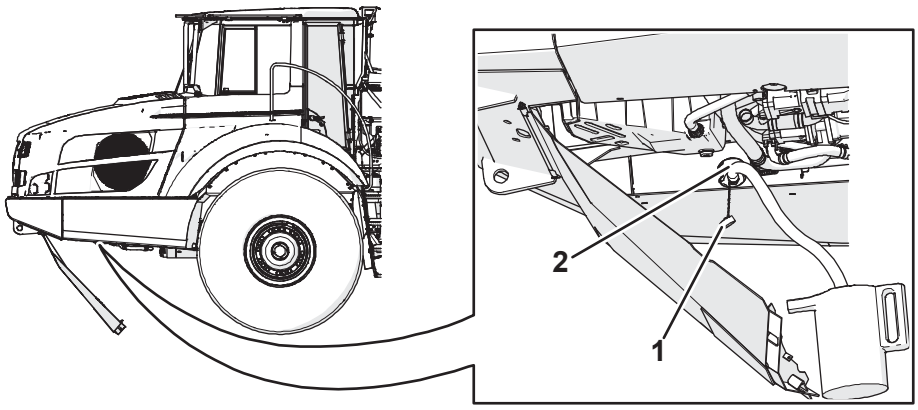
Maintenance

- Start the engine and cab heater for at least ten minutes every month of the year.
- Check and test the engine and cab heater before use, e.g., in winter, to make sure that it works.

- Only applies to machines with engine alternative F: Drain the extra fuel tank of sludge before and after every season of use by connecting the drain hose that is supplied with the machine.

Extra fuel tank, draining sludge

NOTE!
Only applies to machines with engine alternative F.

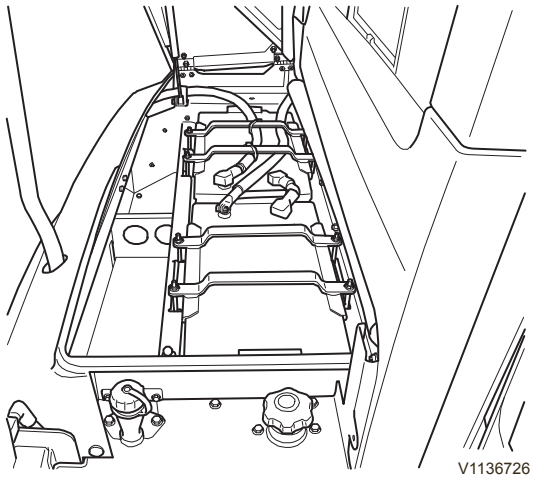


1 Metal cap
2 Drain

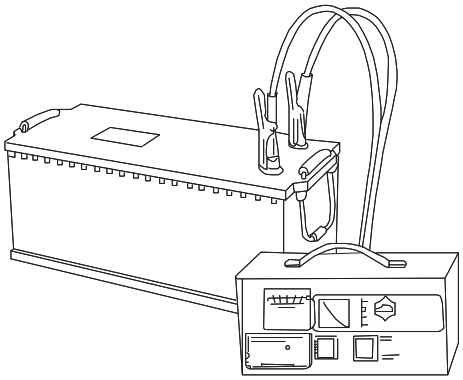
1 Place machine in the service position. Refer to page *270*.
2 Swing down the front underbody skid plate, see page *274*.
3 Remove the metal cap in front of the drain valve in the right fender.
4 Remove the protective cap for the drain valve.
5 Get the drain hose from the toolbox.
6 Connect the drain hose to the drain valve, place the end of hose in a container and drain the sludge from the fuel tank.
7 Remove the drain hose and put it back in the toolbox.
8 Install the protective cap and the metal cap.
9 Swing up the underbody skid plate.
10 Restore the machine from service position.

Batteries

The batteries are located on the left fender.
The batteries are two 12 V batteries connected in series, providing a system voltage of 24 V.
The batteries are maintenance-free.



Maintenance-free batteries


V1136992

Charging battery

Batteries, charging

WARNING

Risk of serious injury.
Short-circuit, open flames or sparks near a charging battery could lead to an explosion.
Switch off charge current before connecting and disconnecting charging cable clamps. Never charge a battery near open flames or sparks. Always charge a battery in well-ventilated areas.

WARNING

Risk of chemical burns.
The battery electrolyte contains corrosive sulphuric acid which could cause severe chemical burns.
If electrolyte spilled on your bare skin, remove it immediately and wash the affected area with soap and plenty of water. If it gets into your eyes or any other sensitive body part, rinse with plenty of water and seek immediate medical attention.

Connecting charger

NOTE!
The charging voltage must be the same as the battery voltage (12 V or 24 V).

1 Place the machine in service position, see page *270*.
2 Turn off the electric power, see page *281*.
3 Protect the battery from dirt.
4 Install the charger's clamps, plus on the plus (positive) terminal and minus on the minus (negative) terminal.
5 Make sure that the battery charger is set to the correct voltage.
6 Start the charger.

NOTE!
Always charge both batteries in the machine. Otherwise, there is a risk that the batteries are not in balance (difference in potential between the batteries). If the batteries are charged so that they are not in balance, it means that when charging (via the alternators) the fully charged battery will be overcharged while the other battery will be undercharged. Over time, this can shorten the battery life.

Disconnecting charger

1 Turn off the charger.
2 Remove the charger's clamps.
3 Turn on the electric power, see page *281*.
4 Restore the machine from service position.
5 Start the machine.

Fuses and relays

The machine has an electrical distribution box installed in the cab on the left cab wall. On the inside of the plastic panel there is a decal showing the different fuses' and relays' locations and their specifications. The electrical distribution box contains most of the fuses and relays of the machine, see page *405*.
If a problem should occur in one of the relays, this can temporarily be overcome, by replacing the defective relay with one that has a less important function. Check thoroughly that the relays are identical.

NOTICE

Risk of fire.
An inappropriate fuse could result in damage or fire on the circuit board.
Never install a fuse with a higher amperage than what is stated on the decal.

If the same fuse blows repeatedly, the cause must be investigated.

Starting with booster batteries

WARNING

Risk of explosion.
Batteries could explode due to the current surge if a fully charged battery is connected to a completely discharged or frozen battery.
Do not boost start a machine with a completely discharged or frozen battery.

WARNING

Risk of crushing.
Unexpected machine movement can cause serious injury.
Never boost-start the engine by connecting directly to the starter motor.

NOTICE

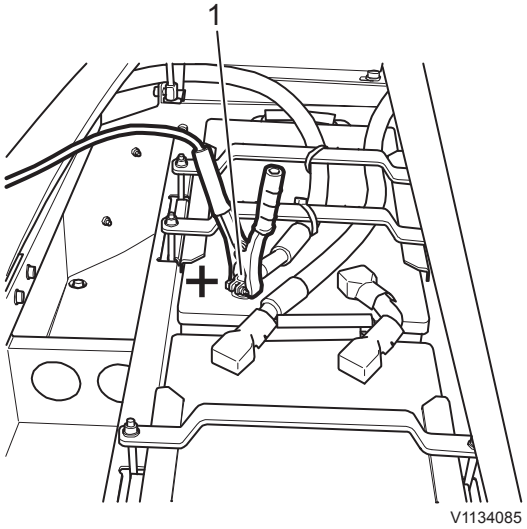
The booster batteries or any other power source must have the same voltage as the batteries on the machine.

NOTICE

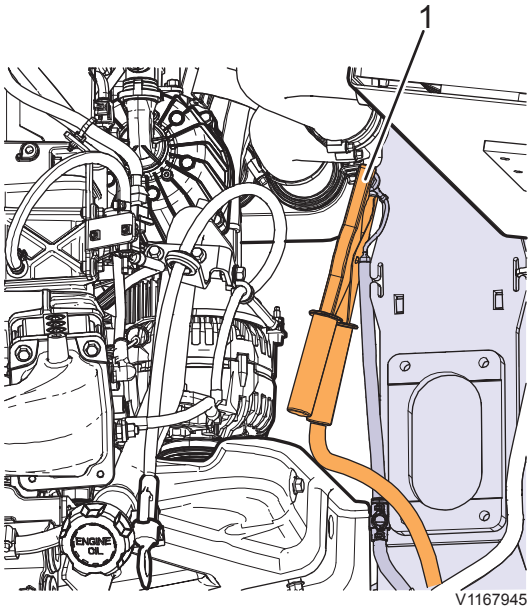
Risk of machine damage.
Incorrect handling of the electrical system can lead to machine damage.
Disconnect or switch off any battery chargers that are connected to the machine before you try to start the engine.

1 Place machine in the service position. Refer to page *270*.

2 Connect two 12 V batteries in series. (+) terminal on one battery to (–) terminal on the other.



1 Cable connection to (+) terminal



1 Grounding point on machine

3 **NOTICE**

Risk of machine damage.
Incorrect handling of the electrical system can lead to machine damage.
Make sure that the machine is without electric power supply (voltage) by turning the ignition to position 0, the information display unit should also be off.

Connect one of the start cables between the (+) terminal on the machine's battery and the booster battery's (+) terminal.

4 Connect the other start cable between the booster battery's (–) terminal and the grounding point on the machine. The grounding point is located between the engine and radiator.

5 Wait for a few minutes and then start the engine with the ignition.

6 When the engine has started, wait a few minutes, and then remove the start cable from the grounding point on the machine and then the start cable's clamp from the booster battery's (–) terminal.

7 Finally disconnect the start cable between the (+) terminals.

8 Reinstall the terminal caps on the battery terminals.

9 Reinstall the rubber protection over the batteries and close the cover.

10 Restore the machine from service position.

Light bulb, replacing

To replace a light bulb, contact a qualified service technician.

For specifications of the machine's lights, see page *404*.

NOTICE

Risk of environmental hazard.
Light bulbs could contain hazardous chemicals and cause an environmental hazard.
Follow local environmental guidelines when disposing light bulbs.
Do not put lights bulbs in general trash.

⚠ WARNING

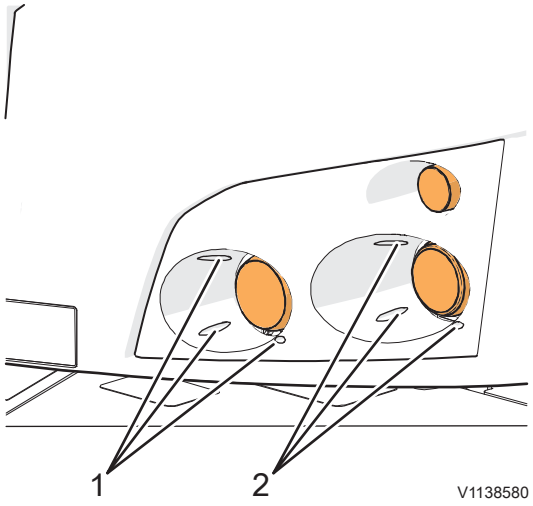
Risk of toxic hazard.
Contact with chemicals contained in light bulbs could cause exposure to hazardous chemicals.
Always wear personal protective equipment when handling light bulbs.

Headlights, adjusting

Headlights

The headlight alignment is of great importance, especially when operating on public roads in the dark. The headlights' low beams are of asymmetrical type.

1 Place the machine, which must be without load, on level ground at right angles to a wall or similar.

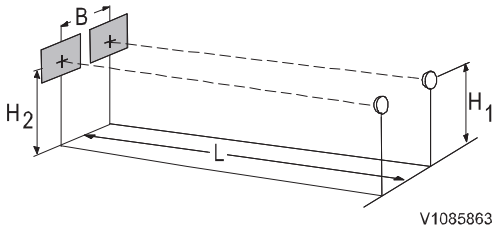


1 Adjusting screw, high beams
2 Adjusting screw, low beams

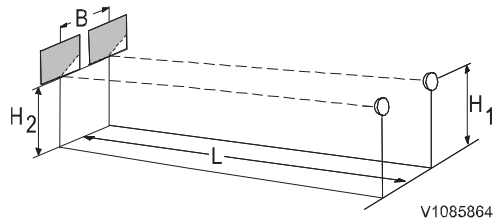
2 Stop the machine carefully so that the suspension is not compressed.

3 Turn on high beams or low beams.

4 Measure the height H1 from the ground up to the middle of the headlight.



High beams



Low beams

5 Adjust the light pattern with the three adjusting screws through the holes in the cover.

Dimensions	Low beams		High beams	
B	1950 mm	76.8 in	1650 mm	64.9 in
H2	H1 minus 250 mm	H1 minus 9.8 in	H1	
L	5000 mm	196.8 in	5000 mm	196.8 in

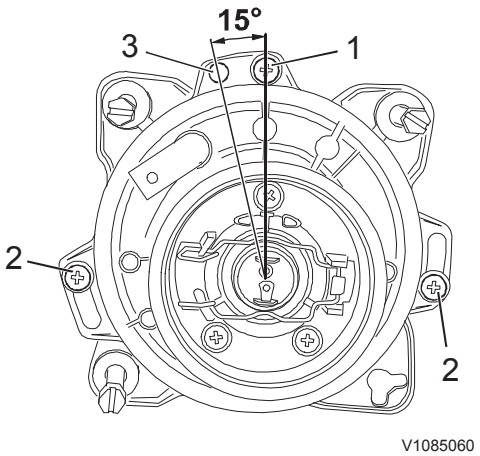
6 Turn off the high or low beams.

Left/right hand traffic, adjusting

The headlight is delivered adjusted for right-hand traffic.

Adjusting for left-hand traffic

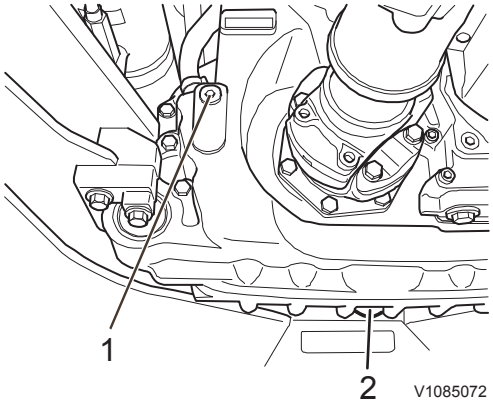
1 Open the engine hood.
2 Remove the screw (1).
3 Loosen the screws (2).
4 Turn the backpiece so that hole (3) ends up in front of the screw hole (1).
5 Install the screw (1).
6 Tighten the screws (2).
7 Close the engine hood.



1 Screw
2 Screws
3 Hole

Drop box oil, checking level and refilling

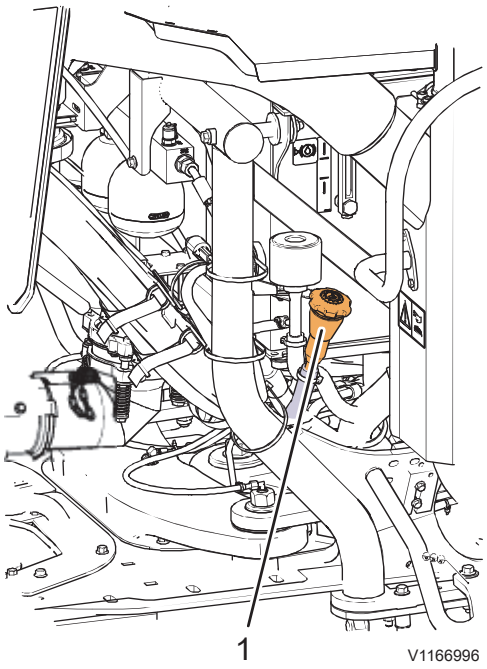
Check the oil level at regular intervals.



1 Level plug
2 Drain plug

1 Place machine in the service position. Refer to page *270*.

2 Remove the level plug. The oil level should be at the bottom edge of the hole.



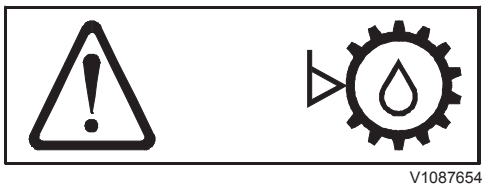
1 Fill pipe

3 If needed, fill new oil through the fill pipe, located on the cab's rear right side, up to the edge of the hole.
For oil grade, see page *384*.

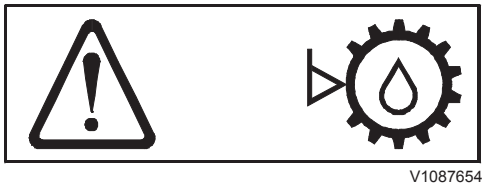
4 Install the level plug.

5 Restore the machine from service position.

Transmission oil, checking level and refilling



Transmission oil level low



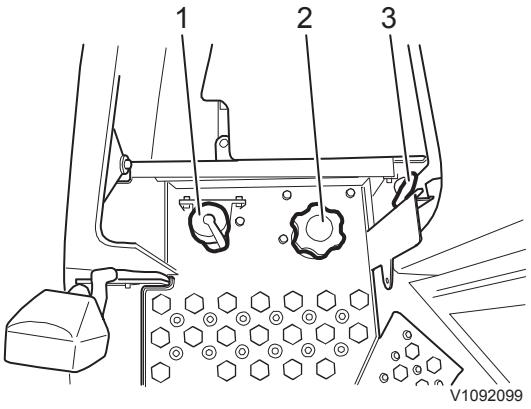
Transmission oil level high

The oil level can be read off on the information display unit, see page *62*. In case of wrong the oil level (low/high), an alarm display is shown, see page *76*. If the temperature in the transmission is high, the control light is on and an alarm display is shown, see page *76*.

Remember:
- The transmission may not drive correctly if there is too little oil, and this may result in transmission damage.
- Too much oil makes the oil foam, which causes the transmission to overheat.

Check the oil when its temperature is approx. 60 °C (140 °F).

NOTE!
Always clean around the dipstick before you check the oil level. Dirt in the oil damages the transmission.

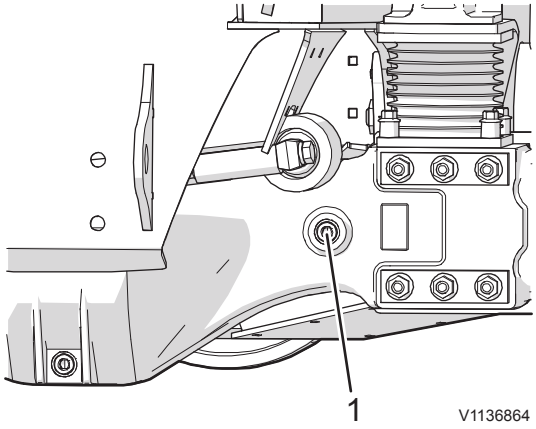


1 Filler point, washer fluid
2 Filler point, transmission oil
3 Dipstick, transmission oil

1 Place machine in the service position. Refer to page *270*.
2 Let the engine run at idle rpm.
3 The gear selector should be in neutral position.
4 Wait for approx. one minute to allow the oil level to stabilize before checking.
5 Open the cover for the battery box.
6 Wipe clean around the oil dipstick.
7 Pull out the oil dipstick, wipe it off, and insert it all the way to measure.
Use a lint-free rag when wiping off the dipstick.
8 The oil level should be 40–70 mm (1.6–2.4 in) over the Min. marking on the dipstick. The corresponding reading on the information display unit is 40–70%.
9 If needed, top up with new oil in the filler pipe. Do not overfill.
10 Check the level again.
11 Restore the machine from service position.

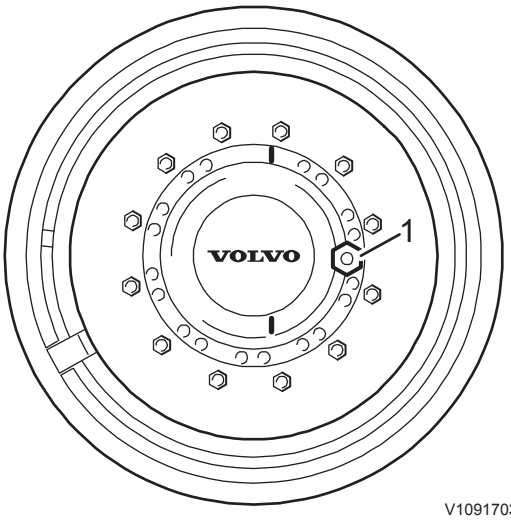
Oil volume between min. and max. on the dipstick is approx 7 litres (1.8 US gal).

Axles oil, checking level and refilling



1 Level and filler plug

1 Place machine in the service position. Refer to page *270* and let it stand for 2 minutes.
2 Remove the combined level and filler plug on the final drive (differential carrier). The oil should be flush with the hole.
The hub reductions have a common oil space with the final drive (differential carrier). The oil level should only be checked at the level and filler plug on the final drive (differential carrier).



1 Position of level and filler plug

3 If oil is to be filled, adjust the wheel so that the level and filler plug is at the same height as the middle of the hub.
For oil grade, see page *384*.
4 Fill new oil in the hub reductions and then in the final drive (differential carrier).
5 Reinstall the level and filler plug.

NOTE!
Wipe off the plug before it is reinstalled.

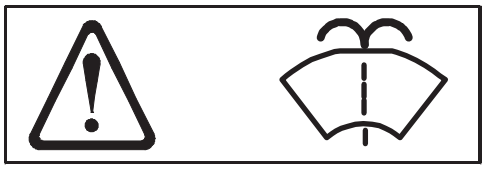
6 Restore the machine from service position.

Brake system, bleeding air

After work in the brake system, it must be bled free from air. The work shall be done by a qualified service technician.

Washer fluid, checking level and refilling

An alarm display is shown on the information display unit in case of low engine oil level, see page *98*.

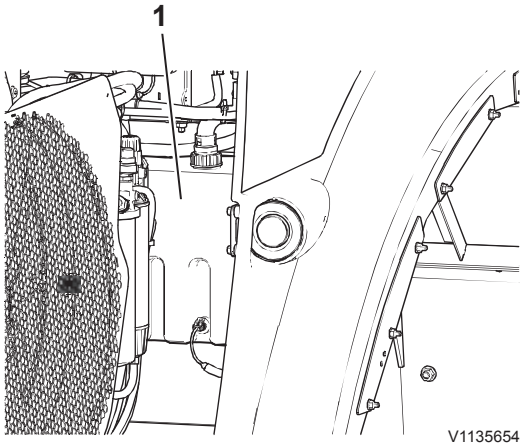


V1170014

Low washer fluid level

Windshield washer fluid, level check

The washer fluid level is checked electronically. The level can also be checked manually.
The washer fluid reservoir is located on the cab's left side in front of the wheel, accessible when the engine hood is opened.

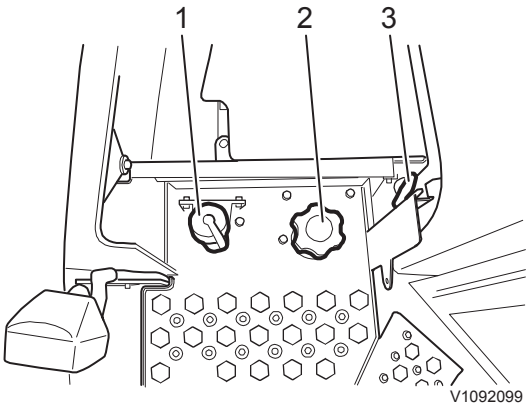


V1135654

1 Washer fluid reservoir

Washer fluid, fill point

NOTE!
When the temperature drops below freezing, anti-freeze should be added to the washer fluid. Follow the manufacturer's recommendations for ambient temperature.

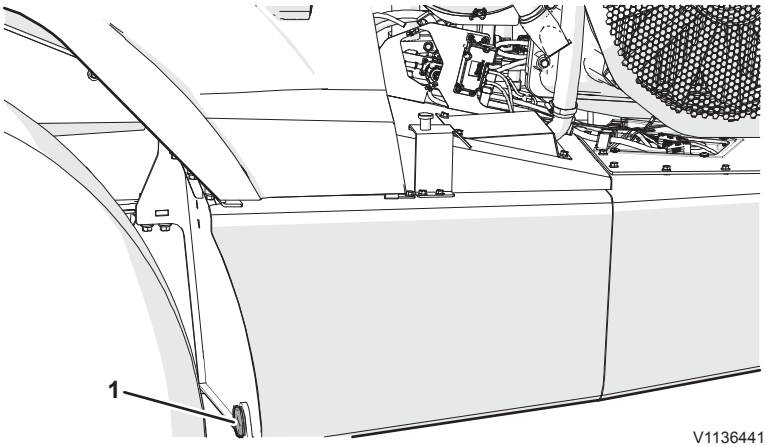


V1092099

1 Filler point, washer fluid
2 Filler point, transmission oil
3 Dipstick, transmission oil

1 Place the machine in service position, see page *270*.
2 Open the battery hatch on the left fender.
3 Remove the cover for the reservoir.
4 Top up washer fluid.
5 Fit the cover for the reservoir.
6 Close the battery hatch.
7 Restore the machine from service position.

Fender box, draining



1 Drain cap

Drain the fender if the machine has been outdoors during heavy rainfalls, has been parked outdoors for a long time, or if water has penetrated into the fender in any other way.

Place machine in the service position. Refer to *270* and drain the fender by opening the drain cap in front of the right front wheel.

Restore the machine from service position.

Snow chains

NOTE!
When operating with anti-slip devices (snow chains), 6-wheel drive should not be engaged.

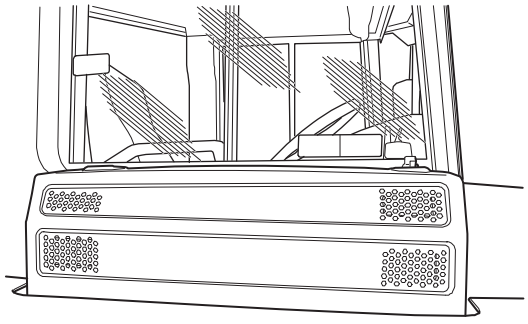
NOTE!
Volvo does not recommend use of snow chains. If snow chains are still installed despite this, it shall be done in consultation with the snow chain's manufacturer. It is important that snow chains are installed correctly since the space is limited and the machine can be damaged in case of incorrect installation. Snow chains can only be installed if the tyre dimension 23.5 R25 is used on the machine.

Cab, ventilation filter

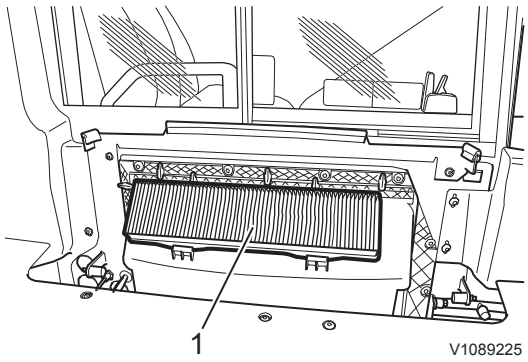
The filters should be checked and cleaned when needed.

The machine is equipped with two ventilation filters in the cab, one prefilter and one main filter. The filters are located on the cab's right side. How much the filters get clogged is completely dependent on the machine's operating conditions. The prefilter can be cleaned as needed. The main filter may not be cleaned, it must be changed. For replacement, contact a qualified workshop.

NOTE!
The cab filters are only intended to separate particles (dust) from the air. Any dangerous gases are not trapped by the filter.



Casing for cab prefilter and main filter



1 Prefilter

Cab, prefilter, clean

Clean the filter when needed.

WARNING

Risk of hazardous inhalation.
Dangerous dust can lead to serious health problems.
Always wear personal protective equipment, including filter mask, eye protection and appropriate gloves when handling and cleaning the engine compartment, coolers and air filters.

Before working on the machine, see page *272*.

1 Place the machine in service position, see page *270*.
2 Remove the casing.
3 Turn the plastic clips, remove the filter.
4 Carefully shake the filters without damaging them – avoid cleaning with compressed air, vacuum cleaner, or water.
5 Install the filter, lock with the plastic clips.
6 Install the casing.
7 Restore the machine from service position.

Weight calibration

(Optional equipment)

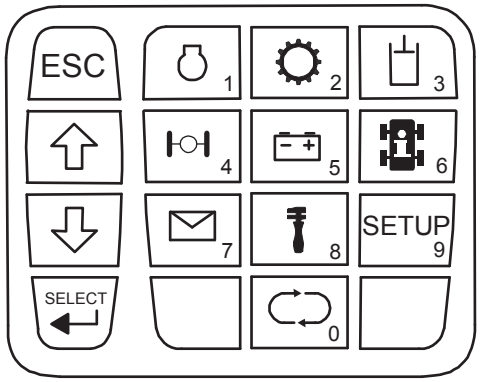
The zero value for an unloaded machine can be calibrated using the information display unit. The operator can run a load calibration if the machine or ground surface on which the machine is operated changes, and the load weight on the information display unit no longer matches the load's weight. This may be the case if, e.g., a tailgate has been installed on the machine.
If the problem remains after calibration, contact a qualified workshop.

A calibration in progress can be cancelled by pressing the ESC-key.
If a failed calibration attempt has been made, press the ESC-key to return to the start display.

Starting calibration

NOTE!
During the calibration sequence the machine should be operated on a ground surface without major grades (inclines), preferably similar to the ground on which the machine normally operates. Differential locks should be disengaged. Make sure that there is no load left in the load body.

Calibration is performed for 30 seconds. At this time speed should be 8–18 km/h (5–11.2 mph).



8 Service key

Calibration is started from the service menu by pressing on the service key and then, using the arrow keys, scrolling down to Weight calibration and pressing the SELECT-key.

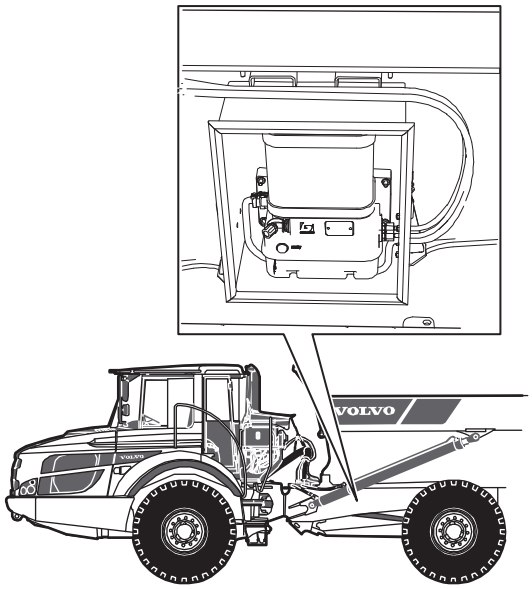
Alarm displays and vehicle messages when calibrating

Text on information display unit	Figure in information display unit	Description
Drive forward 8 - 18 km/h		Calibration in progress. Remaining time is shown.
Weight calibration denied		Conditions for calibration are not fulfilled. The conditions that are not fulfilled are shown.
Weight calibration failed		Calibration has been performed without all conditions being fulfilled. The conditions that have not been fulfilled are shown.
Weight calibration successful		Calibration has been performed without remark.

Automatic lubrication system

(Optional equipment)

The machine can be equipped with a central lubrication system (automatic greasing system) that automatically greases a number of points according to a preselected lubrication cycle, see figure below. Depending on the machine's operating conditions and load, there is a choice of three different lubrication intervals:



V1136689

Alternative A: Position of the grease reservoir on the inside of the trailer unit frame (2-litre reservoir)

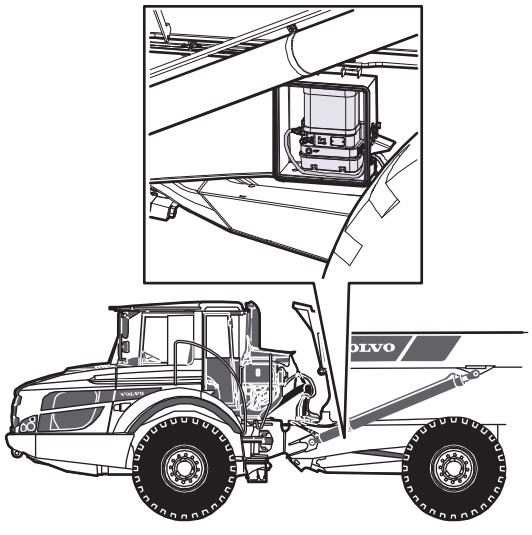
light — with long intervals between lubrication cycles

medium — with average length intervals between lubrication cycles

heavy — with short intervals between lubrication cycles (used for demanding work loads)

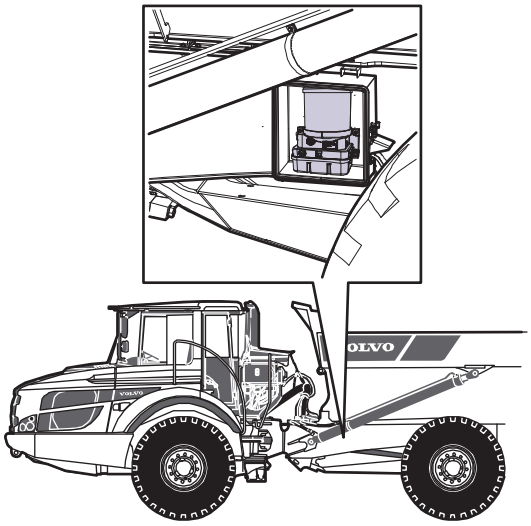
The time intervals for lubrication cycles are pre-set and can be changed with the greasing system's service tool.

The automatic greasing system is turned off automatically when the parking brake is applied manually, and starts again when it is deactivated.



V1179024

Alternative B: Position of the grease reservoir on the outside of the trailer unit frame (2-litre reservoir)



V1220035

Alternative C: Position of the grease reservoir on the outside of the trailer unit frame (4-litre reservoir)

The automatic greasing system should be inspected at regular intervals and should be coordinated with other regular maintenance and checking.

The following should be checked at regular intervals:

1 Place machine in the service position. Refer to page *270*.

2 **When the pump is positioned on the inside of the trailer unit frame (alternative A):**
Raise the dumper body and secure with the body lock, see page *279*.

3 Check the grease level in the reservoir and the condition of the grease.
For filling grease, see page *378*.

NOTE!
Do not fill the grease reservoir until the display in the cab generates a warning for low grease level. However, fill as soon as possible after the display has generated the warning for low grease level. This is to prevent air from entering the system.

4 Check the function on the display in the cab.

5 Check that selected lubrication interval is adapted to the machine's operating conditions.
To change lubrication interval, see page *381*.

6 Check the pump unit for damage and leaks.

7 Check the grease lines for damage and leaks.

8 Check that the grease points receive adequate grease (grease is forced out by the grease points).
Position of grease points, see below.

9 Check the system's function by running a single test lubrication cycle, see page *379*.

10 Clean the pump unit and the area around it.

11 Clean the filter, which is located behind the grease filler nipple under the reservoir on the pump unit, see page *376*.

12 **When the pump is positioned on the inside of the trailer unit frame (alternative A):**
Remove the dumper body lock and lower the dumper body.

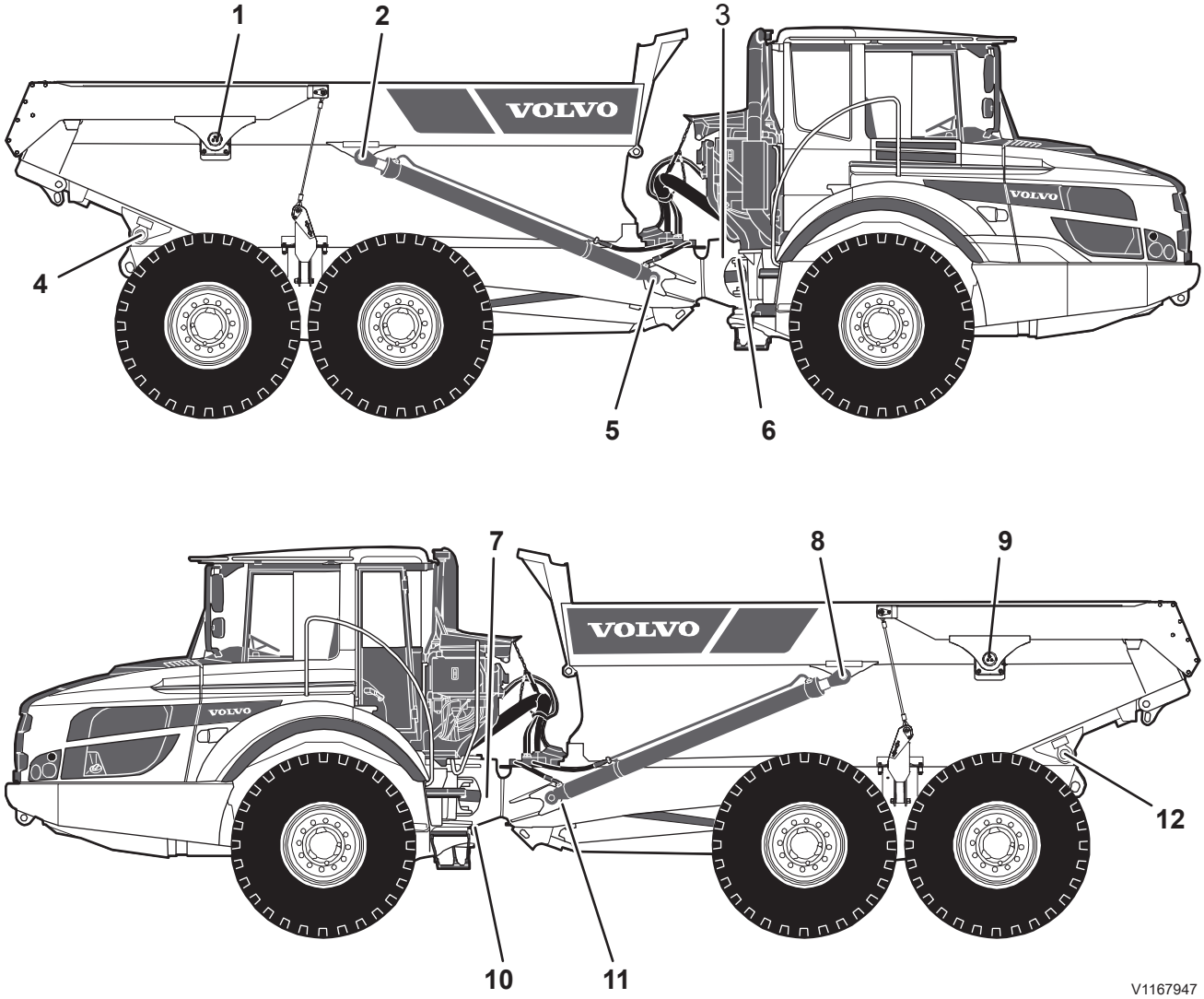
13 Restore the machine from service position.

Continuous test lubrication cycle after high-pressure wash

Normally, water cannot get in to the system. However, during high-pressure washing the risk increases and the pump unit should be protected since water that has entered the system does not disappear by itself, instead it can cause operating problems and malfunctions. A continuous test lubrication cycle should be run after high-pressure washing, see page *379* to obtain extra greasing.

NOTE!
For troubleshooting, adjusting, or repairing the pump unit, contact a qualified workshop.

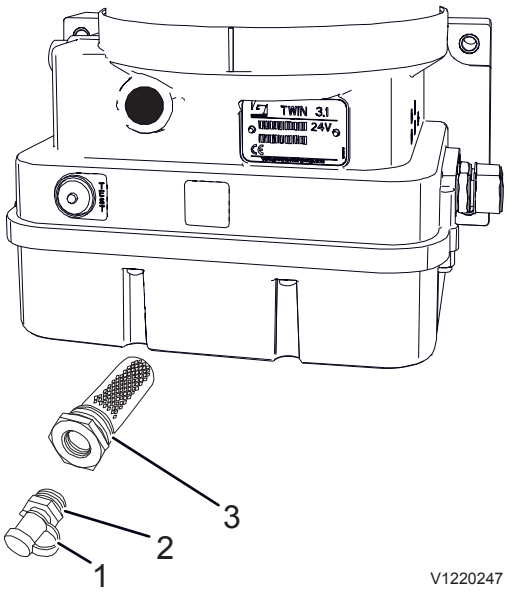
Grease points



1	Overhung tailgate (optional equipment)	7	Steering cylinder, rear bearing
2	Hoist cylinder bearing, upper	8	Hoist cylinder bearing, upper
3	Steering joint	9	Overhung tailgate (optional equipment)
4	Dump joint bearing	10	Steering joint
5	Hoist cylinder bearing, lower	11	Hoist cylinder bearing, lower
6	Steering cylinder, rear bearing	12	Dump joint bearing

Automatic lubricating system filter, cleaning

(Optional equipment)



New type of pump (4-litre reservoir)

1 Protection for filler connection
2 Filler connection
3 Filler filter

WARNING

Risk of serious injury.
Compressed air, water jets or steam may cause damage to unprotected skin and eyes.
Always wear personal protective gloves, goggles and clothing when using compressed air, water jets or steam.

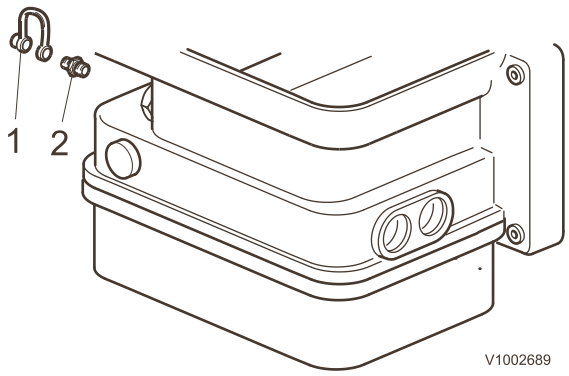
NOTE!
If the filter is damaged, the whole pump must be thoroughly cleaned. Contact a qualified workshop.

New type of pump (4-litre reservoir)

1 Place machine in the service position. Refer to page *270*.
2 Remove the filler connection (grease nipple).
3 Remove the filler filter.

NOTE!
There is a nut on the filter, it does not have to be loosened to remove the filter.

4 Clean the filter thoroughly with diesel. Check that the filter is not damaged.
5 Dry the filter thoroughly with compressed air.
6 Install the filler filter and the filler connection with the protection.
7 Restore the machine from service position.

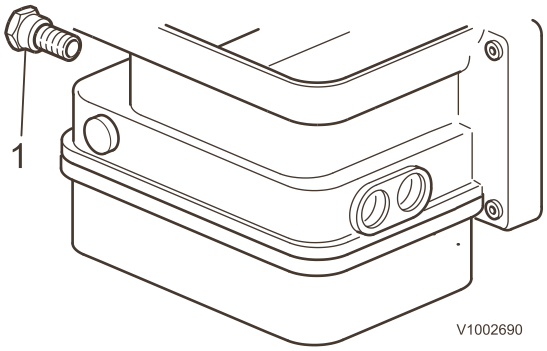


Earlier type of pump (2-litre reservoir)

1 Protection for filler connection
2 Filler connection

Earlier type of pump (2-litre reservoir)

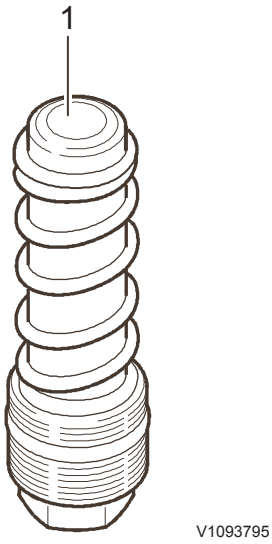
1 Place machine in the service position. Refer to page *270*.
2 **When the pump is positioned on the inside of the trailer unit frame:**
Raise the dumper body and secure it with the body lock, see page *279*.
3 Remove the filler connection (grease nipple).



Earlier type of pump (2-litre reservoir)

1 Filler filter

4 Remove the filler filter.



1 Filler filter

NOTE!
There is a nut on the filter, it does not have to be loosened to remove the filter.

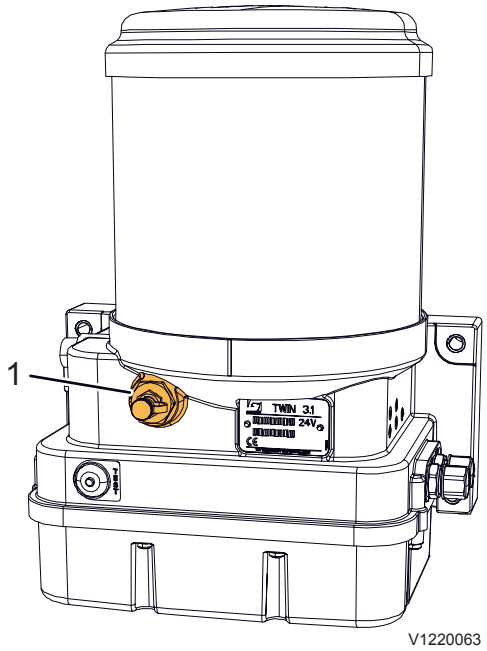
5 Clean the filter thoroughly with diesel. Check that the filter is not damaged.

6 Dry the filter thoroughly with compressed air.

7 Install the filler filter and the filler connection with the protection.

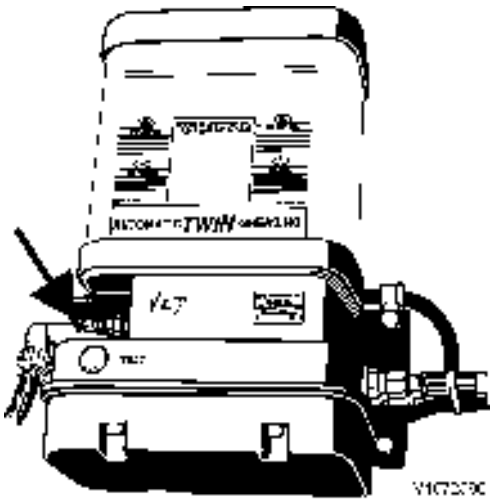
8 **When the pump is positioned on the inside of the trailer unit frame:**
Remove the load body lock and lower the load body.

9 Restore the machine from service position.



New type of pump (4-litre reservoir)

1 Filler connection



Earlier type of pump (2-litre reservoir): Filler connection

Filling lubricant

If the display in the cab shows low grease level (see page *373*), fill grease in the grease reservoir.

NOTE!
Do not fill the grease reservoir until the display in the cab generates a warning for low grease level. However, fill as soon as possible after the display has generated the warning for low grease level. This is to prevent air from entering the system.

On the pump unit there is a filler connection (grease nipple) to which a hand pump or an industrial pump is connected when filling.

NOTE!
When using an industrial pump, it is extra important that the filter between the connection and the pump is cleaned regularly, see page *376*. A blocked filter can easily crack, resulting in high risk of dirt and small particles entering the greasing system. In turn, this may lead to breakdown.

For information on the type of grease, see **lubricant recommendations** on page *389*.

Proceed as follows:

1 Place machine in the service position. Refer to page *270*.

2 **When the pump is positioned on the inside of the trailer unit frame:**
Raise the load body and secure it with the body lock, see page *279*.

3 Carefully clean the filler connection and the coupling on the filler hose.

4 Fill the filler hose completely full with grease before beginning to fill. This prevents air from entering the system.

5 Remove the protective cap on the filler connection and connect the coupling to the filler connection.

6 Fill grease to the max. level on the reservoir .(1) If it is difficult to pump in the grease, either the filter behind the filler connection is blocked or there may be dirt in the filler nipple itself. Clean the filter, see page *376*, and try again.

NOTE!
When the grease is cold it may also be difficult to pump it into the pump unit. Store the grease in a warm place for easier filling.

7 Reinstall the protective cap.

8 Store the grease pump in a dust-free place, so that it is not exposed to dirt.

9 **When the pump is positioned on the inside of the trailer unit frame:**
Remove the load body lock and lower the load body.

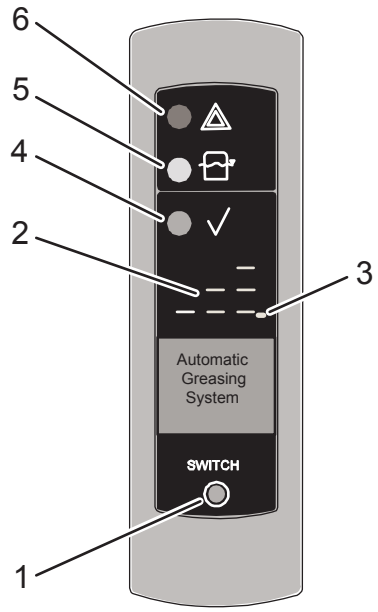
10 Restore the machine from service position.

1. If the reservoir is filled over max. level, the excess grease is drained through the breather hole on the left side of the reservoir. Any air under the plate in the reservoir is also drained through the breather hole.

System test

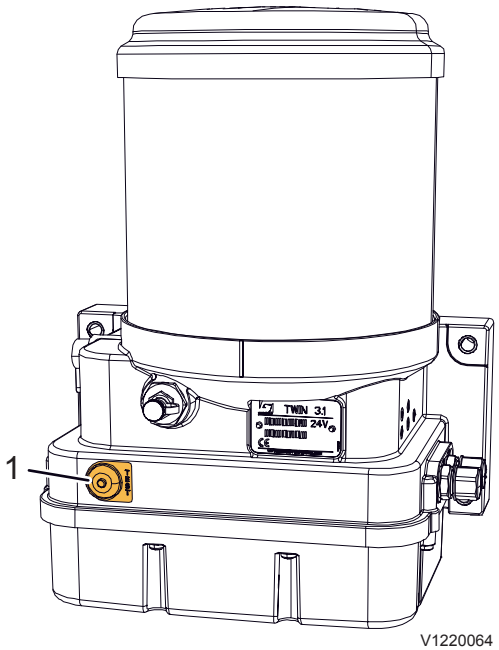
Run a system test to check the greasing system's function or to obtain extra greasing.

A test cycle can only be carried out when the pump is between two ordinary lubrication cycles (not during an ongoing lubrication cycle). Turning the ignition on and off does not end the lubrication cycle, instead it continues from where it was when the ignition is turned on again.



Display

1 Switch
2 Three-digit display
3 Decimal point
4 Green light-emitting diode — system active
5 Amber light-emitting diode — low grease level in grease reservoir
6 Red light-emitting diode — alarm



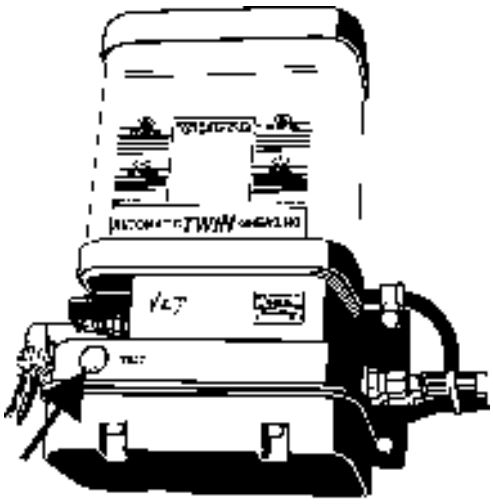
New type of pump (4-litre reservoir)

1 Test button

Single test lubrication cycle

The pump only carries out **one lubrication cycle** via **one** main line. Single test lubrication cycle can be run to check the greasing system's function.

1 Turn the ignition to position 1 (operating position).
2 Press in the 'switch button' on the display in the cab for at least 5 seconds.
The three-digit display starts to flash.
3 Press the 'switch button' repeatedly until T1 is shown on the three-digit display.
4 The lubrication cycle starts when code T1 stops flashing and changes to fixed light.
While the lubrication cycle is in progress, the green light-emitting diode flashes on the display. Code T1 and a wandering decimal point indicates in which part of the lubrication cycle the system is.
5 The test cycle ends automatically.



Earlier type of pump (2-litre pump): Test button

As an alternative, the test cycle can be started by pressing and holding in the test-button on the pump unit for **2–6 seconds**. Otherwise, as above.

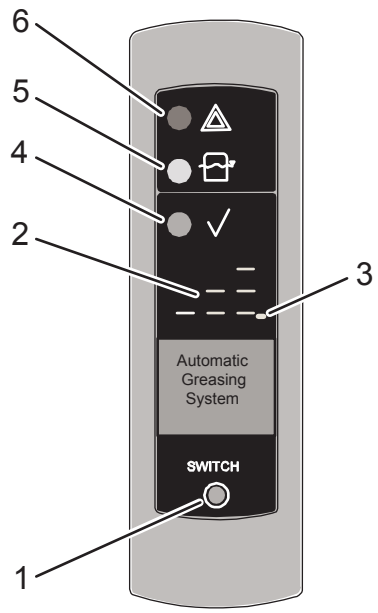
Continuous test lubrication cycle

The pump runs **an unlimited number of lubrication cycles**, that is, it continuously pumps out lubricant via **both** main lines. **Used after washing the machine, or when cleaning or bleeding the system.**

1 Turn the ignition to position 1 (operating position).
2 Press in the 'switch button' on the display in the cab for at least 5 seconds.
The three-digit display starts to flash.
3 Press the 'switch button' repeatedly until T2 is shown on the three-digit display.
4 The lubrication cycle starts when code T2 stops flashing and changes to fixed light.
While the lubrication cycle is in progress, the green light-emitting diode flashes on the display. Code T2 and a wandering decimal point indicates in which part of the lubrication cycle the system is.
5 End the test cycle by turning the ignition to position 0.

NOTE!
The test cycle does not end automatically.

As an alternative, the test cycle can be started by pressing and holding in the test-button on the pump unit for **more than 6 seconds**. Otherwise, as above.



Display

1 Switch
2 Three-digit display
3 (Decimal point)
4 Green light-emitting diode — system active
5 Amber light-emitting diode — low grease level in grease reservoir
6 Red light-emitting diode — alarm

Change of lubrication interval

When delivered, the system is preset to light lubrication interval. If the pre-selected lubrication interval does not suit the work or load conditions in which the machine operates, then another lubrication interval can be selected using the display in the cab. Three lubrication intervals can be selected:

light — long intervals between lubrication cycles (suitable for light work loads)

medium — average length intervals between lubrication cycles (suitable for average work loads)

heavy — short intervals between lubrication cycles (suitable for demanding work loads).

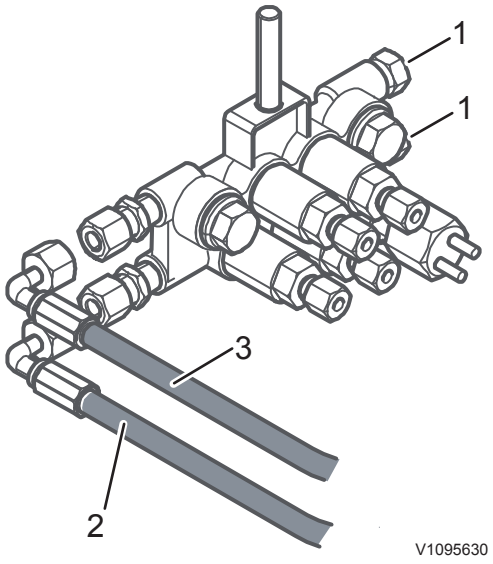
Proceed as follows to change lubrication interval:

1 Turn the ignition to position 1 (operating position).

2 Press in the switch button for at least 5 seconds.
The three-digit display on the display starts to flash.

3 Press the 'switch button' repeatedly until desired lubrication interval is shown, see section **Automatic greasing system, display** on page *136*.

4 Let the desired lubrication interval flash for at least 6 seconds until the selected lubrication interval lights up.
This confirms that the selected lubrication interval has been changed.



1 Plug
2 Main line A
3 Main line B

Automatic lubricating system, bleeding

WARNING

Risk of high pressure injection.
Oil or fuel leaks from high pressure hoses could cause serious injury caused by high pressure injection.
If oil or fuel leaks from high pressure hoses or loose screws are found, stop operations immediately and contact a qualified service technician.

If the grease reservoir has been emptied below min. level before new grease is filled and the system does not work as intended, there is a risk that there are air pockets either in the pump unit or in one of the main lines. The system has to be bled.

1 Place machine in the service position. Refer to page *270*.
2 **When the pump is positioned on the inside of the trailer unit frame:**
Raise the dumper body and secure it with the body lock, see page *279*.
3 Make sure that the grease reservoir is filled to the max. mark.
4 Remove the end plugs (1) for the main lines on the metering block located farthest from the pump unit.
There is a risk that the lines may be pressurized. To prevent personal injury when the end plugs are loosened, make sure that no persons are directly in front of the end plugs.
5 Turn the ignition to position 1 (operating position).
6 Start continuous test lubrication cycle, see page *379*.
7 Bleeding is finished when air-free grease comes out from the main lines.
8 Turn the ignition to position 0 and install the end plugs.
9 Run a single lubrication test cycle twice in a row to check that the system works, see page *379*.
10 **When the pump is positioned on the inside of the trailer unit frame:**
Remove the load body lock and lower the load body.
11 Restore the machine from service position.

Paint finish maintenance

Machines used in corrosive conditions are more prone to rusting than others. As a preventive measure it is recommended that the paint finish should be maintained every sixth months.If there is any doubt whether the conditions are corrosive or not, contact your dealer.

- At first clean the machine.
- Apply Dinol 77B (or corresponding transparent waxy anti-rust agent) at a thickness of 70–80 µm.
- A protective layer of underseal Dinol 447 (or corresponding) may be applied under the mudguards where mechanical wear is expected.

Wheel nuts, checking tightening

After replacement of a wheel or if a wheel has been removed for other reasons, the wheel nuts must be check-tightened after 3 hours of operation.

Tightening torque: 800 Nm (590 lbf ft)

For more information about tire change and actions in connection with changing, see page *419*.

Specifications
Recommended lubricants

Recommended lubricants

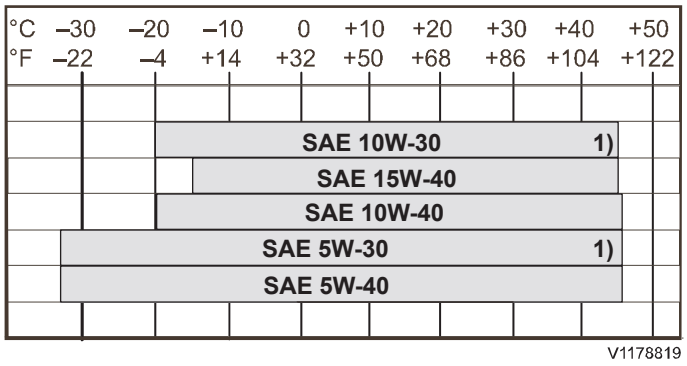
For questions about oils, lubricants, and extreme outdoor temperatures, contact an authorised dealer for information.

Bio oil
When changing from a mineral oil to a bio oil, contact an authorised dealer.

NOTE!
Keep in mind the type of engine with which the machine is equipped and follow the instructions that apply to that engine.

Recommended lubricants, engine alternative L and M

NOTE!
It is very important that instructions for oil grade are followed, otherwise deposits from the oil may clog the aftertreatment system.

	Oil grade	Recommended viscosity at different ambient temperatures
ENGINE D11L D11M	**Volvo Engine Oil VDS-4.5 10W-30** or **Volvo Engine Oil VDS-4.5 15W-40** or **other approved VDS-4.5 engine oil** Follow recommended change intervals according to the oil's grade (quality class) and sulphur content in the fuel.	 1) VDS-4.5 and VDS-4 approved oils. Non VDS-4.5 or VDS-4 approved oils can be used up to +30 °C (+86 °F).
	Volvo Engine Oil VDS-4 10W-30 or **Volvo Engine Oil VDS-4 15W-40** or **other approved VDS-4 engine oil** Follow recommended change intervals according to the oil's grade (quality class) and sulphur content in the fuel.	
	ACEA: E9 API: CJ-4 or CK-4 Follow recommended change intervals according to the oil's grade (quality class) and sulphur content in the fuel.	

Follow recommended change intervals according to the oil's grade (quality class).

For machines manufactured before June 2020

Oil grade	Sulphur content in fuel, in ppm (> 15 ppm is not allowed) Oil change interval < 15 ppm
Volvo Engine Oil VDS-4.5	500 hours
Other approved VDS-4.5 engine oil	
Volvo Engine Oil VDS-4	500 hours
Other approved VDS-4 engine oil	
ACEA: E9	250 hours
API: CJ-4 or CK-4	

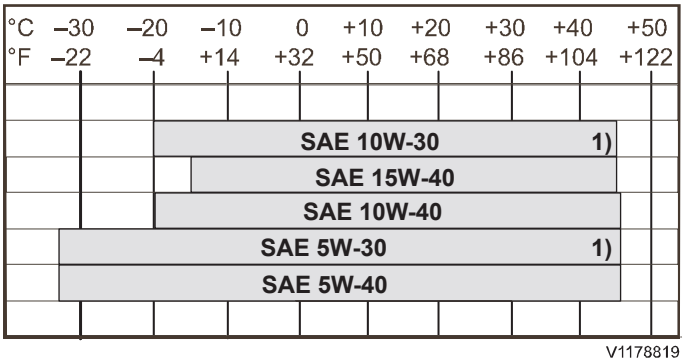
For machines manufactured from and during June 2020

Oil grade	Sulphur content in fuel, in ppm (> 15 ppm is not allowed) Oil change interval < 15 ppm	
	Volvo High Performance engine oil filter	Volvo Performance engine oil filter
Volvo Engine Oil VDS-4.5	1000 hours or at least every 12 months	500 hours
Other approved VDS-4.5 engine oil[(a)]		
Other approved VDS-4.5 engine oil	500 hours	500 hours
Volvo Engine Oil VDS-4		
Other approved VDS-4 engine oil		
ACEA: E9	250 hours	250 hours
API: CJ-4 or CK-4		

a) Approved for 1000 hours as per the VDS 4.5 standard.

Recommended lubricants, engine alternative F and E

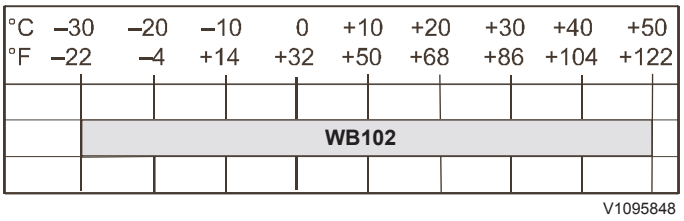
NOTE!
It is very important that instructions for oil grade are followed for fuels with different sulphur contents. Otherwise acid deposits may shorten the engine's service life.

	Oil grade	Recommended viscosity at different ambient temperatures
ENGINE D11F D11E	Volvo Engine Oil VDS-4.5 10W-30 or Volvo Engine Oil VDS-4.5 15W-40 or other approved VDS-4.5 engine oil Follow recommended change intervals according to the oil grade and sulphur content in the fuel.	 1) VDS-4.5 and VDS-4 approved oils. Non VDS-4.5 or VDS-4 approved oils can be used up to +30 °C (+86 °F).
	Volvo Engine Oil VDS-4 10W-30 or Volvo Engine Oil VDS-4 15W-40 or other approved VDS-4 engine oil Follow recommended change intervals according to the oil grade and sulphur content in the fuel,	
	Volvo Engine Oil VDS-3 10W-40 or Volvo Engine Oil VDS-3 15W-40 or other approved VDS-3 engine oil Follow recommended change intervals according to the oil grade and sulphur content in the fuel,	
	ACEA: E7 or E9 API: CI-4 or CJ-4 or CK-4 Follow recommended change intervals according to the oil grade and sulphur content in the fuel,	

Follow recommended change intervals according to the oil grade and sulphur content in the fuel.

Oil grade	Sulphur content in fuel, in ppm (10000 = 1%)				
	< 15 ppm	15 – 500	500 – 3000	3000 – 5000	>5000
	Oil change interval				
Volvo Engine Oil VDS-4.5 10W-30 Volvo Engine Oil VDS-4.5 15W-40	500 hours			250 hours	125 hours
Volvo Engine Oil VDS-4 10W-30 Volvo Engine Oil VDS-4 15W-40	500 hours			250 hours	125 hours
Volvo Engine Oil VDS-3 10W-40 Volvo Engine Oil VDS-3 15W-40	500 hours			250 hours	125 hours
ACEA: E7 or E9 API: CI-4 or CJ-4 or CK-4	250 hours			125 hours	75 hours

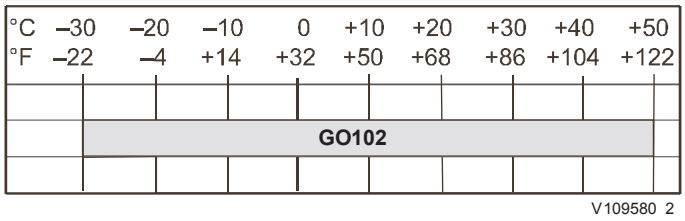
Recommended lubricants, brake cooling system

Oil grade	Interval between changes hours	Recommended viscosity at different ambient temperatures
Volvo Wet Brake Oil Volvo 97304 WB102	4000	
Volvo Wet Brake Oil Volvo 97303 WB101	2000	
Other approved oils according to Volvo Standard 1273,03 (97303, WB101)	2000	

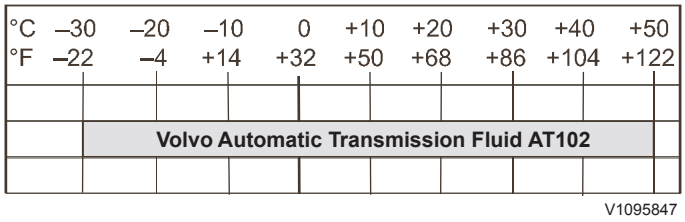
Recommended lubricants, drive axles

Oil grade	Interval between changes hours	Recommended viscosity at different ambient temperatures
Volvo Synthetic Axle Oil 97312 75W-90	First at 500, then every 4000	
Other approved oils against Volvo Standard 1273,12 (97312 75W-90)	First at 500, then every 4000	
Volvo Axle Oil 97321 80W-90 or Volvo Axle Oil 80W-90 GL-5	First at 500, then every 1000	
Other approved oils according to Volvo Standard 1273,21 (97321 80W-90)	First at 500, then every 1000	

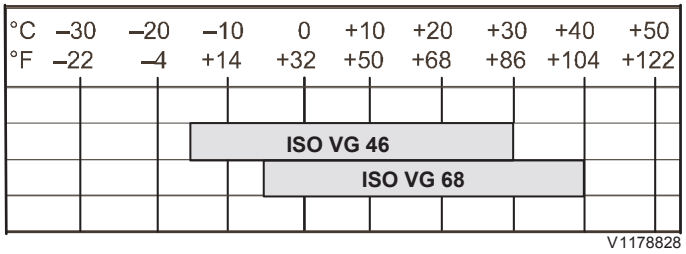
Recommended lubricants, dropbox

Oil grade	Interval between changes hours	Recommended viscosity at different ambient temperatures
Volvo Axle Oil Volvo 97317 75W–80 GO102	4000	
Volvo Axle Oil 97321 80W-90 or Volvo Axle Oil 80W-90 GL-5	1000	
Other approved oils according to Volvo Standard 1273,21 (97321 80W-90)	1000	

Recommended lubricants, transmission

Oil grade	Interval between changes hours	Recommended viscosity at different ambient temperatures
Volvo Automatic Transmission Fluid Volvo 97342 AT102	2000	
Volvo Automatic Transmission Fluid Volvo 97341 AT101	1000	
Other approved oils according to Volvo Standard 1273,41 (97341, AT101)	1000	

Recommended lubricants, hydraulic system

Oil grade	Interval between changes hours	Recommended viscosity at different ambient temperatures
Volvo Hydraulic Oil Volvo 98608 Super 46 or Volvo Hydraulic Oil Volvo 98608 Super 68	4000	
Volvo Hydraulic Oil Volvo 98610 Biodegradable 46	4000	

Recommended lubricants, miscellaneous

	Oil grade	Interval between changes hours
GHS (Gas-Hydraulic Suspension)	See *388*	4000
Cooling system	Volvo Coolant VCS Ready Mixed See page *397*.	6000 or every 4th year
Hood pump	See *388*	If needed
Oil-bath air cleaner (1)	Same grade as in engine, see *385*	250

Grease

Lubrication points	Type of grease	Examples of greases
Machine, general lubrication (pins, bushings, joints) if nothing else stated	Lithium- or calcium-based grease with extreme pressure (EP) additives, consistency NLGI 2	– Volvo Lithium Grease EP2 – Volvo Multipurpose Grease 97718 GR101 – Volvo Resistant Grease 97720 GR102 – Other greases approved against Volvo standards 1277,18 / 1277,2
Hitch	Synthetic, lithium complex grease	– Mobilith SHC220 – Chevron Ulti-plex Synthetic Grease EP
Automatic lubrication system	Lithium- or calcium-based grease with extreme pressure (EP) additives, consistency NLGI 2, 3-5% molybdenum disulphide (MoS2). Consistency NLGI 1 or NLGI 0 may be used at temperatures below -5°C	– Volvo Lithium Grease EP2 – Volvo Multipurpose Grease 97718 GR101 – Volvo Resistant Grease 97720 GR102 – Volvo Extreme Grease 97765 GR103 – Other greases approved against Volvo standards 1277,18 / 1277,2 / 1277,65
Exhaust heated dump body (previous design)		– See page *389*

Exhaust heated dump body

Recommended lubricant (only applies to previous exhaust-heated dumper body design)

Use a graphite-based lubricant, e.g., Molykote D321 R or similar.

1. Only applies to machines with engine alternative E and F.

Fuel system

Fuel

NOTE!
The manufacturer's warranties may become invalid and void if unsuitable or incorrect fuels are used.

Fuel, specifications (EU certified engines)

D11L engines with exhaust aftertreatment / D11M engines with exhaust gas recirculation (EGR) and with exhaust aftertreatment

Diesel engines from 2011 and later are only intended to be run on sulphur-free fuel, with a maximum sulphur content of 10 ppm. Using any other fuel than sulphur-free fuel results in an engine with lower efficiency and shorter service life, permanent damage to advanced emission control devices and systems, inferior fuel economy, and possibly that the engine does not work at all.

Correct selection of fuel is decisive for good economy, performance, and engine life. Market fuel that meets CEN diesel fuel standard EN 590:2013 or European Fuel Quality Directive 98/70EC shall be used. Other fuels such as HVO (Hydrotreated Vegetable Oil), GTL (Gas-To-Liquids), CTL (Coal To Liquids), BTL (Biomass-To-Liquids), and Swedish Environment Classification 1 (MK1) diesel fuel are also allowed, if they meet the above standards and directives.

It is important that the fuel is not contaminated by dust or water since these can cause damage to the fuel system and also increase engine wear. The cleanliness of the fuel in the machine's fuel tank must therefore be 18/16/13 or cleaner in accordance with ISO 4406 or ASTM D7619.

Fuel, specifications (USA certified engines)

D11L engines with exhaust aftertreatment / D11M engines with exhaust gas recirculation (EGR) and with exhaust aftertreatment

Diesel engines for model year 2011 and later are designed to only run on fuels with very low sulphur content, Ultra Low Sulphur Diesel (ULSD), with a maximum sulphur content of 15 ppm. Using any other fuel than ULSD results in an engine with lower efficiency and shorter service life, permanent damage to advanced emission control devices and systems, inferior fuel economy, and possibly that the engine does not work at all. Use of other fuels than ULSD in diesel-powered machines is illegal and punishable according to civil legislation.

Correct selection of fuel is decisive for good economy, performance, and engine life. ASTM D 975 Number 2D ULSD should be used when climate conditions permit. ASTM D 975 Number 1D ULSD can be used in cold weather. Mixtures of ASTM D 975-fuels Number 1D and Number 2D ULSD can be used to suit different climate conditions.

It is important that the fuel is not contaminated by dust or water since these can cause damage to the fuel system and also increase engine wear. The cleanliness of the fuel in the machine's fuel tank must therefore be 18/16/13 or cleaner in accordance with ISO 4406 or ASTM D7619.

Fuel, specifications (engines without exhaust aftertreatment)

D11F/D11E-engines without exhaust aftertreatment

This diesel engine is intended to be run on commercially available diesel fuel oil. Use fuel that meets national or international standards for diesel fuel oil. Fuel with low sulphur content (below 1000 ppm) is preferable, since this reduces both wear and environmental impact.

Correct selection of fuel is decisive for good economy, performance, and engine life. It is important that the fuel is not contaminated by dust or water since these can cause damage to the fuel system and also increase engine wear.

Bio-diesel fuel, specifications

Vegetable oils and/or esters, also called "bio-diesel", (e.g., rape-seed methyl ester, RME fuel) are offered on certain markets both as pure products and as mixed into the diesel fuel.
Volvo Construction Equipment accepts max. 7% intermix of bio-diesel fuel in the diesel fuel, ready-mixed from the oil companies.

Alternative fuels

This statement is only valid for Volvo branded engines.

Hydro-treated vegetable oil (HVO) and fatty acid methyl ester (FAME) biodiesel are both made from renewable raw materials such as vegetable oils and animal fats, but they are chemically processed in different ways.

Hydro-treated vegetable oil (HVO)

HVO is created using a chemical process called hydro-treating. Hydro-treating creates an oxygen-free hydrocarbon product that is very similar to distillate diesel fuel and is well suited for use in diesel engines. HVO fuels complying with the CEN diesel fuel standard EN 590:2013 or with the European Fuel Quality Directive 98/70/EC are approved for use in all Volvo Construction Equipment diesel engines with no changes to maintenance intervals. Paraffinic diesel fuels complying with the CEN standard EN 15940 may be used in all machines operating outside the European Union and for EU-certified engines up to the emission level Stage IV. These fuels may also be used for the EU-certified D11, D13 and D16 engines meeting the emission level Stage V.

Biodiesel

Biodiesel is a product made from renewable resources such as vegetable oils or animal fat. Biodiesel that has been chemically processed into fatty acid methyl ester (FAME) can be blended with distillate diesel fuel and used in some diesel engines. Unblended biodiesel is referred to as B100 because it is 100% biodiesel.
Rapeseed methyl ester (RME) is the most common type of FAME used in Europe. Soy methyl ester (SME) and sunflower oil methyl ester (SOME) are the most common types of FAME used in the US.
Although use of FAME biodiesel is now a legal requirement in some markets, it is not as suitable for use in diesel engines as conventional diesel fuel or HVO (hydro-treated vegetable oil).

Biodiesel fuel requirements

The FAME biodiesel blends specified in the table below are approved for use if:

- The biodiesel is pre-blended by the fuel supplier
- The biodiesel used in the blend conforms to EN14214 or ASTM D6751
- The distillate fuel used in the blend meets fuel sulphur requirements
- The distillate fuel used in the blend conforms to EN590 or ASTM D975
- B1-B5 biodiesel blends conform to EN590 or ASTM D975
- B6-B7 biodiesel blends conform to EN590 or ASTM D7467
- B8-B20 biodiesel blends conform to EN16709(B20) or ASTM D7467

Engine emission designation	Engine size	Acceptable blend
EU Stage II / US Tier 2 * EU Stage IIIA / US Tier 3 * EU Stage IIIB / US Tier 4 interim EU Stage IV / US Tier 4 final EU Stage V	Below D4 / 4 litres	Up to B7
EU Stage II / US Tier 2 * EU Stage IIIA / US Tier 3 * EU Stage IIIB / US Tier 4 interim EU Stage IV / US Tier 4 final	D4–D8	Up to B7
EU Stage II / US Tier 2 * EU Stage IIIA / US Tier 3 * US Tier 4 final, special North America arrangement **	D9–D16	Up to B20
EU Stage IIIB / US Tier 4 interim EU Stage IV / US Tier 4 final	D11–D16	Up to B10
EU Stage IIIB / US Tier 4 interim, equipped with High Sulphur Fuel Conversion Kit (only available in unregulated markets) EU Stage IV / US Tier 4 final, equipped with High Sulphur Fuel Conversion Kit (only available in unregulated markets)	D4–D16	Up to B20
EU Stage V	D4–D16	Up to B7
* As Tier 2 and Tier 3 emissions regulations ended in 2005 and 2010 respectively, engines produced since then typically **meet Stage II / Stage IIIA regulations**, allowing their sale in less regulated markets. ** With additional restrictions and special operating conditions, equipment used in North America may operate on B20 diesel.		

NOTE!
Failures directly caused by the use of poor quality biofuel, or any other fuel not conforming to standards, are not factory defects and the manufacturer's warranty does not apply.

Maintenance interval requirements

Additional service actions and shorter maintenance intervals are mandatory when using biodiesel blends above B10.

Every 10 hours
- Check the engine oil and change if it rises above the maximum fill level - Inspect the fuel system components and replace as necessary
Half of original interval
- Change the engine oil and filter - Replace the fuel filter(s)
Every year, regardless of operating hours
- Change the engine oil and filter - Clean the fuel tank

Effects of biodiesel on engine oil

Using biodiesel can lead to increased oil dilution. Use engine oil analysis tools frequently to check for fuel dilution and monitor engine oil condition. Check the engine oil level daily. Always

change the engine oil if the oil level rises above the maximum fill level.

Effects of biodiesel on fuel systems

Biodiesel dissolves and loosens some fuel system deposits. During the initial conversion to biodiesel, loosened deposits will travel to the fuel filters and require more frequent fuel filter replacements. Start with new fuel filters when using biodiesel for the first time.

Biodiesel is aggressive to some materials used in fuel system components. Inspect seals, hoses, rubber and plastic components every 10 hours. Repair or replace any components that are damaged, softened or leaking. Clean biodiesel from painted surfaces immediately to prevent paint damage.

Biodiesel is more sensitive to bacteria and water contamination than distillate diesel fuel.

- Use as much fuel as possible before refilling the fuel tank in order to prevent bacteria growth if a machine is in regular use, e.g. regularly uses up a tank of fuel within a week. In climates where condensation is a risk, or when the machine is working for short durations, keep the fuel tank full.
- Do not use biodiesel in machines with low utilization or operating time.
- Do not store machines for more than 4 weeks without flushing biodiesel out of the fuel system by operating the machine through at least one full tank of distillate diesel fuel.
- Always follow the manufacturer’s storage recommendations and “best-before” dates for each delivery of biodiesel.

Effects of biodiesel on exhaust aftertreatment systems

Biodiesel leaves higher levels of ash in diesel particulate filters and may require more frequent diesel particulate filter (DPF) regeneration and cleaning. Biodiesel can cause deviations in temperatures and functionality of the DPF burner and may cause fault codes or errors.
Biodiesel exhaust gas is aggressive to some materials used in selective catalytic reduction systems (SCR) and may require more frequent cleaning, repairing or replacing of SCR parts.

Effects of biodiesel on cold weather operation

Biodiesel has a high viscosity at temperatures below 0 ˚C (32 ˚F) and may cause problems starting the engine. Use a fuel heater or park machines in a heated building if possible.

Effects of biodiesel on engine performance

Biodiesel B100 has about 8% lower energy density compared to regular diesel fuel. Blends equal or lower than B20 have a small impact on engine performance.

Effects of biodiesel on emissions compliance

Engines are certified to comply with U.S. EPA, California and EU emissions standards based upon the use of test fuels with specifications established by these regulatory agencies. Alternative fuels, including biodiesel, that are not substantially similar to the required test fuels may adversely affect engine emissions compliance. As a result, Volvo does not warrant that the engine will conform to applicable Federal or California and EU emissions limits when operated on, or having previously being operated on, biodiesel or other alternative fuels that are not substantially similar to specified test fuels used for certification, nor if biodiesel / regular diesel is used in blends that exceed the recommendations.

However, the use of biodiesel up to a maximum of 20% (B20) in and of itself, will not affect the manufacturer's mechanical warranty as to engine or emissions system, provided the bio fuel used in the blend conforms to the applicable standards and the additional steps outlined herein are followed.

AdBlue®/DEF

NOTICE

Risk of machine damage.
In the short term, use of the wrong fluid can lead to reduced engine power. In the long term, it can lead to damage to the SCR-system and the catalyst. Reusing AdBlue®/DEF can lead to contamination. Damages caused by the use of incorrect fluids will not be covered by the warranty.
Always use fluid specified in ISO 22241-1. Do not reuse drained AdBlue®/DEF.

For reducing nitrogen oxides (NO_X) the engine is equipped with a selective catalytic reduction (SCR) system. A diesel exhaust fluid is needed for the process to work. The fluid is called AdBlue® in Europe and Asia, but in North America it is called Diesel Exhaust Fluid (DEF). When needed, the SCR system warms up the AdBlue®/DEF-tank and lines.

The fluid is filled in a separate tank, which is completely separated from the fuel tank. AdBlue®/DEF may not be mixed in the fuel tank and fuel may not be mixed in the AdBlue®/DEF-tank.

AdBlue®/DEF consists of urea crystals (32.5%) and distilled water (67.5%). It is transparent, clear, and has a slight odour of ammonia. The fluid is not considered to be hazardous, but should still be handled with care. It is very corrosive, especially with copper and aluminium. For this reason, avoid spilling the fluid on electric cables and components. Always wipe up any spilled AdBlue®/DEF.

AdBlue®/DEF is not a combustible product. When exposed to high temperatures it will convert to ammonia and carbon dioxide. The fluid should not come into contact with other chemicals or be mixed with other chemicals.

AdBlue®/DEF is sensitive to both high and low temperatures. It should not be exposed to direct sunlight for any extended period of time. If the machine is not in use, AdBlue®/DEF starts to freeze at −11 °C (12 °F). The fluid volume in the tank increases when frozen, this is why it is important to follow the recommended fill volume. AdBlue®/DEF does not break down or degrade when it freezes. The SCR-system will thaw the fluid so that it regains its concentration with maintained quality. The machine will work normally during the time that the fluid melts.

At AdBlue®/DEF temperatures above 20 °C (68 °F) the fluid starts to degrade. Then the fluid gives off ammonia, which is aggressive to materials such as rubber. At temperatures above 75–80 °C (167–176 °F), ammonia production increases. However, high temperatures are permitted for a short time.

AdBlue®/DEF should be stored in a cool, dry, and ventilated place. The fluid may not be stored in direct sunlight. The recommended storage temperature for AdBlue®/DEF is between −11 °C (12 °F) and 25 °C (77 °F). Under these conditions, storage life is approx. two years. Long-term storage of AdBlue®/DEF at a temperature above 25 °C (77 °F) can reduce the lifetime of the fluid. A short time exposure to higher temperatures has no impact on the quality.

NOTE!
If the machine is to be parked for an extended period of time (several months) in ambient temperatures above 40 °C (104 °F) the tank must be drained. This to prevent the fluid from having the wrong quality when starting the machine or that precipitates have a negative impact on the component parts.

NOTE!
If the tank has been drained completely it should be rinsed out with new AdBlue®/DEF before new fluid is filled. Never reuse old fluid. If distilled water or ordinary water is used when rinsing there is a risk that the system will generate an alarm due to wrong quality of AdBlue®/DEF.

NOTE!
Water of any kind should not be used when cleaning AdBlue®/DEF system or AdBlue®/DEF components since there is a risk that even a small amount of water remains in the system after cleaning. The only exceptions allowed are operations described in the service information made by Volvo.

AdBlue®/DEF is available in plastic container, barrel, IBC, or bulk.
For information on ordering AdBlue®/DEF (only applies to USA-market):
- Volvo Construction Equipment: 1-877-823-1111 (office hours)
- www.volvoce.com (outside of office hours)

For information on ordering AdBlue®/DEF (other markets), contact your local Volvo dealer.

Actions in case of contact with AdBlue®/DEF:

- In case of skin contact, rinse thoroughly with water. The fluid may cause irritation of the skin.
- In case of eye contact, rinse thoroughly for several minutes. If needed, contact a doctor for advice.
- In case of inhalation, breathe fresh air and contact a doctor if needed.
- If swallowed, drink water and contact a doctor.

Cooling system

Coolant

The previous coolant, Volvo Coolant VCS (yellow fluid) has been replaced with Volvo Coolant VCS2 (orange fluid). The fluids can be mixed together.
Machines that previously used Volvo Coolant VCS (yellow fluid) can now be filled with the new Volvo Coolant VCS2 (orange fluid).

Only use Volvo Coolant VCS2 when filling and changing the coolant.
To avoid damage to the engine and cooling system, different coolants or corrosion protection must not be mixed with Volvo Coolant VCS/VCS2.
When using concentrated Volvo Coolant VCS2 and clean water, the mixture must contain 40–60% concentrated coolant and 60–40% clean water. The amount of concentrated coolant must never be less than 40% of the total mixture, see table below.
Volvo Coolant VCS2 is orange.

Freezing protection down to	Mixed-in amount of concentrated coolant
-25 °C (-13 °F)	40 %
-30 °C (-22 °F)	42% (mixture from factory)
-37 °C (-35 °F)	50%
-40 °C (-40 °F)	60 %

The coolant may not be mixed with water having a high content of lime (hard water), salt or metals.

Clean water for the cooling system must also meet the following requirements:

Description	Value
Total number of solid particles	< 300 ppm
Total hardness	< 7° dH
Chloride	< 40 ppm
Sulphate	< 100 ppm
pH value	6.5-8.5
Silica	< 20 ppm
Iron	< 0.10 mg Fe/litre
Manganese	< 0.05 mg Mn/litre
Electrical conductivity	< 400 µS/cm
Organic content, COD-Mn	< 8 ppm

If there is any doubt about the water quality, ready-mixed Volvo Coolant VCS2 containing 40% concentrated coolant must be used. Do not mix with other ready-mixed coolants since this may cause engine damage.

Service capacities and change intervals

Oil and fluid change, intervals

Intervals for oil changes and fluid changes, see page *384*.

Filter change engine, intervals

	Hours
Engine oil filter	500 (performance filter) or at each oil change
	1000 (high performance filter) or at least once a year Only applies to machines with engine alternative M under some conditions, see page *384* for detailed information.
Fuel filter, primary	500 (performance filter) or when the filter is clogged
	1000 (high performance filter) or when the filter is clogged Only applies to machines with engine option M manufactured from June 2020.
Fuel filter, secondary	500 (performance filter) or when the filter is clogged
	1000 (high performance filter) or when the filter is clogged Only applies to machines with engine option M manufactured from June 2020.
AdBlue®/DEF tank, ventilation filter (applies to machines manufactured from and during September 2020)[a]	4000
AdBlue®/DEF tank, ventilation filter (applies to machines manufactured prior to September 2020)[b]	6000 or at least every four years
AdBlue®/DEF system, pump unit, main filter[c]	6000
Engine air cleaner, primary filter[d]	2000 or when signaled or at least once a year
Engine air cleaner, secondary filter	6000 or every 3rd main filter or at least every two years
Fuel tank, breather filter	2000
Diesel particulate filter, clean[e][f]	4500
Fuel prefilter, optional (optional equipment)[g]	250 or when the filter is clogged
Engine and cab heater (diesel-powered), fuel filter (optional equipment)	500 or if the filter becomes clogged earlier
Engine heater and cab heater (diesel-powered), extra fuel tank, breather filter (optional equipment) [h]	2000

a)Only applies to machines with engine alternative M.

b)Only applies to machines with engine alternative L or M.

c) Only applies to machines with engine alternative L.

d) An EON filter (optional equipment) can be installed instead of a standard filter. Should be changed when the control light is on.

e) Cleaning takes place using an exchange system.

f) Only applies to machines with engine alternative M.

g) Only applies to machines with engine alternative E or F.

h)Only applies to machines with engine alternative E or F.

Filter change transmission, intervals

	Hours
Main oil filter	1000
Lubrication oil filter	1000
Breather filter	2000

Filter change dropbox, intervals

	Hours
Breather filter	2000

Filter change drive axles, intervals

	Hours
Breather filter	2000

Filter change brake system, intervals

	Hours
Pressure-oil filter	First 1000, then 2000
Brake cooling oil tank, return oil filter	1000
Brake cooling oil tank, breather filter	2000

Filter change compressed air system, intervals

	Hours
Receiver drier	4000 or at least every two years

Filter change cab, intervals

	Hours
Prefilter	1000
Main filter	2000
Asbestos filter (optional equipment)	1000

Filter change hydraulic system, intervals

	Hours
Hydraulic oil tank, return oil filter	First 1000, then 2000
Hydraulic oil tank, breather filter	1000

Change capacities

	When changing
Engine incl. filter	35 litres (9.2 US gal)
Cooling system[a]	48 litres (14 US gal)
Cooling system[b]	53 litres (12.7 US gal)
Transmission incl. filter	41 litres (10.8 US gal)
Dropbox	9 litres (2.4 US gal)
Front axle (incl. hub reductions), A25G	30 litres (7.9 US gal)
Front axle (incl. hub reductions), A30G	31 litres (8.2 US gal)
Front bogie axle (incl. hub reductions), A25G	31 litres (8.2 US gal)
Front bogie axle (incl. hub reductions), A30G	32 litres (8.5 US gal)
Rear bogie axle (incl. hub reductions), A25G	30 litres (7.9 US gal)
Rear bogie axle (incl. hub reductions), A30G	31 litres (8.2 US gal)
Hub reduction	3 litres (0.8 US gal)
Suspension cylinder	2.8 litres/cylinder (0.74 US gal/cylinder)
Brake cooling oil, tank	35 litres (9.2 US gal)
Hydraulic oil tank	137 litres (36.2 US gal)
Oil-bath air cleaner (optional equipment)[c]	9.1 litres (2.4 US gal)

a)Only applies to machines with engine alternative E, F and L.

b)Only applies to machines with engine alternative M.

c)Only applies to machines with engine alternative E and F.

System capacity

	Total
Fuel tank	380 litres (100.4 US gal)
AdBlue®/DEF tank[a]	39 litres (10.3 US gal)
Engine hood pump	0.7 litres (0.2 US gal)
Automatic greasing system (optional equipment) New type with round tank	4 litres (1.06 US gal)
Automatic greasing system (optional equipment) Earlier type	2 litres (0.53 US gal)
Extra fuel tank, engine heater and cab heater, diesel-powered (optional equipment)[b]	39 litres (10.3 US gal)

a)Only applies to machines with engine alternative L and M.

b)Only applies to machines with engine alternative F.

Engine

Engine

Engine Options

General

Engine alternative F

	A25G	A30G
Make	Volvo	
Designation	D11F	
Max. power at 2,100 rpm (35 r/s) ISO 9249	234 kW (314 hp)	264 kW (354 hp)
Torque at 1,150 rpm (19.2 r/s) ISO 9249	1,942 Nm (1,432 lbf ft)	–
Torque at 1,200 - 1,300 rpm (20 - 21.6 r/s) ISO 9249	–	1,942 Nm (1,432 lbf ft)
Number of cylinders	6	
Cylinder capacity, total	10.8 l (659 cu in)	
Compression ratio	18:1	
Injection order	1-5-3-6-2-4	
Reduced idle speed	550 ±50 rpm (8.3 ±0.8 r/s)	
Idle speed, low	700 ±50 rpm (11.7 ±0.8 r/s)	
Idle speed, high	2200 ±50 rpm (36.7 ±0.8 r/s)	
Idle speed, high, machines with sound kit (optional equipment)	1900 ±25 rpm (31.7 ±0.4 r/s)	
Stall speed, transmission	1600 ±90 rpm (26.7 ±1.5 r/s)	1700 ±90 rpm (28.3 ±1.5 r/s)

Engine alternative E

	A25G	A30G
Make	Volvo	
Designation	D11E	
Max. power at 2,100 rpm (35 r/s) ISO 9249	234 kW (314 hp)	264 kW (354 hp)
Torque at 1,150 rpm (19.2 r/s) ISO 9249	1,942 Nm (1,432 lbf ft)	–
Torque at 1,200 - 1,300 rpm (20 - 21.6 r/s) ISO 9249	–	1,942 Nm (1,432 lbf ft)
Number of cylinders	6	
Cylinder capacity, total	10.8 l (659 cu in)	
Compression ratio	17:1	
Injection order	1-5-3-6-2-4	
Reduced idle speed	550 ±50 rpm (8.3 ±0.8 r/s)	
Idle speed, low	700 ±50 rpm (11.7 ±0.8 r/s)	
Idle speed, high	2200 ±50 rpm (36.7 ±0.8 r/s)	
Idle speed, high, machines with sound kit (Optional equipment)	1900 ±25 rpm (31.7 ±0.4 r/s)	
Stall speed, transmission	1600 ±90 rpm (26.7 ±1.5 r/s)	1700 ±90 rpm (28.3 ±1.5 r/s)

Engine alternative L

	A25G	A30G
Make	Volvo	
Designation	D11L	
Max. power at 2,100 rpm (35 r/s) ISO 9249	234 kW (314 hp)	264 kW (354 hp)
Torque at 1,150 rpm (19.2 r/s) ISO 9249	1,942 Nm (1,432 lbf ft)	–
Torque at 1,200 - 1,300 rpm (20 - 21.6 r/s) ISO 9249	–	1,942 Nm (1,432 lbf ft)
Number of cylinders	6	
Cylinder capacity, total	10.8 l (659 cu in)	
Compression ratio	16:1	
Injection order	1-5-3-6-2-4	
Reduced idle speed	550 ±50 rpm (8.3 ±0.8 r/s)	
Idle speed, low	700 ±50 rpm (11.7 ±0.8 r/s)	
Idle speed, high	2200 ±50 rpm (36.7 ±0.8 r/s)	
Idle speed, high, machines with sound kit (optional equipment)	1900 ±25 rpm (31.7 ±0.4 r/s)	
Stall speed, transmission	1600 ±90 rpm (26.7 ±1.5 r/s)	1700 ±90 rpm (28.3 ±1.5 r/s)

Engine alternative M

	A25G	A30G
Make	Volvo	
Designation	D11L	
Max. power at 2,100 rpm (35 r/s) ISO 9249	234 kW (314 hp)	264 kW (354 hp)
Torque at 1100 (1100) rpm (19.2 r/s) ISO 9249	2030 Nm (1497 lbf ft)	–
Torque at 1,200 - 1,300 rpm (20 - 21.6 r/s) ISO 9249	–	2031 Nm (1498 lbf ft)
Number of cylinders	6	
Cylinder capacity, total	10.8 l (659 cu in)	
Compression ratio	17:1	
Injection order	1-5-3-6-2-4	
Reduced idle speed	550 ±50 rpm (8.3 ±0.8 r/s)	
Idle speed, low	700 ±50 rpm (11.7 ±0.8 r/s)	
Idle speed, high	2200 ±50 rpm (36.7 ±0.8 r/s)	
Idle speed, high, machines with sound kit (Optional equipment)	1900 ±25 rpm (31.7 ±0.4 r/s)	
Stall speed, transmission	1600 ±90 rpm (26.7 ±1.5 r/s)	1700 ±90 rpm (28.3 ±1.5 r/s)

Air cleaner

Type	Dry filter with secondary filter
Prefilter	Air precleaner (optional equipment)
	Oil-bath air cleaner (optional equipment)

Cold start device

Type	Electrical coil
Power, preheating coil	3.6 kW
Time relay (integrated), engagement time	Variable

Fuel feed pump

Type	Gear-driven pump
Feed pressure: at 600 rpm Feed pressure: at 1200 rpm	min. 220 kPa (2.2 bar) (31.9 psi) min. 375 kPa (3.75 bar) (54.4 psi)

Unit injector

Type	Electronically controlled injection volume and injection timing
Quantity	6

Cooling fans

Type	Hydraulically driven
Type	Electrically driven

Thermostat

Single circuit system	
Type	Piston thermostat
Quantity	1
Begins to open at	81 °C (178 °F)
Fully open at	90 °C (194 °F)
Relief valve, opening pressure (cap, expansion tank)	75 MPa (0.75 bar) (10.9 psi)

Carbon dioxide emissions

The table below shows the value of carbon dioxide emissions (CO_2). The values are established at testing of the parent engine for EU-type approval, in the warm part of Non Road Transient Test Cycle (NRTC).

Stage V	**Test cycle**	
	NRTC	
Parent engine	B7 Fuel	HVO fuel
D11M, CO_2 (g/kWh)	713,3	687,1

Electrical system

Electrical system

System voltage	24 V

Electrical system, battery

Quantity	2
Battery voltage	12 V
Battery capacity	170 Ah
Weight	32.8 kg (72.3 lbs) without electrolyte 45.9 kg (101.2 lbs) with electrolyte
Ground connection	Negative terminal

Electrical system, alternator

Watt	3396 W

Electrical system, lamp

Bulbs shall be of the highest quality; shake-proof and with long life.

Bulbs tractor unit			
		Watt	**Socket**
Cab lighting		10 / 21	Ba 15s
Headlights	Halogen	70 W	H1
	LED (optional equipment)	Included in the light unit	
Running lights (headlights)		4 W	T4W
Running lights (LED)		Included in the light unit	
Direction indicators		21 W	PY21W
Work lights (optional equipment)	LED	Included in the light unit	
	Halogen	70 W	H3
Rotating beacon (optional equipment)	LED	Included in the light unit	
Seatbelt indicator, external (Optional equipment)	LED	Included in the light unit	
Entrance lighting(optional equipment)	Halogen	70 W	H3
	LED	Included in the light unit	
Lights, load weighing (LED)(optional equipment)		Included in the light unit	

Bulbs, trailer unit		
	Watt	**Socket**
Tail lights (LED)	Included in the light unit	
Brake lights (LED)	Included in the light unit	
Direction indicators (LED)	Included in the light unit	

Bulbs, trailer unit			
		Watt	Socket
Back-up light	Halogen	70 W	H3
	LED (optional equipment)	Included in the light unit	

Electrical system, voltage converter

(optional equipment)

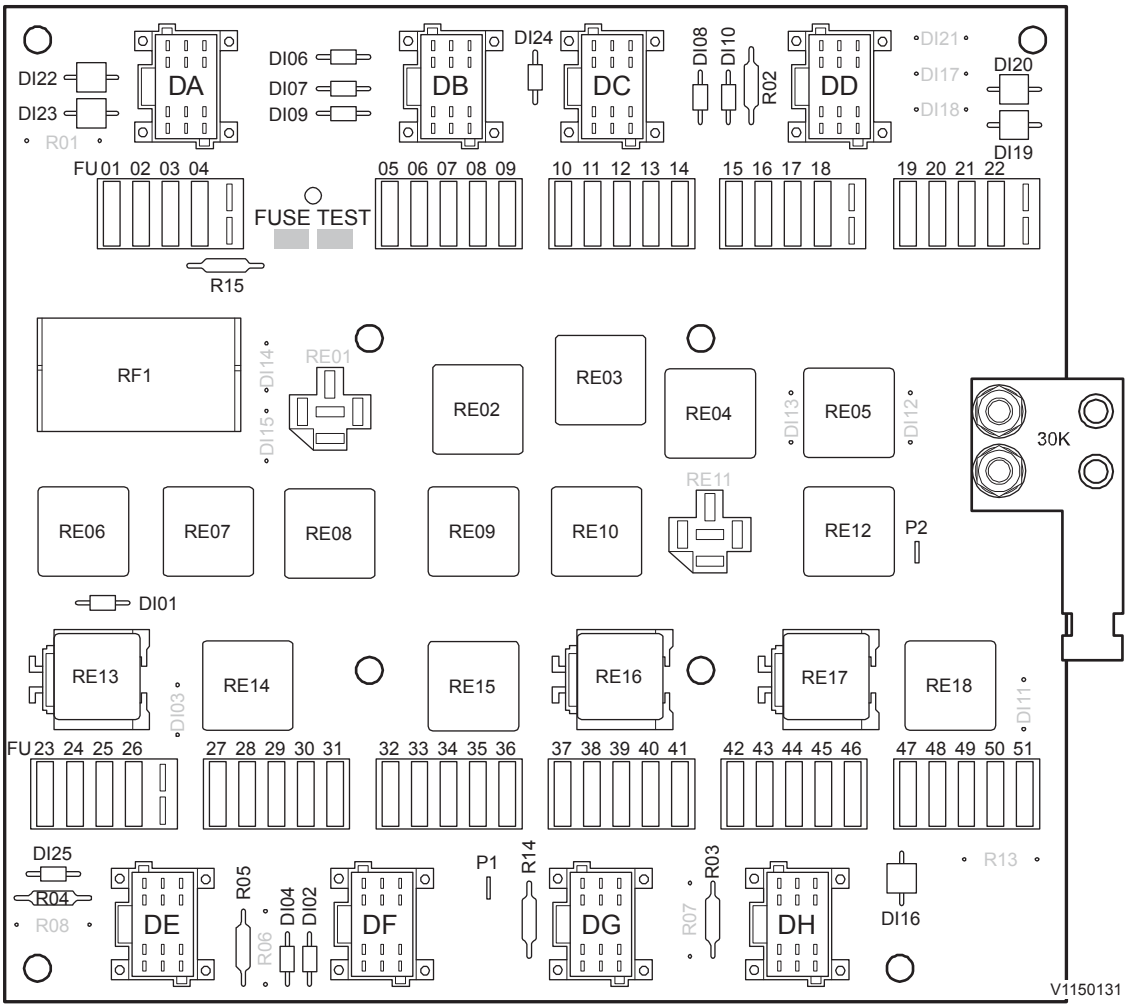
Output voltage	14 V DC
Output (max.)	280 W

Fuses and relays

Fuses

Fuses on circuit board:

NOTE!
Fuses can be tested on the circuit board. See FUSE TEST located between FU04 and FU05.



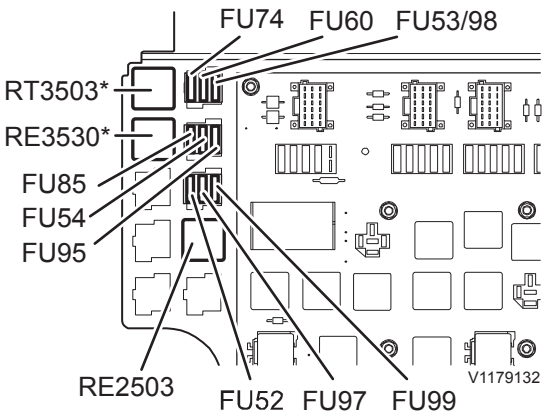
Circuit board

Designation	Rated current	Description
FU01	5 A	Relay RE10 (brake lights)
FU02	10 A	Voltage feed HMIM and IC

Designation	Rated current	Description
FU03	15 A	Relay RE07 (work lights front)
FU04	5 A	Relay RE14 (climate control system)
FU05	5 A	Running lights left; License plate light
FU06	5 A	Running lights right
FU07	5 A	Low beam left
FU08	5 A	Low beam right
FU09	10 A	Relay RE02; Back-up light; Back-up alarm unit
FU10	5 A	High beam right
FU11	5 A	High beam left
FU12	5 A	Voltage converter SO3902 (control voltage)
FU13	15 A	Relay RE03 Voltage feed CU3622 (Engine Gateway) (Only applies to machines with engine alternative D11L.)
FU14	5 A	–
FU15	15 A	Relay RE04 (work lights rear)
FU16	15 A	Relay RE11
FU17	10 A	Relay RE13; W-ECU (CareTrack); Oil pressure monitor transmission; Pressure monitor oil filter transmission; Alternator; Hydraulic oil level monitor; Switch differential locks; Switch ATC; Switch increased rpm; Switch delayed engine shutdown; Switch regeneration of particulate filter; Position monitor longitudinal differential lock; Position monitor seatbelt buckle; Switch gearshift lockout (shift inhibitor); Switch automatic exhaust brake for accelerator and brake pedal; Switch parking brake; Cooling oil level monitor tank; Connector VE; Sensor for sideways and longitudinal inclination
FU18	10 A	Voltage socket 28 VDC
FU19	15 A	Switch headlights; Fuse FU05; Fuse FU06
FU20	10 A	Cigarette lighter (voltage outlet 28 VDC)
FU21	5 A	Switch rotating beacon; Switch interior lighting; Relay RE08 (interior lighting)
FU22	–	–
FU23	5 A	Relay RE06 (starter motor)
FU24	25 A	Emergency stop switch; Fuse FU23; Fuse FU30; Fuse FU31; Voltage feed E-ECU
FU25	20 A	Voltage feed V-ECU
FU26	20 A	Voltage feed V2-ECU
FU27	20 A	Voltage feed ECC (climate control system - AC); Ventilation fan; Compressor (climate control system - AC)
FU28	10 A	Relay RE 8701 (cab heat/cab ventilation timer) (optional equipment)
FU29	5 A	Function relay RE05 (cab heat/cab ventilation timer)
FU30	5 A	PWM-valve exhaust brake Solenoid valve, control engine brake (VCB) (Only applies to machines with engine alternative D11F and D11L.) Solenoid valve, control IEGR (Only applies to machines with engine alternative D11E.) Relay RE03 (CU3622 engine gateway) (Only applies to machines with engine alternative D11E and D11L.)

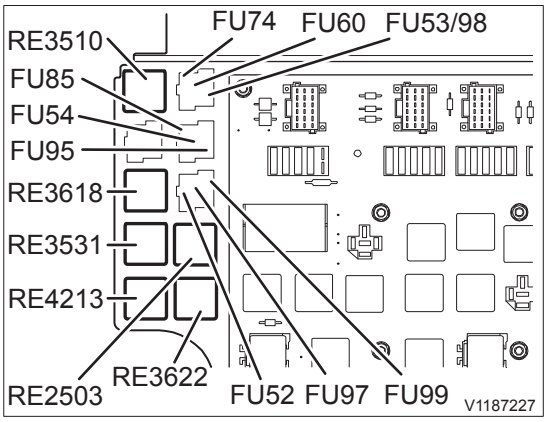
Designation	Rated current	Description
FU31	15 A	Relay RE2501 preheating induction air Wastegate valve (Only applies to machines with engine alternative D11L.); Key-feed ACM (Only applies to machines with engine alternative D11L.); Sensor NO_x (nitrogen oxides) in and out (Only applies to machines with engine alternative D11L.)
FU32	–	–
FU33	10 A	Switch headlight flasher; Fuse FU10; Fuse FU11
FU34	–	–
FU35	10 A	Switch windshield wiper; Switch windshield washer; Windshield wiper; Windshield washer; Switch horn; Horn; Relay RE09
FU36	5 A	–
FU37	5 A	Direction indicators (turn signals)
FU38	5 A	Back-up camera (optional equipment)
FU39	10 A	Rear-view mirrors (adjusting and heating); Seat heat and air-suspension KAB operator's seat; Seat heat and compressor air-suspension Grammer operator's seat
FU40	10 A	Washer fluid level monitor; Fuel warming
FU41	10 A	Switch work lights (front, rear); Relay RE04; Relay RE07; Relay RE11
FU42	5 A	Relay RE3530 (entrance lighting) – discontinued for machines manufactured after March 2017
FU43	10 A	Key-feed V-ECU
FU44	5 A	Service socket OBD
FU45	5 A	Key-feed ECC (climate control system)
FU46	10 A	Automatic greasing system (optional equipment)
FU47	10 A	Key-feed CU3622 (engine gateway) (Only applies to machines with engine alternative D11L.)
FU48	5 A	Key-feed connector VE, Seatbelt indicator light external (Optional equipment); Volvo Co-Pilot
FU49	5 A	Relay RE12
FU50	5 A	Voltage feed V2-ECU
FU51	5 A	–

Other fuses:



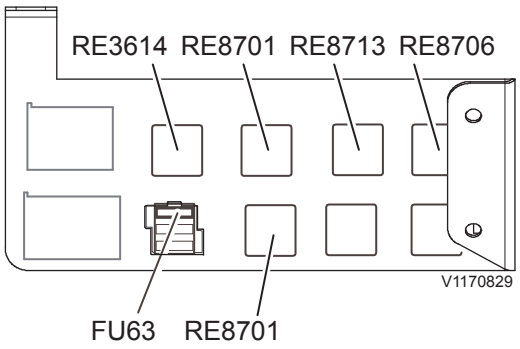
* discontinued for machines manufactured after March 2017

Position: Electrical distribution box in cab

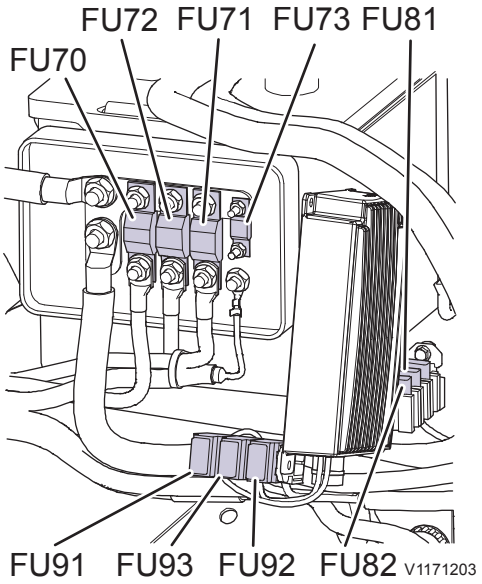


Applies to machines manufactured from 2020

Position: Electrical distribution box in cab



Position: Under control panel



Position: Engine compartment in front of left fender (mudguard)

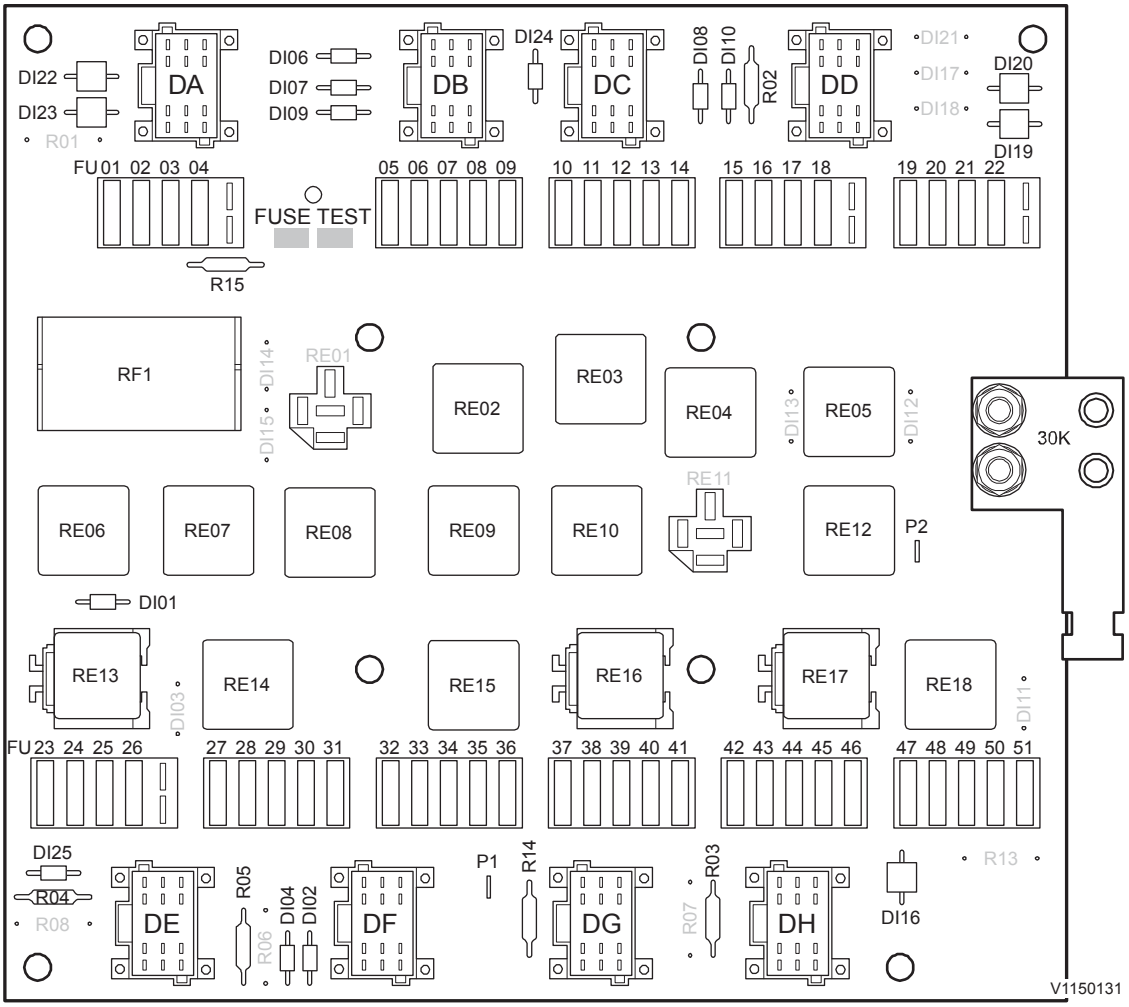
Designation	Rated current	Description
FU52	10 A	Voltage feed OBD
FU53	–	–
FU54	15 A	–
FU60	15 A	Lighting switch entrance lighting (optional equipment)
FU63	10 A	Windshield wiper, rear (optional equipment)
FU70	150 A	Relay RE2501 (preheating induction air)
FU71	80 A	Main fuse cab
FU72	60 A	Condenser fans
FU73	40 A	Hood pump
FU74	15 A	Voltage converter SO3902; W-ECU (CareTrack); Alternator; Fuse FU95; Volvo Co-Pilot
FU81	20 A	Engine heater and cab heater, diesel-powered (optional equipment)
FU82	15 A	Engine heater and cab heater, diesel-powered (optional equipment)
FU85	30 A	Aftertreatment control module (ACM) (Only applies to machines with engine alternative D11L.)

Designation	Rated current	Description
FU91	15 A	Battery charger (optional equipment)
FU92	15 A	Fuel preheater (optional equipment)
FU93	15 A	Battery heater (optional equipment)
FU95(1)	10 A	Switch entrance lighting; Switch ignition; Switch hazard flashers; Position monitor door; Relay RE3530 entrance lighting (optional equipment); Time relay RT3503 entrance lighting (optional equipment)
FU95(2)	10 A	Switch entrance lighting; Switch ignition; Switch hazard flashers; Position monitor door
FU97	10 A	Entrance lighting(optional equipment); Relay RE15
FU98	15 A	Voltage converter SO3906 (Electric coolant pump)
FU99	5 A	Back-up (reverse) camera (optional equipment)

1. For machines manufactured before April 2017
2. For machines manufactured after March 2017

Relays

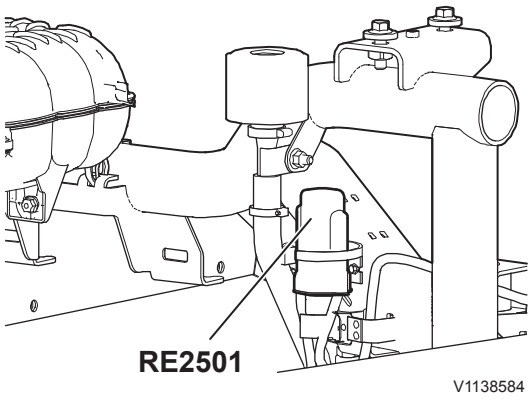
Relays on circuit board:



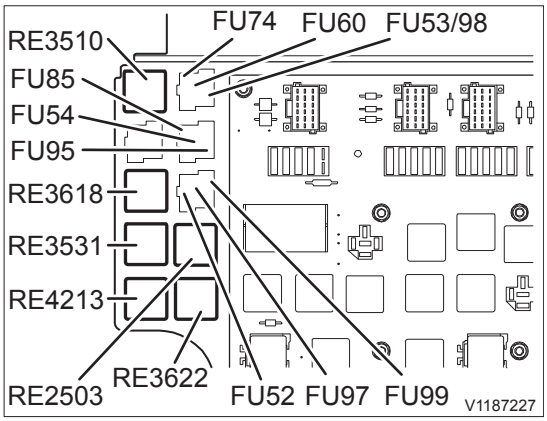
Circuit board

Designation	Description
RE01	–
RE02	Back-up light; Back-up warning; Back-up camera; Fuse FU99; Connector VE
RE03	Voltage feed CU3622 (engine gateway) (Only applies to machines with engine alternative D11E and D11L.)
RE04	Work lights, rear
RE05	Function relay (battery disconnector)
RE06	Starter motor
RE07	Work lights, front
RE08	Interior lighting; Voltage feed ECC
RE09	Switch windshield wiper; Windshield wiper
RE10	Brake lights
RE11	–
RE12	Relay RE13; W-ECU (CareTrack); Oil pressure monitor transmission; Pressure monitor oil filter transmission; Alternator; Hydraulic oil level monitor; Switch differential locks; Switch ATC; Switch increased rpm; Switch delayed engine shutdown; Switch regeneration of particulate filter; Position monitor longitudinal differential lock; Position monitor seatbelt buckle; Switch gearshift lockout; Switch automatic exhaust brake for accelerator and brake pedal; Switch parking brake; Connector VE
RE13	Fuse FU24; Fuse FU25; Fuse FU26

Designation	Description
RE14	Fuse FU27; Fuse FU28; Fuse FU29
RE15	Entrance lighting (optional equipment)
RE16	Fuse FU33; Fuse FU35; Fuse FU36; Fuse FU37; Fuse FU38
RE17	Fuse FU39; Fuse FU40; Fuse FU41
RE18	Fuse FU42; Fuse FU43; Fuse FU44; Fuse FU45; Fuse FU46; Fuse FU47; Fuse FU48; Fuse FU49; Fuse FU50; Fuse FU51

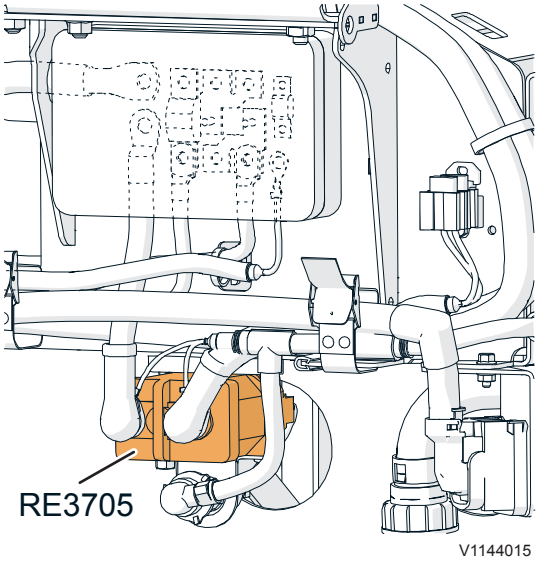


Position: Engine compartment



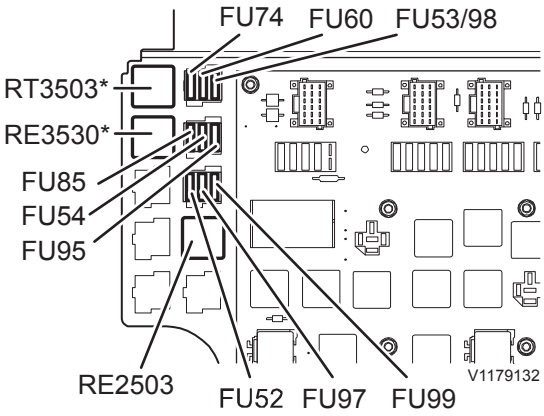
Applies to machines manufactured from 2020

Position: Electrical distribution box in cab



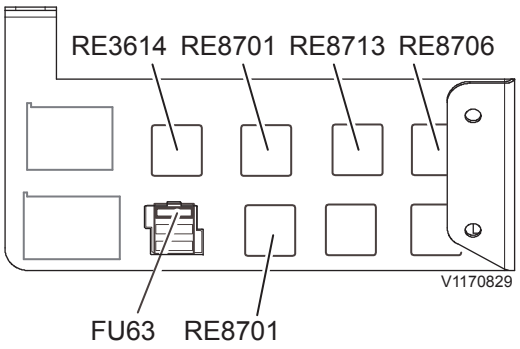
Position: Engine compartment in front of left fender (mudguard)

Other relays:



* discontinued for machines manufactured after March 2017

Position: Electrical distribution box in cab



Position: Under control panel

Designation	Description
RE2501	Preheating induction air
RE2503	–
RE3510	Relay for low beam activation

Designation	Description
RE3530	Entrance lighting(optional equipment) – discontinued for machines manufactured after March 2017.
RE3614	Windshield wiper, rear (optional equipment)
RE3705	Main relay (battery disconnector)
RE8701	Two relays with mutual exclusion: Cab heat/cab ventilation timer (optional equipment) Alternative Auxiliary heater (optional equipment)
RE8706	Engine and cab heater, diesel-powered (1) (optional equipment)
RE8713	Engine and cab heater, diesel-powered (2) (optional equipment) (not used)

Designation	Description
RT3503	Time relay entrance lighting – discontinued for machines manufactured after March 2017.

Designation	Description
RF1	Flash relay

Transmission

Power transmission

Transmission

Make	Volvo
Type	Automatic planetary type transmission with six forward gears and two reverse gears
Designation	PT2116
Torque converter, type	Single stage with free-wheeling stator and automatic direct drive clutch (Lock-up)

Dropbox

Make	Volvo
Designation	IL-1 ATC
Power take-off	1 for ground-dependent hydraulic pump
Drive	4-wheel drive in permanent engagement

Differential locks

Longitudinal	Dog-clutch	100% locking in dropbox
Transverse	Dog-clutch	100% locking in drive axles

Drive axles

	Tractor unit	Front bogie axle	Rear bogie axle
Make	Volvo	Volvo	Volvo
Designation, A25G	AHW56	AHW56	AHW56
Designation, A30G	AHW64	AHW64	AHW64

Final drive (Differential carrier assembly)

	Tractor unit	Front bogie axle	Rear bogie axle
Make	Volvo	Volvo	Volvo
Differential lock	Dog-clutch	Dog-clutch	Dog-clutch
6-wheel drive (6×6)			Drive via dog-clutch in front bogie axle

Hub reduction

	Tractor unit	Front bogie axle	Rear bogie axle
Type	Planetary gear	Planetary gear	Planetary gear

Speed ranges (max.)

Max. speed in each gear and standard tires.

Gear	
Forward	
1st	8.3 km/h (5.2 mph)
2nd	11.9 km/h (7.4 mph)
3rd	21.1 km/h (13.1 mph)
4th	30.3 km/h (18.8 mph)

Gear	
Forward	
5th	38.4 km/h (23.9 mph)
6th	52.7 km/h (32.7 mph)
Reverse	
1st	7.7 km/h (4.8 mph)
2nd	13.7 km/h (8.5 mph)

Brake

Brake system

Parking brake	
Type	Hydraulically operated, spring-applied disc brake. Acts on both front axle and front bogie axle by automatic activation of the differential lock in the dropbox.

Service brakes	
Type	Hydraulically operated, divided in two circuits. One circuit for the tractor unit and one for the trailer unit. Wet disc brakes cooled using external fin oil cooler.

Foot brake valve	
Type	Two-circuit slide valve.

Load and dump brake	
Type	Valve in load and dump brake block that activates all wheel brakes.

Compressed air system

Compressed air system

Compressed air regulator

Cut-in pressure	810–730 kPa (8.1–7.3 bar)
Cut-out pressure (unloading pressure)	830–870 kPa (8.3–8.7 bar)

Compressor

Type	1-cylinder piston compressor

Compressed air tanks

	Quantity
4 litres (1.06 US gal) regeneration tank	1
10 litres (2.64 US gal) circuit tank	1

Safety valve

Opening pressure	1000 ±100 kPa (10 ±1 bar) (145 ±14.5 psi)

Air drier

	Quantity
Drier cartridge	1

Steering

Steering system

Type of steering	Hydro-mechanical articulated steering
Steering lock	2 × 45°
Steering wheel movement	3.4 revolutions
Pressure, max.	25 MPa (250 bar) (3626 psi)

Wheels

Tyre sizes and pressures

If other tyres are used for than those stated, the tyre manufacturer should be contacted for information about the correct tyre pressure.

NOTE!
Avoid mixing tyres with different circumference and with different type designations on the same axle. This may result in unnecessary wear of the drivetrain and also change the machine's characteristics.

NOTE!
Keep in mind that changing to another tyre type requires changes to the machine's software using the authorized service tool.

NOTE!
For machine with On-Board Weighing (optional equipment), the equipment should be checked in connection with changing a wheel. Check the cable and its attaching points, as well as the load cell.

see page *382*

Tyre, specifications (A25)

Applies to models: A25G

NOTE!
The table also includes tires that have been removed from the range since the machine was introduced.

Tyre inflation pressure at 25,000 kg (55,000 lb) payload [a]	A25G	
Tyres	Front kPa (psi)	Rear kPa (psi)
Bridgestone 23.5 R25 VLT	400 (58.0)	450 (65.0)
Bridgestone 23.5 R25 VLTS	400 (58.0)	450 (65.0)
Bridgestone 750/65 R25 VLT	375 (54.5)	400 (58.0)
Bridgestone 750/65 R25 VLTS	375 (54.5)	400 (58.0)
Goodyear 23.5 R25 GP-4D	375 (54.5)	400 (58.0)
Goodyear 23.5 R25 TL-3A+	375 (54.5)	400 (58.0)
Goodyear 750/65 R25 TL-3A+	300 (44.0)	325 (47.0)
Michelin 23.5 R25 XADN+	375 (54.5)	425 (61.5)
Michelin 23.5 R25 XTRA DEF.	325 (47.0)	400 (58.0)
Michelin 23.5 R25 X SUPER TERRAIN+	375 (54.5)	425 (61.5)
Michelin 750/65 R25 XAD65-1	325 (47.0)	375 (54.5)
Michelin 750/65 R25 XTRA DEF.	275 (40.0)	325 (47.0)
Yokohama 23.5 R25 RT31	375 (54.5)	425 (61.5)

a) The specified load is the maximum load for a standard machine, even on an occasional basis. Rebuilding of the machine or installation of optional equipment may require a different tyre pressure. If so, approval for use and the recommended tyre pressure for the changed conditions should be obtained from the tyre supplier.

Tyre, specifications (A30)

Applies to models: A30G

NOTE!
The table also includes tires that have been removed from the range since the machine was introduced.

Tyre inflation pressure at 29,000 kg (64,000 lb) payload [a]	A30G	
Tyres	Front kPa (psi)	Rear kPa (psi)
Bridgestone 23.5 R25 VLT	425 (61.5)	500 (72.5)
Bridgestone 23.5 R25 VLTS	425 (61.5)	500 (72.5)
Bridgestone 750/65 R25 VLT	375 (54.5)	400 (58.0)
Bridgestone 750/65 R25 VLTS	375 (54.5)	400 (58.0)
Goodyear 23.5 R25 GP-4D	400 (58.0)	475 (68.5)
Goodyear 23.5 R25 TL-3A+	400 (58.0)	475 (68.5)
Goodyear 750/65 R25 TL-3A+	325 (47.0)	400 (58.0)
Michelin 23.5 R25 XADN+	400 (58.0)	500 (72.5)
Michelin 23.5 R25 XTRA DEF.	350 (51.0)	475 (69.0)
Michelin 23.5 R25 X SUPER TERRAIN+	400 (58.0)	475 (69.0)
Michelin 750/65 R25 XAD65-1	325 (47.0)	375 (54.5)
Michelin 750/65 R25 XTRA DEF.	275 (40.0)	375 (54.5)
Yokohama 23.5 R25 RT31	425 (61.5)	500 (72.5)

a) The specified load is the maximum load for a standard machine, even on an occasional basis. Rebuilding of the machine or installation of optional equipment may require a different tyre pressure. If so, approval for use and the recommended tyre pressure for the changed conditions should be obtained from the tyre supplier.

Wheel nuts, tightening torque

Tightening torques	800 Nm (590 lbf ft)

Suspension

Suspension cylinder (GHS), specifications

Number of cylinders	2
Stroke	140 mm (5.5 in)
Suspension agents	Hydraulic oil and nitrogen gas

Cab

General	
The cab is mounted on rubber pads, is insulated, and has a flat floor with rubber mat.	
Tested and approved as safety cab. ROPS tested according to ISO 3471–2008 and FOPS tested according to ISO 3449–2008.	
Cab interior fittings and upholstery	Fire-retardant (fire-resistant) measured according to ISO 3795-1989. Also meets MVSS 302.
Number of emergency exits	2 (right and left side window)

Heating and ventilation
The basic version of the machine is provided with an air conditioning system as well as a heating and ventilation system with defrosting for all windows and best possible air distribution. The cab fan is a twin radial fan with endless variable speed.

Engine and cab heater, diesel-powered (optional equipment)	
Extra tank, volume (optional equipment)	39 l (10.3 US gal)
Output max.	12 kW
Fuel consumption max.	1.5 l/h (0.40 US gal)
Power consumption max.	86 W
Diesel grade	
For temperatures down to -20 °C (-4 °F), use winter diesel according to DIN EN 590. For temperatures between -20 °C (-4 °F) and -40 °C (-40 °F), use arctic diesel or polar diesel. On machines with extra tank for engine and cab heater, the diesel can be mixed with kerosene if needed. In special cases and at temperatures above 0 °C (32 °F), fuel oil according to DIN 51603 can be used.	

Operator's seat	This machine is equipped with an operator's seat that meets the criteria for EN ISO 7096 and EM1.	
	KAB	Grammer (optional equipment)
Height adjustment	+23/-37 mm (+0.9/-1.5 in)	±40 mm (±1.6 in)
Suspension stroke (travel)	±62 mm (±2.4 in)	±50 mm (±2.0 in)
Fore-aft adjustment	160 mm (6.3 in)	210 mm (8.3 in)
Adjustment for operator's weight	50–150 kg (110–331 lbs)	50–170 kg (110–375 lbs)
Backrest adjustment (adjustable backrest angle)	Forward 66° Backward 72°	Forward 10° Backward 70°
Upholstery	Fire-resistant	
Lap-type seatbelt with roller	Yes	
Three-point seatbelt	No	Option

Refrigerant

Type	Quantity	GWP[a]
R134a	1,35 kg (2.98 lb)	1931 CO_2-eq

a) Global warming potential (GWP) is a measure of how much heat a gas traps in the atmosphere relative to that of carbon dioxide (CO_2). GWP is calculated in terms of the 100–year warming potential of 1 kg of a greenhouse gas relative to 1 kg of CO_2.

Noise and vibrations

Hand-arm vibrations

Emission of hand-arm vibrations generated during real operating conditions when the machine is used as intended is less than 2.5 m/s^2 RMS (root mean square) acceleration according to ISO 8041:2005.

Whole-body vibrations

Emission of whole-body vibrations generated during real operating conditions when the machine is used as intended is according to the table below.

Typical operating conditions	Vibration emissions, value $a_{w,eqx}$ (m/s^2 RMS)	Vibration emissions, value $a_{w,eqy}$ (m/s^2 RMS)	Vibration emissions, value $a_{w,eqz}$ (m/s^2 RMS)
Loading	0.29	0.41	0.24
Transporting with load	0.64	0.89	0.67
Dumping	0.49	0.42	0.30
Transporting without load	0.82	1,02	0.81

The following vibration directions are defined:
x = longitudinal
y = lateral
z = vertical

The values for the whole-body vibrations stated above have been taken from ISO/CEN Technical Reports.

NOTE!
These whole-body vibration emission values were determined at special operating and ground conditions, and therefore they are not representative for all various conditions according to the intended use of the machine and should not solely be used to determine the whole-body vibrations to which the operator is exposed when using the machine. For this purpose, the information in ISO/CEN Technical Report is recommended.

To ensure that the generated whole-body vibration emissions during machine use is kept to a minimum, see page *245*.

Noise level values

Machines with sound-absorbing optional equipment [a]				
	A25G (engine alternative F)	A30G (engine alternative F)	A25G (engine alternative L)	A30G (engine alternative L)
Sound pressure level (LpA) at operator's station. Measuring method according to ISO 6396 (measured value).	72 LpA dB(A) (±2 dB)		70 LpA dB(A) (±2 dB)	
Sound power level (LWA) around the machine. Measuring method according to 2000/14/EC with applicable appendices and according to ISO 6395 (guaranteed value).	108 LwA dB(A)	109 LwA dB(A)	108 LwA dB(A)	109 LwA dB(A)

a)Sound-absorbing optional equipment is a requirement for CE-marked machines.

Machines without sound-absorbing optional equipment				
	A25G (engine alternative F)	A30G (engine alternative F)	A25G (engine alternative L)	A30G (engine alternative L)
Sound pressure level (LpA) at operator's station. Measuring method according to ISO 6396 (measured value).	72 LpA dB(A) (±2 dB)			
Sound power level (LWA) around the machine. Measuring method according to ISO 6395 (measured value).	110 LwA dB(A) (±2 dB)	111 LwA dB(A) (±2 dB)	110 LwA dB(A) (±2 dB)	111 LwA dB(A) (±2 dB)

Hydraulic system

Hydraulic system

Dumping system

	A25G	A30G
Cylinders	2 pcs.	2 pcs.
Type	Double-acting	Double-acting
Dumping time	12 seconds	12 seconds
Lowering time	10 seconds	10 seconds
Dump angle	74°	70°

Machine weights

Weights

The weights apply with tires 23.5 R25		
Weight	**A25G**	
Operating weight (incl. operator and all fluids)	22,700 kg	50,045 lbs
Front axle pressure (at operating weight)	12,800 kg	28,219 lbs
Bogie pressure (at operating weight)	9,900 kg	21,826 lbs
Maximum permitted load on front axle	14,950 kg	32,959 lbs
Maximum permitted load on bogie	32,750 kg	72,201 lbs
Max. load	25,000 kg	55,116 lbs
Gross weight	47,700 kg	105,160 lbs

NOTE!
If the machine features the following optional equipment then the max. load should be reduced by the corresponding weight, otherwise max. axle load/pressure, the machine's gross weight, etc., will be exceeded.

Weights for optional equipment		
Weight	**A25G**	
Body extensions, 200 mm *	330 kg	728 lb
Body extensions, light material *	1910 kg	4211 lb
Front plate (upper body plate)	170 kg	375 lb
Tailgate, overhung, cable-controlled *	920 kg	2028 lb
Tailgate, overhung and underhung, link-controlled *	850 kg	1874 lb
Tailgate, overhung *	320 kg	705 lb
Wear plates *	950 kg	2094 lb
Wear plates, Heavy Duty *	1920 kg	4233 lb

NOTE!
Note that the above equipment marked with a * affects the machine's weight distribution.
Assumes that the equipment weight is loaded on the bogie.

The weights apply with tires 750/65 R25		
Weight	**A30G**	
Operating weight (incl. operator and all fluids)	23,600 kg	52,029 lbs
Front axle pressure (at operating weight)	12,900 kg	28,440 lbs
Bogie pressure (at operating weight)	10,700 kg	23,589 lbs
Maximum permitted load on front axle	15,700 kg	34,612 lbs
Maximum permitted load on bogie	36,900 kg	81,350 lbs
Max. load	29,000 kg	63,934 lbs
Gross weight	52,600 kg	115,963 lbs

NOTE!
If the machine features the following optional equipment then the max. load should be reduced by the corresponding weight, otherwise max. axle load/pressure, the machine's gross weight, etc., will be exceeded.

Weights for optional equipment		
Weight	**A30G**	
Body extensions, 200 mm *	340 kg	750 lb
Body extensions, light material *	2040 kg	4497 lb
Front plate (upper body plate)	180 kg	397 lb
Tailgate, overhung, cable-controlled *	920 kg	2028 lb
Tailgate, overhung and underhung, link-controlled *	890 kg	1962 lb
Tailgate, overhung *	330 kg	728 lb
Wear plates *	1070 kg	2359 lb
Wear plates, Heavy Duty *	1920 kg	4233 lb

NOTE!
Note that the above equipment marked with a * affects the machine's weight distribution.
Assumes that the equipment weight is loaded on the bogie.

Weights

Hauler Chassis

HC42

Weight	A25G(1)		A30G(2)	
	kg	lbs	kg	lbs
Operating weight (incl. operator and all fluids)	18900	41667	19600	43211
Front axle pressure (at operating weight)	12400	27337	12550	27668
Bogie pressure (at operating weight)	6500	14330	7050	15543
Maximum permitted load on front axle	14950	32959	15700	34613
Maximum permitted load on bogie	32750	72201	36900	81350
Max. load	28800	63493	33000	72752
Gross weight	47700	105160	52600	115963

1. The weights apply with tyres 23.5 R25
2. The weights apply with tyres 750/65 R25

HC54

Weight	A25G[1]		A30G[2]	
	kg	lbs	kg	lbs
Operating weight (incl. operator and all fluids)	19650	43321	20300	44754
Front axle pressure (at operating weight)	12900	28440	13000	28660
Bogie pressure (at operating weight)	6750	14881	7300	16094
Maximum permitted load on front axle	14950	32959	15700	34612
Maximum permitted load on bogie	32750	72201	36900	81350
Max. load	28050	61840	32300	71209
Gross weight	47700	105160	52600	115963

HC59

Weight	A25G[3]		A30G[4]	
	kg	lbs	kg	lbs
Operating weight (incl. operator and all fluids)	19850	43762	20500	45195
Front axle pressure (at operating weight)	13550	29873	13700	30203
Bogie pressure (at operating weight)	6300	13889	6800	14991
Maximum permitted load on front axle	14950	32959	15700	34612
Maximum permitted load on bogie	32750	72201	36900	81350
Max. load	27850	61398	32100	70768
Gross weight	47700	105160	52600	115963

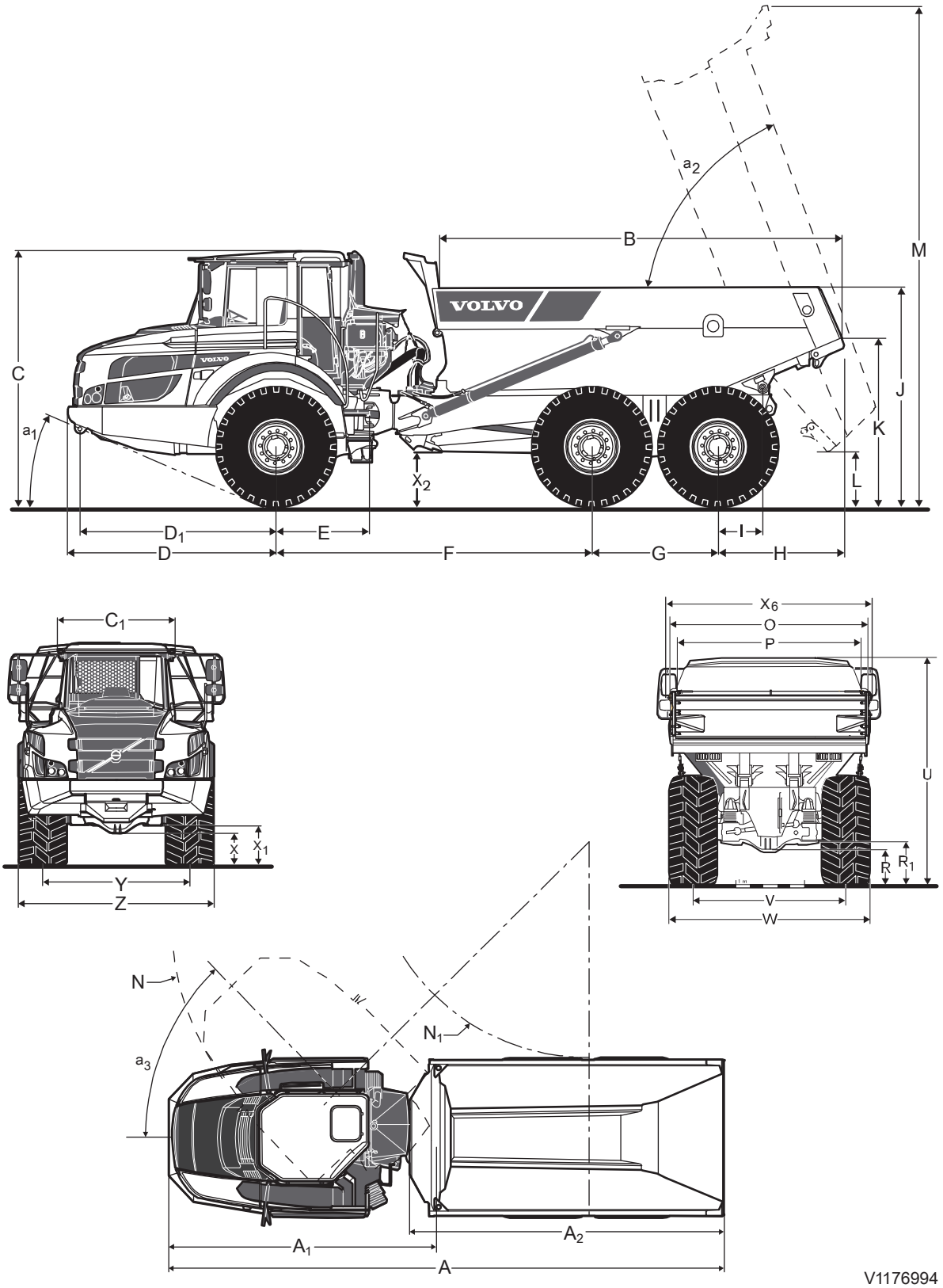
1. The weights apply with tyres 23.5 R25
2. The weights apply with tyres 750/65 R25
3. The weights apply with tyres 23.5 R25
4. The weights apply with tyres 750/65 R25

Dimensions

Dimensional drawing

Applies to models: A25G

The letters in the figures refer to the text on the next page.

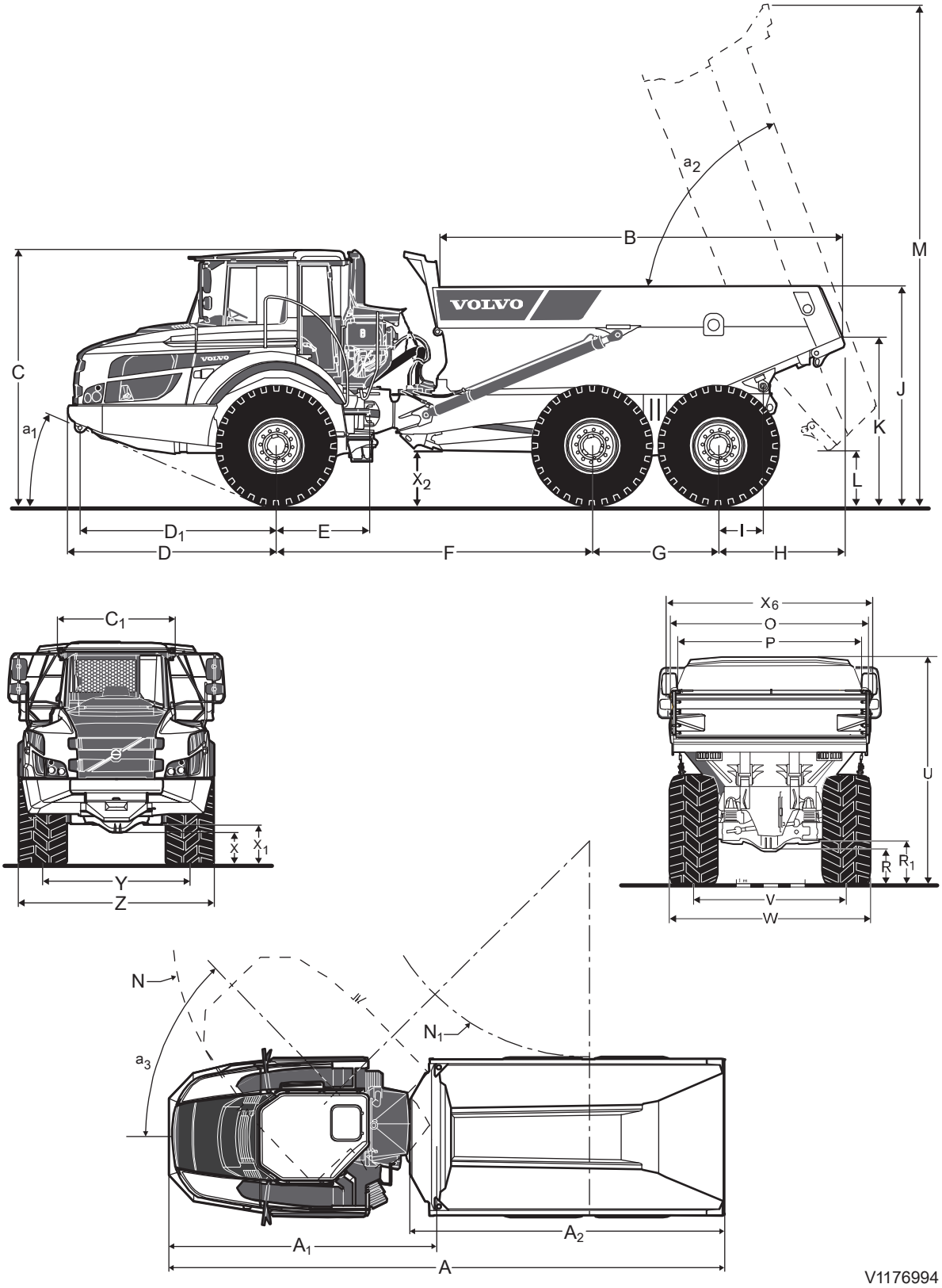


The dimensions apply to an unloaded machine with tires, dimension 23.5 R25			
Dimensions		mm	inch
Overall length	A	10218	402.3
Overall length, tractor unit	A1	4954	195.0
Overall length, trailer unit	A_2	5736	225.8
Load body length, standard body	B	5162	203.2
Height to roof of cab	C	3356	132.1
Width across cab	C1	1772	69.8
Overhang, front	D	2762	108.7
Distance, front axle – steering centre	E	1209	47.6
Wheel base, drive axles	F	4175	164.4
Wheel base, bogie axles	G	1670	65.7
Overhang, rear	H	1610	63.4
Overhang, frame	I	609	24.0
Loading height	J	2791	109.9
Height to load body	K	2103	82.8
Free dumping height	L	678	26.7
Overall height, elevated load body	M	6529	257.1
Outer turning radius	N	8109	319.3
Inner turning radius	N1	4092	161.1
Outside width, load body	O	2776	109.3
Inside width, load body	P	2490	98.0
Min. ground clearance, trailer unit	R	519	20.4
Ground clearance axle, trailer unit	R1	633	24.9
Max. height, upper body plate load body	U	3263	128.5
Track width, trailer unit	V	2258	88.9
Overall width, trailer unit	W	2915	114.8
Lowest ground clearance, tractor unit	X	455	17.9
Ground clearance axle, tractor unit	X1	581	22.9
Ground clearance, hitch	X2	660	26.0
Width, overhung tailgate, load unit	X_6	2900	114.2
Track width, tractor unit	Y	2258	88.9
Overall width, tractor unit	Z	2915	114.8
Approach angle	a1	23.5°	
Dump angle	a2	74°	
Max. steering angle	a3	45°	

Dimensional drawing

Applies to models: A30G

The letters in the figures refer to the text on the next page.

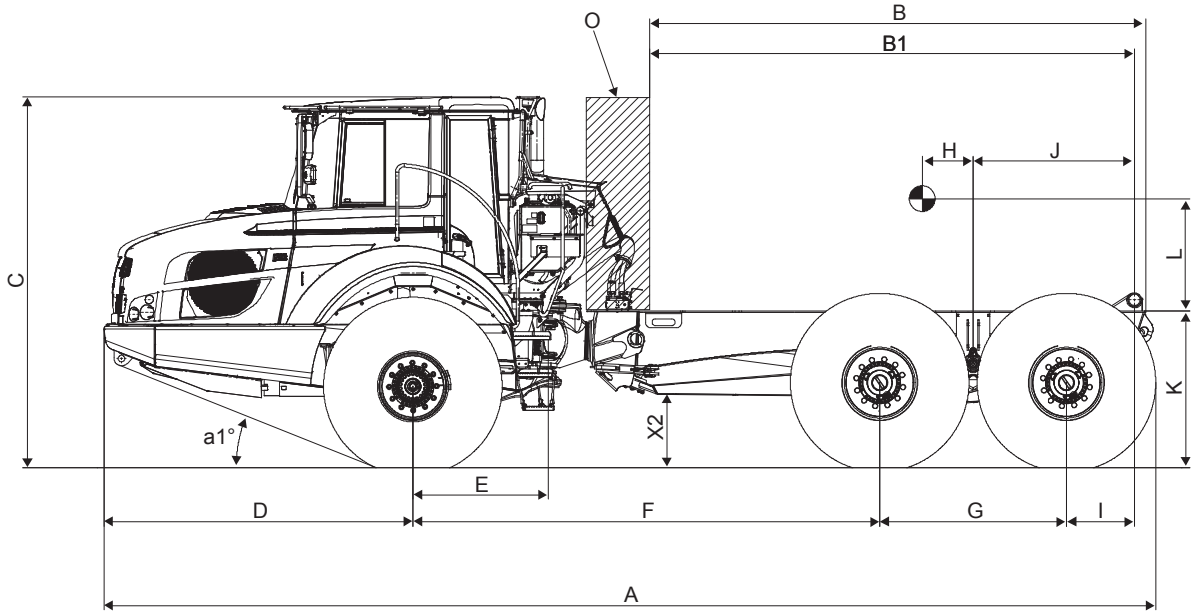


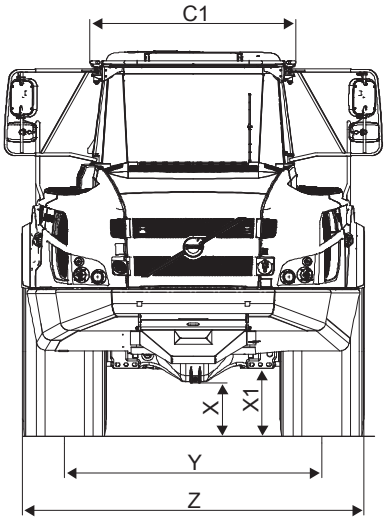
The dimensions apply to an unloaded machine with tires, dimension 750/65 R25			
Dimensions		mm	inch
Overall length	A	10296	405.3
Overall length, tractor unit	A1	4954	195.0
Overall length, trailer unit	A_2	5811	228.8
Load body length, standard body	B	5384	211.0
Height to roof of cab	C	3366	132.5
Width across cab	C1	1772	69.8
Overhang, front	D	2762	108.8
Distance, front axle – steering centre	E	1209	47.6
Wheel base, drive axles	F	4175	164.4
Wheel base, bogie axles	G	1670	65.7
Overhang, rear	H	1688	66.5
Overhang, frame	I	609	24.0
Loading height	J	2866	112.8
Height to load body	K	2183	85.9
Free dumping height	L	688	27.1
Overall height, elevated load body	M	6562	258.3
Outer turning radius	N	8109	319.3
Inner turning radius	N1	4048	159.4
Outside width, load body	O	2,976	117.2
Inside width, load body	P	2690	105.9
Min. ground clearance, trailer unit	R	524	20.6
Ground clearance axle, trailer unit	R1	639	25.2
Max. height, upper body plate load body	U	3325	130.9
Track width, trailer unit	V	2216	87.2
Overall width, trailer unit	W	2954	116.3
Lowest ground clearance, tractor unit	X	466	18.3
Ground clearance axle, tractor unit	X1	592	23.3
Ground clearance, hitch	X2	680	26.8
Width, overhung tailgate, load unit	X_6	3098	122.0
Track width, tractor unit	Y	2216	87.2
Overall width, tractor unit	Z	2954	116.3
Approach angle	a1	23.2°	
Dump angle	a2	70°	
Max. steering angle	a3	45°	

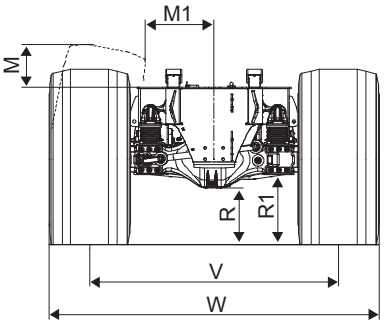
Dimensional drawing

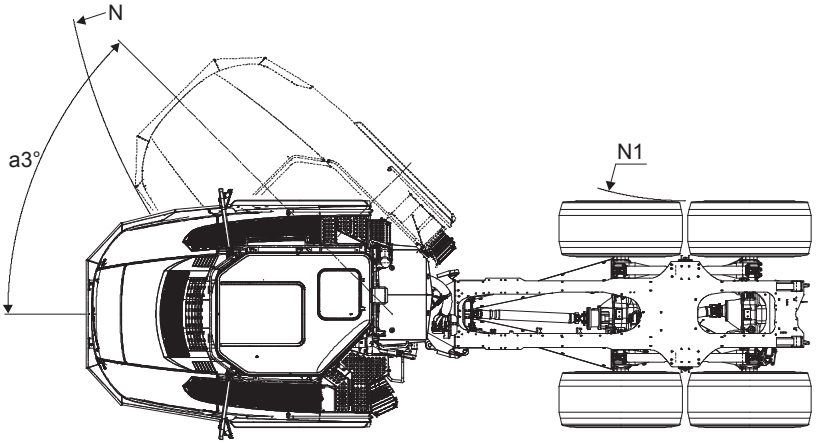
Hauler chassis — HC42

The letters in the figures refer to the text on the next page.









V1138055

Dimensions					
		A25G HC42 [a]		A30G HC42 [b]	
		mm	in	mm	in
Overall length	A	9406	370.5	9406	370.5
Distance, front edge — rear edge trailer unit	B	4435	174.6	4435	174.6
Distance, front edge bogie – centre of dump hinge	B1	4335	170.7	4335	170.7
Height over cab	C	3356	132.2	3366	132.5
Width across cab	C1	1772	69.8	1772	69.8
Overhang, front	D	2762	108.7	2762	108.7
Distance, front axle – steering centre	E	1209	47.6	1209	47.6
Wheel base, drive axles	F	4175	164.4	4175	164.4
Wheel base, bogie axles	G	1670	65.8	1670	65.8
Centre-of-gravity position from bogie centre[c]	H	437	17.2 in	455	17.9 in
Overhang, frame	I	609	24.0	609	24.0
Distance, bogie centre – centre of dump hinge	J	1444	56.9	1444	56.9
Height to top of trailer frame	K	1412	55.6	1417	55.8
Centre-of-gravity position from top of trailer frame[d]	L	940	37.1	1005	39.6
Max bogie movement, height	M	365	14.4	380	15.0
Distance to centre of trailer, at max. bogie movement (sideways)	M_1	720	28.4	615	24.2
Outer turning radius	N	8109	319.3	8109	319.3
Inner turning radius	N1	4092	161.1	4048	159.4
Free zone [1]	O				
Min. ground clearance, trailer unit	R	519	20.4	524	20.6
Ground clearance axle, trailer unit	R1	633	24.9	639	25.2
Track width, trailer unit	V	2258	88.9	2216	87.2
Overall width, trailer unit	W	2915	114.8	2954	116.3
Lowest ground clearance, tractor unit	X	455	17.9	466	18.4
Ground clearance axle, tractor unit	X1	581	22.9	592	23.3
Ground clearance, hitch	X2	660	26.0	680	26.8
Track width, tractor unit	Y	2258	88.9	2216	87.2
Overall width, tractor unit	Z	2915	114.8	2954	116.3
Approach angle	a1	23.5°		23.2°	
Max. steering lock	a3	45°		45°	

a)Dimensions apply to an unloaded machine with tire dimension 23,5 R25

b)Dimensions apply to an unloaded machine with tire dimension 750/65 R25

c)Centre-of-gravity position applies to superstructure with max. permitted load

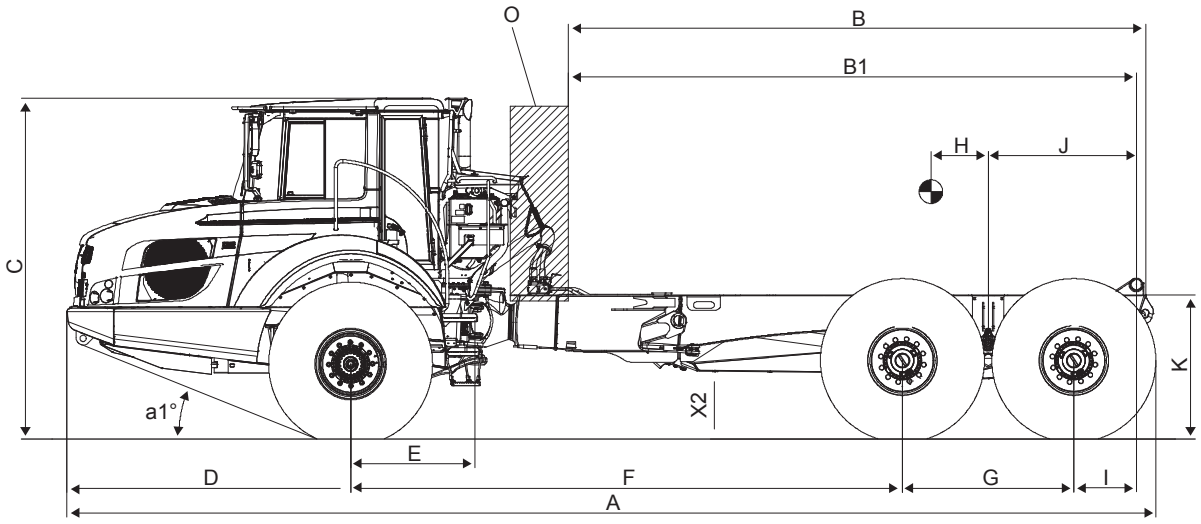
d)Centre-of-gravity position applies to superstructure with max. permitted load

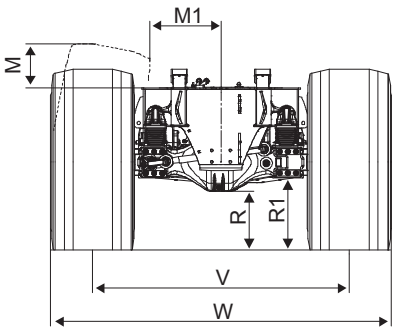
1. No superstructure allowed in this area. Applies to entire machine width.

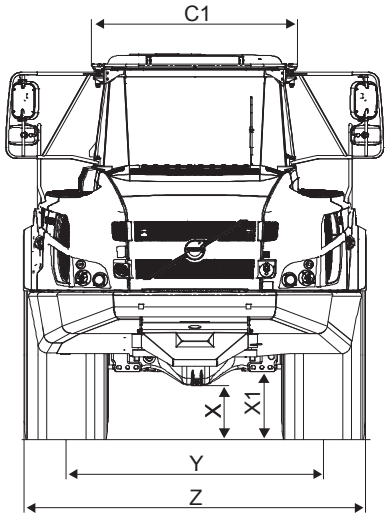
Dimensional drawing

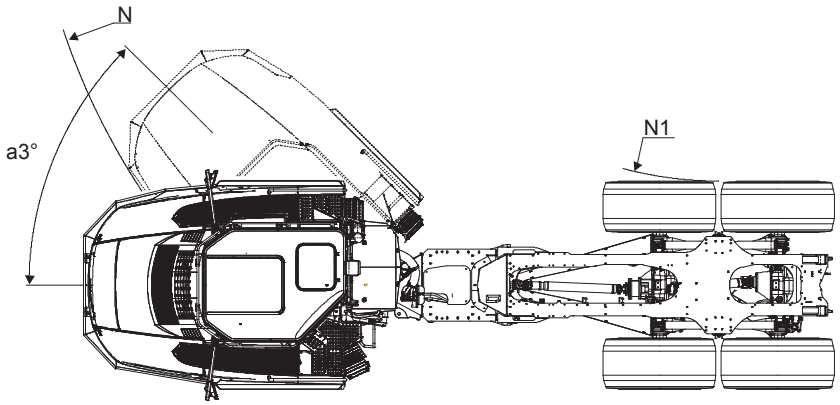
Hauler chassis — HC54

The letters in the figures refer to the text on the next page.









V1138056

Dimensions					
		A25G HC54 (a)		30G HC54 (b)	
		mm	in	mm	in
Overall length	A	10606	417.6	10606	417.6
Distance, front edge — rear edge trailer unit	B	5635	221.9	5635	221.9
Distance, front edge trailer unit — centre of dump hinge	B1	5535	217.9	5535	217.9
Height over cab	C	3358	132.2	3366	132.5
Width across cab	C1	1772	69.8	1772	69.8
Overhang, front	D	2762	108.8	2762	108.8
Distance, front axle – steering centre	E	1209	47.6	1209	47.6
Wheel base, drive axles	F	5375	211.6	5375	211.6
Wheel base, bogie axles	G	1670	65.8	1670	65.8
Centre-of-gravity position from bogie centre(c)	H	510	20.1	538	21.2
Overhang, frame	I	609	24.0	608	23.9
Distance, bogie centre – centre of dump hinge	J	1444	56.9	1444	56.9
Height to top of trailer frame	K	1412	55.6	1417	55.8
Centre-of-gravity position from top of trailer frame(d)	L	940	37.0	1005	39.6
Max bogie movement, height	M	365	14.4	380	15.0
Distance to centre of trailer, at max. bogie movement (sideways)	M_1	720	28.4	615	24.2
Outer turning radius	N	9731	383.1	9771	384.7
Inner turning radius	N1	5264	207.2	5240	206.3
Free zone (1)	O				
Ground clearance axle, trailer unit	R	519	20.4	524	20.6
Ground clearance axle, trailer unit	R1	633	24.9	639	25.2
Track width, trailer unit	V	2258	88.9	2216	87.2
Overall width, trailer unit	W	2915	114.8	2954	116.3
Lowest ground clearance, tractor unit	X	455	17.9	466	18.4
Ground clearance axle, tractor unit	X1	581	22.9	592	23.3
Ground clearance, hitch	X2	660	26.0	680	26.8
Track width, tractor unit	Y	2258	88.9	2216	87.2
Overall width, tractor unit	Z	2915	114.8	2954	116.3
Approach angle	a1	23.5°		23.2°	
Max. steering lock	a3	45°		45°	

a)Dimensions apply to an unloaded machine with tire dimension 23,5 R25

b)Dimensions apply to an unloaded machine with tire dimension 750/65 R25

c)Centre-of-gravity position applies to superstructure with max. permitted load

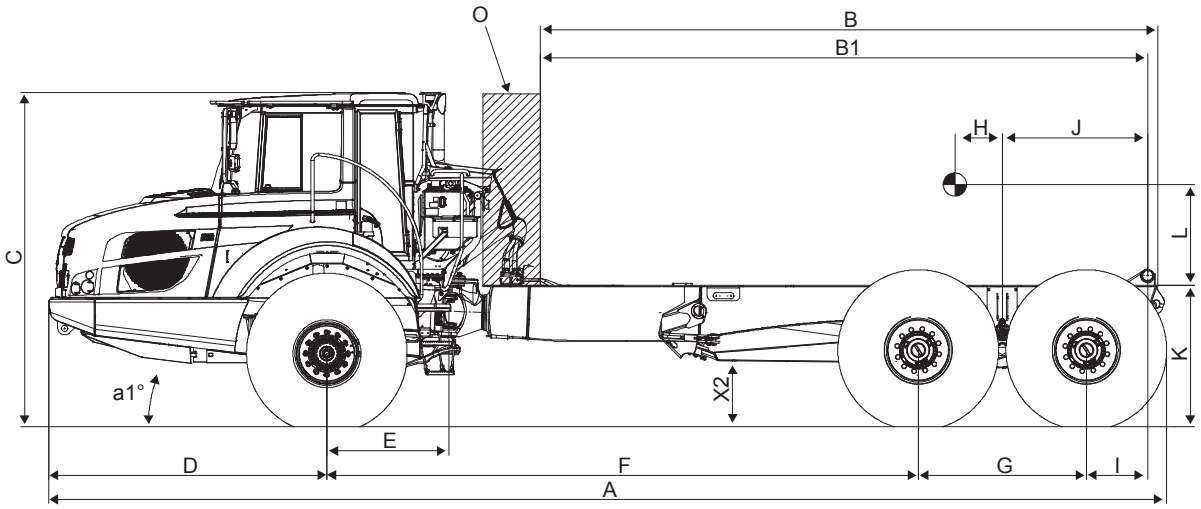
d)Centre-of-gravity position applies to superstructure with max. permitted load

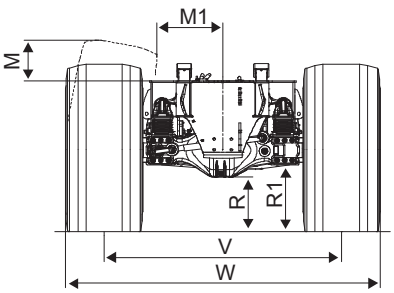
1. No superstructure allowed in this area. Applies to entire machine width.

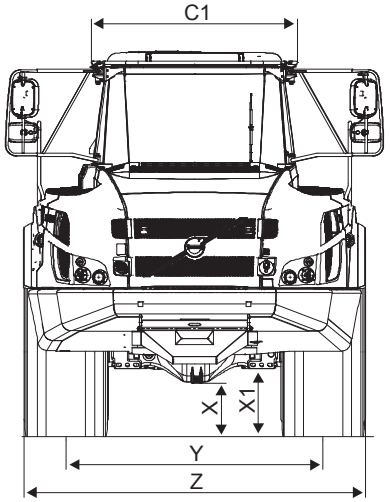
Dimensional drawing

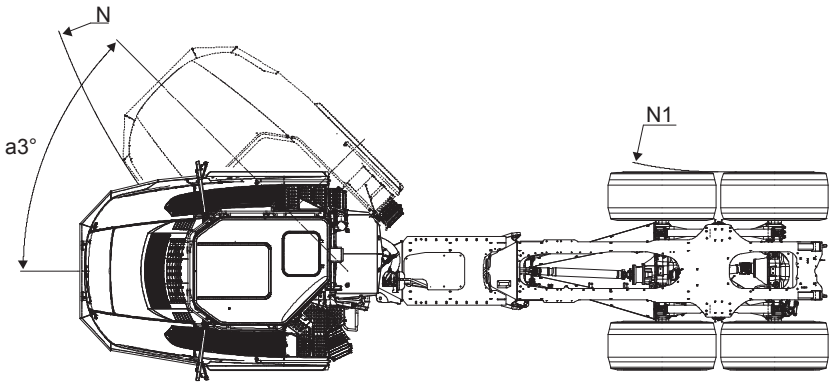
Hauler chassis — HC59

The letters in the figures refer to the text on the next page.









V1138057

Dimensions					
		A25G HC59 (a)		A30G HC59 (b)	
		mm	in	mm	in
Overall length	A	11106	437.2	11106	437.2
Distance, front edge — rear edge trailer unit	B	6135	241.5	6135	241.5
Distance, front edge trailer unit — centre of dump hinge	B1	6035	237.6	6035	237.6
Height over cab	C	3358	132.2	3366	132.5
Width across cab	C1	1772	69.8	1772	69.8
Overhang, front	D	2762	108.8	2762	108.8
Distance, front axle – steering centre	E	1209	47.6	1209	47.6
Wheel base, drive axles	F	5875	231.3	5875	231.3
Wheel base, bogie axles	G	1670	65.8	1670	65.8
Centre-of-gravity position from bogie centre(1)	H	544	21.4	575	22.6
Overhang, frame	I	609	24.0	608	23.9
Distance, bogie centre — centre of dump hinge	J	1444	56.9	1444	56.9
Height to top of trailer frame	K	1412	55.6	1417	55.8
Centre-of-gravity position from top of trailer frame(c)	L	940	37.0	1005	39.6
Max bogie movement, height	M	365	14.4	380	15.0
Distance to centre of trailer, at max. bogie movement	M_1	720	28.4	615	24.2
Outer turning radius	N	10436	410.9	10500	413.4
Inner turning radius	N1	5762	226.9	5740	226.0
Free zone (2)	O				
Min. ground clearance, trailer unit	R	519	20.4	524	20.6
Ground clearance axle, trailer unit	R1	633	24.9	639	25.2
Track width, trailer unit	V	2258	88.9	2216	87.2
Overall width, trailer unit	W	2915	114.8	2954	116.3
Lowest ground clearance, tractor unit	X	455	17.9	466	18.4
Ground clearance axle, tractor unit	X1	581	22.9	592	23.3
Ground clearance, hitch	X2	660	26.0	680	26.8
Track width, tractor unit	Y	2258	88.9	2216	87.2
Overall width, tractor unit	Z	2915	114.8	2954	116.3
Approach angle	a1	23.5°		23.2°	
Max. steering lock	a3	45°		45°	

a)Dimensions apply to an unloaded machine with tire dimension 23,5 R25

b)Dimensions apply to an unloaded machine with tire dimension 750/65 R25

c)Centre-of-gravity position applies to superstructure with max. permitted load

1. Centre-of-gravity position applies to superstructure with max. permitted load
2. No superstructure allowed in this area. Applies to entire machine width

Mechanical equipment

Trailer hitch

(Additional options)

The trailer hitch is used to tow small trailers		
Maximum trailer weight, braked trailer:	10,000 kg	22,050 lb
Max. horizontal load on trailer hitch:	8,500 kg	18,739 lbs
Max. vertical load on trailer hitch:		
Up to 25 km/h (15.5 mph)	2,000 kg	4410 lb
Above 25 km/h (15.5 mph)	1,500 kg	3300 lb

Environmental Declaration

Core values

Along with quality and safety, caring for the environment is one of Volvo's core values. This means that Volvo Construction Equipment works with an overall perspective of the products that extends throughout their entire life cycle. This includes engineering and design, material selection, manufacturing processes, use, and recycling.

Manufacturers

Manufacturing of the main components - engines, transmissions, drive axles and cabs as well as assembly of complete articulated haulers takes place at production facilities of Volvo Construction Equipment. All of these are certified according to ISO 14001. A lot of our components and parts are purchased from external suppliers. Volvo Construction Equipment works in close cooperation with these suppliers in order to ensure that purchased components and parts meet our environmental requirements.

Declarations

Upholstery and other cab materials do not contain mercury. Plastics and other interior materials are fire-classed according to Volvo standard 104-0001. Brake pads do not contain mercury, cadmium, or asbestos. The complete machine does not contain any cadmium or asbestos. If the machine is equipped with air conditioning (option), refrigerant type R134a (2.0-2.3 kg/4.4-5.1 lbs) is used.

Tires

Tires do not contain highly aromatic oils (HA-oils) in the tread.

Paint and surface treatment

In order to reduce consumption of water and chemicals, cleaning and recirculation takes place during the treatment processes in the factories.

Table. Specification of paint

Main components	Paint type	Chlorine	Pre-treatment
Cab	Electrocoat + TopPowder	No	Degreasing, Pickling, Zinkphosphating
Frames and load body (load carrying structure)	2K epoxy Direct-To-Metal	No	Steel shot blasting
Axles	2K waterborne epoxy primer+2K waterborne PUR Topcoat	No	Iron phosphating

Engine emissions

Stage V: the engine is certified through official testing according to regulation (EU) 2016/1628 and ECE R96: Stage V.

Exhaust emissions are measured as specific emission in g/kWh according to non-road stationary test cycle (NRSC) C1 version and the non-road transient cycle (NRTC).

Tier 4f: the engine is certified according to USA requirements non- and off-road (40 CFR 1039 and 40 CFR 1068): EPA and CARB Tier 4f.

Exhaust emissions are measured as specific emission in g/kWh according to non-road ramped mode cycle (RMC) C1 version and the non-road transient cycle (NRTC).

In order to achieve the legal requirements, the after-treatment of exhaust emissions is required.

Emission levels	NOx (g/kWh)	HC (g/kWh)	PM (g/kWh)	CO (g/kWh)	PN (g/kWh)	Power range (kW)
EU, Stage V	0,4	0,19	0,015	3,5	$1x10^{12}$	130-560
US EPA + CARB Tier 4f	0,4	0,19	0,02	3,5		130-560
Stage III	4,0		0,2	3,5		130-560
Stage II	6,0	1,0	0,2	3,5		130-560

The load-sensing working hydraulics contribute to lower fuel consumption through a demandcontrolled flow of hydraulic oil.

Operator’s environment

Incoming air for the cab first passes through a pre-filter, which separates out coarser particles. It then passes through the main filter in the cab. Up to 90% of all air can be recirculated through the main filter. This creates an overpressure in the cab, ensuring no air entering the cab bypasses the filter system. This guarantees clean working environment.

Service

To facilitate draining and reduce the risk of spilling engine and hydraulic oil, a special drain hose is supplied with each machine. There is a breather filter to reduce oil mist for venting axles, transmission and hydraulic tank. The hydraulic tank as well as front and rear axles has a protective valve in the breather filter. This will minimize leakage in the event of a roll-over or turnover. The tank cap is closed tight to prevent fuel leaks in case of a roll-over or turn-over. All engines have a system for cleaning the crankcase emissions of oil particles and mist. For service intervals and other maintenance, see Operator’s Manual for each machine model.

Oils and fluids

Volvo Construction Equipment recommends Volvo Biodegradable Hydraulic Oil. If the Volvo oil is not available, please contact your authorized dealer.

Recycling

The design of Volvo articulated haulers allows for recycling at the end of their useful life cycle. Materials can be reused in new Volvo haulers or other products. According to our own calculations, the machine is recyclable to 95% by weight. Most of our plastic parts are marked for recycling according to Volvo standards 5052,41; 5052,411; 5052,412; 103-0002 and ISO 1043-1, 1043-2, 1043-3, 1043-4, 1629.

Recycling

Model	Units	A25G	A30G
Steel and iron	kg	17 000	17 500
	lb	37,485	38,588
Copper	kg	35	35
	lb	77	77
Aluminium	kg	72	72
	lb	159	159
Bronze bushings	kg	5	5
	lb	11	11
Lead batteries	kg	91	91
	lb	201	201
Glass	kg	75	75
	lb	165	165
Polymer materials and rubber	kg	118	118
	lb	260	260
Tires	kg	1 908	2 436
	lb	4,207	5,371
Fluids, oils and chemicals	kg	1 124	1 124
	lb	2,478	2,478
Other	kg	1 100	1 100
	lb	2,426	2,426
Total recyclable material(1)	kg	21 528	22 556
	lb	47,469	49,736
Recycling quota	**%**	**95**	**96**

The calculation of the weights is based on defined machines. Variations are caused by different equipment. These material fractions can be recycled (material and/or energy recycled) if applicable.

Producer responsibility

In most countries today, there is a producer responsibility for our products, applicable to components such as batteries, tires etc. There are special regulations for these components.

For further information, please contact your dealer.

1. Varies depending on equipment, for example tires and load body.

Service history

Service 500 hours		Type of service	Signature and stamp
Date	Hours	☐ First 500 hours ☐ Service and maintenance	

Service 1000 hours		Type of service	Signature and stamp
Date	Hours	☐ First 1000 hours ☐ Service and maintenance	

Service 1500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 2000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 2500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 3000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 3500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 4000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 4500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 5000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 5500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 6000 hours		Type of service	Signature and stamp
Date	Hours	☐ First 6000 hours ☐ Service and maintenance	

Service 6500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 7000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 7500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 8000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 8500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 9000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 9500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 10000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 10500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 11000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 11500 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

Service 12000 hours		Type of service	Signature and stamp
Date	Hours	☐ Service and maintenance	

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