Important information
Serious risk of injury

Work that is classified as electrical work may only be carried out by trained and qualified personnel who are authorised to perform electrical work.

Therefore, block the starting device and ensure that the electric drive system is powered off.

WARNING!

This warning symbol and text can be found next to maintenance items where it is particularly important to bear in mind the risk of injury.

Operator's manual
Electric machine
en-GB 3 452 070

Issue 4.0

IMPORTANT!

The owner is responsible for making sure that maintenance is carried out on time and in accordance with the instructions.

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Start of warranty

The more Scania knows about you, your company and your equipment, the more effectively we can adapt our services to you. If you have started to use a new Scania electric machine, it is very important that you send in the warranty report to Scania immediately. Quite simply, Scania needs to register all the details on electric machine ownership etc. in order to carry out monitoring for you.

You can report the start of the warranty on the Scania website https://www.scania.com/.

Note:

If you do not send in the warranty report, the electric machine is not covered by the accompanying Scania warranty.

Also fill in below the details you enter in the warranty report. These details can facilitate contact with a workshop, for example. The serial number is indicated on the type plate.

Product serial number (e.g. 1 111 111)

Vessel identification number (e.g. MMSI 111 111 111 or IMO 1 111 111)

Start date (yyyy-mm-dd)

Company name

Contact person

Phone number

Email address

Address

Postal code

Post town

State/County

Country

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Introduction

This Operator's Manual describes the operation and maintenance of Scania electric machines.

Electric machines are available with different output. The power for the electric machine ordered is indicated on a plate located on the engine control unit.

Note:

Only standard components are described in the operator's manual. For more information on special equipment, refer to the instructions provided by the respective manufacturers.

To ensure the maximum performance and the longest service life for the electric machine, remember the following:

- Read through the Operator's manual before starting to use the engine. Even regular users of Scania electric machines will get new information from the Operator's Manual.
- Always follow the maintenance instructions.
- Read the section on safety carefully.
- Get to know your electric machine so that you know what it can do and how it works.
- Always contact a workshop with qualified personnel for maintenance and repair.

The information in this Operator's manual was correct at the time of going to press. Scania reserves the right to make alterations without prior notice.

Certification

IMPORTANT!

For Scania to guarantee that the electric machine corresponds to its certified configuration, and take responsibility for any damage and injuries that occur, maintenance must be carried out in accordance with the instructions in this Operator's Manual.

Otherwise, the instructions in the Operator's Manual for the running and maintenance of the electric machine shall apply. Follow the safety precautions on the following pages.

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Environment and safety

Environmental liability

Scania develops and produces engines that are as environmentally-friendly as possible. Scania has made major efforts to fulfil the environmental requirements in force in almost every market.

At the same time, we have been able to maintain a high level of performance and operating economy for Scania engines. To maintain these throughout the entire service life of the engine, it is important for the user to follow the instructions on driving, maintenance and fuel, lubricating oil and coolant as outlined in the Operator's manual.

Other green initiatives taken include ensuring that, following maintenance and repair, waste that is harmful to the environment (for example oil, fuel, coolant, filters and batteries) is disposed of accordance with the applicable environmental requirements.

Safety

The following pages contain a summary of the safety precautions to be complied with when operating and maintaining Scania electric machines. The equivalent text can also be found under the relevant maintenance item.

To prevent damage to the electric machine and to ensure that it runs optimally, follow the instructions in the warnings and advisories.

If the instructions are not followed, the warranty can cease to apply.

Different types of advisory

Warning!

All advisories preceded by Warning! are very important. They warn of serious faults and incorrect operation that could lead to personal injury. Example:

WARNING!

Work that is classified as electrical work may only be carried out by trained and qualified personnel who are authorised to perform electrical work.

Important!

Advisories preceded by Important! warn of faults and incorrect operation that could lead to equipment being damaged. Example:

Please note:

Advisories preceded by Note: refer to information important to ensure the best possible operation and functionality. Example:

Note:

The definition of electrical work is when you can come into contact with normally live parts, such as open poles. Electrical work does not include loosening harness-to-component connectors, as no contact is made with normally live parts.

Environment

This Operator’s manual contains specially highlighted text with instructions to help protect the environment during maintenance. Example:

Environment

Depending on the battery type, the vehicle's batteries may contain corrosive diluted sulphuric acid and the toxic metal lead. Lead is harmful to humans and the environment. Wash your hands after contact with the battery. The batteries should be handled in accordance with national regulations on environmentally hazardous substances.

Warnings and advisories

Smoking

Depending on the battery type, explosive hydrogen gas may be generated during charging. Smoking is prohibited and there must not be any devices that can generate sparks in the vicinity.

Safety precautions for driving

Daily maintenance

Always perform a visual inspection of the electric machine and the rest of its equipment before starting the machine or after shutting it down following operation.

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This inspection should be done to detect oil or coolant leakage, or anything else that may require corrective action.

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Batteries

WARNING!

If the propulsion battery is damaged or is suspected to be damaged, the vehicle may not be parked inside or in the immediate vicinity of the workshop. This applies both to physical damage and damage such as high acceleration. No repairs may be carried out on any part of the vehicle.

Contact Local Technical Helpdesk.

WARNING!

Operations classified as VCB work may only be carried out by trained and qualified personnel who are authorised to perform this work.

WARNING!

Batteries can explode if a spark occurs due to misconnection.

An incorrectly connected battery cable or jump lead can cause sparking.

There must be no smoking, naked flames or sparks near the batteries or the battery compartment.

WARNING!

Never use a high pressure gun against surfaces close to the batteries. Water can penetrate and damage batteries and other electrical equipment.

IMPORTANT!

The propulsion battery must not be subjected to direct sunlight. Never park the vehicle outdoors without protective casings. Direct sunlight could cause the propulsion battery to reach a high temperature that would permanently damage the cells.

Note:

When renewing the propulsion battery, return the old battery using the propulsion battery packaging from the new battery. The propulsion battery must be carried out in accordance with the applicable regulations for the transport of dangerous goods (ADR).

Environment

Used batteries must be disposed of as specified in national and international laws and regulations.

Hazardous gases

WARNING!

Risk of personal injury Never try to extinguish a burning propulsion battery Avoid the smoke.

Starter lock

IMPORTANT!

If the instrument panel is not fitted with a starter lock, the engine compartment should be locked to prevent unauthorised personnel from starting the engine. Alternatively, a lockable master switch or battery master switch can be used.

Starter gas

WARNING!

Never use starter gas or similar agents to help start the engine. This can cause an explosion in the intake manifold and possible injury.

Driving

WARNING!

The engine must not be run in environments where there is a risk of explosion, as all of the electrical or mechanical components can generate sparks.

Approaching a running engine always poses a safety risk. Parts of the body, clothes or dropped tools can get caught in rotating parts such as the fan and cause injury. For personal safety all ro-

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tating parts and hot surfaces must be fitted with guards.

Safety precautions for handling materials

Fuel and lubricating oil

WARNING!

All fuels and lubricants as well as many chemicals are flammable. Always follow the instructions on the relevant packaging.

The work must be carried out on a cold engine. Fuel leaks and spillages on hot surfaces can cause fire.

Store used rags and other flammable materials safely so as to avoid spontaneous combustion.

Chemicals

WARNING!

Most chemicals such as glycols, anti-corrosive agents, preservative oils and degreasing agents, are harmful. Some chemicals, such as preservative oil, are also flammable. Always follow the safety precautions on the packaging.

Store chemicals and other harmful materials in approved and clearly marked containers, where they are inaccessible to unauthorised persons.

Environment

Excess and used chemicals must be disposed of as specified in national and international laws and regulations.

Safety precautions for maintenance

Switch off the engine

WARNING!

Working on a running engine always poses a safety risk. Parts of the body, clothes or dropped tools can get caught in rotating parts and cause injury.

Always switch off the engine before maintenance, unless otherwise indicated.

Make it impossible to start the engine: Remove any starter key, or cut the power using the main power switch or battery master switch and lock them.

Fit a warning plate somewhere appropriate, showing that work is being carried out on the engine.

Lubrication system

WARNING!

Hot oil can cause burns and skin irritation. Wear protective gloves and eye protection when changing hot oil.

Make sure that there is no pressure in the lubrication system before starting work on it.

Make sure that the oil filler cover is fitted when starting and driving in order to avoid oil escaping.

Environment

Used oil must be disposed of as specified in national and international laws and regulations.

Cooling system

WARNING!

Never open the coolant filler cap when the engine is hot. Hot coolant and steam may spray out and cause burns. If the cover has to be opened do it slowly to release the pressure before removing the cover. Wear protective gloves as the coolant is still very hot.

Avoid skin contact with coolant as this may cause irritation to the skin. Wear eye protection and gloves when handling coolant.

Ethylene glycol can be fatal if ingested.

Environment

Used coolant must be disposed of as specified in national and international laws and regulations.

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Electrical system

WARNING!

Switch off the engine and switch off the power by disconnecting the electrical cables to the battery. External power supplies to extra equipment in the engine must also be disconnected.

Always use Scania spare parts for the fuel and electrical systems. Scania spare parts are designed to minimise the risk of fire and explosion.

Electric welding

WARNING!

When carrying out welding work on and near the engine, disconnect the battery and alternator leads. Pull out the multi-pin connector for the engine control unit as well.

Connect the welding clamp close to the component to be welded. The welding clamp must not be connected to the engine, or so that the current can cross a bearing.

When welding is finished:

1. Connect the alternator and engine control unit cables.
2. Connect the batteries.

Before starting

WARNING!

Ensure that all protections are in place before starting the electric machine. Ensure that no tools or other objects have been left on the engine.

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Electrical safety – VCB system

The vehicle is fitted with an electrical system in voltage class VCB (Voltage Class B). This means that several components operate with high DC voltage (up to 1500 V DC). Even after the vehicle is shut down, dangerous voltage may remain in the system.

Operator restrictions

Operators are not allowed to open, loosen or disconnect anything that is part of the VCB system. This also applies to:

- Orange high-voltage cables (VCB cables)
- Enclosed components marked with a lightning symbol Battery units, charging sockets and inverters Contactors, fuses and harness-to-harness connectors in the high voltage system

These components must only be handled by trained and authorised personnel.

WARNING!

VCB components contain high voltage that can cause electric shock, fire, or serious injury.

Never touch electrical cables or enclosures marked with lightning bolt symbols.

WARNING!

A damaged or overheated propulsion battery may catch fire. The smoke is toxic.

Leave the vehicle immediately and contact the fire brigade or emergency services if fire or battery damage is suspected.

VCB work

VCB work may only be performed by authorised personnel. Examples of such work:

- Opening components marked with a lightning symbol.
- Replace or reroute VCB cables.
- Install or remove components that are not fully encapsulated.
- Welding or cutting near high-voltage cables

The VCB system has delayed discharge. Dangerous voltage may remain for several minutes after batteries are disconnected.

Some functions are activated automatically via remote communication or timers – never assume that the system is voltage-free.

Wiring faults or faulty switches can damage components and injure personnel.

Affected parts are clearly marked – **orange cable harness and warning symbols are used**.

Operator's responsibility

Operators must:

- Recognise and avoid touching VCB components Report damage or suspected faults directly to the responsible technician.Never attempt to repair, unplug, or modify electrical components yourself.
- Stop work and contact the technical manager if you have the slightest doubt.

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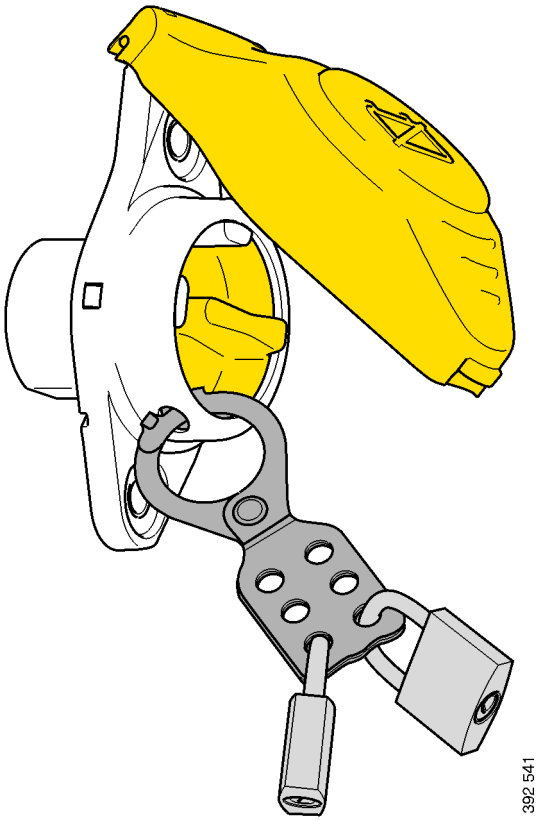
Securing VCB electrical work

WARNING!

The VCB system contains dangerous electrical voltage. Improperly executed electrical work can result in serious injury or death. Follow the procedure in the order indicated and always verify that the system is de-energised before starting work.

1. Disconnect the 15 voltage (U15).
   - If the 15 voltage is not already off, turn it off.
2. Switch off and lock the control switch (S229).
   - Use the control switch for the electric drive system (S229) and lock it in the off position with scissor lock 2 743 006.
   - Only the person performing the work may unlock the switch. Lock the starter key in the padlock if possible.
3. Switch off the 24 V supply.
   - Use the battery master switch or disconnect the negative battery terminals.
4. Wait for residual voltage discharge.
   - Wait at least 15 minutes before continuing the work, so that any remaining voltage has time to be discharged.
5. Check that the VCB system is de-energised. Check that there is no voltage left in the system according to the voltage check instructions. Measure with a 1000 V insulation multimeter. Check the voltage between plus and minus and against the chassis. If the vehicle is equipped with CUD, it must be used as a measuring point. Acceptable value: 0 V.
   - Measure voltage with insulation multimeter (1000 V) between:
     – positive and negative
     – the respective terminal and chassis
   - If the vehicle is equipped with CUD, it must be used as a measuring point.
     Acceptable value: 0 V.
6. Confirm that the work can be done.
   - When the check measurement shows 0 V, the system is considered de-energised. The work can now be done.



Scissor lock for control switch

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Marking according to directives

According to current requirements, the following information must be legibly and permanently marked on enclosures that receive incoming electric power supply in industrial applications:

- Supplier name
- Component designation
- Rated voltage
- Rated current/power
- Enclosure rating (IP)
- Standards

This applies to the following components:

- Inverter
- Electrical air compressor
- Electrical A/C compressor
- Direct current converter
- Main distribution unit for VCB
- Extra distribution unit for VCB
- Charging interface (CCS type 2)

Marking is carried out using Scania-specific labels identified by part number.

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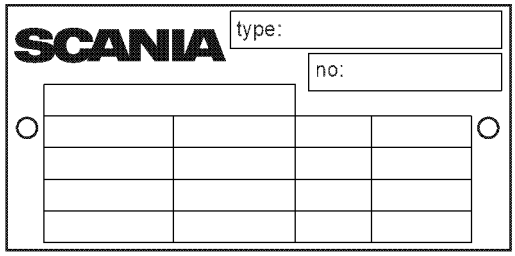
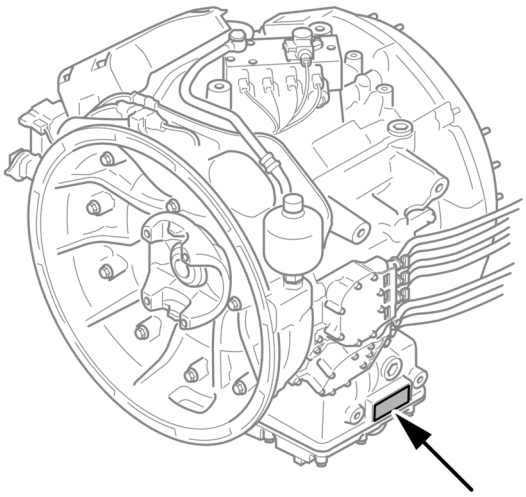
Type plate

The type plate is located on the front housing of the electric machine. It displays important information about the identity and characteristics of the electric machine.

The type designation indicates size, performance, certification code and variant. The type plate also shows the component serial number.



594 165



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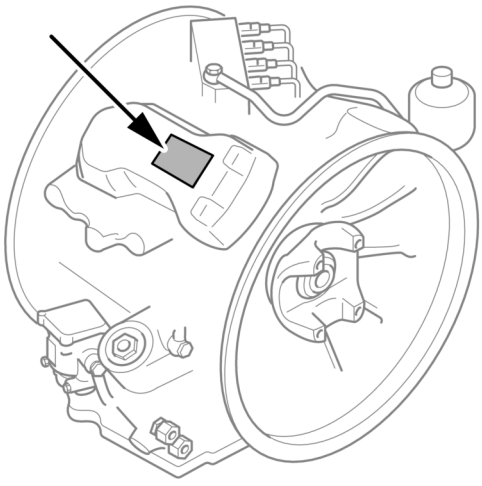
Type plate.

Produktserienummer

A label with the product serial number is located on the control unit casing. The product serial number is used for identification at installation level.



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Serial number.

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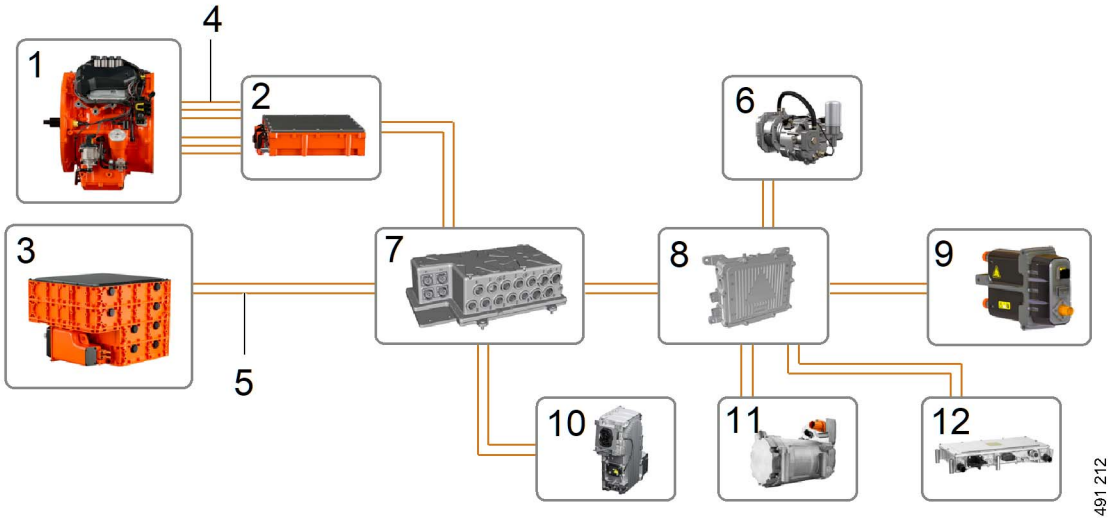
Component identification

System overview



1 Electric machine	7 Main distribution unit for VCB
2 Inverter	8 Auxiliary distribution unit for VCB
3 Battery pack	9 Auxiliary heater
4 Scania-supplied VCB cable harnesses, (1.2 or 1.8 m)	10 Charging interface
5 Scania-supplied VCB cable harnesses, (3 to 10 m)	11 Electrical A/C compressor
6 Electrical air compressor	12 Direct current converter

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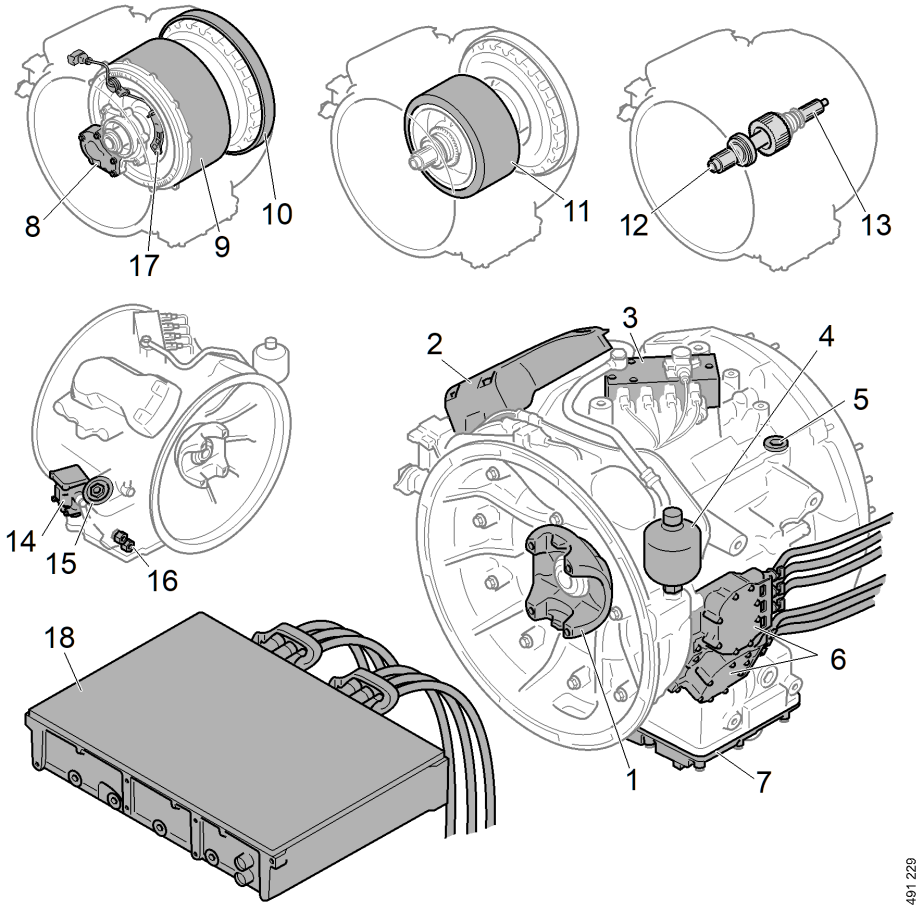
Electric machine

The electric machine is an oil-cooled, electric drive source with an integrated inverter and control system. It can be used in electric drive, hybrid drive or as auxiliary power. The system is developed by Scania and is controlled via a CAN bus (J1939).

The electric machine is connected to the combustion engine via an SAE 1 flange and can drive or brake the power transmission. An internal clutch system allows for seamless switching between different operating modes.



1 End yoke	10 Torsion damper
2 Control unit	11 Rotor
3 Valve block for operation	12 Output shaft
4 Pressure accumulator	13 Input shaft for connection of the combustion engine
5 Oil filler and connection for manual disengagement	14 Oil pump
6 Connection point for class B cable harness	15 Oil filter
7 Oil sump	16 Oil connections
8 Mechanical oil pump	17 Rotor position sensor
9 Stator	18 Inverter

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Propulsion battery

Scania's battery packs contain lithium-ion cells of the lithium-nickel-cobalt-manganese-oxide (Li-NMC) type.

They are developed for high performance, long life, and safe operation. The battery cells are encased in a robust aluminium housing designed to withstand external stresses and high temperatures without unnecessarily increasing weight.

Each battery pack has an integrated control system and a liquid-based cooling and heating system that optimises the temperature of the cells. The battery control is developed by Scania and ensures high operational reliability and protection against overheating.

WARNING!

Work inside a battery pack is classified as work with voltage.

Only authorised personnel who have undergone training in work with live voltage on the current battery type may carry out this work.

IMPORTANT!

Do not use high pressure cleaning equipment when cleaning the propulsion battery and battery junction box.

Residual water in the high pressure washer that has not dried may enter the battery junction box.

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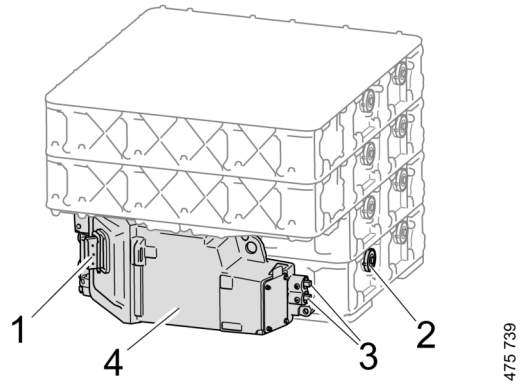
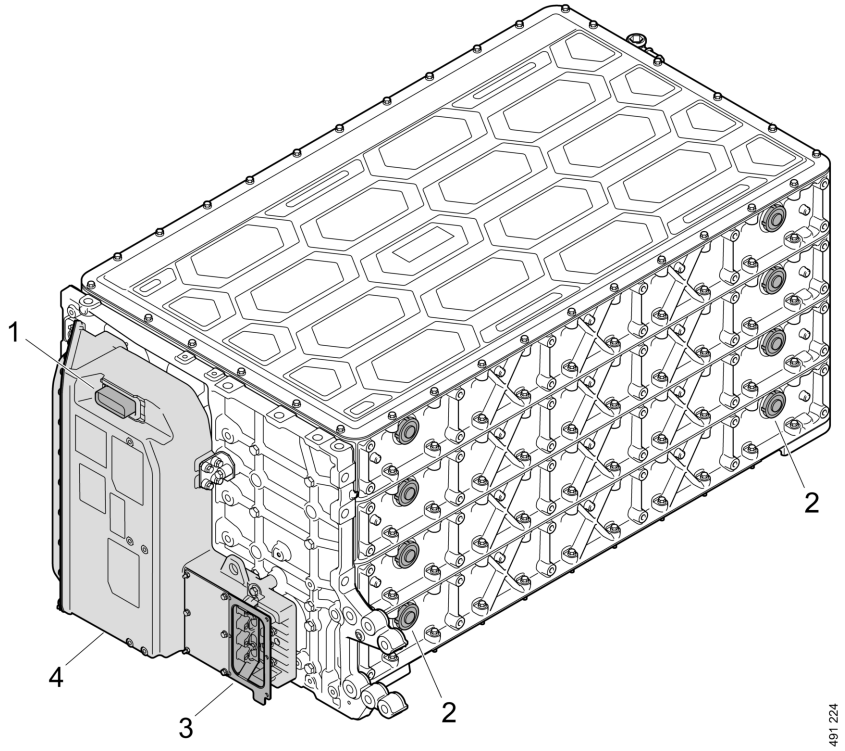
Battery pack B8 408



1 VCA connection
2 Overpressure valves
3 VCB connection
4 Battery junction box

Battery pack B8 413



1 VCA connection
2 Overpressure valves
3 VCB connection
4 Battery junction box

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Warning labels

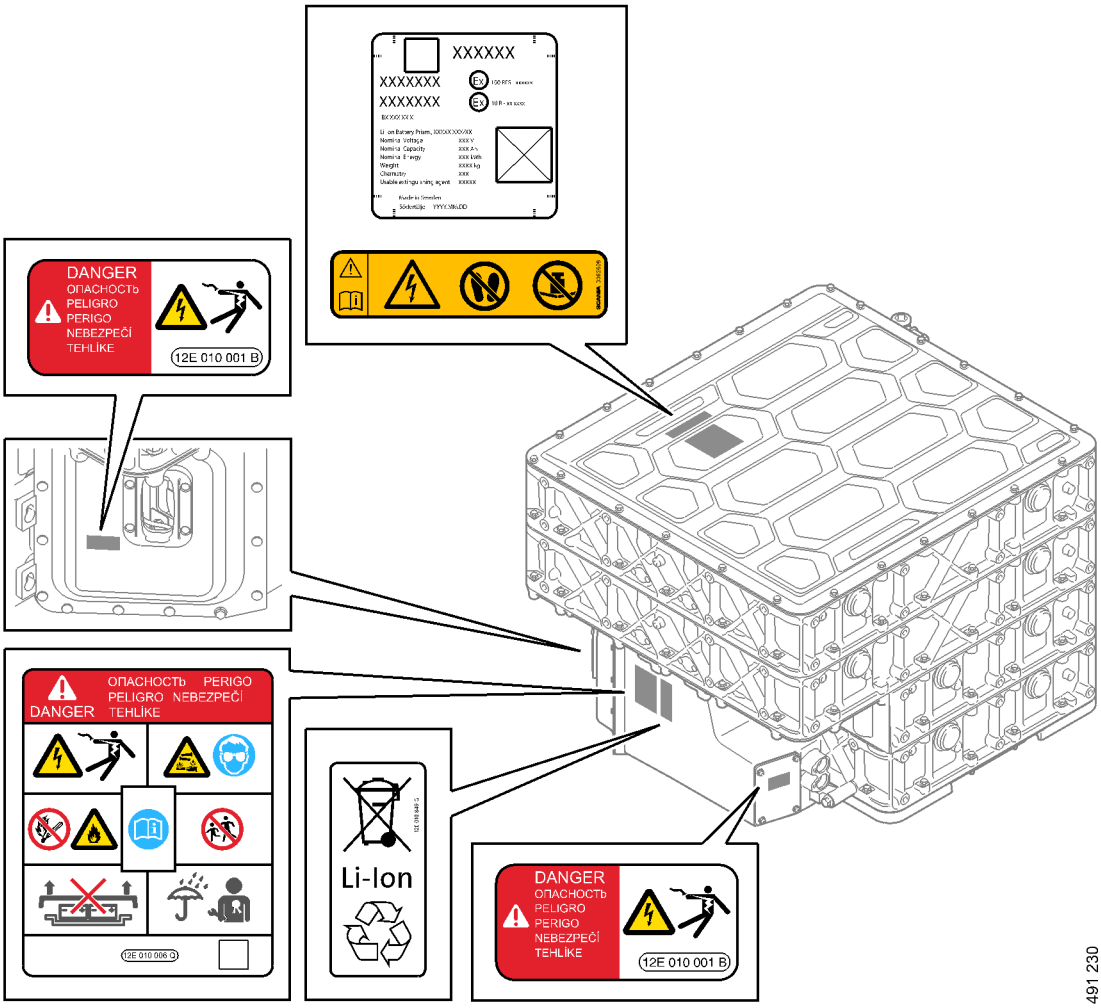
WARNING!

All warning labels must be visible and replaced if they are damaged or lost.

The battery packs are equipped with warning labels with legal requirements and safety requirements. Legal requirements may vary depending on which application the battery pack is used for.

All legal requirements for the application to which the battery pack is used must be met. Regardless of local regulations, original labels must remain in place.

Warning labels for B8 408.



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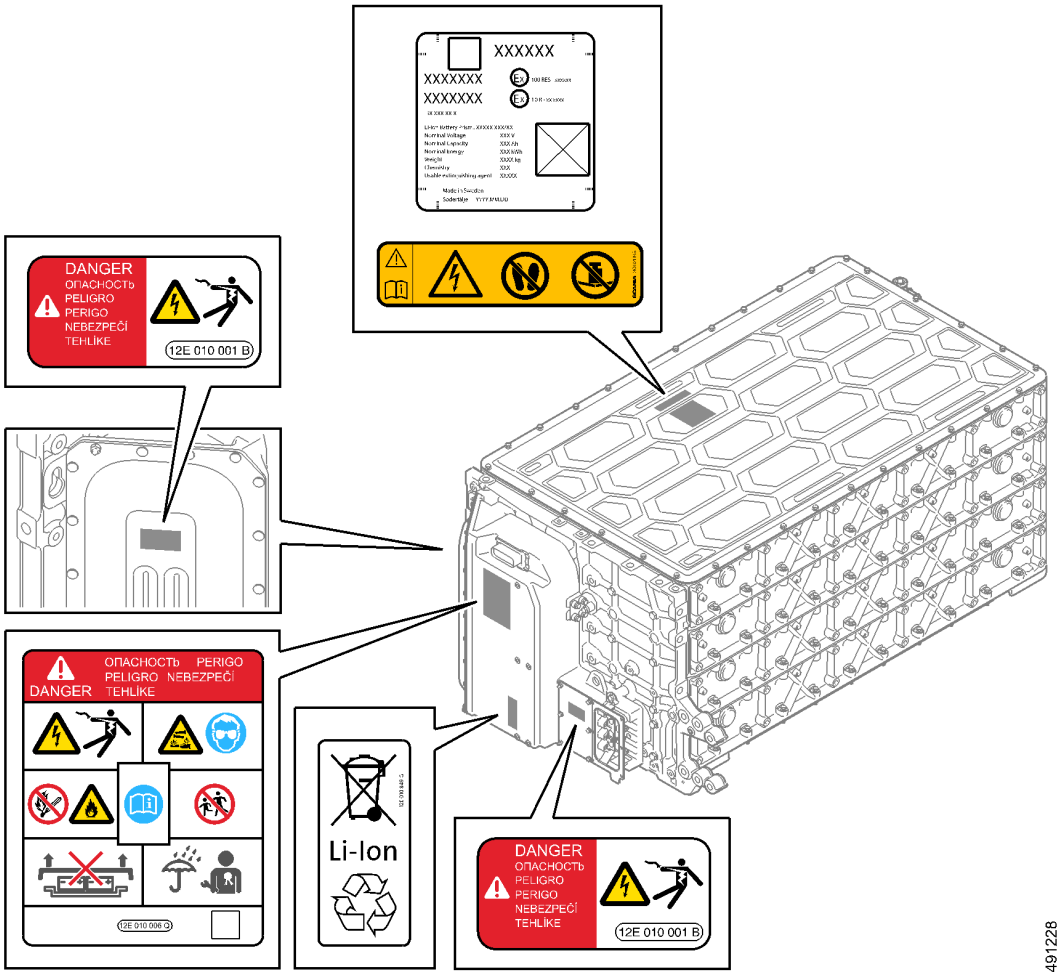
Warning labels B8 413



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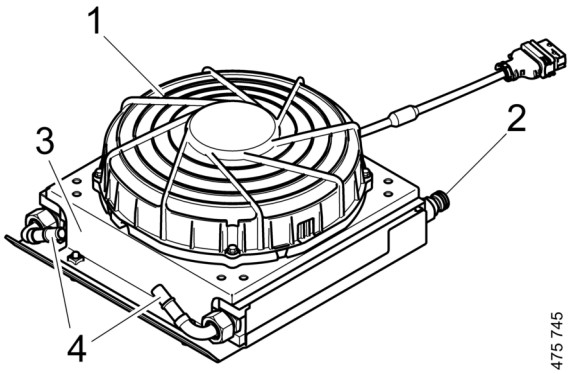
Cooling system for industrial applications

The industrial cooling system is designed to cool electric machine, power electronics, and propulsion batteries during operation. The system uses both oil cooling and liquid cooling depending on the component.

- The electric machine is cooled by means of oil circulating between 2 radiators with integrated fans. The customer is responsible for correct connection of oil pipes and hoses between the electric machine and radiator.
- The power electronics and the battery have separate cooling circuits. These consist of 2 radiators, 2 fans and a PCU control unit that regulates the cooling and battery systems.
- The component stand contains water pumps, A/C compressor and expansion tank.

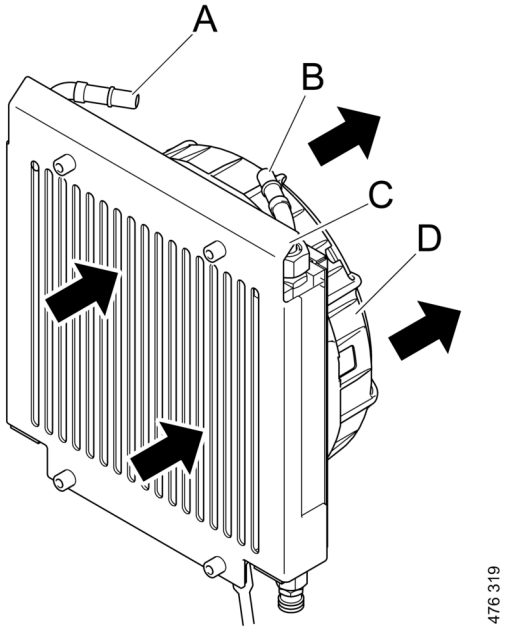
Cooling the electric machine

The cooling system uses 2 radiators with a preassembled fan. The customer is responsible for ensuring that the connecting oil pipe and hoses between the electric machine and radiator are fitted correctly. The system uses oil to cool the electric machine.



Oil cooler for electric machine.

1. *Fan*
2. *Draining point*
3. *Radiator*
4. *Incoming and outgoing oil pipes*



The arrows show the air flow.

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Cooling of propulsion batteries and power electronics with radiator

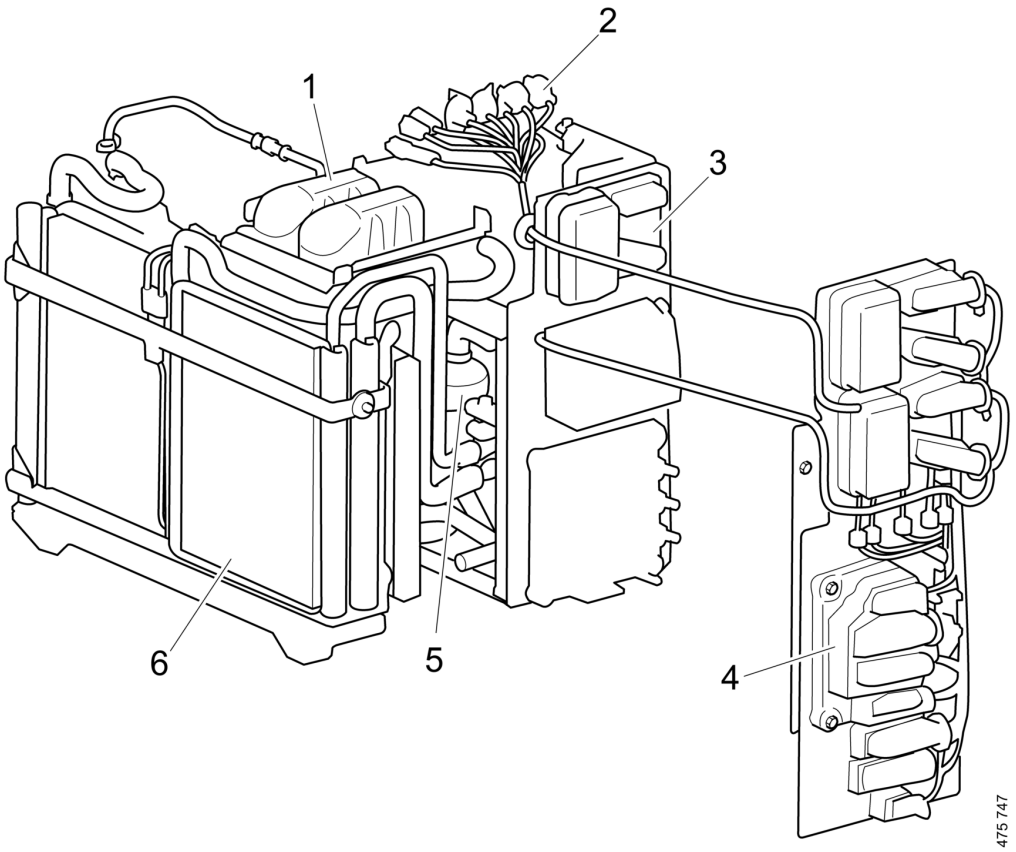
The cooling package for industrial applications consists of:

- 2 separate cooling circuits to separately cool the power electronics and batteries
- 2 radiators 1 for cooling the power electronics and 1 for cooling the battery
- 2 fans to ensure that the coolant is cooled.
- Cooling stand

The cooling rod consists of different components to facilitate cooling. The different components are:

- Water pumps
- A/C compressor – EMU is used to control both the cooling system and the battery system.

The system uses coolant to cool the power electronics and propulsion battery.



1 Expansion tank	4 EMU, for controlling the cooling system and battery system
2 Cable duct on cooling package	5 Cooling components

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3 Fuse box	6 Radiator for power electronics and propulsion batteries

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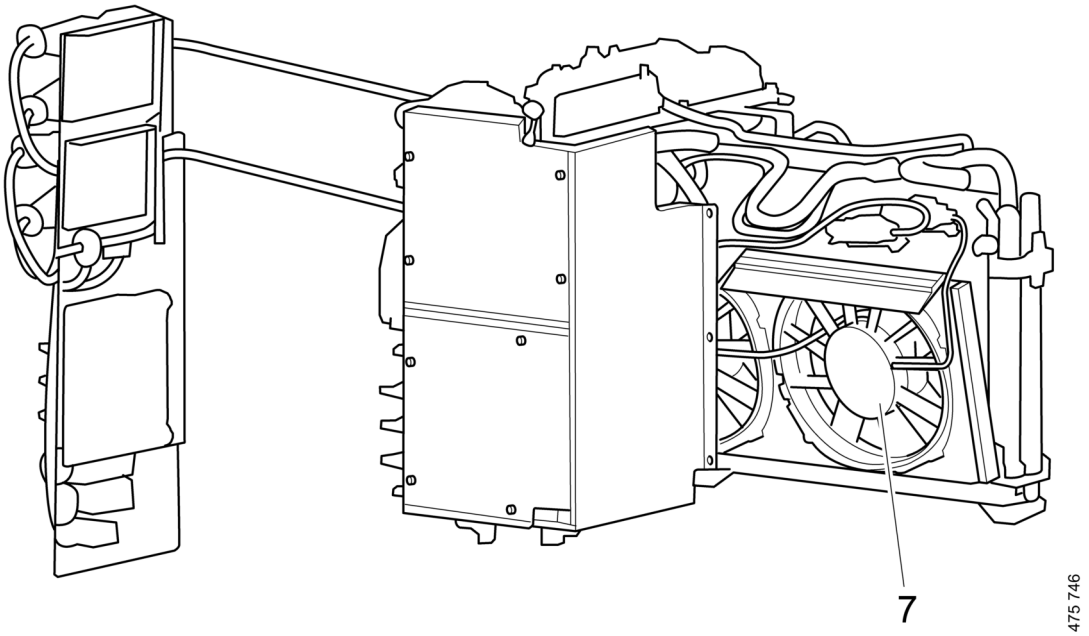
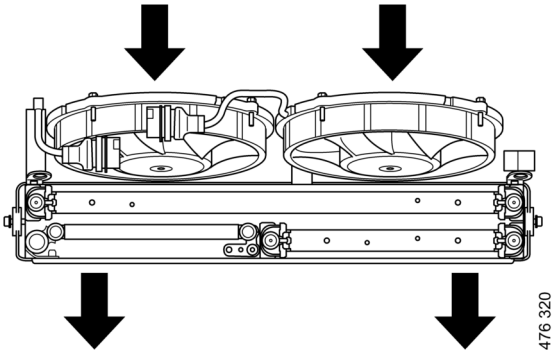


7 Fan.



The arrows show the air flow. The illustration is shown from above.

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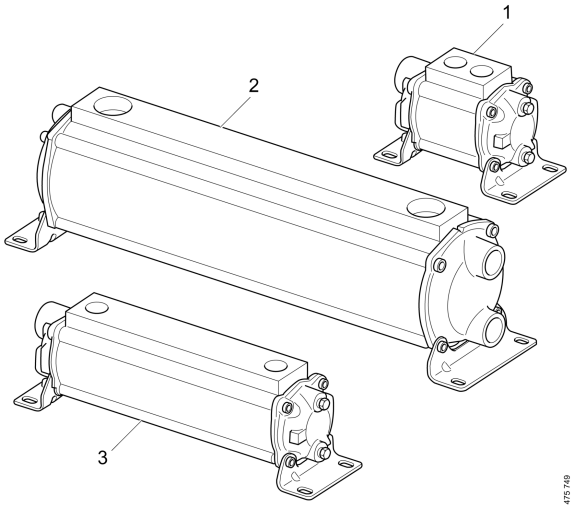
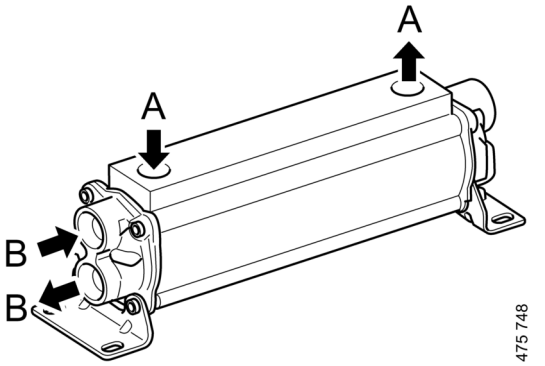
Cooling system for marine applications

In marine installations, heat exchangers are used to cool electrical machinery, power electronics and propulsion batteries. Seawater is used as the primary cooling source, and the components are connected in series on the seawater side.

- The electric machine's oil is cooled via a heat exchanger to regulate temperature, lubrication and function.
- The power electronics are cooled by a separate heat exchanger that is connected in series with the heat exchanger of the electric machine.
- The propulsion batteries are cooled via a dedicated heat exchanger, connected in series with the battery's radiator.



1. *Heat exchanger for the power electronics*
2. *Heat exchanger for the propulsion battery*
3. *Heat exchanger for the electric machine*



A Heat exchanger for the electric machine

B Intake and outlet for sea water.

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Charging interface

The system supports direct current charging.

- DC charging: Up to 325 kW via CCS type 2

Scania offers ready-made charging interfaces.

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Starting and running

Checks before first start

Complete the maintenance tasks listed under "First Start" in the maintenance schedule before starting the engine for the first time. Check the following:

- Oil level
- State of battery charge

For more information, see the section Maintenance intervals.

Checks before running

Perform daily inspections of the coolant level for both the electronics cooling circuit and the battery cooling circuit. This is done by checking that the liquid level in the expansion tanks is sufficient.

Also look for visible leakage.

For more information, see the section Maintenance intervals.

Driving

Check instruments and warning lamps at regular intervals.

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Emergency control

If the internal jaw coupling between the combustion engine and the electric machine fails to engage, meaning the vehicle does not switch to hybrid mode, activate manual emergency control.

The emergency shutdown is used to mechanically disconnect the electric machine from the driveline. It is necessary during maintenance or when the electric machine needs to be isolated from the movements of the propeller, for example when towing or in strong water currents.

When the propeller rotates, it affects the electric machine, which can lead to unintentional generation of voltage in the electrical system. If the electric machine is electrically disconnected at the same time, this poses a safety risk. By mechanically disconnecting the electric machine, power is prevented from being generated and fault effects from spreading to other systems.

There is an oil filler hole on top of the electric motor. Use this hole to manually operate the emergency control system.

The electric motor comes equipped with a lifting eye bolt. Fit the bolt through the oil filler hole for manual steering.

IMPORTANT!

Before repair or maintenance can be performed, please ensure that the electric machine is disconnected.

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Procedure

The operating unit is a clutch that connects and disconnects the electric machine from the driving axle.

There are 2 indicator lines on the pull rod, indication lines 1 and 2. See illustration. To connect the combustion engine, the pull rod must be in position so that the other indicator line is level with the edge of the housing; see the right arrow in the illustration. Follow the steps below.

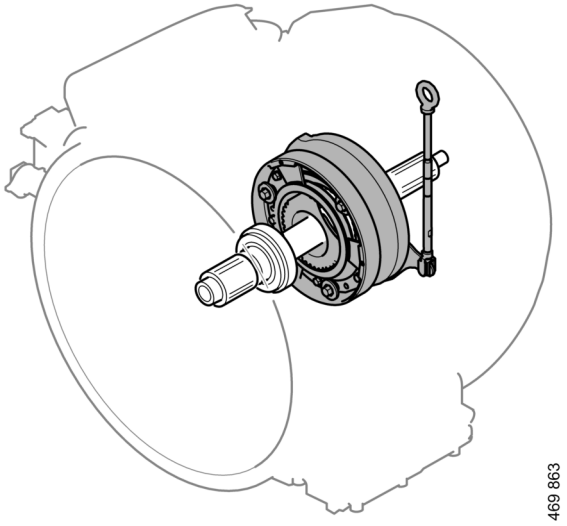
1. Remove the oil filler plug and attach a lifting eye to the pull rod.
2. Pull the emergency control to indicator line 1 on the pull rod.
3. Press the emergency control down to its original position.
4. Rotate the output shaft forwards and backwards while simultaneously pulling the emergency control unit. It should now be possible to slide the pull rod to indicator line 2.
5. If it stops at indicator line 1, repeat steps 3 and 4.
6. When the emergency control has been pulled to indicator line 2, the control system has been connected to the engine.
7. Remove the lifting eye, press the pull rod, refit the rubber holder securing the pull rod position and close the hatch.
8. Fit the oil filler plug.

Note:

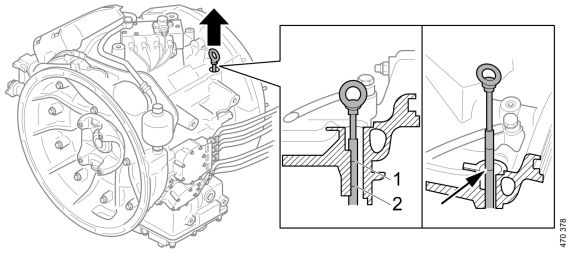
An electric machine requires approximately 300 N of lifting force to connect the control system to the engine.

If the pull rod does not pass the first indicator line, more force is needed.

It is not possible to pull harder on the pull rod, and it is necessary to rotate either the input shaft or the output shaft.



Operating unit



Indication lines on pull rod

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The Scania maintenance programme

Scania maintenance programme for engines with electric propulsion

This Operator's Manual describes operation and provides information in order to plan basic maintenance of Scania electric machines.

A Scania electric machine is optimised for good economy. Regular maintenance is crucial for the service life of the electric machine and in order to avoid unplanned stops.

This section describes the periodic maintenance programme, with renewal intervals for components and systems.

Be aware that several factors can affect the maintenance requirements of the electric machine. This may involve:

- In what type of operation is the electric machine used?
- Are local adaptations of the maintenance programme required?
- Is the electric machine used in an environment that requires extra maintenance in addition to the regular maintenance programme?

The maintenance programme covers a number of points that are divided into the following sections:

- Lubrication system
- Cooling system

WARNING!

It must not be possible to start the electric machine during maintenance work on it. If the electric machine starts unexpectedly, there is a serious risk of injury.

IMPORTANT!

On delivery, a Scania electric machine is optimised for its application. However, regular maintenance is necessary to:

- prevents unplanned stops.
- extend the service life of the electric machine.
- maximise the long-term emission performance of the electric machine.
- give the best possible operating economy.

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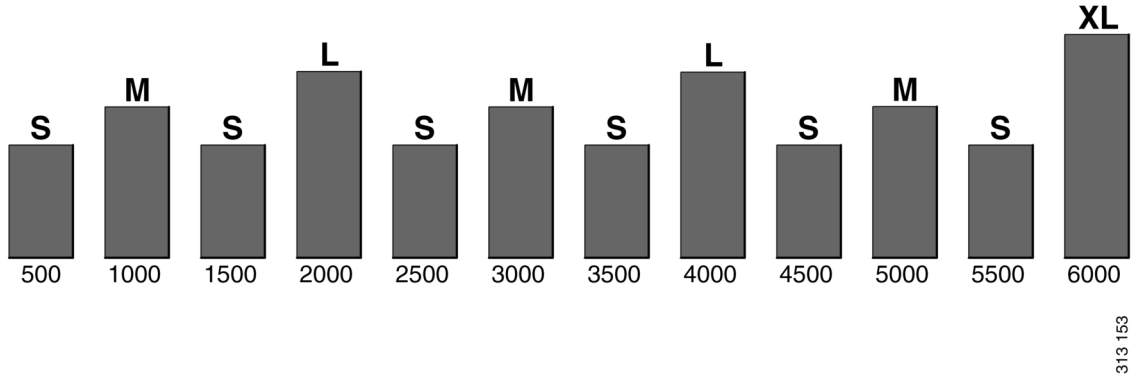
The maintenance programme includes the following:

- Maintenance R: One event when taken into service
- Maintenance S: Minimum basic maintenance
- Maintenance M: More extensive maintenance
- Maintenance L: Includes nearly all maintenance items in the form.
- Maintenance XL: Includes all maintenance items in the form.

During a period, the sequence is S-M-S-L-S-M-S-L-S-M-S-XL.



The illustration shows the order of recommended maintenance events.

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Maintenance intervals

Maintenance intervals for the entire installation

	Intervals (hours)					At least	
Intervals	**500**	**500**	**1,000**	**2000**	**6,000**	**Every year**	**Every 4 years**
Type of interval	**R**[1]	**S**	**M**	**L**	**XL**		
Oil system							
Checking fault codes. Uploading operational data	X	X	X	X	X		
Checking the oil level	X	X	X	X	X	X	X
Changing the oil in the electric machine					X[2]		X
Changing the oil filter in the electric machine					X[2]		X
Cooling system							
Checking the coolant level	X	X	X	X	X		
Checking the coolant's antifreeze and corrosion protection				X	X	X	
Pneumatic system							
Changing oil in electrical air compressor				X[3]		X	
Renewing the oil separation filter				X[3]		X	
Changing air filter in electrical air compressor				X[3]		X	
Other							
Checking for leakage		X	X	X	X		

1. Valid only when commissioning (Running in).
2. Check whether the oil and filter in the electric machine should be renewed. See the table Change intervals for electric machine.
3. Check that the maximum operating time of the compressor has not been exceeded.

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Maintenance intervals for the electrical air compressor

Type	Oil grade[1]	Change interval	Comment
Electrical air compressor EACS 2	Castrol Alphasyn T46	Calendar time 1 year Maximum compressor running time 1,500 h	Change oil and renew the air filter and oil separation filter.
	Chevron Cetus PAO46		
	Chevron Cetus PAO68		

1. Perform maintenance at the interval that is reached first.

Renewal interval for electric machine.

IMPORTANT!

The electric machine is damaged by an incorrect oil grade. Use an approved oil grade according to the specification.

Component designation	Oil grade	Oil change intervals
		Perform maintenance at the interval that is reached first.
MG4115-1 505A01	STO EV	Calendar time 4 years or 20,000 h

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Washing of the electric machine

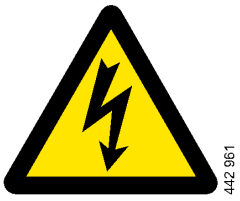
WARNING!

Beware of hot washing water. Wear eye protection, protective clothes and protective gloves.

WARNING!

VCB components marked with a high voltage warning plate must not be high pressure washed.

VCB orange cables must not be high pressure washed.



Warning plate for high voltage

Environment

Dispose of the washing water in compliance with relevant national or local regulations.

Electric machine with few hours of operation

IMPORTANT!

On engines with few hours of operation, maintenance must be carried out annually or every 5 years.

Stand-by generator sets and similar items that are not used regularly should be test run and checked in accordance with the manufacturer's instructions.

The following maintenance items must be carried out once the engine has been warmed up to operating temperature.

1. Checking the oil level
2. Checking the coolant level
3. Checking for leakage on the electric machine

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Lubrication system

Oil grade

This table applies to electric vehicles where the electric machine and gearbox have separate oil systems.

The recommended oil for the electric machine is STO EV.

Oil volume	Oil grade
9.2 litres	STO EV

Checking the oil level

REQUIREMENT!

Leave the electric machine off for at least 7 minutes before you check the oil level.

For information on the correct oil grade, see section Oil grade.

The oil level in the electric machine is displayed on the customer's instrument cluster via an electric oil level sensor fitted at the bottom of the electric machine.

Check the oil level daily before starting the machine.

If the oil level is below the recommended level, fill the electric machine with oil according to the specifications.

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Oil system

WARNING!

Hot oil can cause burns and skin irritation. Use protective gloves and eye protection when renewing hot oil. Make sure that there is no pressure in the lubrication system before changing the oil. The oil filler cover must always be in place when starting and running the engine to prevent oil being ejected.

Note:

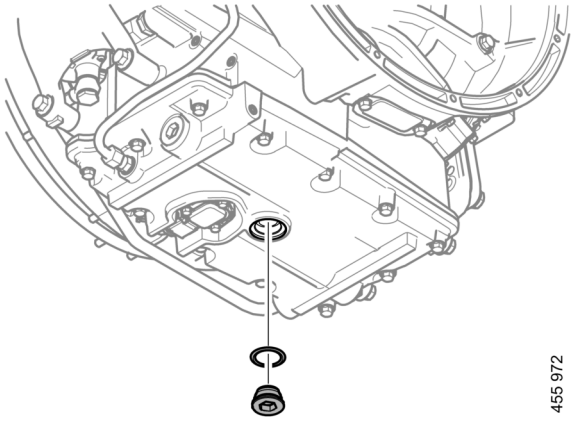
Change the oil more often if the electric machine is operated in particularly demanding conditions, e.g. in a dusty environment.

Environment

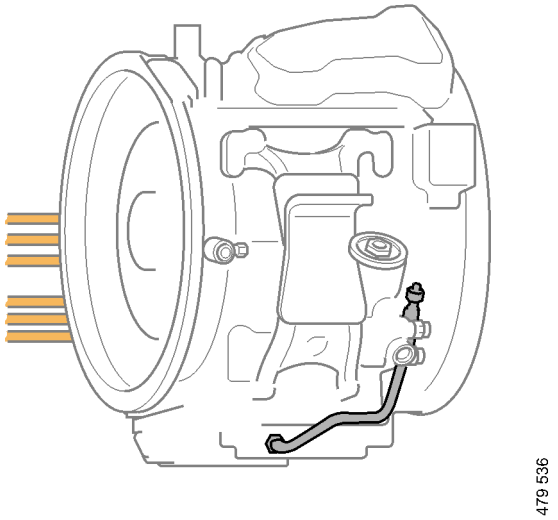
Use a suitable container. Used oil must be disposed of as specified in national and international laws and regulations.

Draining the oil

1. Unscrew the oil plug and drain the oil.
2. It is also possible to connect an external drain pump and extract the oil from the oil sump.



Oil plug with gasket.



Connection for external oil drain pump.

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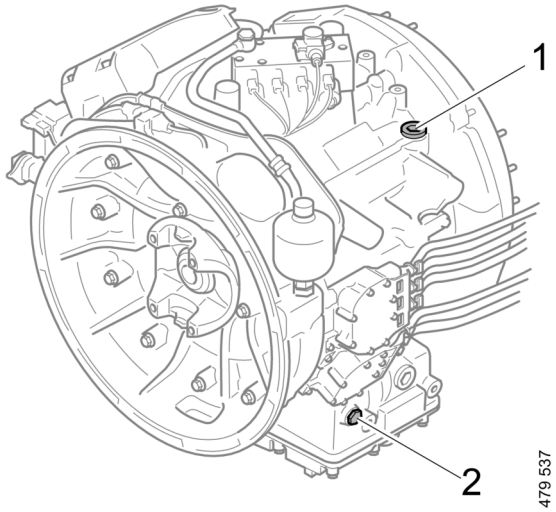
Fill with oil

1. Remove the oil filler plug (1) and the oil plug (2).
2. Fill with new oil in the level hole (2) until the oil reaches the edge.
3. Close the oil plug and the oil filler plug.
4. Run the electric pump for 5 minutes to fill the cooling system. The pump is started via Scania's work tool.
   - If an external oil cooler is filled through the hydraulic unit, additional oil is displaced to the cooler.
   - If the external cooling system holds more than 4 litres of oil, step 4 must be adjusted.
5. Check the oil level. If the level is too low, top up with oil.
6. Reinstall the oil level plug and the oil filler plug.
7. Run the electric machine for at least 5 minutes with the output shaft at 500 r/min or more. This fills the ports in the gearbox's lubrication circuit, including the oil filter.
8. Repeat steps 4–7 until the correct oil level has been reached in the electric machine and the external cooling system.



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Renewing the oil filter

Tool

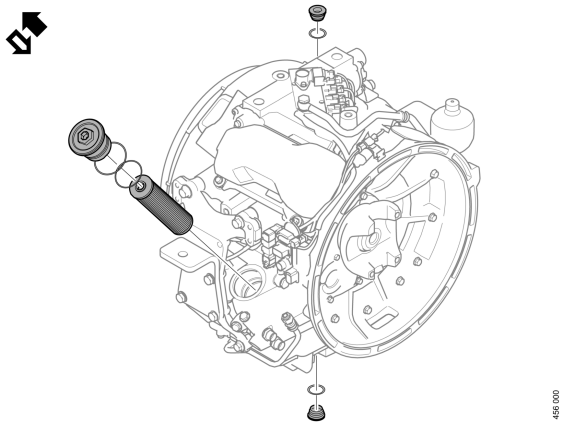
Designation	Illustration
Hexagon socket, 1/2", 36 mm	

1. Unscrew the filter cover using the socket.

IMPORTANT!

Do not use an adjustable spanner or other open tool, as there is a risk of damaging the filter cover.

2. Lift out the filter housing cover with filter element. The filter housing will drain automatically once the filter has been removed.
3. Detach the old filter from the cover by holding the cover and carefully tapping the entire filter element against something hard. Remember that there will be oil splashes.
4. Fit the new filter and tighten the filter cover to 25 Nm (18 lb/ft).



Oil filter location.

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Cooling system

Coolant

The section only applies to batteries and inverters.

The electric machine is oil-cooled; for more information see the section Lubrication system.

Note:

The coolant should be changed when the cooling system is cleaned: every 6,000 hours or at least every five years. See the section The Scania maintenance programme.

The coolant recommended by Scania is a mixture of water with antifreeze (ethylene glycol) and corrosion protection. The coolant has several properties which are important for the function of the cooling system:

- Corrosion protection.
- Antifreeze.
- Increases the boiling point.

The coolant should always contain 35-55 per cent by volume of antifreeze and corrosion protection so that the coolant properties ensure that the coolant works correctly.

Note:

Too high a dose of antifreeze and corrosion protection will increase the amount of sludge and blockages accumulating in the radiator. Too low a concentration can lead to corrosion of the cooling system and ice formation at low temperatures.

Hot climates

In order to retain the corrosion protection and the higher boiling point, it is essential to use coolant consisting of water mixed with antifreeze and corrosion protection (ethylene glycol). This also applies in countries where the temperature never drops below 0°C (32°F).

Antifreeze and corrosion protection

The antifreeze and corrosion protection used in Scania engines should be of the antifreeze (ethylene glycol) and corrosion protection type.

Only the product Scania coolant, or other products tested as antifreeze and corrosion protection for Scania, may be used in Scania engines. Products that do not satisfy the requirements for use in a Scania engine may result in faults in and damage to the cooling system. This may lead to the invalidation of Scania's warranty for faults and damage caused by the use of unsuitable coolant.

Scania Ready Mix coolant is a pre-mixed coolant consisting of water, antifreeze (ethylene glycol) and corrosion protection.

Water

Use only pure fresh water that is free from particles, sludge and other impurities. If there is uncertainty about the quality of the water, Scania recommends use of Scania ready-mixed coolants. See the section Recommended Scania products.

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Recommended Scania products

Scania Ready Mix 50/50

Scania Ready Mix 50/50 is a ready-mixed coolant containing 50% antifreeze (ethylene glycol) and corrosion protection and 50% water. It should be used in cold countries where there is a risk of freezing in the cooling system.

Part no.	Volume litres	Volume US gallons
1 921 955	5	1.3
1 921 956	20	5.3
1 921 957	210	55
1 896 695	1,000	264

Scania concentrate

Scania also produces coolant with antifreeze and corrosion protection in the form of a concentrate.

Part no.	Volume litres	Volume US gallons
1 894 323	5	1.3
1 894 324	20	5.3
1 894 325	210	55
1 894 326	1,000	264

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Topping up

Coolant must only be topped up with pre-mixed coolant. The pre-mixed coolant can either be concentrate mixed with clean freshwater or pre-mixed coolant from the factory. Use only pure fresh water that is free from particles, sludge and other impurities.

IMPORTANT!

Containers used for mixing coolant must be intended for the purpose and free from any dirt or contaminants. When the containers not in use they must be kept closed to avoid collecting dirt and dust.

Note:

Within the coolant change interval, coolant may only be reused if it has been cleaned of dirt, sludge and particles. If the coolant is contaminated with oil or fuel, it must not be reused.

Addition of antifreeze and corrosion protection to water

The coolant should contain 35-55% by volume antifreeze (ethylene glycol) and corrosion protection. The percentage varies depending on the need for antifreeze.

A minimum of 35% by volume of Scania antifreeze and corrosion protection is needed to provide sufficient corrosion protection.

Measure the ethylene glycol content (antifreeze and corrosion protection) with a refractometer following the instructions in the section Checking the coolant's antifreeze and corrosion protection.

Risk of freezing

As the coolant starts to freeze, the water in the coolant starts to crystallise and the percentage of ethylene glycol in the coolant therefore rises. If freezing produces a great increase in the amount of ice, circulation problems could arise. There is no risk of damage by freezing if the content of Scania antifreeze and corrosion protection, or an equivalent mixture of a similar product, is at least 35% by volume.

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Antifreeze and corrosion protection concentration table, litres

Freezing point (°C)	-21	-24	-30	-38	-50	Cooling system volume
Ethylene glycol (vol. %)	35	40	45	50	60	(litres)
Ethylene glycol (litres)	11	12	14	15	18	30
	14	16	18	20	24	40
	18	20	23	25	30	50
	21	24	27	30	36	60
	25	28	32	35	42	70
	28	32	36	40	48	80
	32	36	41	45	54	90
	35	40	45	50	60	100
	39	44	50	55	66	110
	42	48	54	60	72	120
	46	52	59	65	78	130
	49	56	63	70	84	140
	53	60	68	75	90	150
	56	64	72	80	96	160
	60	68	77	85	102	170
	63	72	81	90	108	180
	67	76	86	95	114	190
	70	80	90	100	120	200

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Antifreeze and corrosion protection concentration table, US gallons

Freezing point (°F)	-6	-11	-22	-36	-58	Cooling system volume
Volume of ethylene glycol (%)	**35**	**40**	**45**	**50**	**60**	**(US gallons)**
Volume of ethylene glycol (US gallons)	2.9	3.2	3.7	4	4.8	7.9
	3.7	4.2	4.8	5.3	6.3	10.6
	4.8	5.3	6.1	6.6	7.9	13.2
	5.5	6.3	7.1	7.9	9.5	15.9
	6.6	7.4	8.5	9.2	11.1	18.5
	7.4	8.5	9.5	10.6	12.7	21.1
	8.5	9.5	10.8	11.9	14.3	23.8
	9.2	10.6	11.9	13.2	15.9	26.4
	10.3	11.6	13.2	14.5	17.4	29.1
	11.1	12.7	14.3	15.9	19	31.7
	12.2	13.7	15.6	17.2	20.6	34.3
	12.9	14.8	16.6	18.5	22.2	37
	14	15.9	18	19.8	23.8	39.6
	14.8	16.9	19	21.1	25.4	42.3
	15.9	18	20.3	22.5	26.9	44.9
	16.6	19	21.4	23.8	28.5	47.6
	17.7	20.1	22.7	25.1	30.1	50.2
	18.5	21.1	23.8	26.4	31.7	52.8

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Checking the coolant level

WARNING!

Do not open the coolant filler cover in the expansion tank if the engine is hot. Hot coolant and steam may spray out and cause burns. If the cover has to be opened do it slowly to release the pressure before removing the cover.

Use protective gloves as coolant can cause irritation if it comes in contact with the skin.

IMPORTANT!

It is not permissible to top up large amounts of coolant via the expansion tank. Filling via the expansion tank leads to air locks in the cooling system which can lead to e.g. cavitation damage to the coolant pump shaft seal. If a large amount of coolant needs to be filled, follow the instructions in the section Coolant.

Only pour pre-mixed coolant into the cooling system.

The following instructions apply to Scania expansion tanks. For other types of expansion tanks, follow the manufacturer's instructions.

1. Open the expansion tank cover and check the coolant level.
   - The right coolant level on a cold engine is at the height of the lower edge of the filler neck.
   - The right coolant level on a hot engine is approximately 25 mm (1 in) over the lower edge of the filler neck.
2. Top up with coolant as necessary.

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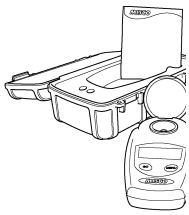
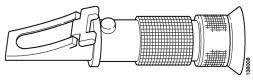
Checking the coolant's anti-freeze and corrosion protection

Tool

Designation	Illustration
Refractometer	
	

WARNING!

Avoid skin contact with coolant as this may cause irritation to the skin. Wear eye protection and gloves when handling coolant.

IMPORTANT!

Use only pure fresh water that is free from particles, sludge and other impurities.

1. Pour a small amount of coolant into a container and check that the coolant is pure and clear.
2. Change the coolant if it is contaminated or cloudy.
3. Measure the antifreeze and corrosion protection content with the refractometer.

The following rules apply to ethylene glycol-based coolant:

- The antifreeze and corrosion protection content must be a minimum of 35 per cent by volume for corrosion protection to be sufficient.
- An antifreeze and corrosion protection content greater than 55 percent by volume impairs the ability to protect against frost.
- If ice forms in the coolant, there are disruptions initially, but there is no immediate risk of damage. The engine should not be subjected to heavy loads when ice starts to form.

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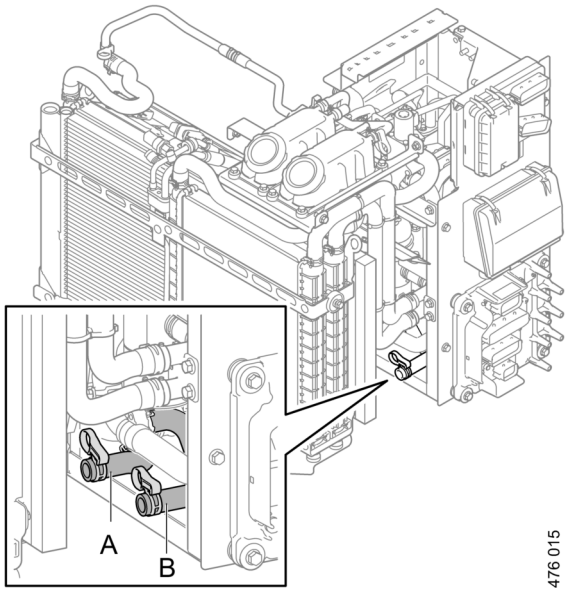
Filling coolant

IMPORTANT!

It is not permissible to fill large amounts of coolant via the expansion tank. Filling via the expansion tank leads to air pockets in the cooling system, which can damage the coolant pump shaft seal, among other things.

The filler pipes are used to fill the power electronic circuit and propulsion battery circuit.



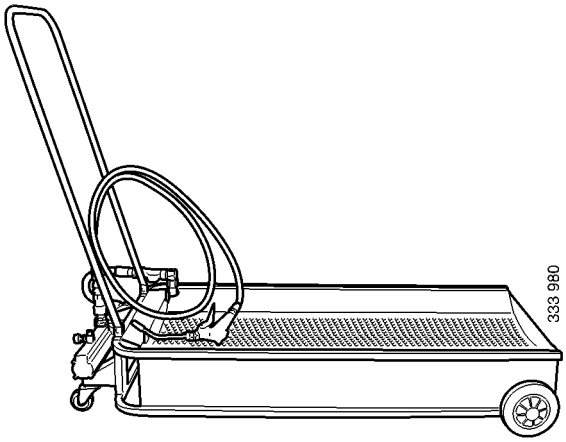
Location of coolant intake.

A. Intake to the power electronics cooling circuit

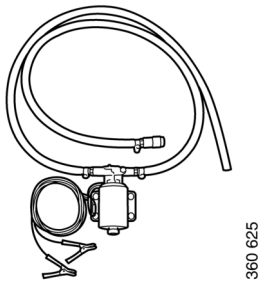
B. Intake to the propulsion battery cooling circuit.

Refilling the cooling system:

1. Use *588 540 Trolley* for coolant, *2 443 679 Pump* for coolant or other suitable equipment for coolant filling
2. Start the engine when the cooling system has been filled. Allow the engine to run for a while.
3. Then check the coolant level and top up with coolant via the expansion tank as necessary.



Coolant trolley 588 540



Coolant pump 2 443 679.

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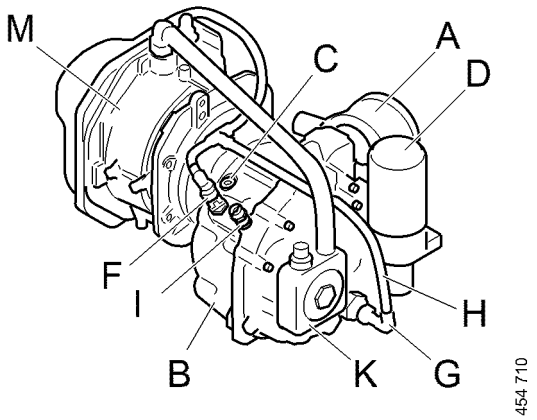
Pneumatic system

General

The electrical air compressor (EACS) system supplies the brake system, gearbox and suspension with compressed air.

The compressor is electrically powered and operates independently of the combustion engine. The system consists of an electric motor coupled to a silent screw compressor. The compressor has an internal oil circuit for lubrication and cooling as well as a separate cooling circuit.

EACS is controlled via CAN communication by the APS system. The power requirement is coordinated between the COO, TMS and the battery control unit (BMU). If the propulsion battery is disconnected or has no available power, no compressed air is produced.



A. Air filter.

B. Drain plug.

C. Drain plug (vacuum).

D. Oil separator.

F. Temperature sensor.

G. Oil level sensor.

H. Cable harness.

I. Safety valve.

K. Oil cooler.

M. Electric motor.

Change oil, oil separator and air filter

WARNING!

Cut off the power to avoid the risk of personal injury.

Preparatory operations

1. Depressurise the vehicle.
2. Cut off the power using the battery master switch due to the risk of a short circuit.

   See the section Securing VCB electrical work.

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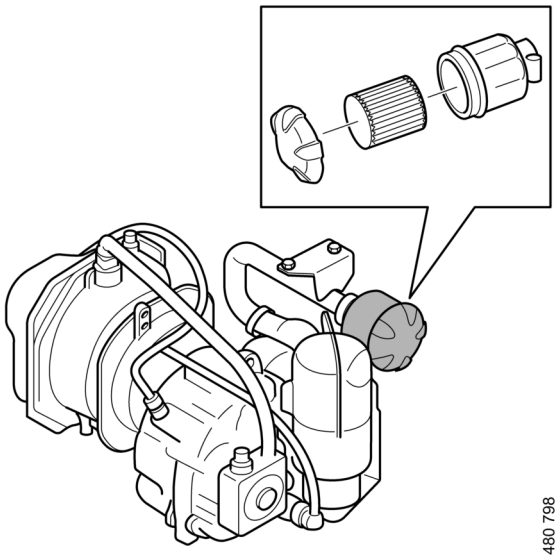
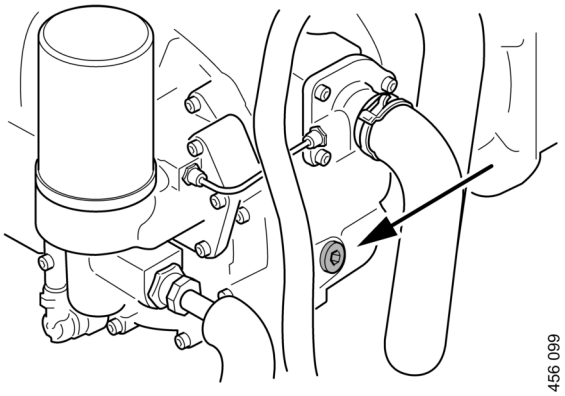
Renewing air filter

1. Remove the cover from the air filter reservoir.
2. Clean the reservoir and renew the filter element.
3. Refit the cover for the air filter reservoir.

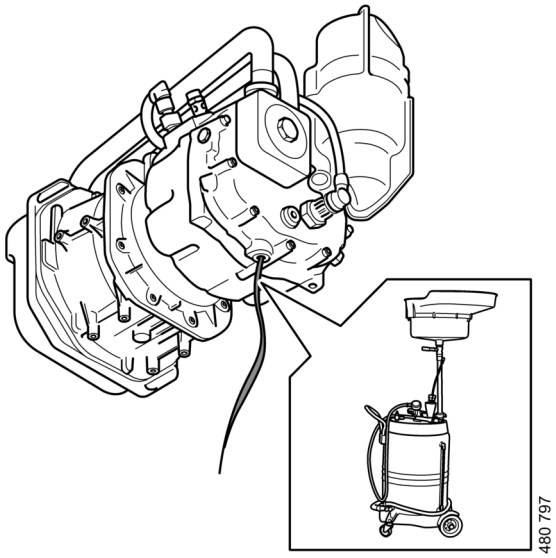


Renewing oil and oil separator

1. Remove the level plug to remove the overpressure in the compressor.



2. Remove the oil plug.
3. Drain the oil. Scania recommends *588 546 Trolley* for waste oil.



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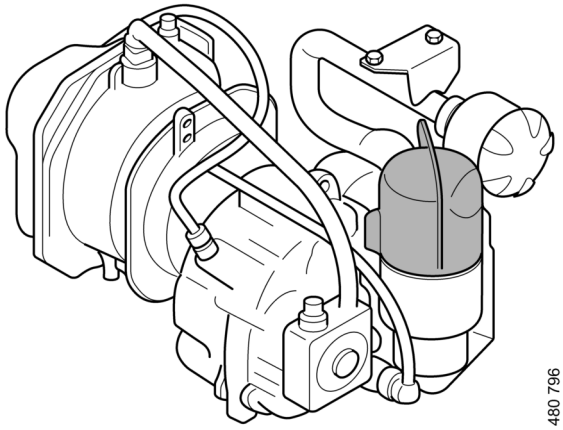
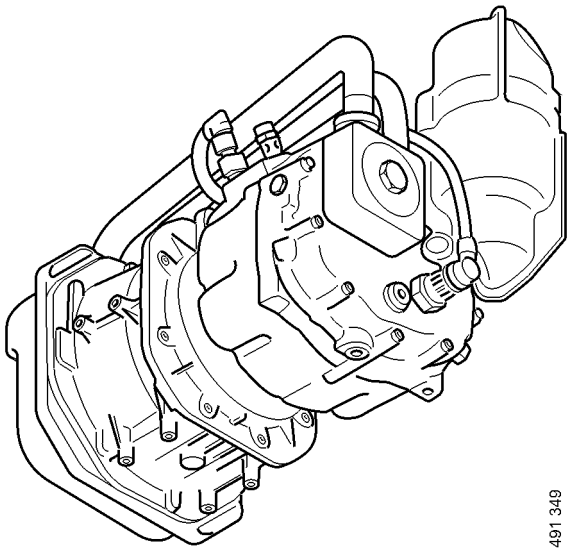
4. Remove the oil separator.
5. Lubricate the sealing surface of the new oil separator using a thin film of compressor oil.
6. Fit the new oil separator according to the instructions on the oil separator.



Finishing operations

1. Fit the oil plug with a new sealing washer.
   Tighten the oil plug to 40 Nm.
2. Fill with oil via the top plug until the oil reaches the bottom of the level plug thread. Refit the plugs with new sealing washers.
3. Connect the electric power supply.



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Battery Safety

Safety in case of battery damage

WARNING!

Never carry out any work on the battery or its installation if the vehicle ignition is on.

WARNING!

Make sure that hazardous gas is vented away and does not reach the driver area or passenger area.

WARNING!

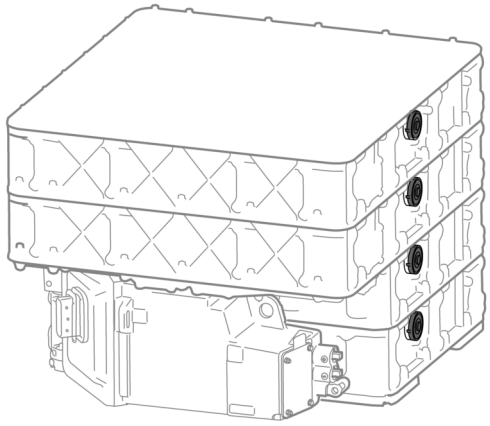
Pressure relief valves must not be covered or blocked.

In case of an event where the battery is seriously damaged, it can cause a fire. The expected sequence of events for major battery damage is:

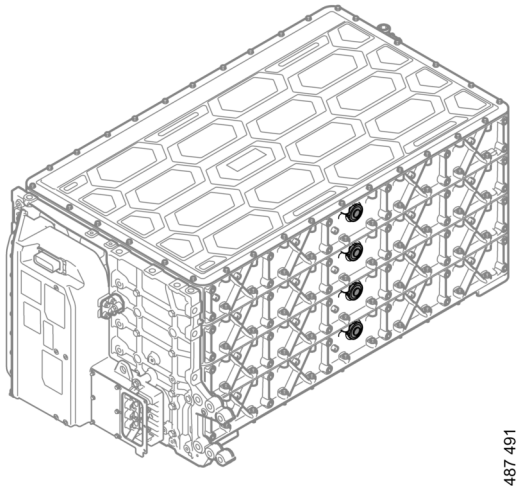
- Smoke discharged through gas evacuation valves, provided that the battery casing remains intact.
- Flames can then burst out from the battery pack in several directions.

The time from the first warning to the start of flames varies, but according to R100 legal requirements, there must be at least 5 minutes from warning to danger.

In the event of fire, both flames and hazardous gases can escape from the battery via the gas evacuation valves.



Gas evacuation valves B8 408.



Gas evacuation valves B8 413.

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Gas evacuation

If the pressure becomes too high, gas can also escape through other openings, such as between the casing and the cover.

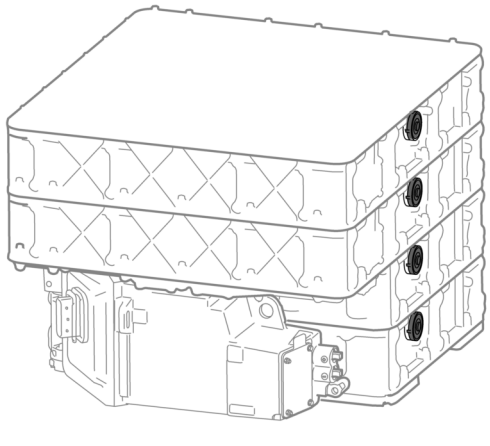
The valves must therefore not be covered or blocked. The design of the battery conducts gases safely out of the system.

To reduce the risk of inhalation of toxic gases and ignition, the following applies:

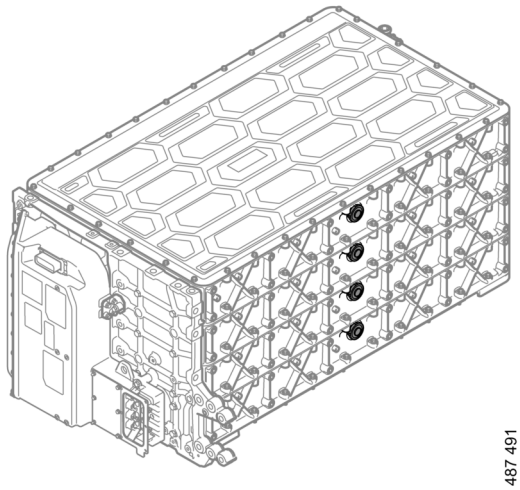
- Vented gases must not be able to enter the driver's cab or passenger areas.
- Vented gases must not accumulate in enclosed spaces.
- The flow of vented gases must be directed away from emergency exits.

Never work with an energy storage system without being fully familiar with the safety procedures in force.

Always use instructions and checklists where available.



Gas evacuation valves B8 408.



Gas evacuation valves B8 413.

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Handling, transport and storage

General

Lithium-ion batteries are classified as hazardous goods, requiring handling by trained and qualified personnel who fully understand the risks and comply with training requirements.

Minimum training requirements

Basic knowledge of the safe handling of propulsion batteries for vehicles, along with fundamental electrical training and an understanding of associated risks.

Scania recommends the following courses on' **Scania Learning Portal**:

- Safety and handling of propulsion batteries for HEV, PHEV and BEV
- Electrical training Level 1 – Electricity, risks and safety

Safety advisor

Organisations involved in the loading, unloading, and transport of hazardous goods must have a certified safety advisor in compliance with ADR/RID 1.8.3.

Transport personnel

All personnel involved in transport, including loading and unloading, must complete training in the relevant transport regulations.

Training should be conducted by a certified organisation and must cover the transport of lithium-ion batteries as follows:

- ADR 1.3 (Transport by road)
- IMDG Code 1.3 (Maritime transport)
- IATA-DGR 1.5 (Air transport)

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Battery status classification

Scania batteries B8 408 and B8 413 are classified into different status categories that determine how they should be handled and transported.

Scania category	Information	Transport category	Handling and transport guidelines	Use in public vehicles
New	A newly produced unit that has not been used or installed in a vehicle.	New or used	See battery-specific handling guidelines	Yes
Used	Used batteries without any problems detected	New or used	See battery-specific handling guidelines	Yes
NOK (Not Ok) Quality	Unit with some form of quality problem without obvious damage	New or used	See battery-specific handling guidelines	No
Unknown	A unit with unknown values.	Defective	See battery-specific handling guidelines	No
Suspect	Unit with deviating measurement values	Defective	See battery-specific handling guidelines	No
Dangerous	Unit with deviating reaction or compromised electric safety barriers. Temperature increase or gas or electrolyte leakage. Major mechanical damage or damage to critical parts. Measured insulation fault	Seriously damaged	See battery-specific handling guidelines	No
Undergoing reaction	Unit exhibiting a clear internal reaction, such as visible flames, cell venting or a rapid increase in internal or surface temperature	Transport prohibited	See battery-specific handling guidelines	No

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Handling guidelines

Handling battery packs and modules requires strict safety measures to prevent injury and ensure safe operation.

All operations must be carried out according to a risk assessment, and personnel must follow established safety procedures.

Damaged or burning batteries must only be handled by emergency services or other specially trained personnel.

Personal protective equipment (PPE)

Handling of closed battery packs (category: New & Used) does not require any additional protective equipment beyond standard work attire. When working with open or unsafe batteries (categories: Unknown, Suspect, Dangerous, After Damage), appropriate personal protective equipment (PPE) must be used based on the risk assessment.

IMPORTANT!

Protective equipment can include:

- Insulated gloves and tools
- Face protection or eye protection
- Flame-retarded work attire
- Respiratory protective equipment in the event of exposure to hazardous leakages

Chemical risks

If a battery cell is leaking or spraying out electrolyte fluid, personnel handling the affected battery module or pack must immediately take safety precautions to prevent exposure to toxic and corrosive substances.

WARNING!

Electrolyte leakage can result in chemical burns on the skin and irritation of the respiratory tract if inhaled.

- Spilled electrolyte must be neutralised and cleaned with the help of suitable chemical absorbents.
- The working area should be ventilated to disperse any hazardous gases.
- Personnel must wear chemical-resistant gloves and protective clothing before beginning decontamination.

General handling instructions for battery pack

Many battery components and interfaces are exposed to external factors and must be handled with care.

Following these guidelines minimises the risk of accidents and damage. Always make sure to follow Scania's safety precautions.

Important handling precautions:

IMPORTANT!

Do not apply external force to the rigid cooling pipes or connections on the battery pack.

- Cover exposed electrical connections (VCA and VCB) with the intended plastic covers when the battery pack is not connected or installed in a vehicle.
- Never expose a standalone battery pack to water or other liquids. The battery's IP rating is valid only when all connections are securely sealed.
- The cooling system connections are very sensitive to dirt, dust and mechanical damage.
  - If cooling pipes are installed,the interface must be protected.
  - If cooling pipes are not installed, ensure that the cooling plate interface remains clean and protected from dust and debris.
- Batteries must not be subjected to impact, punctures, breaks or pin damage. If this occurs, an immediate risk assessment must be carried out to determine its classification.
- Exercise caution when handling Battery Junction Box (BJB), as it is particularly vulnerable and sensitive to improper handling.

Lifting

Always lift battery packs and modules with approved lifting accessories to avoid damage.

- Only certified lifting accessories may be used.
- Always lift batteries by the intended mechanical connection points.

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- Use a four-point lifting device and approved equipment.
- Avoid off-center loads or sudden force when lifting.
- Fork lift trucks may only be used if the battery is packed or placed on a pallet.

For further information, see section Securing VCB electrical work.

Storage guidelines

Proper procedures are essential to maintain safety and performance during storage. Incorrect storage can affect the service life, capacity and safety of the battery.

Self-discharge and ageing

Batteries lose charge over time, which can cause deep discharge and render them unusable.

IMPORTANT!

Batteries with a cell voltage below 1.5V should be discarded.

- New batteries should be charged to 50% state of charge during manufacture and can be stored for up to 6 years before requiring a maintenance charge.
- After 6 years: Check the state of charge (SOC) and maintenance charge if the level is below 20%.
- Avoid storing fully charged batteries – this accelerates the ageing process.
- If any cell voltage is below 3.2V (0% state of charge), a specific charging procedure must be followed. Contact the nearest Scania workshop.

Storage conditions (general requirements)

As each storage environment is different, a risk assessment must be completed before storage. The basic requirements for safe and efficient storage are listed below.

- Do not store large amounts of batteries unnecessarily. Adjust the storage volume as needed.
- Batteries must be stored in upright position.
- Keep all electrical connections (VCA/VCB) covered with the designated protective covers.
- Protect the cooling system connections from dirt and moisture.
- Do not place batteries directly on the floor – use an EU pallet or similar.
- Avoid humid environments and keep batteries protected from rain and snow.
- Temperature limits:
  - Operating temperature, 30°C till 60°C. Long-term storage: -5°C to 20°C (recommended). Temperatures above 20°C accelerate battery ageing.
- The storage space must be marked and comply with fire safety requirements pursuant to GR23.
- Well-ventilated areas are recommended to reduce gas formation.

Specific storage guidelines

WARNING!

Batteries in the category *Undergoing reaction* must not be stored and must be handled immediately.

New, Used and NOK quality:

- Store according to general requirements.
- Ensure that the storage area is clean and dry.

Prototype, Unknown, Suspect, Dangerous, Undergoing reaction, After damage:

- Must be stored in a separate, fireproof space.
- Ventilation is mandatory in order to minimise gas formation.

Transport and logistics

Transport requirements

Batteries are classified as hazardous goods and must be transported according to:

- ADR 1.3 (Transport by road)
- IMDG Code 1.3 (Maritime transport)
- IATA-DGR 1.5 (Air transport)

Basic requirements:

- Battery classification must be completed before transport.
- Maximum SOC 30%, unless otherwise specified in transport regulations.

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- Visual inspection of the battery's condition prior to transport
- Packaging in accordance with UN regulations, including marking and labelling

Packaging and marking

A battery package must be transported in approved packaging with:

- Hazardous goods labels (UN3480, UN3481 for lithium-ion batteries)
- Warning signs indicating high voltage and flammability
- Transport documentation containing information on battery classification and accident handling procedures

Note:

Loads must be properly secured to prevent movement during transport and to protect them from physical damage.

Reception and unloading

Upon arrival at the destination, receiving personnel must:

- Check the battery’s condition for possible damage.
- Ensure that all transport documents are correct and adhere to regulations.
- Carry out safe detachment with trained personnel.
- Store batteries in accordance with guidelines.

Following these guidelines ensures safe and efficient transport while minimising the risk of damage and security incidents.

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Recycling and disposal

Repair and re-use

Batteries can often be reconditioned or utilised in other applications:

- Reconditioning and repair – Renewing defective modules to extend the service life of the battery
- Second-life use (Second Life)– Batteries with sufficient capacity can be re-used in stationary energy storage systems.

Only approved workshops and certified operators may carry out repairs and re-use.

Recycling and disposal

Batteries that cannot be reused must be recycled by authorised installations.

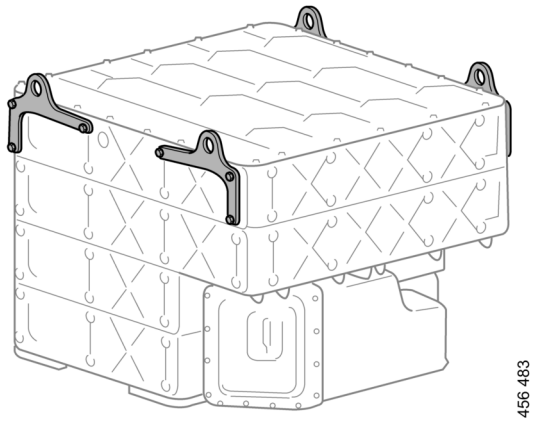
- Lithium-ion batteries must never be discarded with household waste.
- Recovery must be carried out through authorised facilities.
- Transport to recycling facilities must adhere to applicable hazardous waste regulations.
- When exporting end-of-life batteries to non-EU countries, compliance with the Basel Convention is mandatory.

Proper recovery ensures sustainable battery management and minimises environmental impact.

Lifting the battery pack

When lifting battery packs, use the correct lifting eyes as recommended by Scania.

Use *98 094 Lifting accessory* when lifting the battery pack.



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Technical data

Electric machine

Output (continuous)	
501 A, 501 M	150 kW
502 A	180 kW
503 A, 503 M	200 kW
505 A, 505 M	230 kW
The system's nominal voltage	650 V DC
System voltage signal	24 V
Rotational speed range	0–2900 rpm
Power density	0.8 kW/kg
Cooling	Oil-cooled
Oil type	Scania STO EV
Oil volume	9.2 litres
Oil filter	Scania cartridge filter
Coolant temperature	Up to 60°C
Operating temperature	25 °C to 80 °C
Operation at high altitude	Max. 3,000 m
Oil pump flow	20 l/min at 1 bar
Regulator	Scania-developed control system
Interface to combustion engine and powertrain	SAE 1 flange
Clutch	Integrated jaw coupling to combustion engine
Weight	230 kg
Communication	CAN, checked by Scania
IP classification	IP44
Approval according to UN ECE R10	

Inverter

The system's nominal voltage	650 V DC
Output	2 x 150 kW
Cooling	Scania coolant, see the chapter on coolant
Weight	33 kg
Communication	CAN, checked by Scania
IP classification	IP6K9K
Up to 97% efficiency with silicon carbide technology (SiC)	

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Propulsion battery

Cell chemistry	Lithium ion NMC/graphite
Configuration	
B8 408	10 modules x 18 s (180 cells), 4 bearings
B8 413	20 modules x 18 s (180 cells), 4 bearings
Cell styles	Prismatic PPE
Cooling	Liquid cooling
Maximum coolant volume	
B8 408	10 litres
B8 413	20 litres
Maximum coolant flow	
B8 408	30 l/min (nominal flow 20 l/min)
B8 413	60 l/min (nominal flow 40 l/min)
Heat dissipation	
B8 408	3 kW
B8 413	6 kW
Weight excluding coolant	
B8 408	approx. 620 kg
B8 413	Approximately 1,150 kg
Calendar life	12 years (at 25 °C)
Communication	CAN, controlled by Scania
IP classification	IP69K, IP67
Approvals	UN ECE R10 and R100
Compliance	Battery Regulation (EU) 2023/1542 & CE marking guidelines PV8450: 2021-11
Installed energy	
B8 408	NV: 104.8 kWh, CATL: 88 kWh
B8 413	NV: 209 kWh, CATL: 176 kWh
Installed capacity	
B8 408	NV: 157 Ah, CATL: 132 Ah
B8 413	NV: 314 Ah, CATL: 264 Ah
The system's nominal voltage	NV: 650 V, CATL 673 V
Battery voltage	Max. 756 V, nominal 661 V, min 504 V
C rate (discharging/charging)	Up to 1.6/up to 1.3
Usable energy	Up to 75%
Total energy flow	
B8 408	500 MWh to 80% battery state of health
B8 413	1,000 MWh to 80% battery state of health

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Discharge current, continuous/maximum	
B8 408	180 A/250 A*
B8 413	360 A/500 A*
Charge current, continuous/maximum	
B8 408	180 A/210 A*
B8 413	360 A/420 A*
Maximum discharging power, continuous/maximum	
B8 408	152 kW/164 kW*
B8 413	304 kW/328 kW*
Maximum charging power, continuous/maximum	
B8 408	128 kW/137 kW*
B8 413	256 kW/274 kW*

* The discharge and charging values apply at the beginning of the battery service life, 25 °C and 50% state of charge The maximum values apply for 20 minutes

Electrical air compressor

Rated voltage	650 V DC
Rated current	7.6 A
IP classification	IP6K9K

Electrical A/C compressor

Rated voltage	650 V DC
Rated current	20 A
IP classification	IP6K9K

Direct current converter

Rated voltage	650 V DC
Rated current	7.5 A
IP classification	IP6K9K

VCB Main distribution unit

Rated voltage	650 V DC
Rated current	500 A
IP classification	IP6K9K
Standards	IEC 61439-1

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VCB Extra distribution unit

Rated voltage	650 V DC
Rated current	500 A
IP classification	IP6K9K
Standards	IEC 61439-1

Charging interface

Rated voltage	650 V DC
Rated current	500 A
IP classification	IP6K9K

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Scania Assistance

Wherever you are, you can always get assistance from Scania's service organisation, Scania Assistance, 24 hours a day, every day of the year.

Always call the contact for your country.

Country	Tel.	Country	Tel.
Austria	+43 1 256 44 11	Latvia	+371 29 44 24 24
America	+1 (0) 800 272 2642	Lithuania	+46 8 52 24 24 24
America	1 800 272 2642	Luxembourg	+32 2 264 00 00
Argentina	800 999 722 642	Malaysia	1800 08 8500
Australia	+611 300 722 642	Malaysia	+6 035 590 907
Belgium	+32 2 264 00 00	Mexico	+543 327 451 092
Botswana	+267 72 102 591	Morocco	+3 222 640 000
Brazil	+8 000 194 224	Namibia	+264 634 461 352
Bulgaria	+359 88 666 0001	Netherlands	+31 76 52 54 111
Chile	188,800,722,642	Norway	+47 223 217 00
Colombia	+1 800 184 548	Peru	0800-51-727
Czech Republic	+420,225,020,225	Peru	(01) 512-1877
Denmark	+45 333 270 44	Poland	+48 22 331 22 33
Estonia	Tallinn: +372 5153 388	Portugal	+34 91 678 9247
Estonia	Tartu: +372 5126 333	Romania	+40 723 27 27 26
Estonia	Pämu: +372 5071 477	Russia	+7(495) 925 77 75
Estonia	Rakvere: +372 5074 655	Singapore	+6 565 917 180
Finland	+358 10 555 24	Slovakia	+421,903,722,048
France	+33 2 414 132 32	South Africa	0 800 005 798
Germany	+49 261 887 8888	South Africa	+27 11 226 5005
Great Britain	0 800 800 660	Spain	+34 91 678 80 58
Great Britain	+441 274 301 260	Sweden	+46 42 10 01 00
Hungary	+36,209,727,197	Switzerland	+41 800 55 24 00
Ireland	+353 71 963 4000	Thailand	+66 819 397 525
Italy	+39046 1996222	Thailand	+1800 019 88
Latvia	+46 8 52 24 24 24	Uruguay	0 800 835 1

Other countries: +46 8 52 24 24 24

Note:

Calls will be recorded for training purposes.

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Tightening torques for screw joints

Screws and nuts

Hexagon screws, hexagon socket screws, Torx screws, hexagon nuts

Metric thread strength class 8.8/8

Thread	Tightening torque	
	Nm	Lb-ft
M4	2.9	21
M5	6	4
M6	9.5	7
M8	24	18
M10	47	35
M12	84	62
M14	135	100
M16	210	155
M18	290	214
M20	420	310
M22	580	428
M24	730	538

Flange screws with hexagonal head and hexagonal flange nuts

Metric thread strength class 8.8/8

Thread	Tightening torque	
	Nm	Lb-ft
M5	6.7	5
M6	10.2	8
M8	26	19
M10	50	37
M12	92	38
M14	149	110
M16	184	136

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