SCANIA

00:01-08

Issue 5 **en-GB**

Product information for the emergency services

Truck

L, P, G, R and S series

374 770

Before starting to read

Note:

Check that this is the latest issue of Scania’s product information for the rescue services.

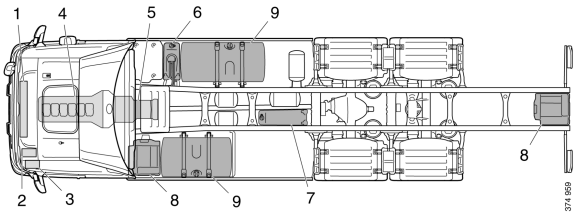
Note:

The information in Scania's product information for emergency services applies to vehicles in the L, P, G, R and S series that have been ordered in the ordinary order system.

Fluids in the vehicle

WARNING!

Fuel in the fuel tank, fuel pipes and fuel hoses may be at a temperature of 70 Celsius.



The following fluids and volumes can be found in the vehicle:

1. Coolant: 80 litres
2. Washer fluid: 16 litres
3. Power steering gear
4. Engine oil: 47 litres
5. Transmission oil: 80 litres
6. Reductant[1]: 38-96 litres.
7. Reductant[1]: 62-115 litres
8. Battery acid
9. Fuel: The capacity is shown on the vehicle's fuel tanks.

1. Reductant is a solution of urea and water that is added to the exhaust gases upstream of the catalytic converter in SCR engines. The aim is to reduce the emissions of nitrogen oxides.

Electrical system

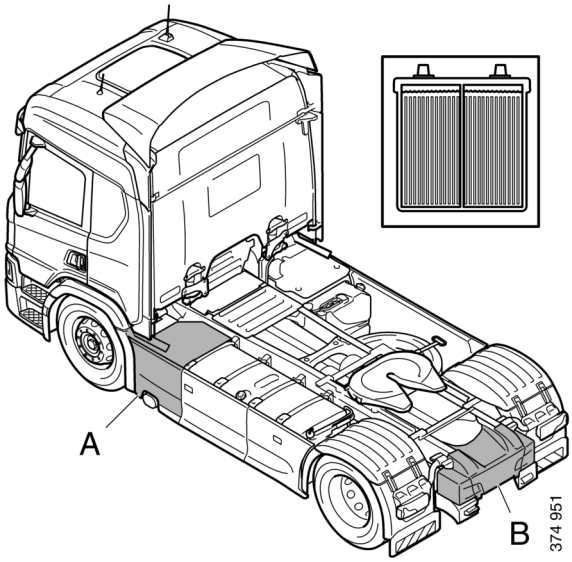
Battery

The location of the battery box varies depending on the vehicle equipment. The illustrations show common placements (A and B). If the vehicle does not have a battery master switch then the battery must be disconnected to switch off the voltage.

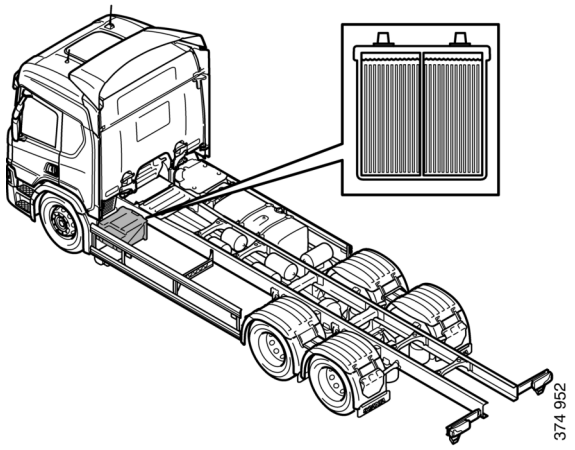
IMPORTANT!

Battery box (A) can hold batteries for 2 separate circuits.

Tractor



Truck



Battery master switch

The vehicle may be fitted with a battery master switch. In most vehicles only the tachograph and the vehicle alarm are supplied with voltage when the battery master switch is activated.

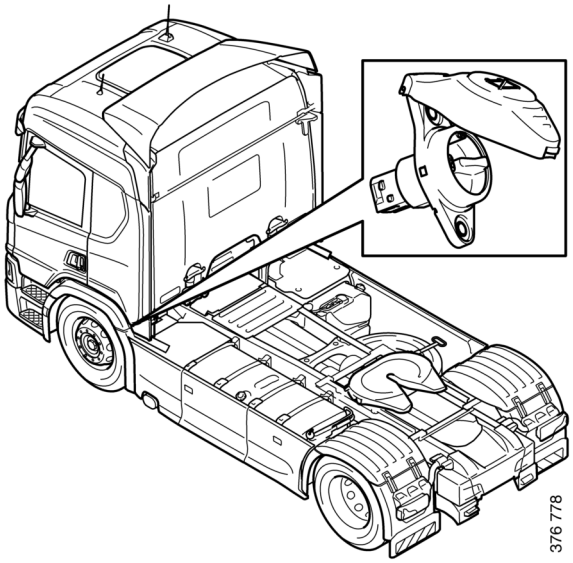
Depending on how the vehicle bodywork is connected, the bodywork may be supplied with voltage even when the battery master switch is activated.

Vehicles with a battery at the rear are fitted with a jump socket that is live even when the battery master switch is not activated.

Depending on the vehicle equipment, the battery master switch can be activated in different ways. The battery master switch can be activated with the battery master switch handle, an external switch or a switch in the instrument panel.

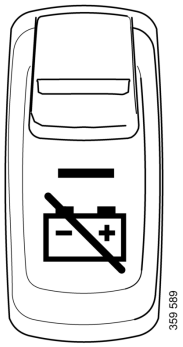
External switch for battery master switch

The vehicle may be fitted with an external switch for the battery master switch; this is normally red. The outer switch for the battery master switch is positioned behind the vehicle cab on the left-hand side.



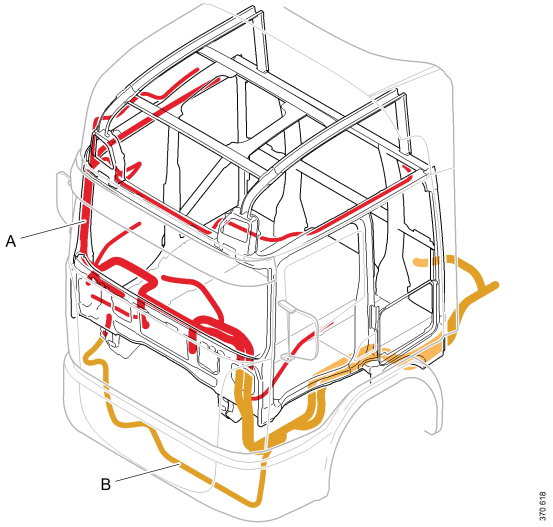
Switch for battery master switch in the instrument panel

The switch for the battery master switch is located in the instrument panel.



Cable harness

The illustration shows the routing of the largest cable harnesses in the cab.



A - Cable harness inside the cab
B - Cable harness on the outside of the cab

Getting into the vehicle

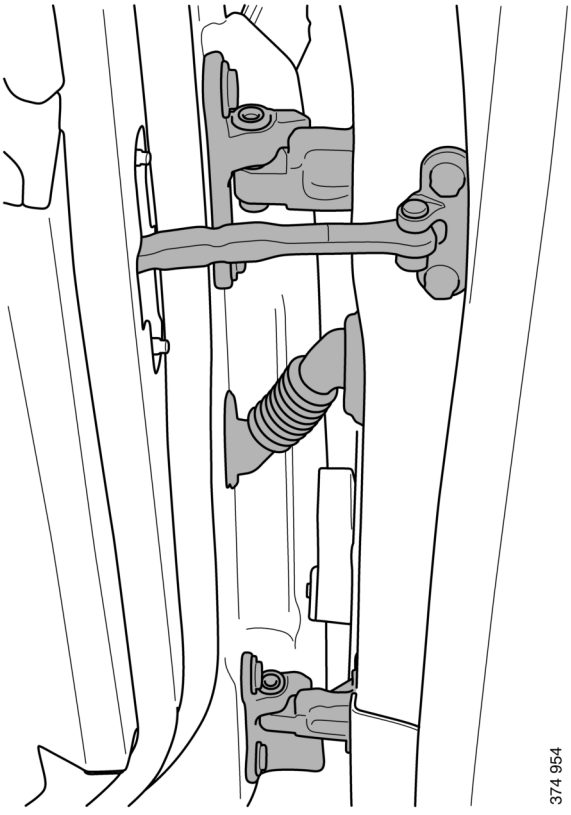
Door

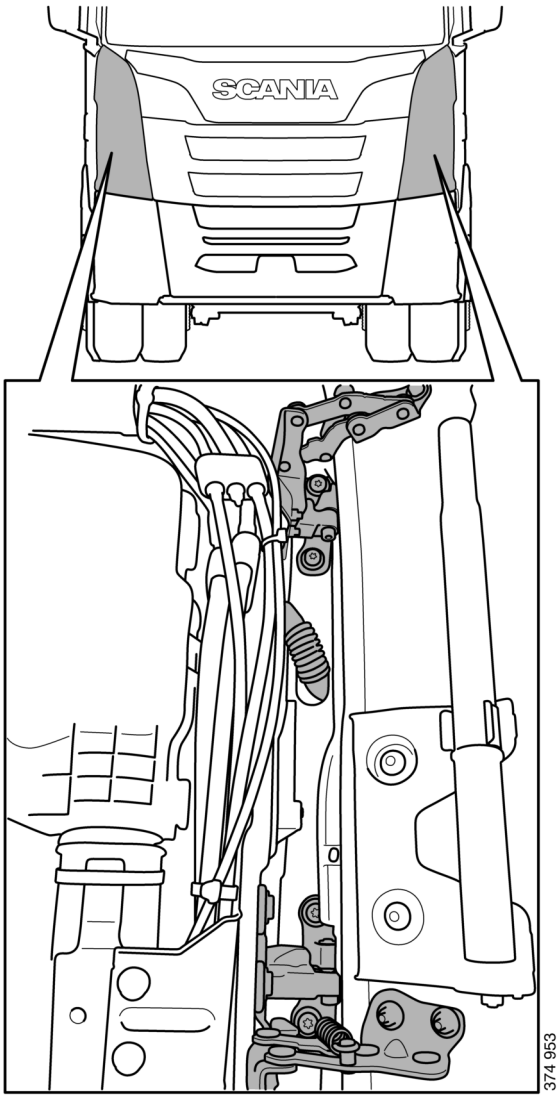
The door can be removed from the cab by cutting off the hinge.

WARNING!

The door can weigh up to 60 kg.

1. Open the cab corner to access the hinge.
2. Cut or saw off hinges, door stop and cable harness.

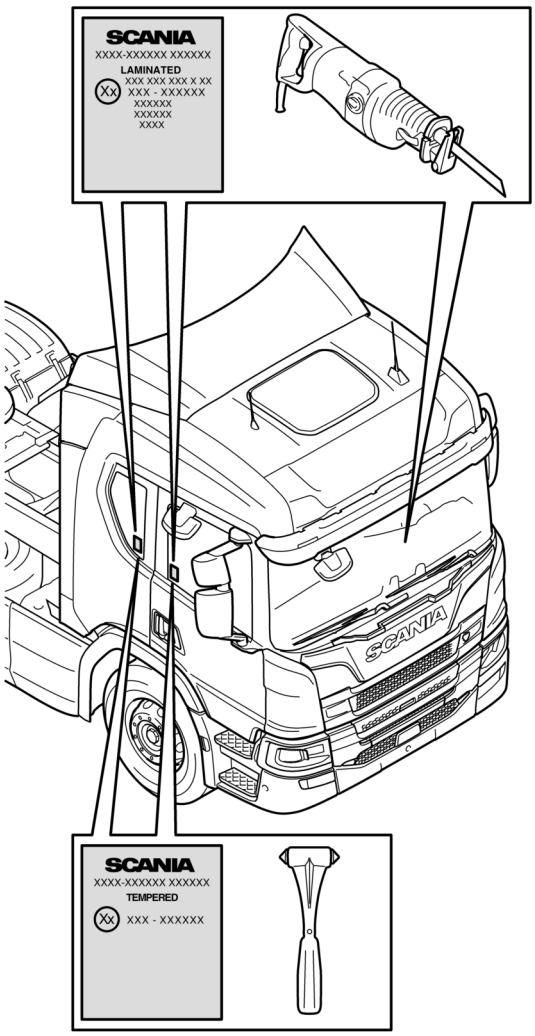




Windscreen and door window

The windscreen is laminated and glued to the cab structure. Use a tiger saw, for example, to saw through the windscreen.

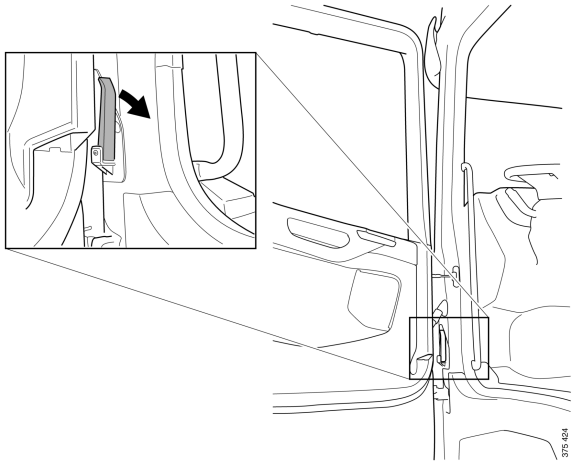
The door window may consist of single or laminated glass. Use an emergency hammer or tiger saw, for example, to smash the door window.



Opening the vehicle front grille panel

Lockable front grille panel

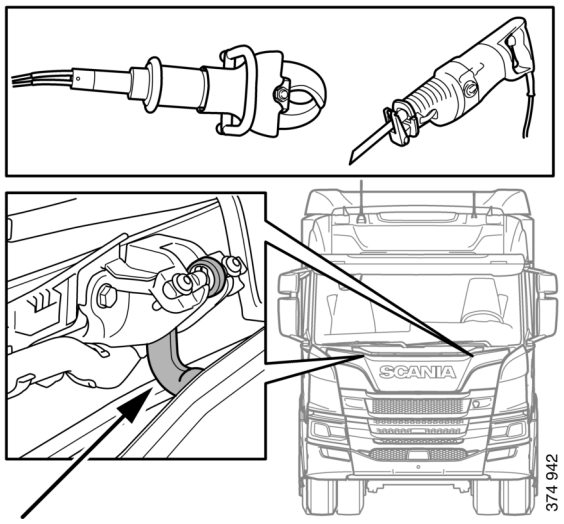
The lockable front grille panel can be opened with a handle in the door pillar. Grasp the handle at the arrow and pull back forcibly. If the front grille panel is stuck, ask someone else to pull up forcibly on the lower edge of the front grille panel at the same time.



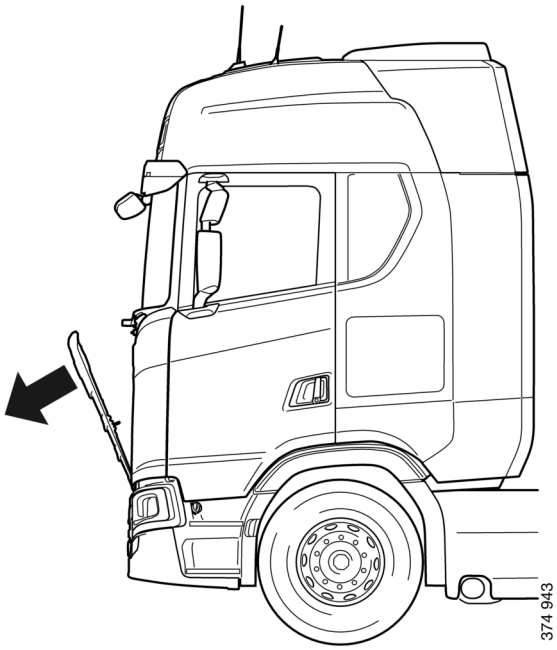
If the front grille panel of the vehicle cannot be opened

The front grille panel of the vehicle is attached by a hinge in the upper part.

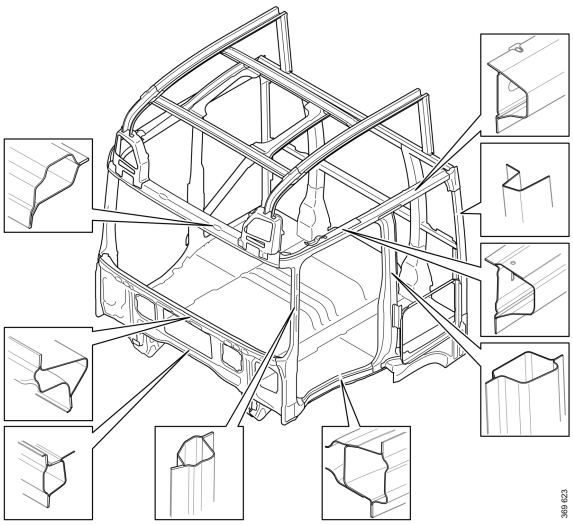
1. Cut or saw off the hinges on the grille panel's left and right side.



2. Fold down the front grille panel.



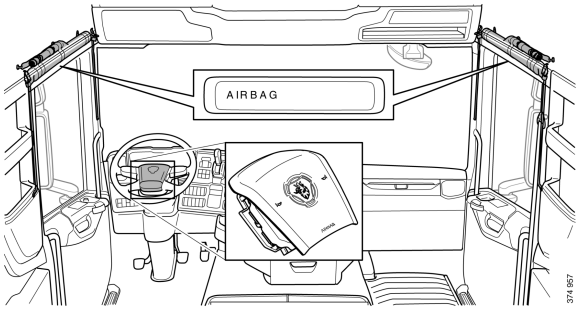
Cab structure



The illustration shows which profiles the cab structure is made up of. All beams in the cab structure can be cut with a cutting tool.

Vehicle safety equipment

Airbag

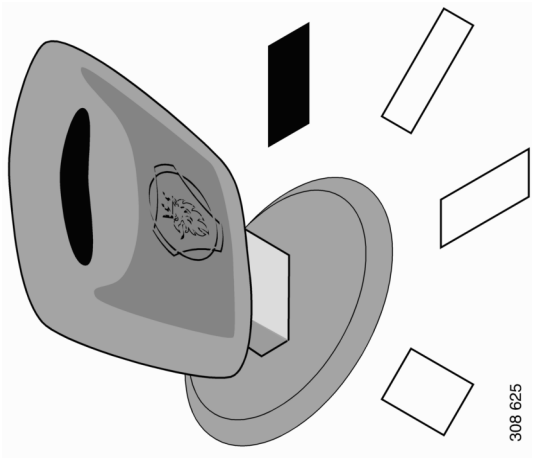


WARNING!

The airbag contains explosive substances.

If the vehicle is fitted with an airbag on the driver's side this is indicated by the text *AIRBAG* on the steering wheel. The passenger side is never fitted with an airbag.

When the vehicle starter key is in the lock position, or there is no vehicle power, then the airbag is deactivated.



The starter key is in the lock position.

Belt pretensioner

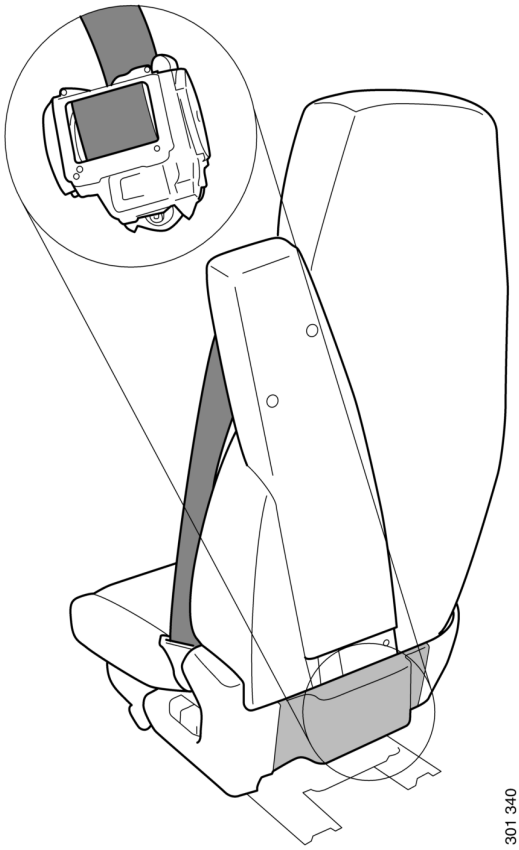
WARNING!

The belt pretensioner contains explosive substances.

The belt pretensioner is positioned on the driver's seat and on the passenger seat. If the vehicle is fitted with an airbag there is always a belt pretensioner on the driver's seat.

When the vehicle starter key is in the lock position, or there is no vehicle power, then the belt pretensioner is deactivated.

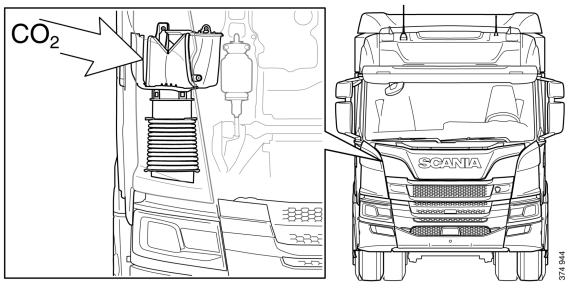
The belt pretensioner is positioned as illustrated on the 2-seat models that are fitted with a belt pretensioner.



Engine air intake

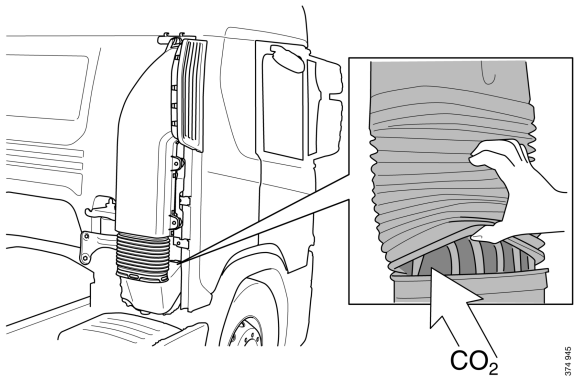
Front air intake

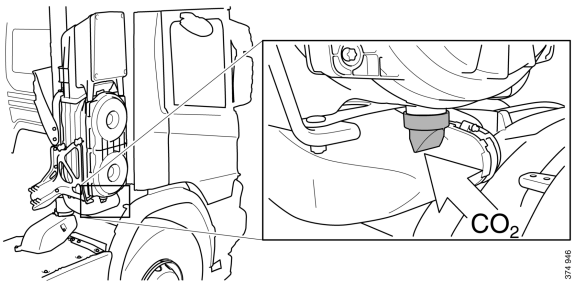
The vehicle engine can be shut off by spraying carbon dioxide into the air intake. The air intake can be accessed with the front grille panel open.



High air intake

On vehicles with high air intake, the air intake can be accessed behind the cab.





Air suspension

Cab with air suspension

On vehicles with a cab with air suspension, the air can be released from the air suspension to stabilise the cab.

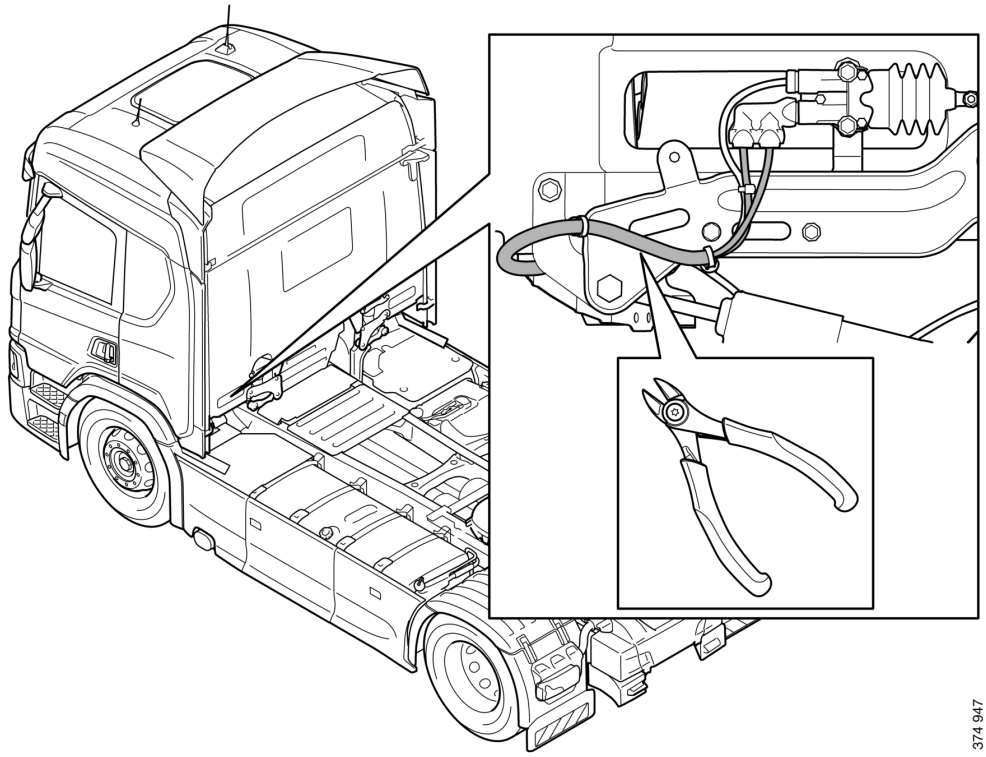
WARNING!

Risk of hearing impairment. A loud noise occurs when the air flows out of the cut hose.

Risk of injury when the cab suspension is emptied.

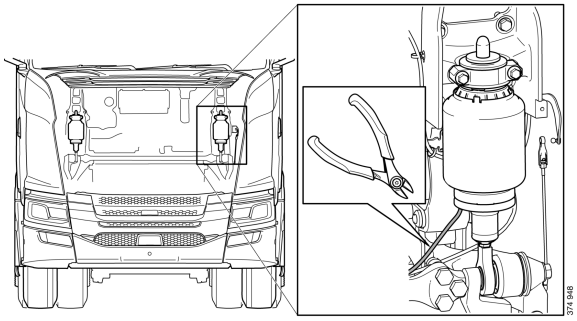
Rear cab suspension

- Cut off air hose to the rear cab suspension.



Front cab suspension

- Cut off air hose to the front cab suspension.

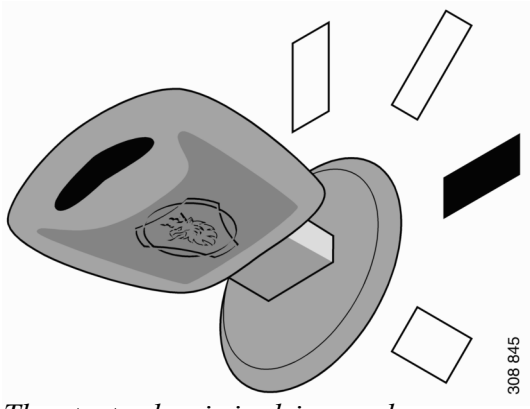


Chassis air suspension

The operation unit

Vehicles with air suspension chassis are raised and lowered using the operation unit. Raising the chassis can be carried out as long as there is pressure in the system's compressed air tanks.

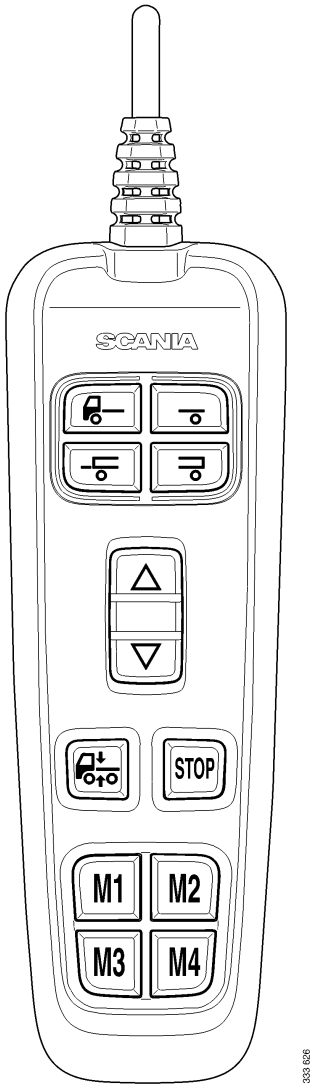
To operate the operation unit, the starter key must be in drive mode and the vehicle voltage must be connected.



The starter key is in drive mode.

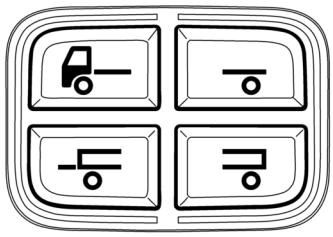
The operation unit is positioned at the side of the driver's seat.

- Axle selection buttons.
- Memory buttons
- Level change buttons.
- Normal level restore button.
- Deactivation
- Stop button
- Memory buttons



Selecting the axle

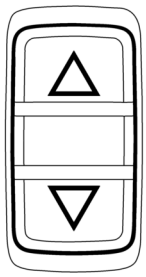
Press the button for the axle on which you wish to change the level. You can also press both buttons to change both axles at the same time. When you have selected an axle the relevant indicator lamp illuminates.



375 418

Change level

Hold down the buttons to raise or lower to the desired level. Release the button to cancel.



375 419

Deactivation

Return to normal vehicle level.

375 420

Stop button

The stop button always cancels the function in progress. Press the stop button if you need to cancel the *Return to normal level* function, for example, if something is in the way.

The stop button can always be used as an emergency stop even if the operation unit is not active.

375 421

Memory buttons

Save 4 memory levels by programming them using the operation unit.

375 422

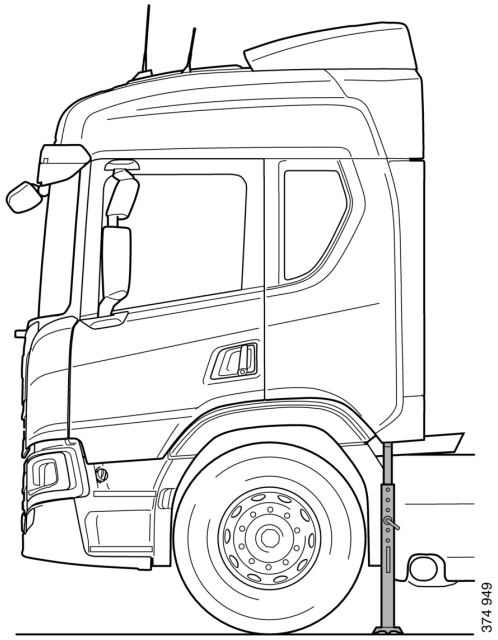
Securing the cab

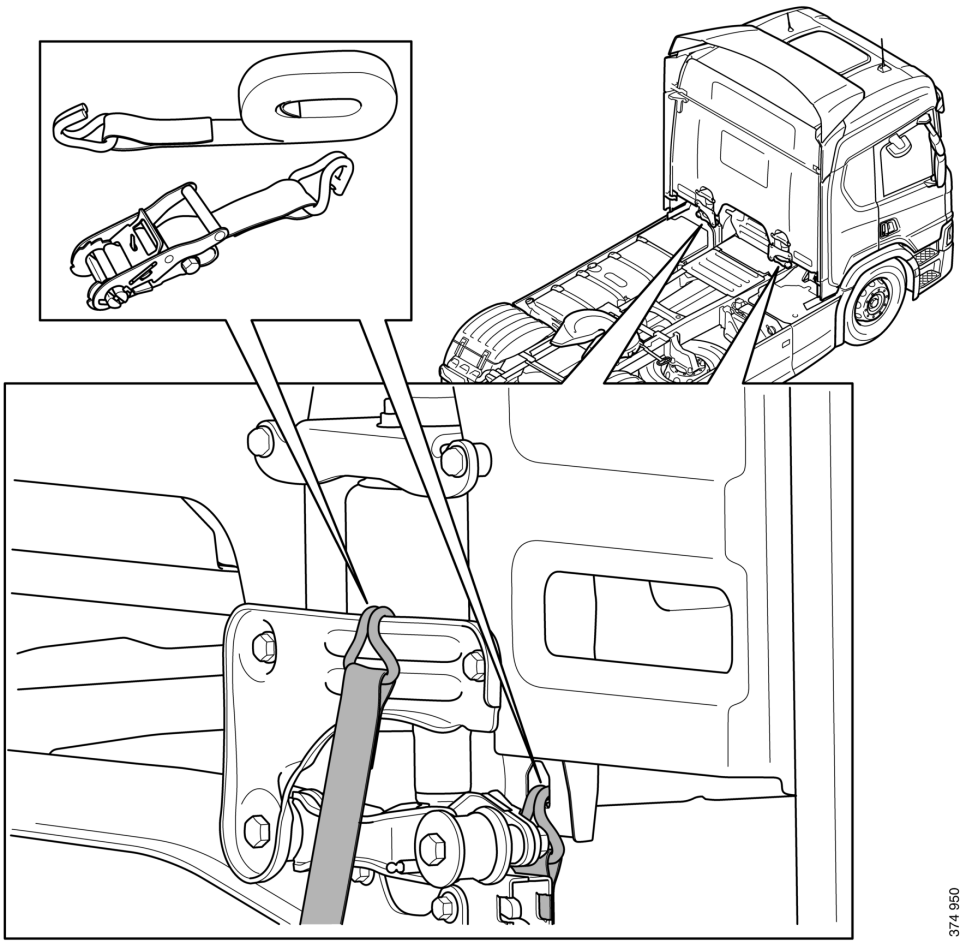
Supports on each side at the rear of the cab prevent the cab from moving downwards.

By anchoring the cab in the frame on each side the cab is prevented from moving upwards. The brackets under the cab can be used as illustrated.

WARNING!

Beware of hot exhaust system mounted on the right side of the vehicle.





Adjusting steering wheel

Adjusting with button

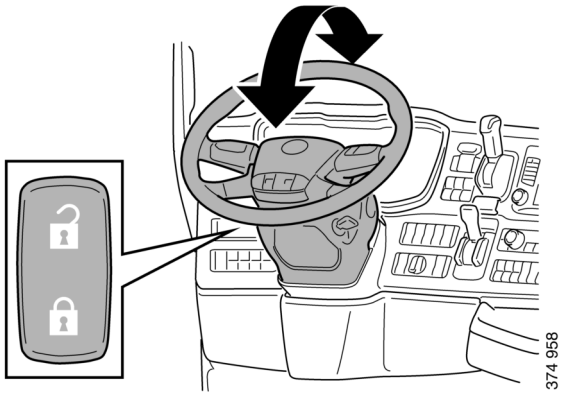
To adjust the height and angle; press the button by the open lock for a few seconds.

To lock the selected setting; press the button by the closed lock.

The settings are also locked automatically after a few seconds.

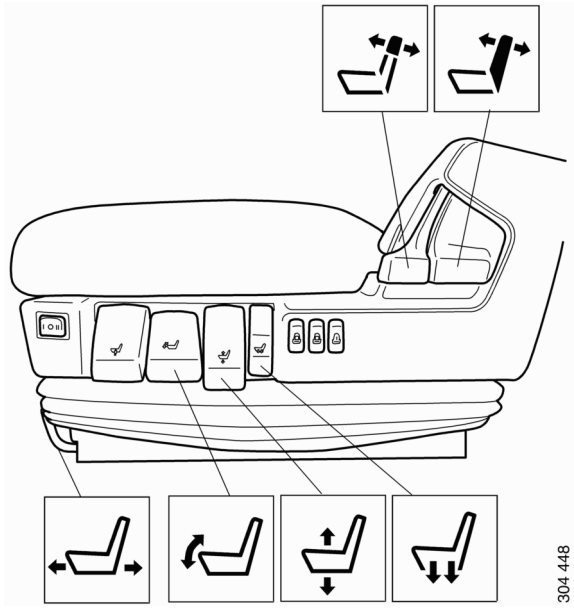
Note:

The function requires that there be compressed air remaining in the vehicle.



Adjusting the seat

The option to adjust the seat depends on the seat type. The illustration shows an example.



Note:

The control for quick lowering of the seat lowers the seat quickly and empties the system of air. This may mean that the seat cannot be adjusted after the control has been used.

Control for quick lowering of the seat.

WARNING!

Risk of hearing impairment. A loud noise occurs when the air flows out of the cut or disconnected hose.

Quick lowering of the seat and emptying of air from the system can also occur if the air hose at the rear of the seat is loosened or cut.

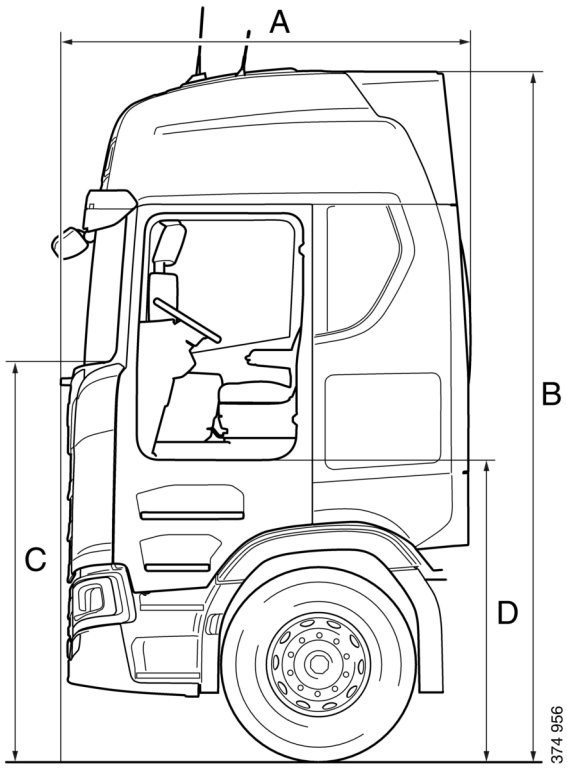
Cab dimensions and weight

The cab can weigh up to 1,320 kg.

The outer dimensions from the ground vary depending on the cab type, roof height, choice of suspension, load and settings.

Table 1: Dimensions (mm)

	Min.	Max.
A	1,730	2,280
B	2,695	3,900
C	1,640	2,250
D	1,000	1,650



Gas vehicles

Vehicle gas

The vehicle gas used in Scania gas vehicles is biogas, natural gas, or a mixture of these.

Vehicle gas is primarily made up of methane and has a methane content of 75-97%. Methane is a highly flammable gas and has explosive limits at 5-16% mixture in air. The gas self-ignites at a temperature of 595°C.

Vehicle gas is essentially colourless and odourless. Pressurised vehicle gas, CNG, is often mixed with odorants to enable leakages to be detected. Liquid vehicle gas, LNG, has no added odour, but major leakages are visible as a mist as the water in the air condenses when it is cooled down by the throttle.

Methane is lighter than air and therefore rises in the event of leakage. This should be taken into account when leakages occur, for example indoors or in a tunnel. The gas can cause suffocation in confined spaces. Liquid and cold methane gas is heavier than air and can run into low points in the event of leakage. Therefore, ensure good ventilation.

Plate

Gas vehicles are marked at several points with a diamond-shaped symbol with the text CNG or LNG.

Pressurised vehicle gas, CNG

CNG stands for Compressed Natural Gas. The gas tank packages consist of a number of gas tanks which are positioned together. A truck with a full tank can hold up to 150 kg of fuel.

The pressure in the gas tank and the fuel system can exceed 230 bar when refuelling.

Green symbol for pressurised vehicle gas, CNG

Liquid vehicle gas, LNG

LNG stands for Liquefied Natural Gas. The fuel is cooled to -130°C and then consists of liquid and gaseous methane. Leaking LNG boils and expands to 600 times the liquid volume at normal pressure. A vehicle with a full tank can hold up to 180 kg of fuel.

The fuel is kept pressurised in the tanks to 10 bar (g). The pressure in the tanks and gas lines can vary, up to a maximum of 16 bar, provided that the safety valves are intact.

Green symbol for liquid vehicle gas, LNG

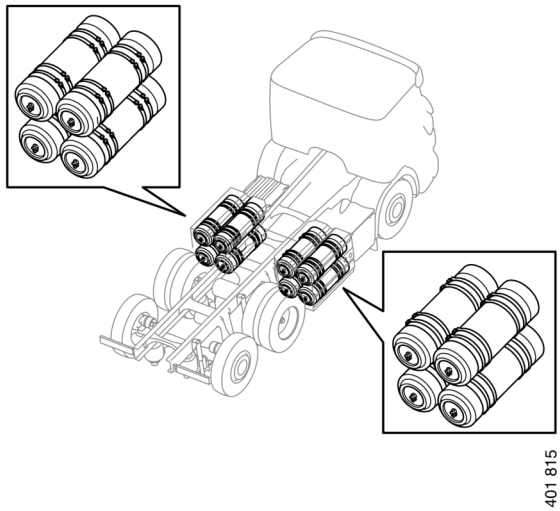
Gas vehicle components in CNG

The design of the gas tanks and valves varies depending on the manufacturer.

Gas tank package

Common positioning of gas tank packages:

- On trucks, the gas tank packages are positioned on the frame.



Position of the gas tank packages on trucks.

There are 2 versions of gas tanks: steel or composite. Each gas tank in the gas tank package is fitted with a solenoid valve, shut-off valve and pipe break valve.

Note:

If the outer casing of composite tanks is damaged, the structure is weakened, which over time can cause the gas tank to crack.

Gas lines

The gas lines on trucks are routed along the frame and between the tank package.

Safety valves

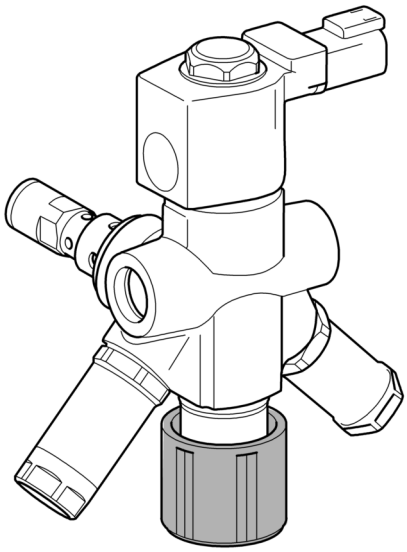
Note:

The solenoid valves are only open when the engine is running.

The gas tanks are equipped with one or more temperature-sensitive fuses. Steel tanks also have pressure fuses. There is also a pipe break valve which restricts the flow from the tank if the pressure causes major leakage from a line. If the pressure exceeds 11 bar on the low pressure side, a safety valve in the pressure regulator is also opened.

On trucks, the safety valves are located at the rear of the gas tanks, directed at an inwards angle and a rearwards angle under the truck.

Gas bottle shut-off valve



406 648

Gas vehicle components in LNG

The design of the gas tanks and valves varies depending on the manufacturer.

Gas tanks

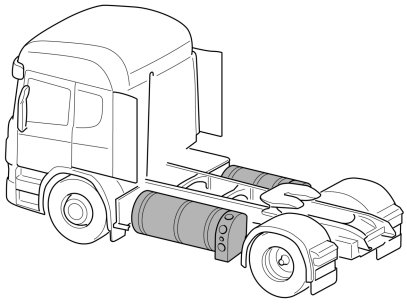
Common positioning of gas tanks:

- On trucks, the gas tank is positioned on the frame.

The gas tanks are made of steel.

The pressure in the tank can be read on a manometer located on the side of the tank.

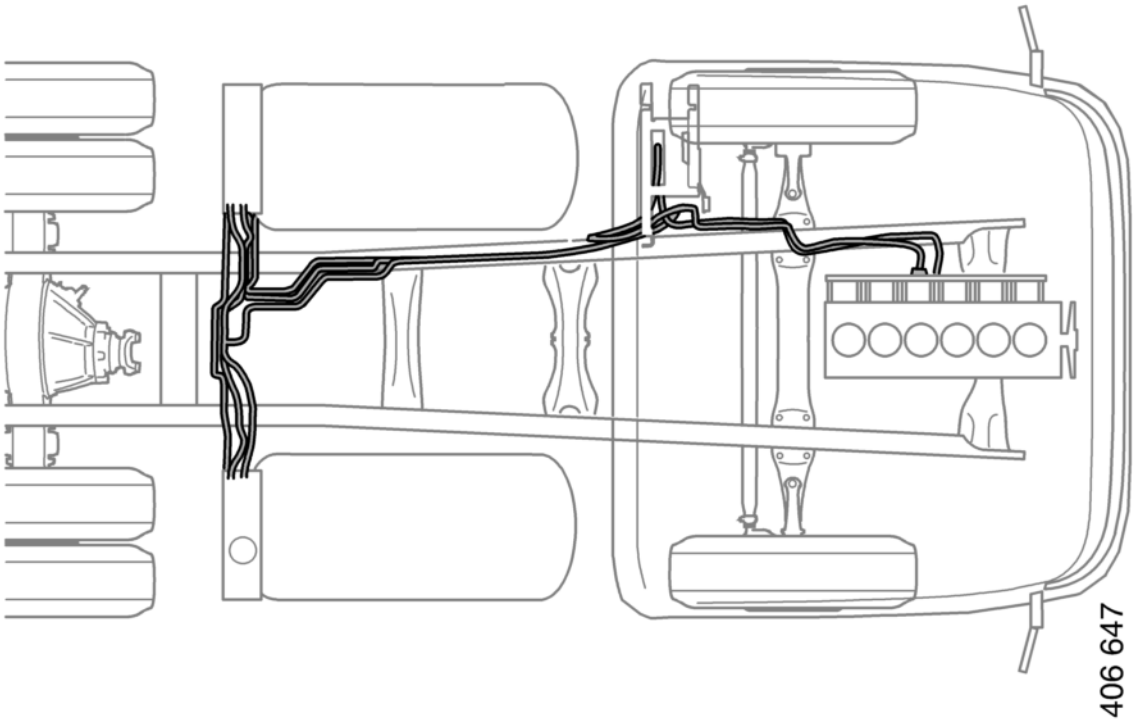
The gas tanks are fitted with a solenoid valve, shut-off valve, pipe break valve, and pressure-activated safety valves.



Position of the gas tanks on trucks.

Gas lines

The gas lines on trucks are routed along the frame and between the tanks.



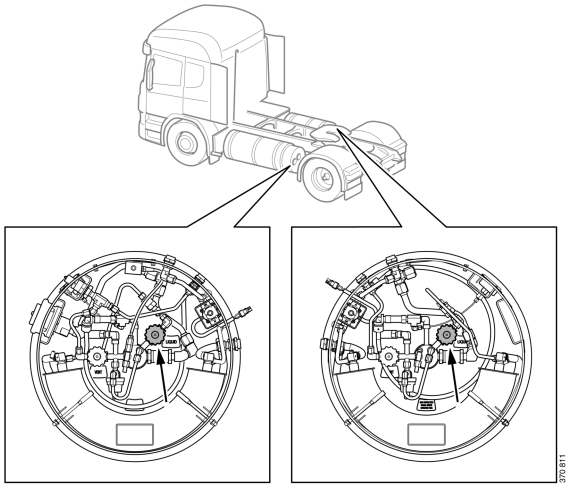
Safety valves

Note:

The solenoid valves are only open when the engine is running.

Each tank is fitted with two overpressure valves in the rear section. These are triggered at 16 bar and 24 bar. The safety valves are directed at an inwards angle and a rearwards angle under the truck.

There is no manual shut-off valve on the gas panel, but there is a manual tap on each tank. There is a pipe break valve which restricts the flow from the tank in the event of major leakage from a line. If the pressure exceeds 12 bar on the low pressure side, a safety valve in the pressure regulator is also opened.



Shut-off cock.

Risk management for gas vehicles

The area must always be evacuated in the event of fire, leakage, or a vehicle with a damaged gas tank.

Due to a risk of explosion and suffocation, gas vehicles must be declared to be free of gas before they are taken indoors. If a gas leakage occurs, the gas will be confined, contributing to an unsafe environment.

Explosion

CNG

The risk of explosion is very small. Temperature fuses are automatically triggered at 110°C in order to prevent explosion. If the vehicle is fitted with a pressure fuse, this triggers at 340 bar. Explosive pressure is 450 bar for steel tanks and 470 bar for composite tanks.

LNG

The risk of explosion is very small. Delivery valves are triggered at 16 bar and 24 bar.

Damaged gas tank

Always evacuate the area around a vehicle with a damaged gas tank.

Vehicle gas expands with the temperature and it is therefore important to lower the pressure in a damaged gas tank. A damaged gas tank can withstand pressure temporarily, but if the pressure is raised, e.g. by heat from the sun, the gas tank may break. Therefore, try to reduce the pressure in a damaged gas tank in a safe way by shooting holes in the tank from a safe distance.

Note:

The pressure displayed on a manometer is the pressure in the pipe system. The gas tanks have solenoid valves, which are closed when power is cut. Therefore, always treat the tank as if it is filled with gas, even if the manometer shows 0 bar.

Leakage

WARNING!

Remove all ignition sources in the vicinity of a gas leakage during evacuation.

WARNING!

The gas can cause suffocation in confined spaces.

WARNING!

Liquid vehicle gas, LNG, is extremely cold. Leakages can lead to personal injury.

If a high-frequency high whining noise is heard, this indicates that the gas system has a leak.

Gas leakage from CNG pressurised vehicle gas can also be identified by an acrid odour if the gas has had an odour added.

Major LNG liquid vehicle gas leakages can be seen as a mist since the cold gas makes the water in the air condense.

If a gas leakage has been identified, evacuate the area until no sound can be heard, no mist can be seen and no odour detected.

Pressurised vehicle gas, CNG, is lighter than air and therefore rises in the event of leakage. Take this into account if leakages occur, for example indoors or in a tunnel.

Liquid vehicle gas, LNG, is initially heavier than air because it is cooled. It rises as the temperature increases.

Fire

If a fire occurs: If possible, cut off the gas supply by switching off the engine.

The area around the vehicle must then be evacuated. Cordon off an area with a radius of at least 300 m around the vehicle. Only then can fire extinguishing activities be carried out, if they can be performed in a safe way. Otherwise, wait until the gas has burnt up.

Water or carbon dioxide must never be used to extinguish LNG vehicles. This can lead to a powerful fire sequence and at worst an explosion. Use a powder fire extinguisher instead.

Do not cool down the temperature-sensitive fuses on CNG tanks, as this can cause the safety valves to close or cease to open. This can lead to a powerful fire sequence and at worst an explosion.

WARNING!

Avoid cooling the tanks or spraying water on the fire. This will result in a more powerful fire.

WARNING!

The safety valve is triggered at abnormally high temperatures or pressure, in order to prevent an explosion. This produces a burst of flame tens of metres long. Evacuate the area in the direction of the safety valve.

Note:

Use a powder fire extinguisher.

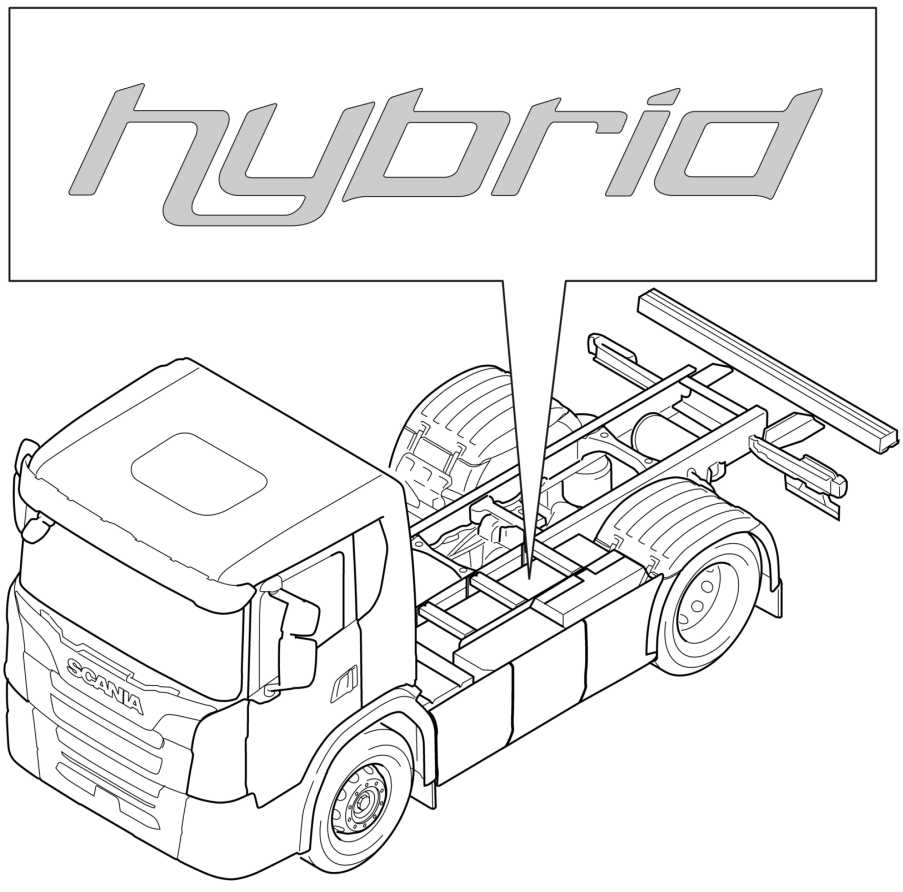
Hybrid vehicles and plug-in hybrid electric vehicles

WARNING!

Use protective goggles and rubber gloves classified for 1,000 V when carrying out work with a risk of coming into contact with voltage class B.

The hybrid system is driven by voltage class B (650 V), see definition below.

Voltage class A	Voltage class B
0 V-60 V DC	60 V-1,500 V DC
0 V-30 V AC	30 V-1,000 V AC

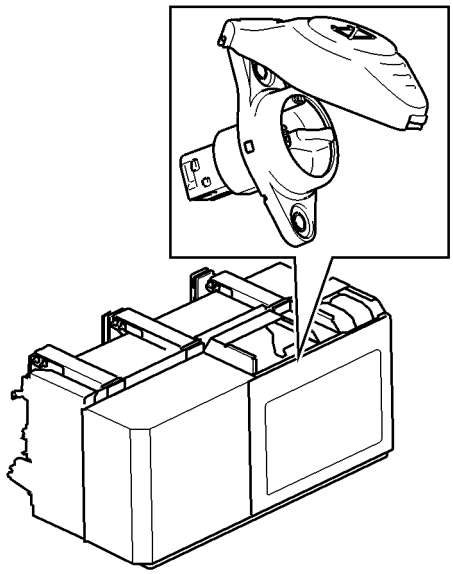


397 317

Built-in safety devices

The hybrid system has the following built-in safety devices:

- The hybrid system cable harness for voltage class B (650 V) is orange. The cable harness for voltage class B (650 V) is insulated from chassis earth. This means that there has to be contact with both conductors before there is a risk of personal injury.
- The hybrid system components that pose a fire hazard are equipped with warning plates warning about voltage class B (650 V).
- The hybrid system monitors the battery temperature, voltage, current intensity and electrical insulation level. The hybrid system disconnects the battery and cuts the power to the cable harness if any results deviate.
- The hybrid system voltage is normally cut off when the 24 V system is cut off.
- The hybrid system is shut off using the control switch, which is normally yellow, located in the hybrid power unit.



Location of the control switch in the hybrid power unit

Procedure for extinguishing a fire

Propulsion battery fire

If there is a visible fire in the propulsion battery, use large amounts of water to cool the propulsion battery.

Contact the fire service, which has equipment to extinguish fires in propulsion batteries for vehicles.

For other vehicle fires, not battery fire

In the event of a vehicle fire where the battery box is intact and not on fire, we recommend using normal procedures for extinguishing a fire.

The propulsion battery must be protected and cooled down with large amounts of water.

If the battery box is significantly damaged, large amounts of water must be used to cool the propulsion battery. It is important for the temperature of the propulsion battery to be reduced by only using water, to prevent risk of fire and to fight any fire.

Cut all power to the vehicle

WARNING!

Use protective goggles and rubber gloves classified for 1,000 V when carrying out work with a risk of coming into contact with voltage class B (650 V).

WARNING!

Avoid cutting the voltage class B (650 V) cable harness, orange, while the voltage is on. There is a high risk of an arc occurring that may cause personal injury.

Wear protective goggles and rubber gloves classified for 1,000 V.

WARNING!

The electric machine always produces power if the combustion engine is in operation, or if it for some other reason starts rotating, even if the hybrid system is otherwise disconnected.

1. Turn off the ignition.
2. Cut off the 24 V system by disconnecting the battery terminals on the 24 V batteries. The 24 V battery is located on the battery shelf behind the cab on the left-hand side.

   Normally, this means that the propulsion battery is disconnected and that starting the combustion engine is prevented. This in turn, prevents voltage from the electric machine.

   In order to be sure that there is no residual voltage remaining in the system, wait for 15 minutes.
3. If the cable harness for voltage class B must be cut or if it is damaged, and if the 24 V system is not accessible, disconnect the connectors on the propulsion battery. This guarantees that the hybrid system is disconnected.

Recovery and shunting

Information and instructions must be followed during recovery and shunting to prevent personal injury and vehicle damage.

Recovery of heavy vehicles should always be entrusted to an authorised recovery company.

Preparatory work

- In the event of recovery from a ditch: unload the vehicle and clear the ditch of stones etc. that may damage or get caught in the vehicle during recovery.
- Check that no damage has occurred to the vehicle that may cause a short circuit in the electrical system. If this is the case, disconnect the batteries to prevent fire.
- When carrying out a recovery on a road, the vehicle should always be lifted without a load. Alternatively, the front axle weight can be reduced as much as possible.
- If it is not possible to start the engine, the brake system must be filled with air using an alternative method. Recovery vehicles usually have air outlets that can supply the towed/recovered vehicle with air.

Recovery

Note:

The information about recovery and shunting that follows only applies when:

- There is no visible damage to the vehicle that has occurred due to a collision or other incident.
- The risk of fire is considered low
- The risk of exposure to high voltage is considered low
- No warnings about electrical hazards are displayed on the instrument cluster (ICL).

If the vehicle is blocking traffic or in any other way constitutes a potential risk, towing with a mounted propeller shaft can be carried out to move the vehicle to a safer place.

Note:

Before towing is carried out:

- the vehicle's 15 voltage is switched off with the starter key on the instrument cluster
- the vehicle's voltage class A (VCA) is switched off using the red control switch
- the electric drive system's voltage class B (VCB) is switched off using the yellow control switch.

WARNING!

When towing with a mounted propeller shaft:

- the vehicle must not be towed further than 500 metres
- the vehicle speed must not exceed 10 km/h.

WARNING!

When towing with a mounted propeller shaft, there is a risk of damage to the vehicle's propulsion unit, propulsion batteries and other parts of the electrical system.

WARNING!

It is common for several of the vehicle functions to be disengaged or out of order during recovery and towing.

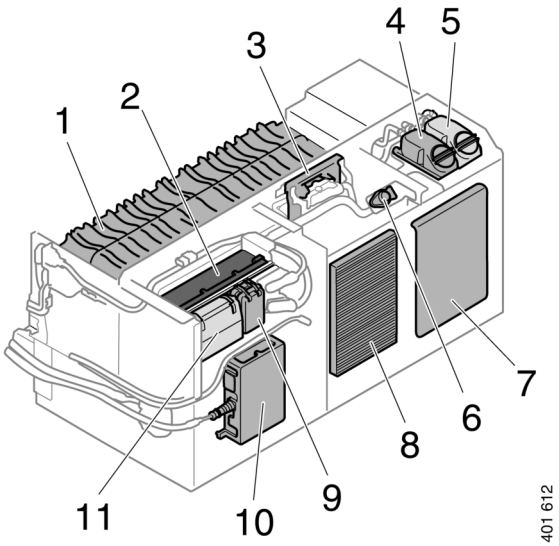
WARNING!

Do not lift on the towing brackets.

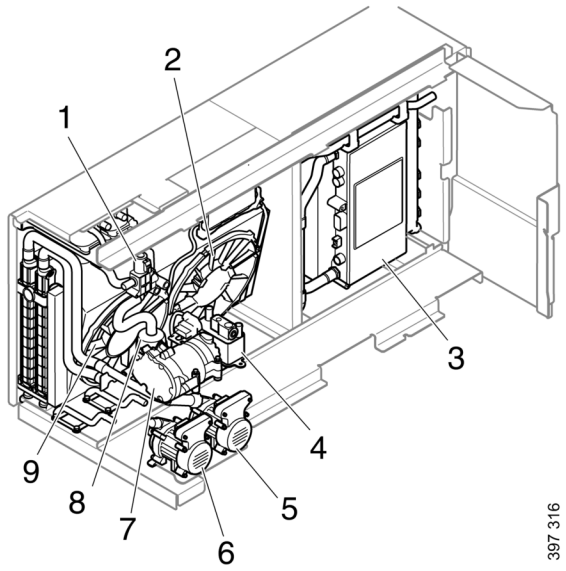
Note:

Vehicles fitted with alarms can react at speed and lock themselves even during recovery. Avoid leaving the starter key in drive mode during recovery or towing.

Hybrid system components



1. *E83, Propulsion battery*
2. *E82, Inverter*
3. *E81, Control unit*
4. *Expansion tank for propulsion battery cooling circuit*
5. *Expansion tank for power electronics cooling circuit*
6. *S229, Switch, normally yellow*
7. *Cooling package*
8. *Condenser*
9. *P13, Central electric unit for voltage class A*
10. *P7, Voltage class B central electric unit*
11. *P12, Central electric unit for voltage class A*



1. *V194, Solenoid valve*
2. *M39, Fan*
3. *E84, Direct current converter*
4. *Evaporator*
5. *M38, Coolant pump for propulsion battery cooling circuit*
6. *M41, Coolant pump for power electronics coolant circuit*
7. *E140, Refrigerant compressor*
8. *H32, Heater*
9. *M40, Fan*

The hybrid system

The hybrid system is a parallel hybrid and comprises a diesel engine assembled with an electric machine. The electric machine is in turn, assembled with the gearbox. The hybrid system is supplied with energy via a propulsion battery which is connected to an electric machine via an inverter.

The inverter supplies the electric machine with 3-phase alternating current.

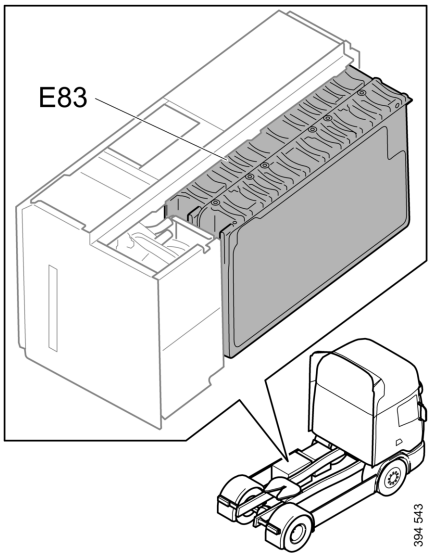
The inverter is cooled with a water cooling system that also cools the direct current converter. The direct current converter supplies the 24 V battery and the vehicle electrical system with 24 V voltage which is transformed from the propulsion battery voltage class B (650 V).

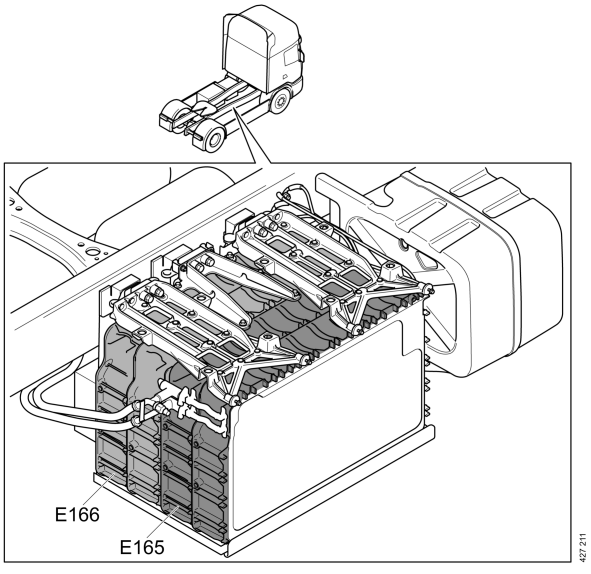
Components with voltage class B (650 V)

Propulsion battery

The propulsion battery is a lithium-ion battery with voltage class B (650 V). The propulsion battery is connected to the electric machine via the inverter and supplies the hybrid system with current.

The propulsion battery is located in the hybrid power unit, which is located behind the battery shelf on the left-hand side of the frame.

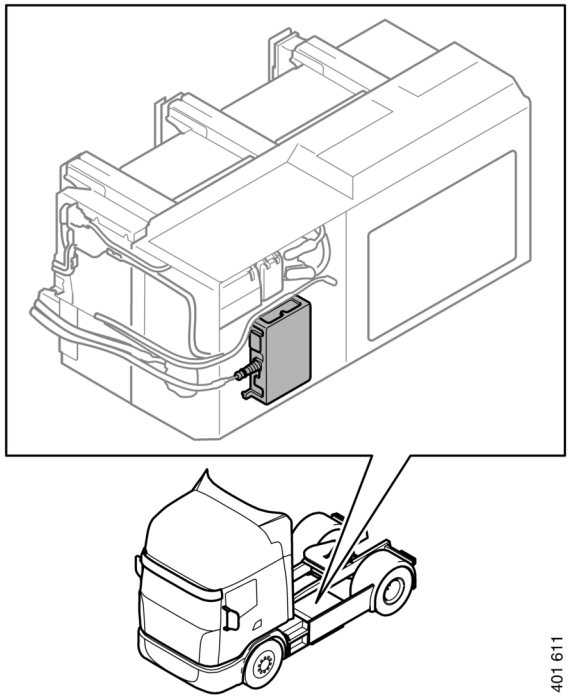


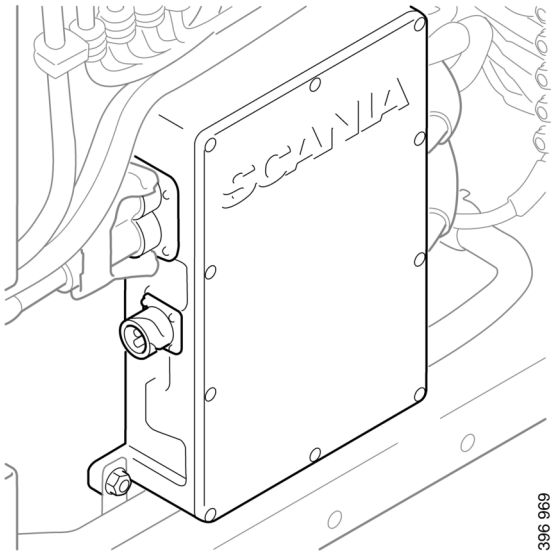


Voltage class B central electric unit

The central electric unit for voltage class B (650 V) connects the propulsion battery, inverter, heater and the direct current converter.

The inverter is located in the hybrid power unit, which is positioned behind the battery shelf on the left-hand side of the frame.

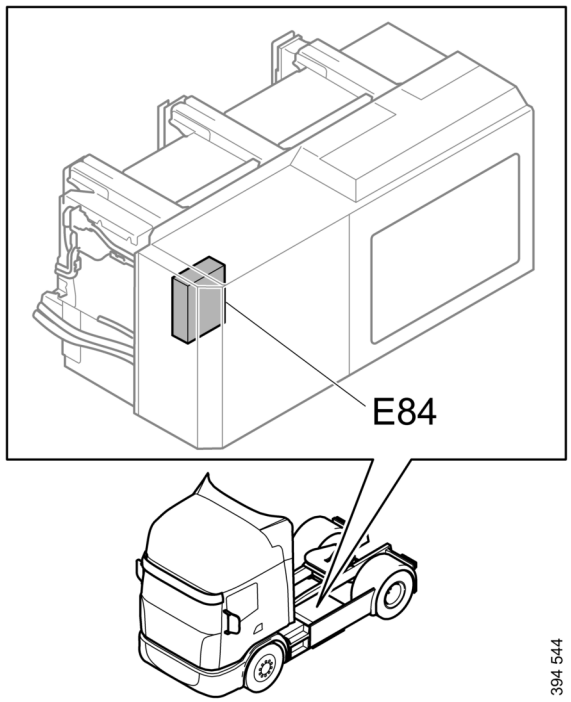


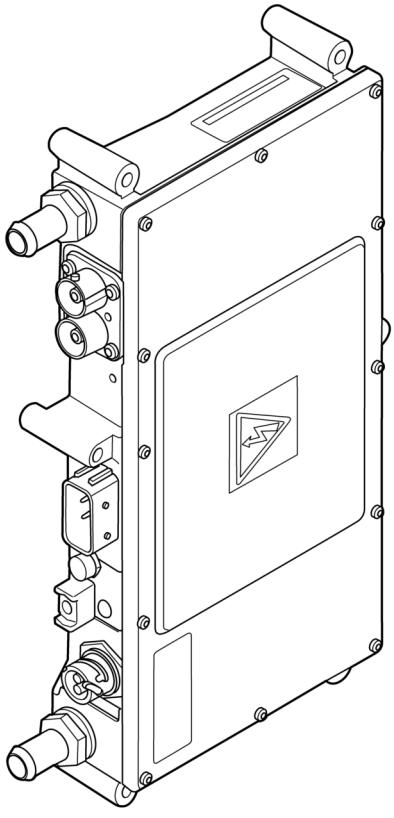


Direct current converter

The direct current converter replaces the alternator and converts voltage class B (650 V) to 24 V.

The direct current converter is located in the hybrid power unit, which is positioned behind the battery shelf on the left-hand side of the frame.

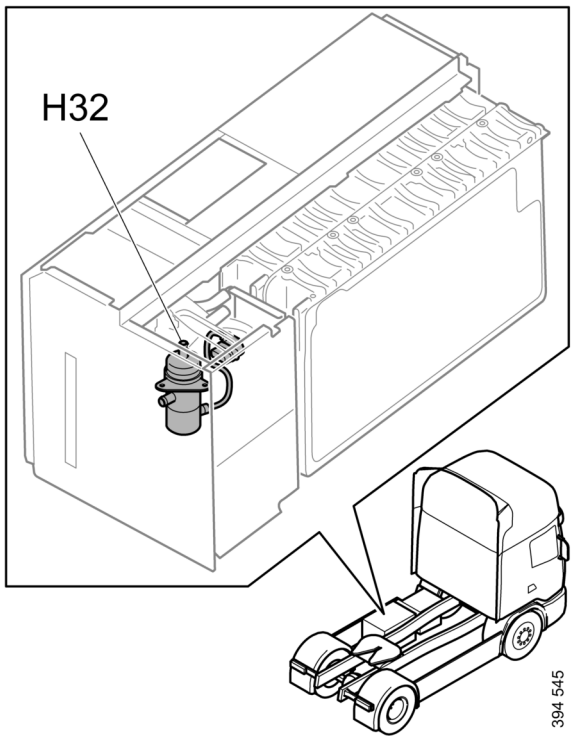


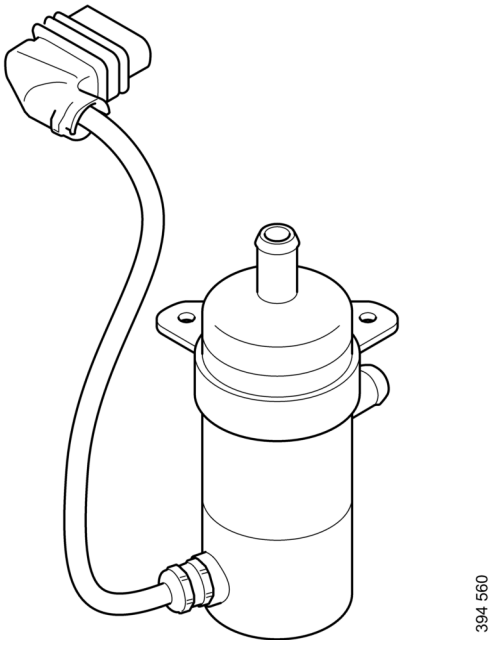


Heater

The electric heater heats the propulsion battery if the temperature of the propulsion battery is below 5°C.

The heater is powered by 650 V and is located in the hybrid power unit, which is positioned behind the battery shelf on the left-hand side of the frame.



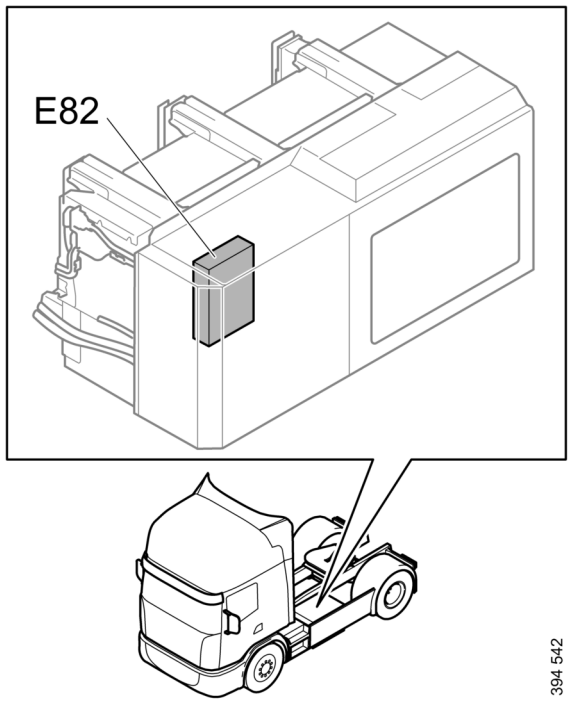


Inverter

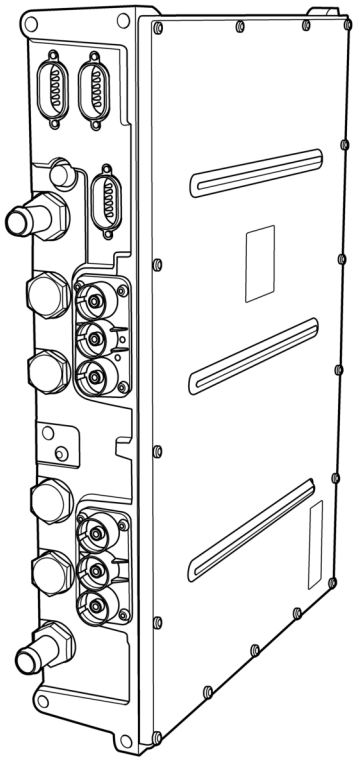
The inverter converts the propulsion battery 650 V DC to 3-phase 400 V AC to drive the electric machine and the reverse when the electric machine works as a generator.

The inverter is located in the hybrid power unit, which is positioned behind the battery shelf on the left-hand side of the frame. It is liquid-cooled and part of one of the 2 cooling circuits in the hybrid power unit.

The inverter is connected to the electric machine using 3 cables for voltage class B.



394 542

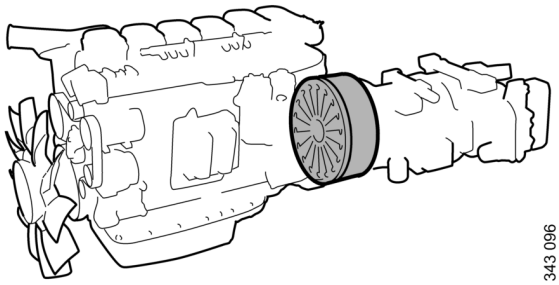


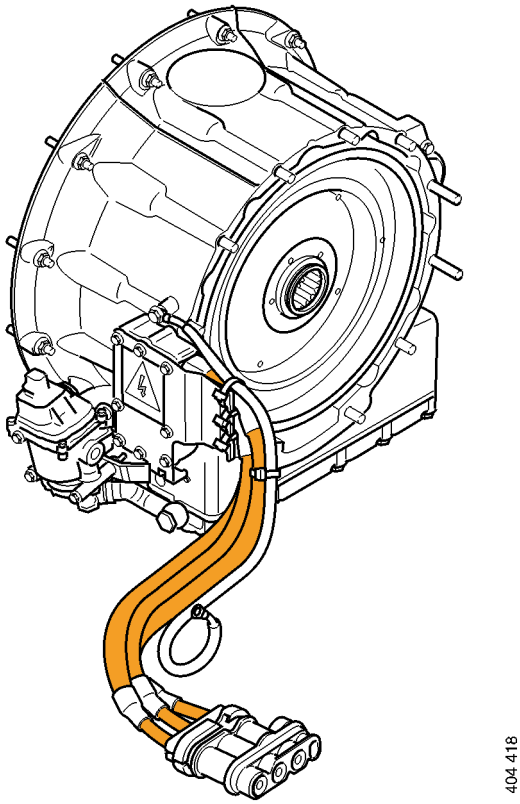
396 727

Electric machine

The electric machine is electromagnetic and transforms electric energy into mechanical energy and vice versa.

It is located between the gearbox and diesel engine and used for propulsion and braking of the vehicle.

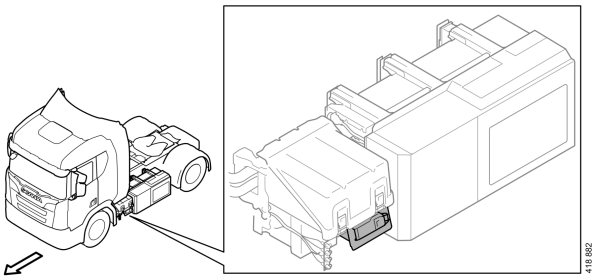


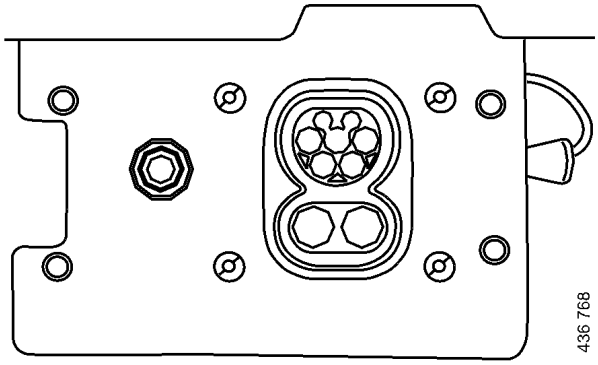


Unit for external charging

Plug-in hybrid electric vehicles have a charging socket to which an external power source from a charging station is connected for charging the vehicle.

The external charging unit is located on the left-hand side of the frame next to the hybrid power unit.





Chemical information on propulsion batteries

Under normal conditions, the chemicals are enclosed in 'cells' located within the propulsion battery and cannot leak out into the environment. The cells usually contain a combination of a liquid and some solid materials, the liquid being firmly retained by the materials.

The risk of contact occurs when the content changes to a gas. This can happen in the event of external damage to one or more of the cells, too high a temperature or overloading.

The liquid within the cells is flammable and can be corrosive if it comes into contact with moisture. Damage and steam or mist from the battery may cause irritation of mucous membranes, air ways, eyes and skin. Exposure can also cause dizziness, nausea and headache.

The cells in the battery can handle up to 80°C. If the temperature in the cells is greater than 80 degrees Celsius the electrolyte in the cell starts to change to a gas. This may cause the pressure relief value in the cells to break, and flammable and corrosive gas is released via the battery pack ventilation duct.

Electric vehicles

WARNING!

Use protective goggles and rubber gloves classified for 1,000 V when carrying out work with a risk of coming into contact with voltage class B.

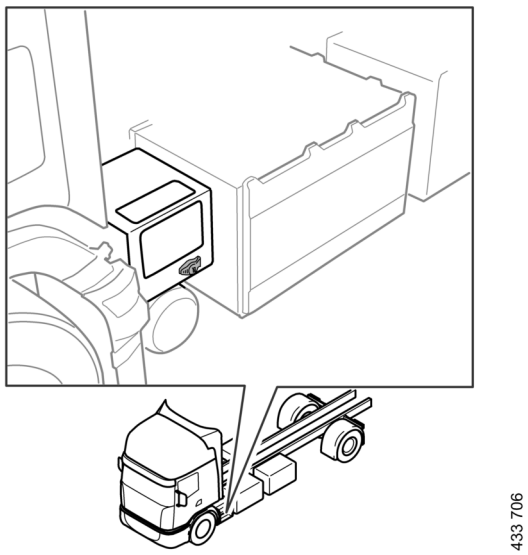
The hybrid system is driven by voltage class B (650 V), see definition below.

Voltage class A	Voltage class B
0 V-60 V DC	60 V-1,500 V DC
0 V-30 V AC	30 V-1,000 V AC

Built-in safety devices

The electric drive system has the following built in safety devices:

- The electric drive system cable harness for voltage class B (650 V) is orange. The cable harness for voltage class B (650 V) is insulated from chassis earth. This means that there has to be contact with both conductors before there is a risk of personal injury.
- The electric drive system components that pose a fire hazard are fitted with warning plates warning about voltage class B (650 V).
- The electric drive system monitors the battery temperature, voltage, current and electrical insulation level. The electric drive system disconnects the battery and cuts the power to the cable harness if any results deviate.
- Voltage for the electric drive system is normally cut off when the 24 V system is cut off; the control switch is normally red.
- The electric drive system's voltage class B is switched off using a control switch located on the left-hand side behind the cab; the control switch is normally yellow.



The control switch is located on the left-hand side behind the cab.

Procedure for extinguishing a fire

Propulsion battery fire

If there is a visible fire in the propulsion battery, use large amounts of water to cool the propulsion battery.

Contact the fire service, which has equipment to extinguish fires in propulsion batteries for vehicles.

For other vehicle fires, not battery fire

In the event of a vehicle fire where the battery box is intact and not on fire, we recommend using normal procedures for extinguishing a fire.

The propulsion battery must be protected and cooled down with large amounts of water.

If the battery box is significantly damaged, large amounts of water must be used to cool the propulsion battery. It is important for the temperature of the propulsion battery to be reduced by only using water, to prevent risk of fire and to fight any fire.

Cut all power to the vehicle

WARNING!

Use protective goggles and rubber gloves classified for 1,000 V when carrying out work with a risk of coming into contact with voltage class B (650 V).

WARNING!

Avoid cutting the voltage class B (650 V) cable harness at the same time as voltage is on. There is a high risk of an arc occurring that may cause personal injury.

Wear protective goggles and rubber gloves classified for 1,000 V.

1. Cut off the 24 V system by disconnecting the battery terminals on the 24 V batteries. The 24 V batteries are located on the right-hand side behind the front wheel.

   This normally results in the propulsion battery being disconnected. This action prevents voltage from the electric machine.

   In order to be sure that there is no residual voltage remaining in the system, wait for 15 minutes.

2. If the cable harness for voltage class B must be cut or if it is damaged, and if the 24 V system is not accessible, disconnect the connectors on the propulsion battery. This guarantees that the electric drive system is disconnected.

Recovery and shunting

Information and instructions must be followed during recovery and shunting to prevent personal injury and vehicle damage.

Recovery of heavy vehicles should always be entrusted to an authorised recovery company.

Preparatory work

- In the event of recovery from a ditch: unload the vehicle and clear the ditch of stones etc. that may damage or get caught in the vehicle during recovery.
- Check that no damage has occurred to the vehicle that may cause a short circuit in the electrical system. If this is the case, disconnect the batteries to prevent fire.
- When carrying out a recovery on a road, the vehicle should always be lifted without a load. Alternatively, the front axle weight can be reduced as much as possible.
- If it is not possible to start the engine, the brake system must be filled with air using an alternative method. Recovery vehicles usually have air outlets that can supply the towed/recovered vehicle with air.

Recovery

Note:

The information about recovery and shunting that follows only applies when:

- There is no visible damage to the vehicle that has occurred due to a collision or other incident.
- The risk of fire is considered low
- The risk of exposure to high voltage is considered low
- No warnings about electrical hazards are displayed on the instrument cluster (ICL).

If the vehicle is blocking traffic or in any other way constitutes a potential risk, towing with a mounted propeller shaft can be carried out to move the vehicle to a safer place.

Note:

Before towing is carried out:

- the vehicle's 15 voltage is switched off with the key on the instrument cluster
- the vehicle's voltage class A (VCA) is switched off using the red control switch
- the electric drive system's voltage class B (VCB) is switched off using the yellow control switch.

WARNING!

When towing with a mounted propeller shaft:

- the vehicle must not be towed further than 500 metres
- the vehicle speed must not exceed 10 km/h.

WARNING!

When towing with a mounted propeller shaft, there is a risk of damage to the vehicle's propulsion unit, propulsion batteries and other parts of the electrical system.

WARNING!

It is common for several of the vehicle functions to be disengaged or out of order during recovery and towing.

WARNING!

Do not lift on the towing brackets.

Note:

Vehicles fitted with alarms can react at speed and lock themselves even during recovery. Avoid leaving the starter key in drive mode during recovery or towing.

The electric drive system

The electric vehicle powertrain is powered by propulsion batteries. An electric vehicle can have between 5 and 9 batteries.

The propulsion batteries have voltage class B (650 V), which supplies the electric machine with 3-phase alternating current via an inverter.

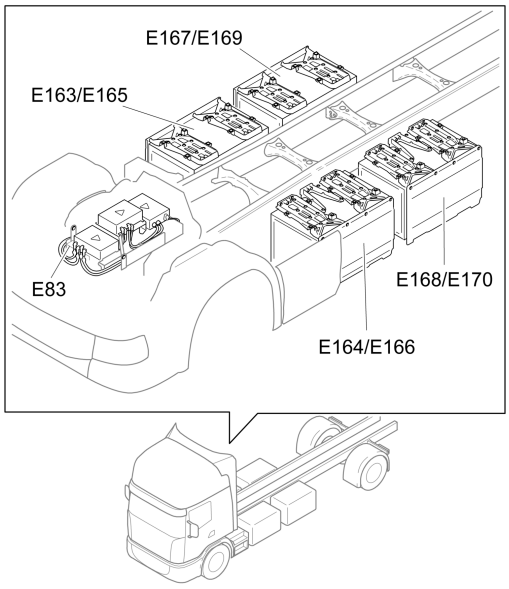
The inverter is cooled with a water cooling system that also cools the direct current converter. The direct current converter supplies the 24 V battery and the vehicle electrical system with 24 V voltage which is transformed from the propulsion battery voltage class B (650 V).

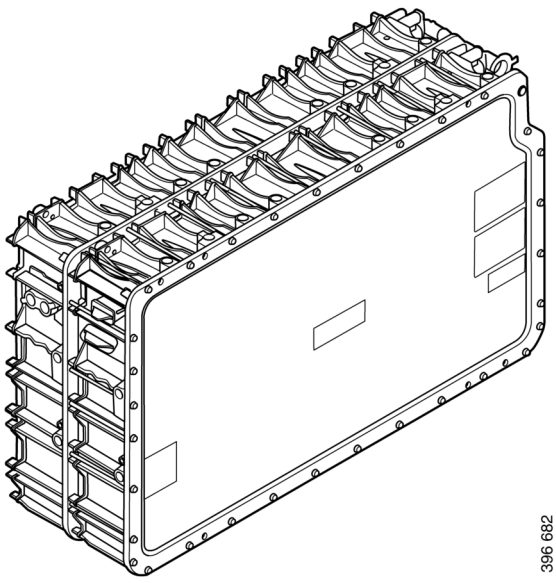
Components with voltage class B (650 V)

Propulsion batteries

The propulsion batteries are lithium-ion batteries with voltage class B (650 V). The propulsion batteries are connected to the electric machine via the inverter and supply the electric drive system with current.

The propulsion batteries are located as shown in the illustration. One is located under the cab and the others are distributed on the left-hand and right-hand side of the frame.

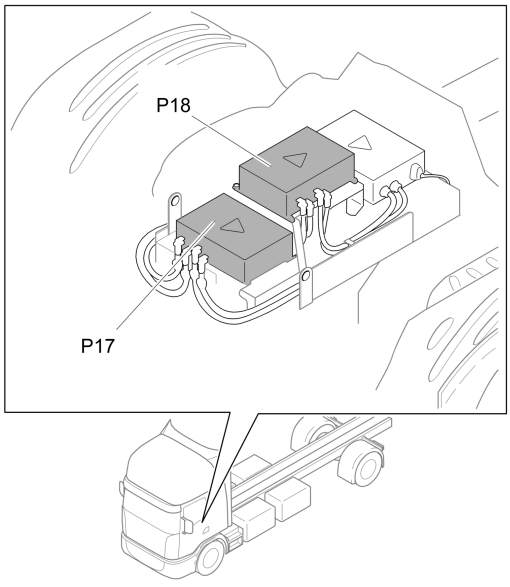




Voltage class B central electric unit

The electric drive system contains 4 central electric units for voltage class B.

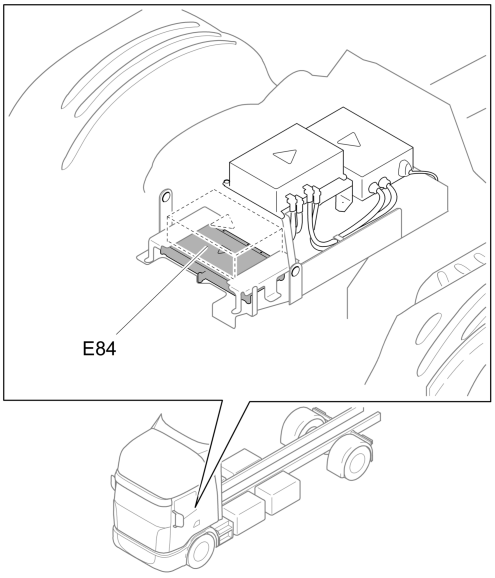
The central electric units function as a secure connection between the components connected to direct current and must supply the connections with positive and negative voltage. The central electric units distribute voltage class B via fuses in order to protect the cable harness and components.



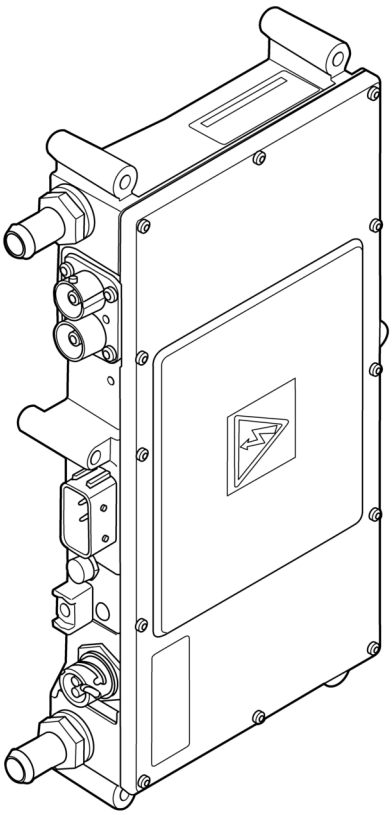
Direct current converter

The direct current converter is positioned under the cab.

The direct current converter replaces the alternator and converts voltage class B (650 V) to 24 V



425 541

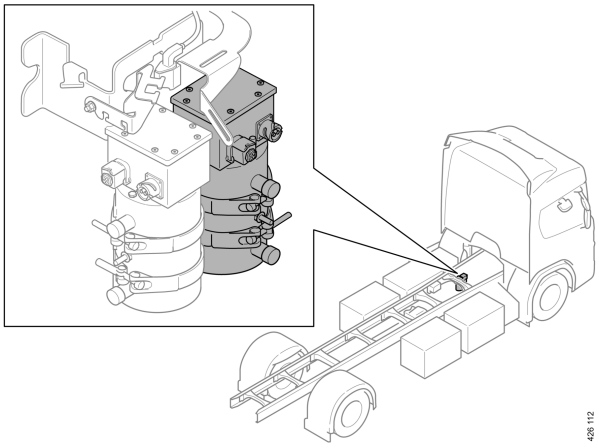


396 725

Heater

Heater H40 is part of the cooling coil for the propulsion batteries and is positioned on the left-hand side of the frame.

The heater is powered with 650 V and heats the propulsion batteries if the temperature of the propulsion batteries falls below 5°C.

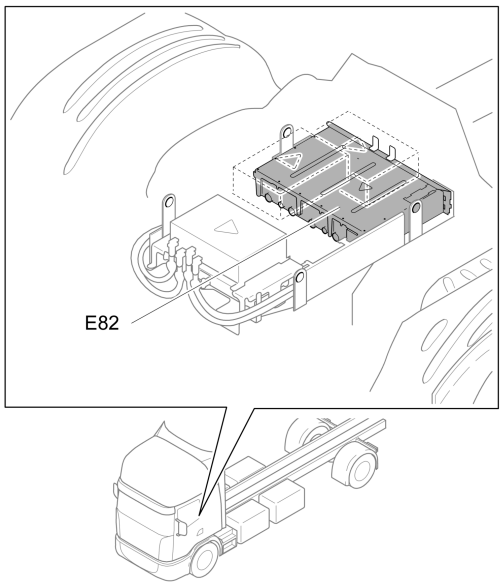


Inverter

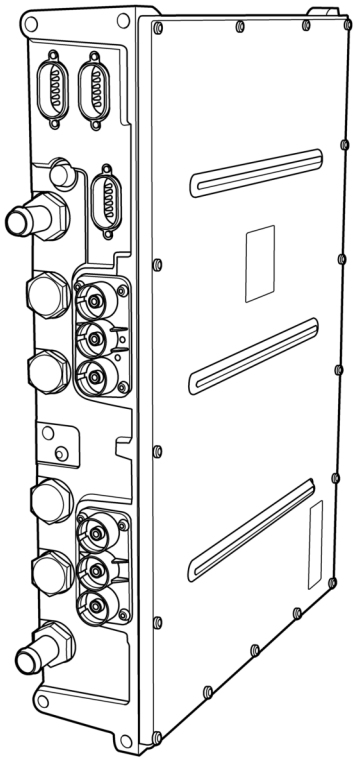
The inverter (E82) is located under the cab.

It converts direct current (650 V) from the propulsion batteries to 3-phase alternating current (300 A).

It is liquid-cooled and connected to the electric machine via 3 cables for voltage class B.



425 542



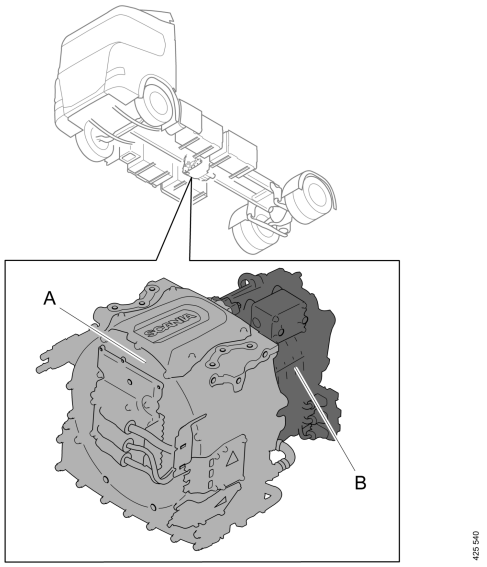
396 727

Electric machine and electric propulsion unit

The electric machine is located in the centre of the vehicle.

The electric machine is electromagnetic and transforms electric energy into mechanical energy and vice versa.

Behind the electric machine (A) there is an electric propulsion unit (B), which is the vehicle's gearbox.

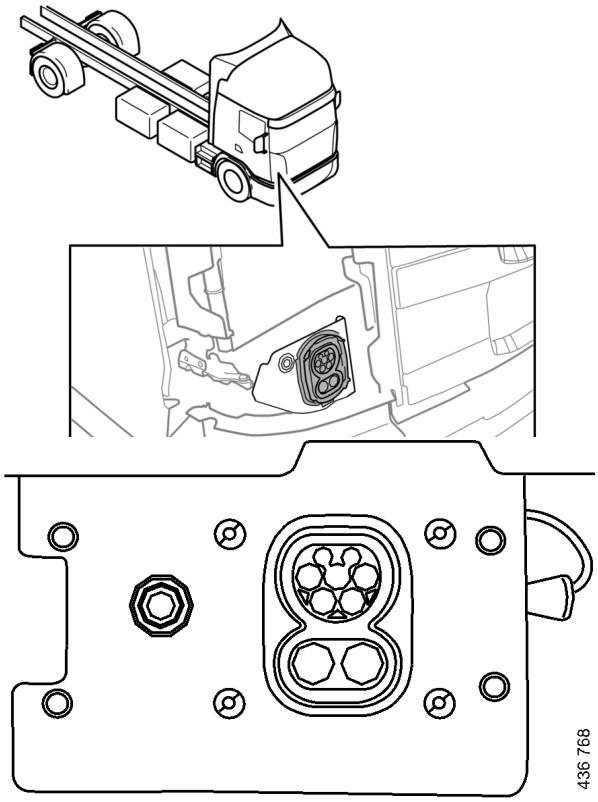


A. Electric machine for electric propulsion unit.
B. Electric propulsion unit.

External charging unit (CCS)

Scania's electric vehicles have a charging socket to which an external power source from a charging station is connected for charging the vehicle.

The external charging unit is located on the right-hand side above the front headlamp unit.



Chemical information on propulsion batteries

Under normal conditions, the chemicals are enclosed in 'cells' located within the propulsion battery and cannot leak out into the environment.

The cells usually contain a combination of a liquid and some solid materials, the liquid being firmly retained by the materials.

The risk of contact occurs when the content changes to a gas. This can happen in the event of external damage to one or more of the cells, too high a temperature or overloading.

The liquid within the cells is flammable and can be corrosive if it comes into contact with moisture. Damage and steam or mist from the battery may cause irritation of the mucous membranes, airways, eyes and skin. Exposure can also cause dizziness, nausea and headache.

The cells in the battery can handle up to 80°C. If the temperature in the cells is higher than 80 degrees Celsius, the electrolyte in the cell starts to change into a gas. This may cause the pressure relief value in the cells to break, and flammable and corrosive gas is released via the battery pack ventilation duct.