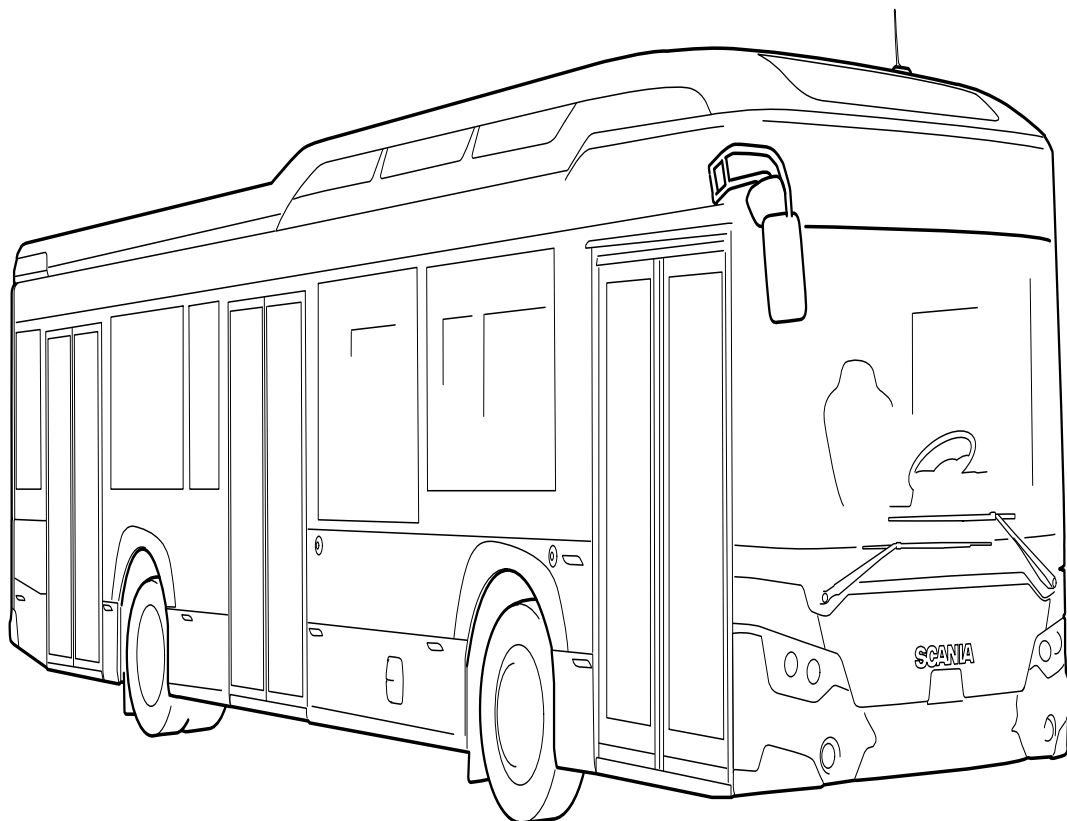


# Product information for the emergency services

**00:01-09**

**Bus**

**C and K series**





---

# Table of contents

<b>Innan du börjar läsa</b> .....	<b>1</b>
<b>Getting into the vehicle</b> .....	<b>2</b>
Windscreen and windows .....	2
<b>Electrical system</b> .....	<b>3</b>
Battery (24 V) .....	3
Electrical system 24 V .....	4
Switch for battery master switch in the instrument panel .....	5
<b>Engine</b> .....	<b>6</b>
<b>Adjusting steering wheel</b> .....	<b>7</b>
Adjusting with button .....	7
<b>Adjusting the seat</b> .....	<b>8</b>
Adjusting the seat .....	8
<b>Gas vehicles</b> .....	<b>10</b>
Vehicle gas.....	10
Plate .....	10
Pressurised vehicle gas, CNG .....	11
Gas tank package .....	12
Gas lines .....	13
Safety valves.....	14
Liquid vehicle gas, LNG.....	15
Gas tanks .....	15
Gas lines .....	15
Safety valves.....	16
Risk management for gas vehicles .....	17
Explosion .....	17
Damaged gas tank .....	17
Leakage.....	18
Fire .....	19
<b>Hybrid vehicles</b> .....	<b>20</b>
Built-in safety devices .....	22
Procedure for extinguishing a fire .....	23
In the event of a battery fire .....	23
For other vehicle fires, not battery fire .....	23
Cut all power to the vehicle .....	24
Chemical information on propulsion batteries .....	25
<b>Electric vehicles</b> .....	<b>26</b>
Electric vehicles.....	26
Built-in safety devices .....	29
Procedure for extinguishing a fire .....	30
In the event of a battery fire .....	30
For other vehicle fires, not battery fire .....	30



---

Cut all power to the vehicle .....	31
Chemical information on propulsion batteries .....	32
<b>Recovery and shunting .....</b>	<b>33</b>
Recovery .....	33
Towing and shunting .....	35
Vehicles with electrohydraulically steered tag axle .....	38
Electronic parking brake release .....	39
Releasing the electronic parking brake on a vehicle without power, K chassis .....	42
Disabling the parking brake .....	45
Releasing the parking brake with inoperative pneumatic system .....	47
Half shaft .....	48
Half shaft with built in flange .....	48
Portal axle .....	50



---

# Innan du börjar läsa



## **WARNING!**

Check that this is the latest issue of Scania's product information for the rescue services. Go to [www.scania.com/group/en/home/products-and-services/rescue-and-towing](http://www.scania.com/group/en/home/products-and-services/rescue-and-towing).



## **NOTE:**

The information in Scania's product information for emergency services applies to vehicles in the C and K series that have been ordered in the ordinary order system.



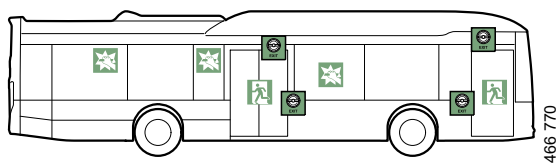
# Getting into the vehicle

## Windscreen and windows

Getting into the bus to access the driver area or to evacuate passengers can take place in different ways depending on the location at the accident site.

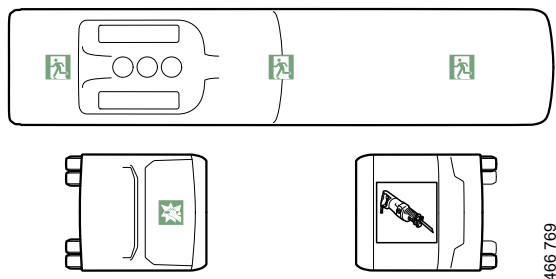
If the bus is in drive mode, access can be carried out as follows

- Via the doors which can be opened from the outside using the emergency opening function.
- By smashing the side windows.



If the bus has folded on the side, access to doors and side windows is prevented or obstructed. Access can then be carried out as follows.

- Via emergency exit in the roof. Please note: Not all buses have an emergency exit in the roof
- By smashing the rear window
- Cut through the laminated windscreen using e.g. a tiger saw.





# Electrical system

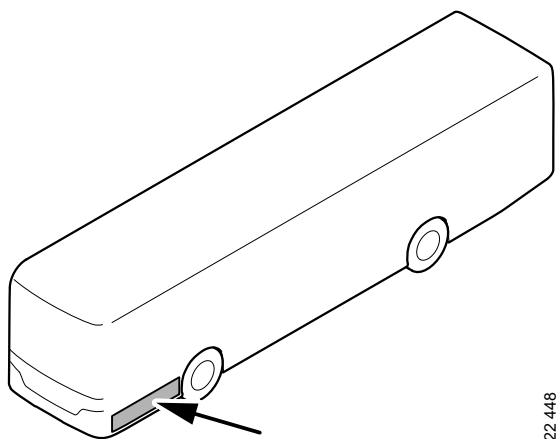
## Battery (24 V)

The vehicle is fitted with a pair of 12 V batteries connected in series, providing 24 V in total.

The capacity can vary depending on the vehicle specification.

If the vehicle does not have a battery master switch then the battery (- terminal) must be disconnected to switch off the voltage.

The location may vary depending on the vehicle body model. The front left- and right-hand sides are most common, but it may also be at the rear.



422 448



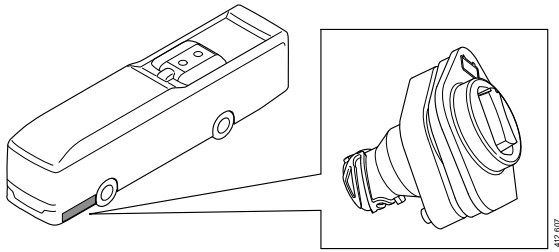
The vehicle may be fitted with a battery master switch. In most vehicles only the tachograph and the vehicle alarm are supplied with voltage when the battery master switch is activated.

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

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.

### Electrical system 24 V

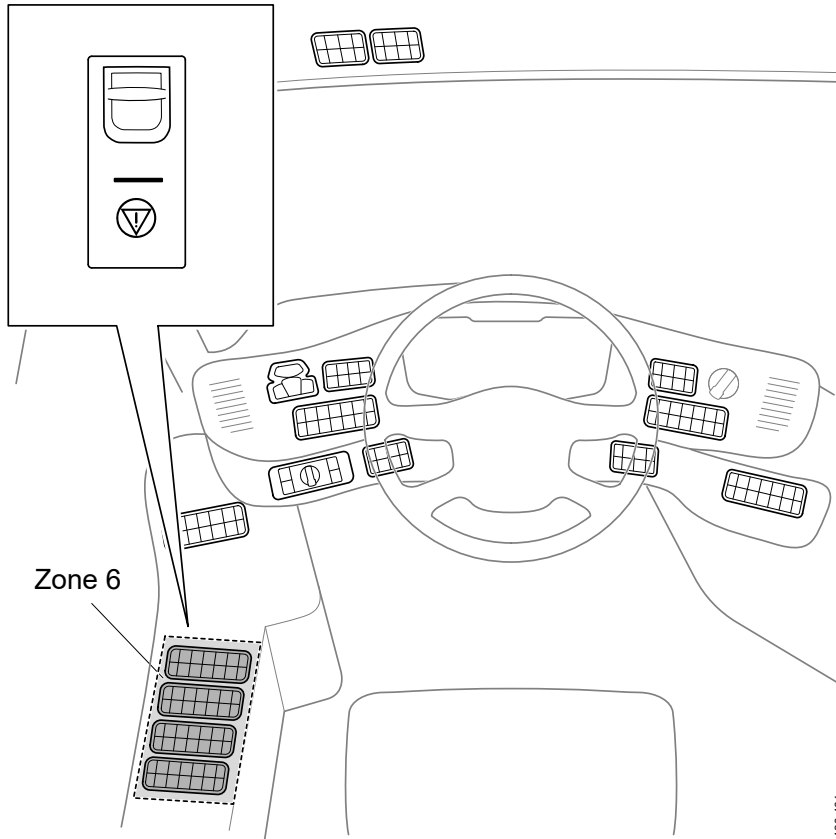
The switch for the battery master switch is located in the battery compartment





## Switch for battery master switch in the instrument panel

Some vehicles are also fitted with switches for the battery master switch in the instrument panel.





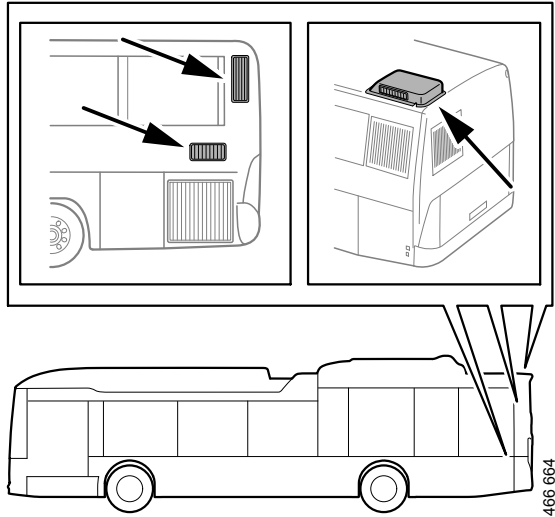


# Engine

## Engine air intake

The vehicle engine can be shut off by spraying carbon dioxide into the air intake.

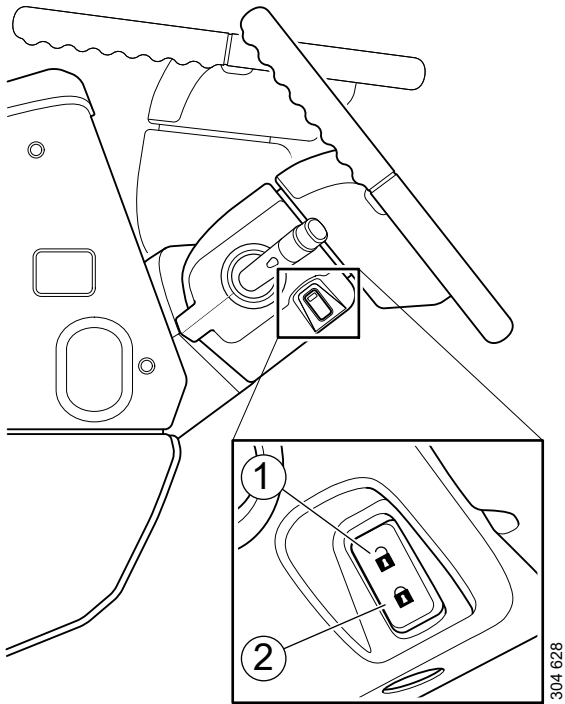
The air intake is located on the left-hand side of the bus or on the roof depending on bus model.





# Adjusting steering wheel

## Adjusting with button



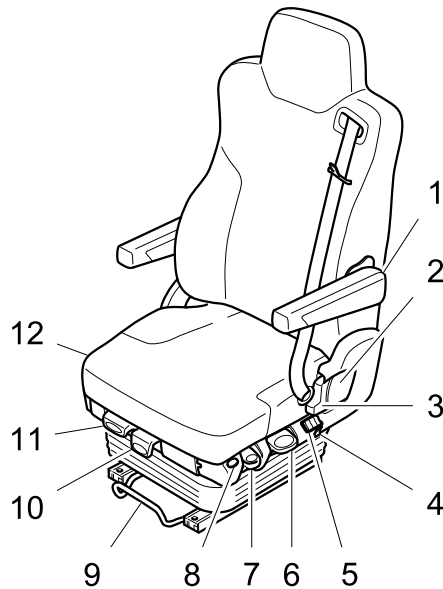
Proceed as follows to adjust the height and angle:

Press button (1). You can then adjust the height and angle for a few seconds. Press button (2) into the locked position to lock the setting. The settings are also locked automatically after a few seconds.



# Adjusting the seat

## Adjusting the seat



152579

- 1. *Folding, adjustable armrest*
- 2. *Backrest adjustment*
- 3. *Shoulder adjustment*
- 4. *Rotating function*
- 5. *Pneumatic backrest system*
- 6. *Height adjustment*
- 7. *Adjustable shock absorption*
- 8. *Quick lowering*
- 9. *Longitudinal setting*
- 10. *Setting the seat squab inclination seat depth*
- 11. *Setting the seat squab inclination*
- 12. *Seat heating*

Example of driver's seat, variants may occur depending on vehicle body model.



304 449

Control for quick lowering of the seat.

### **WARNING!**

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.

### **WARNING!**

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



## Adjusting the seat

---

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.



# 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.



441 429



441 430



## Pressurised vehicle gas, CNG



CNG stands for Compressed Natural Gas, Compressed Natural Gas.

The gas tank packages on a CNG gas vehicle consist of a number of gas tanks interlinked in one or more packages. The gas lines are connected to one or more filler nipples and to the vehicle gas panel. The gas in the lines and the gas tanks is compressed and may have a pressure of more than 230 bar. Operating pressure for a fully refuelled system is 200 bar. The pressure may, however, vary depending on the ambient temperature.

The gas tanks have a capacity of up to 375 litres per gas tank. Each gas tank has a valve unit, which serves as an inlet and outlet for the gas, and also a control. The gas tanks are made of a composite of fibreglass and carbon fibre and the design allows them to expand with the gas pressure. Since vehicle gas expands with the temperature, it is important to lower the pressure in a damaged gas tank as quickly as possible. A damaged gas tank can withstand pressure temporarily, but if the pressure is raised, e.g. by the sun, the gas tank may break. Therefore try to reduce the pressure in a damaged gas tank as rapidly as possible in a controlled and safe manner. The gas tanks are equipped with 2 safety valves in the valve units: one is activated by temperature and the other by pressure.

The gas tank package is located on the roof. CNG vehicles are marked at several points with a diamond-shaped symbol with the text CNG.

### Gas tank packages are available in 3 sizes.

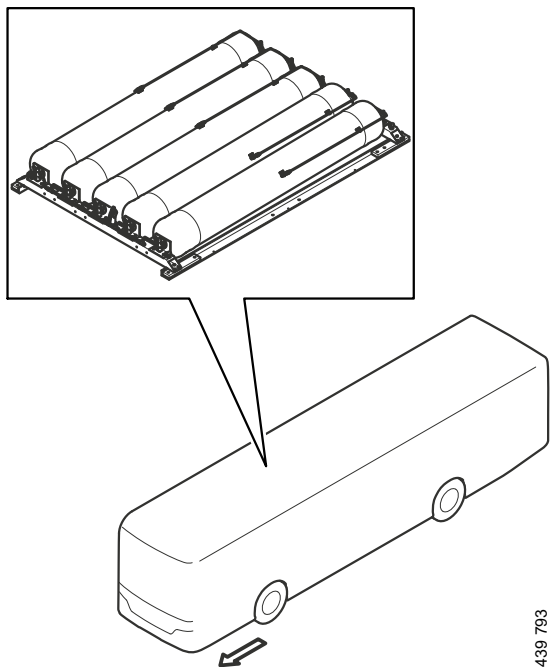
- 1,260 litres (4x315)
- 1,575 litres (5x315)
- 1,875 litres (5x375)

The 1,260 litre and 1,575 litre gas tank packages are intended for use on 2-axle buses. The 1,875 litre gas tank package is mainly used on 3-axle buses.

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



## Gas tank package



438 793



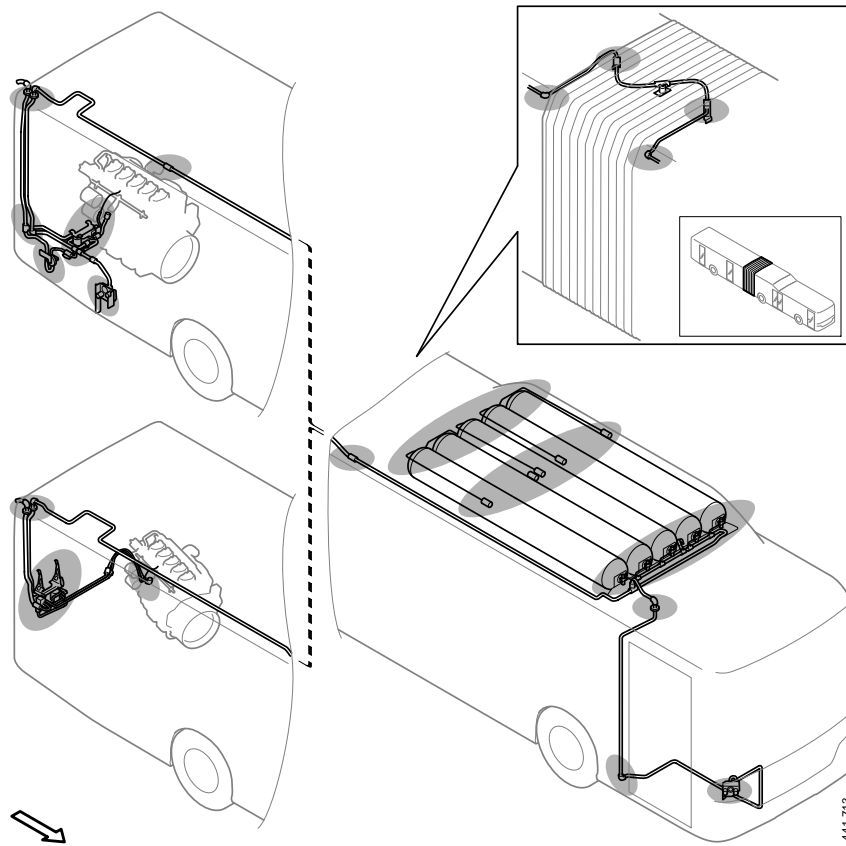
### **WARNING!**

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 are routed in the body from the roof to the engine compartment and filler nipples



*Examples of gas line routing and filler nipple locations, variants may occur depending on vehicle body model.*

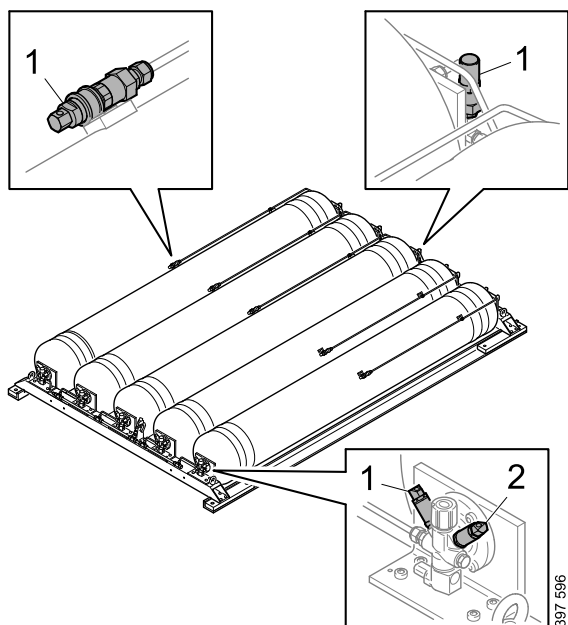




## Safety valves

### **WARNING!**

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



1. *Temperature fuse*
2. *Overpressure fuse*

The gas tanks are fitted with one or more safety valves.

The **temperature and pressure-activated safety valves** are directly connected to the gas tank. If the pressure in a gas tank exceeds 340 bar, the pressure activated safety valve opens and releases the gas in order to prevent an explosion. If the temperature exceeds 110°C, the temperature activated safety valve opens. **Therefore, do not cool the safety valves in the event of a fire.** The safety valves cannot be reset if they have been triggered.

The **pipe break valve** is located in the part of the valve unit inside the gas tank. If the pressure drops at the pipe rupture valve outlet compared to the inlet, e.g. if there is a leakage in the high pressure line, the pipe break valve is activated and limits the flow from the gas tank to the fuel pipe.

If the pressure exceeds 12 bar on the low pressure side, a safety valve in the gas regulator is also opened.



## Liquid vehicle gas, LNG



LNG stands for Liquefied Natural Gas. The fuel is cooled to -130 degrees and consists then 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.

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

### Gas tanks

The gas tanks are located in the cargo area.

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.

### Gas lines

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



## Safety valves



### **WARNING!**

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

Each tank is fitted with two overpressure valves at the rear. These are triggered at 16 bar and 24 bar. The safety valves are angled inwards and rearwards under the vehicle.

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.



## 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 equipped 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. Pressure 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 making holes in the tank from a safe distance.



#### **WARNING!**

Actions must be carried out by an authorised person with the correct training.



#### **WARNING!**

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 pressure gauge 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 of 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.


### **WARNING!**

Use a powder fire extinguisher.



---

# Hybrid vehicles

 **WARNING!**

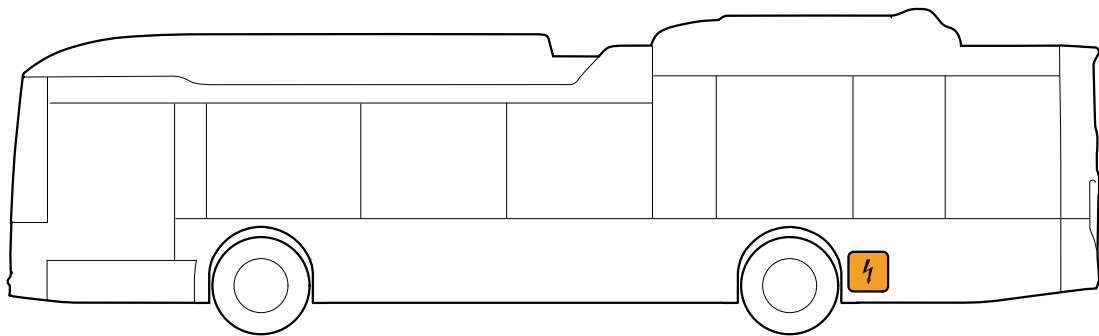
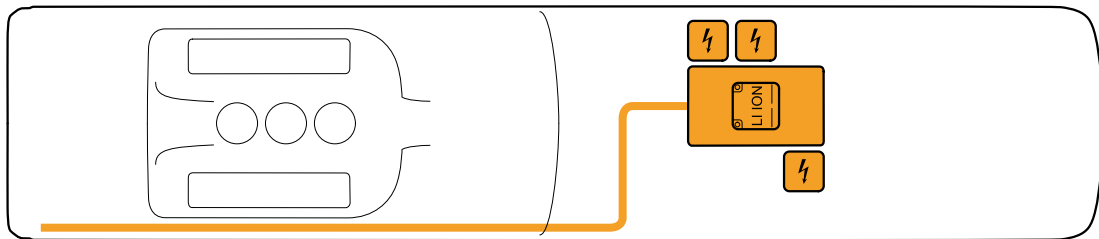
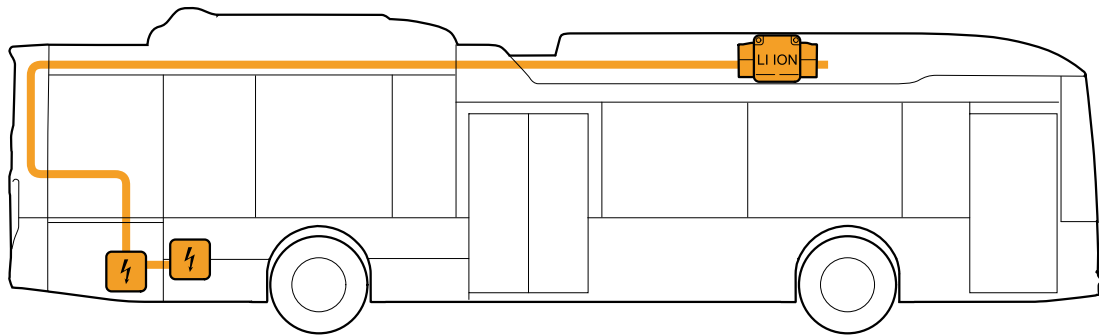
Wear eye protection and rubber gloves classified for 1,000 V when carrying out work with a risk of coming into contact with voltage class B.

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



Location of high voltage components



466 768

 <p>466 767</p>	 <p>466 766</p>	 <p>466 765</p>
High voltage components	Propulsion battery	High voltage cable harness (voltage class B 650V)

High voltage components

- Electric machine
- Inverter
- Direct current converter
- Central electric unit
- Heater propulsion batteries

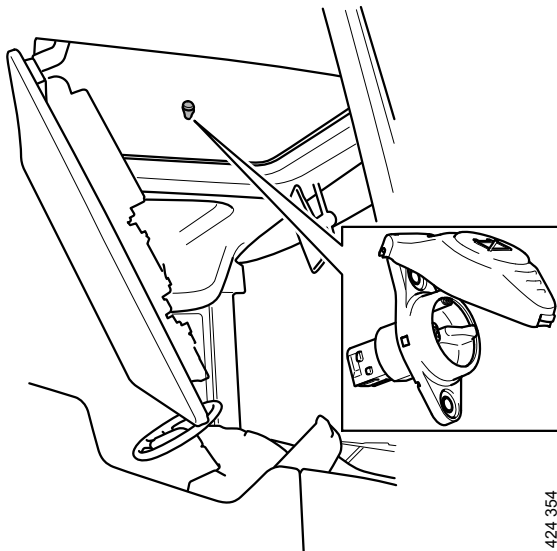




## Built-in safety devices

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 which involve a risk of electrical hazards 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 isolates the power to the cable harness if the 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 located by the central electric unit in the roof panel.





## **Procedure for extinguishing a fire**

### **In the event of a battery fire**

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

### **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 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 battery. It is important for the temperature of the 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!**

Wear eye protection 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 risk of personal injury.

Wear eye protection 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.

If the vehicle must be towed, detach the propeller shaft to ensure that the electric motor is disconnected.

- Turn off the ignition.
- Cut off the 24 V system by disconnecting the battery terminals on the 24 V batteries. The 24 V battery is located under the driver area and is accessible from outside the vehicle.

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.

- 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.

The propulsion battery is located on the roof.



## 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 valve in the cells to break, and flammable and corrosive gas is released via the battery pack ventilation duct.



---

# Electric vehicles

## Electric vehicles



### **WARNING!**

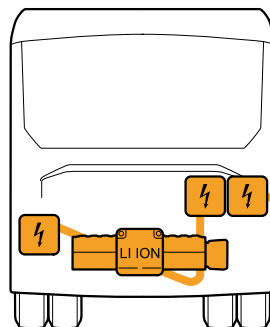
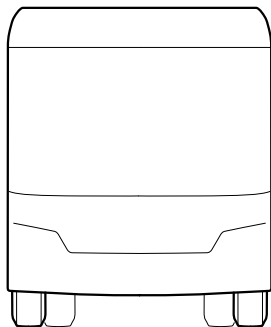
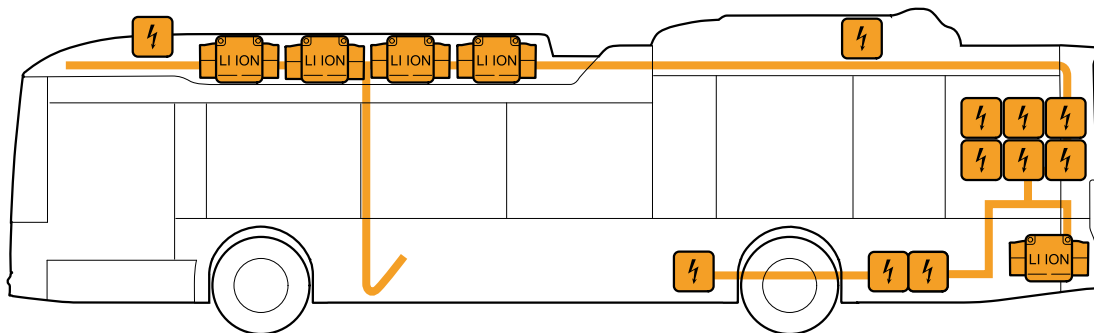
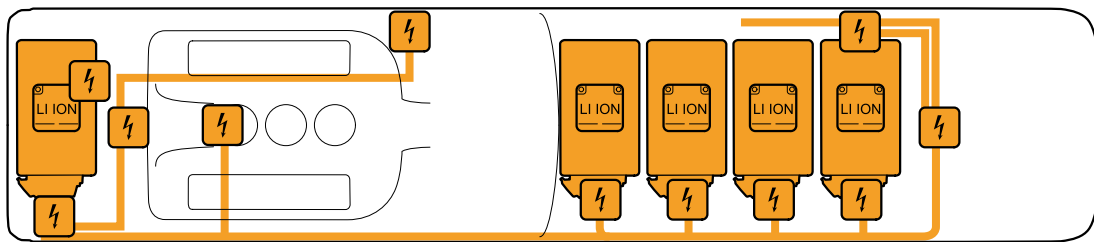
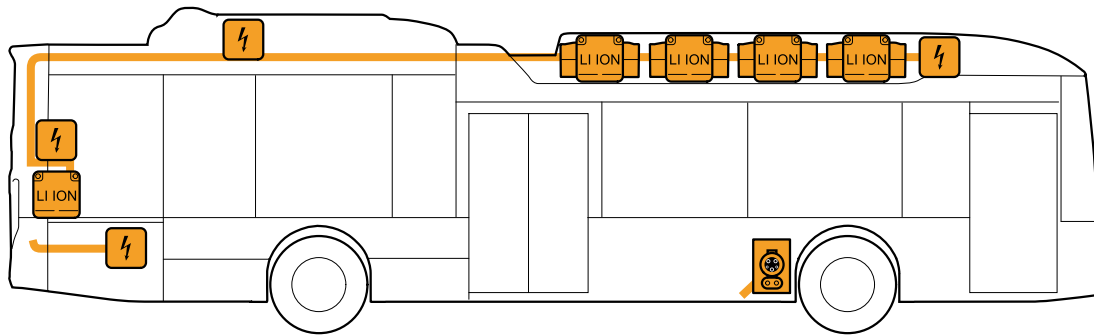
Wear eye protection and rubber gloves classified for 1,000 V when carrying out work with a risk of coming into contact with voltage class B.

The electric drive 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



Location of high voltage components





466 926

 <p>466 767</p>	 <p>466 766</p>	 <p>466 765</p>
High voltage components	Propulsion battery	High voltage cable harness (voltage class B 650V)



## Electric vehicles

---

 466 925	 466 924
Contact rails pantograph charging	Contact the socket (CCS) for DC charging. (The location may vary depending on the model)

### High voltage components

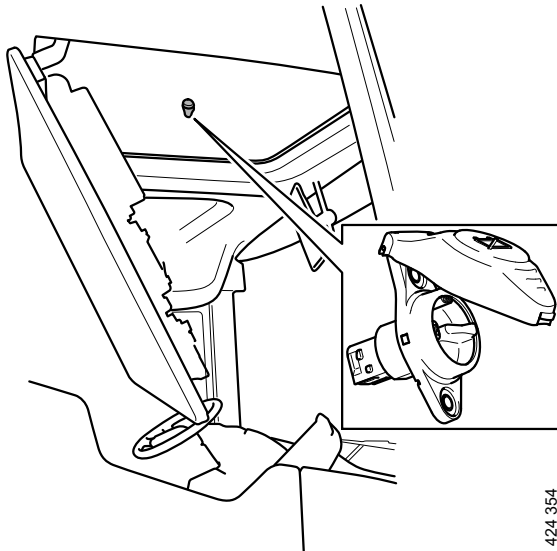
- Electric machine
- Inverter
- Direct current converter
- Central electric unit
- Contactor unit
- Defroster heater passenger area
- Heater propulsion batteries



## 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 electric drive system is switched off using the control switch located by the central electric unit in the roof panel.



424 354





## **Procedure for extinguishing a fire**

### **In the event of a battery fire**

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

### **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 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 battery. It is important for the temperature of the 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!**

Wear eye protection 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 risk of personal injury.

Wear eye protection and rubber gloves classified for 1,000 V.

### **WARNING!**

The electric machine always produces power if it starts rotating for any reason, even if the electric drive system is otherwise disconnected.

- Cut off the 24 V system by disconnecting the battery terminals on the 24 V batteries. The 24 V battery is located under the driver area and is accessible from outside the vehicle.

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.

- If the cable harness for voltage class B must be cut or becomes 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.

The propulsion batteries are located on the roof and at the rear of the bus.



## 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 valve in the cells to break, and flammable and corrosive gas is released via the battery pack ventilation duct.



# Recovery and shunting

## Recovery

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

Recovery should be entrusted to a recovery company authorised for heavy vehicles.

### **WARNING!**

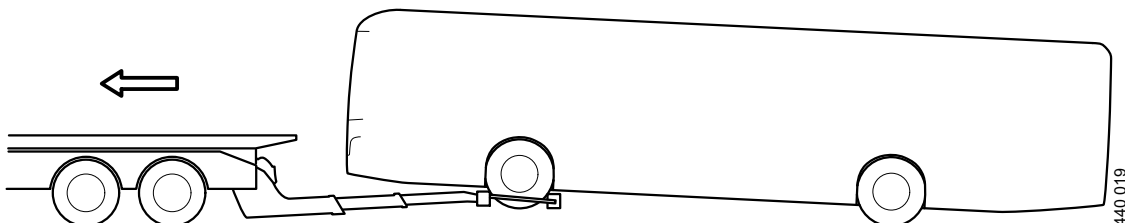
It is common for several of the vehicle functions to be disengaged or out of order during recovery and towing.

### **IMPORTANT!**

Detach the propeller shaft or half shafts if the vehicle is to be towed or recovered further than 500 metres. If you do not detach the propeller shaft or half shafts, the gearbox could be damaged. See section Detaching the propeller shaft and Removal – Half shaft.

### **IMPORTANT!**

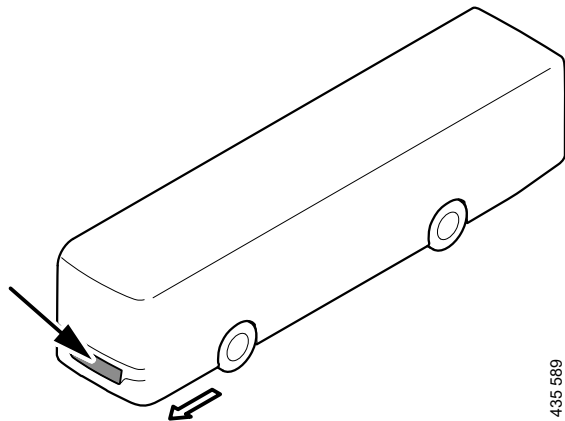
Do not lift on the towing brackets.



*Raising the wheels minimises the risk of damage to the chassis and body during recovery and towing*

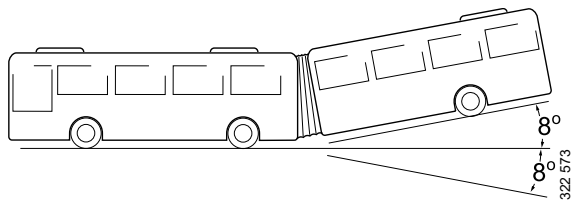
### **Preparatory operations**

- 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.

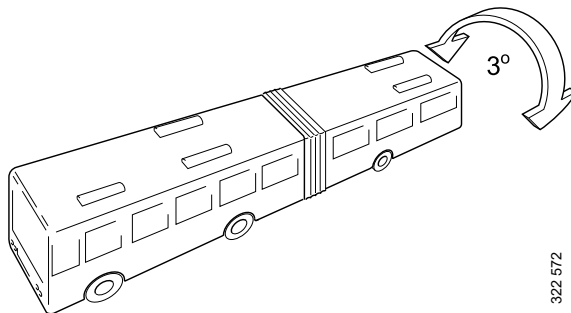


- When the VCB system is switched off using the switch, the electrical air compressor will be deactivated. The brake system must therefore be topped up with air in a different way. Recovery vehicles usually have an air outlet from which the vehicle to be towed/recovered can be supplied with air.

### Articulated bus, maximum incline and rotation angles



The chassis permits an incline angle of 8° in the articulation unit. Depending on bus bodybuilding, this angle may be smaller. Care must therefore be taken when lifting, so that this angle is not exceeded.



The chassis permits a rotation angle of 3° in the articulation unit. Depending on bus bodybuilding, this angle may be smaller.

### Alternative procedure for recovery of vehicles from a ditch:

- From front, vehicle with leaf spring suspension: During recovery from a ditch, the spring attachment on the front axle beam is a suitable towing point.
- From front, vehicle with air suspension: During recovery from a ditch, the front axle by the air bellows attachment is a suitable towing point.
- From rear and from side:



## Towing and shunting

Recovery is always preferable to towing. Towing should always be carried out with a drawbar.

### **WARNING!**

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

### **IMPORTANT!**

Detach the propeller shaft or half shafts if the vehicle is to be towed or recovered further than 500 metres. If you do not detach the propeller shaft or half shafts, the gearbox could be damaged. See section Detaching the propeller shaft and Removal – Half shaft.

### **WARNING!**

Vehicles without functioning brakes must not be towed.

### **IMPORTANT!**

Never tow with the clutch pedal depressed. The gearbox can be damaged.

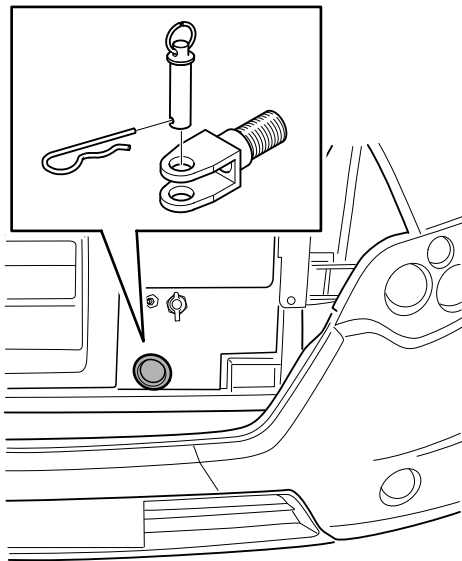
### **IMPORTANT!**

Tow-starting should not be carried out for more than 500 metres. Otherwise, the gearbox could be damaged through insufficient lubrication.

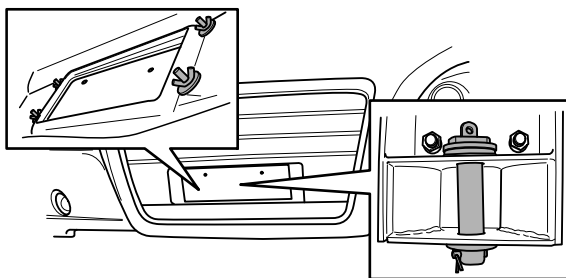
### **NOTE:**

The engine cannot be tow-started when the vehicle is equipped with an automatic gearbox.

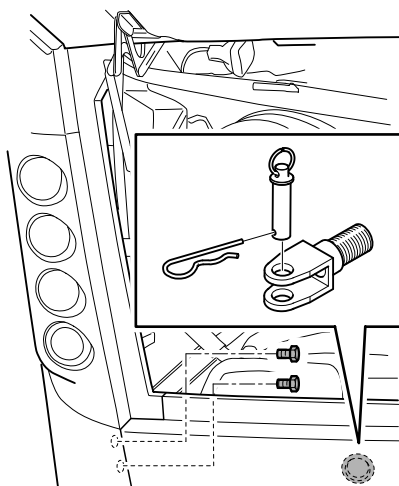
When towing, the tow pin should be used together with a drawbar. If possible, run the engine at idle speed to obtain power steering and air pressure in the brake system. The parking brake can be applied automatically in the event of the pressure in the brake system falls if it is released with air to the braking system. Therefore, if air is not continuously supplied from the towing vehicle, stop at regular intervals and charge the air system.



Example of front towing connection



Example of front towing connection



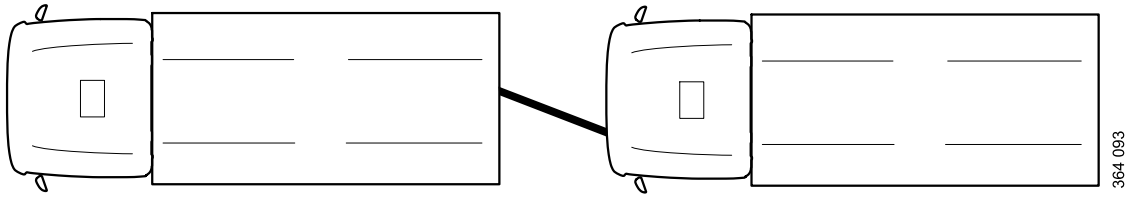
Example of rear towing connection

Stringent requirements are stipulated for the person steering the towed vehicle. The drawbar can turn in relation to the attachment. This can result in the vehicles colliding. The picture illustrates how the vehicles should be positioned in relation to each other during towing.



# Recovery and shunting

---







## Vehicles with electrohydraulically steered tag axle



### NOTE:

If the battery voltage of the towed vehicle is low, there is a risk that EST will not be able to be adjusted without connecting jump leads.

Switch off the voltage to lock the tag axle in its current position.

If the **yellow** system warning lamp is on:

- The tag axle is centred automatically when the yellow warning lamp is on.
- Switch off the power to lock the tag axle in the centred position.

If the **red** system warning lamp is on:

- The tag axle is self-steering or locked in the central position.
- In the case of a serious system fault, the tag axle may need to be centred manually.
  - Centre the tag axle manually or tow the vehicle straight ahead until the tag axle is centred. The ignition must be switched on when the centring is being done.
  - Switch off the power to lock the tag axle in the centred position.



## Electronic parking brake release

### **WARNING!**

When the parking brake is put out of action in this way, there is no parking brake function. The vehicle must therefore be prevented from rolling before the ball valve is opened.

Use a drawbar when towing

### **IMPORTANT!**

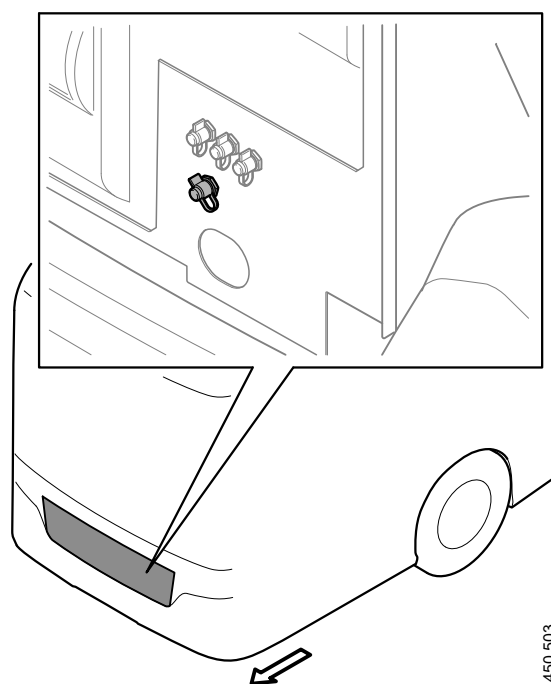
The 15 voltage must be switched off.

Manual release of the parking brake with external air.

The bus is fitted with a connection at the front for filling directly to the parking brake module.

In order for the air to reach the spring brake chambers, the ball valve for the parking brake circuit needs to be opened.

Place chocks on the wheels so that the vehicle cannot roll away when the parking brake is released.

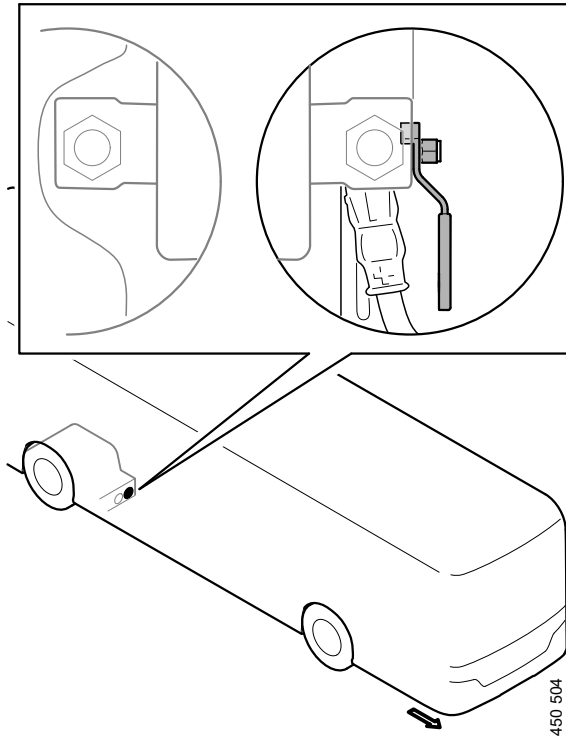


Connection for releasing the electronic parking brake

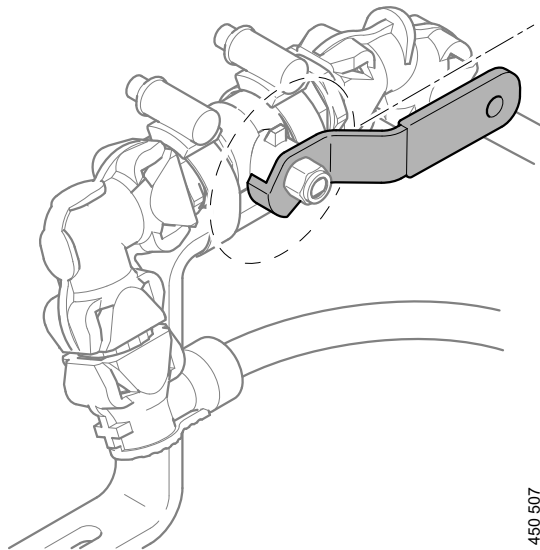
Connect compressed air to the parking brake module using its connection at the front. Note that the exact location of the connection may differ between different buses.



## Recovery and shunting

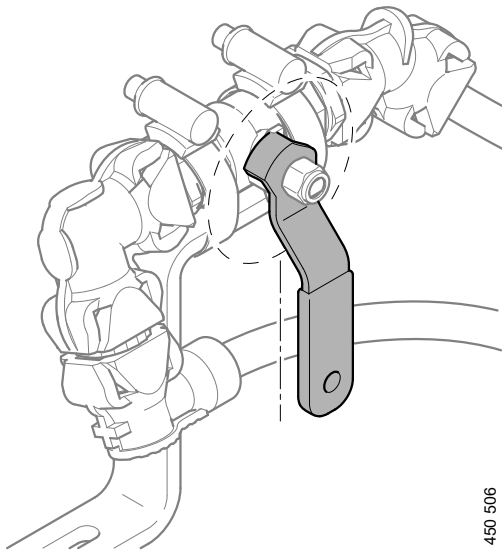


*The ball valve is accessed through the service hatch for the torque rod in front of the right-hand wheel housing.*



*Valve in open position*

Open the ball valve. The ball valve is accessed through the inspection hatch for the torque rod in front of the right-hand wheel housing.



Valve in closed position.

**⚠ WARNING!**

To actuate the parking brake again, the air must be drained via the same connection.

The parking brake is applied again by depressurising the supply line and closing the ball valve.

## Releasing the electronic parking brake on a vehicle without power, K chassis

### **WARNING!**

When the parking brake is put out of action in this way, there is no parking brake function. The vehicle must therefore be prevented from rolling before the ball valve is opened.

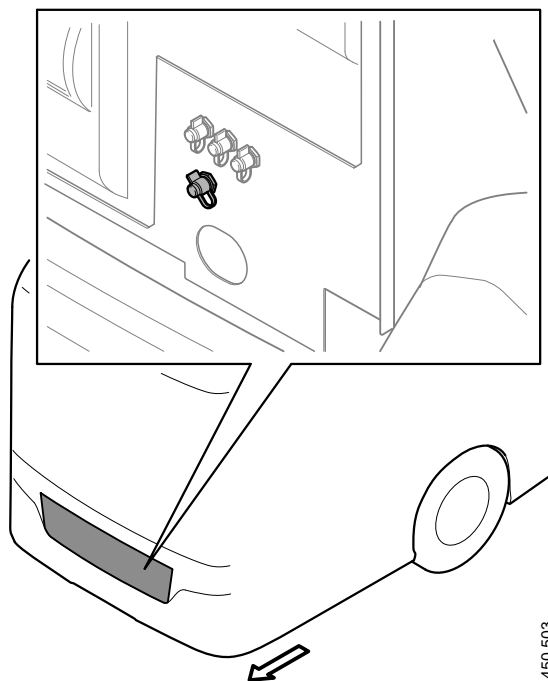
Use a drawbar when towing

Manual release of the parking brake with external air. Used, for example, on a vehicle without power.

The bus is fitted with a connection at the front for filling directly to the parking brake module.

In order for the air to reach the spring brake chambers, the ball valve for the parking brake circuit needs to be opened.

Place chocks on the wheels so that the vehicle cannot roll away when the parking brake is released.

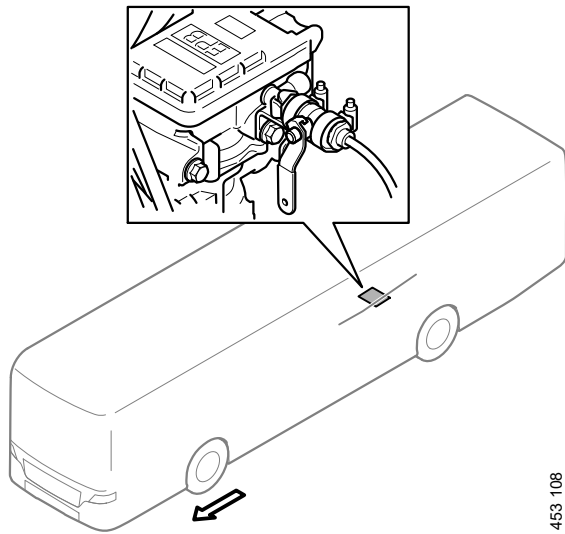


*Connection for releasing the electronic parking brake*

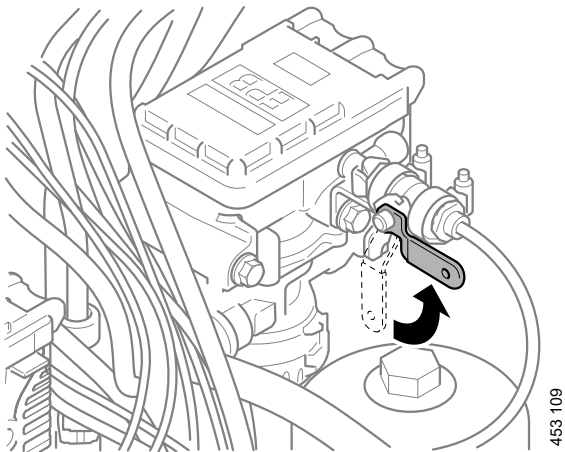
Connect compressed air to the parking brake module using its connection at the front. Note that the exact location of the connection may differ between different buses.



## Recovery and shunting

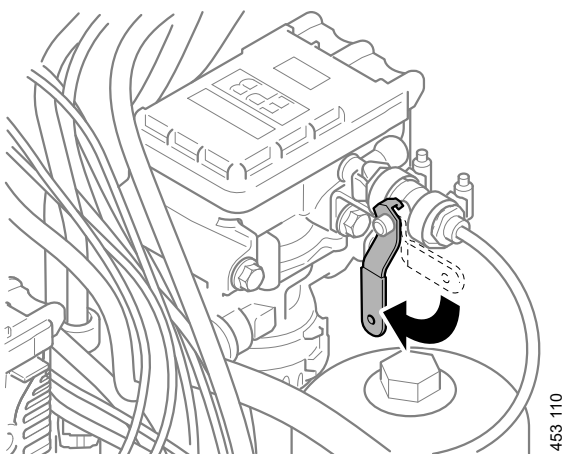


The ball valve is accessed through the service hatch for brake components located in the aisle in front of the rear axle.



Open the valve.

The vehicle can now be moved.



Valve in closed position.



### **WARNING!**

To actuate the parking brake again, the air must be drained via the same connection.

The parking brake is applied again by depressurising the supply line and closing the ball valve.

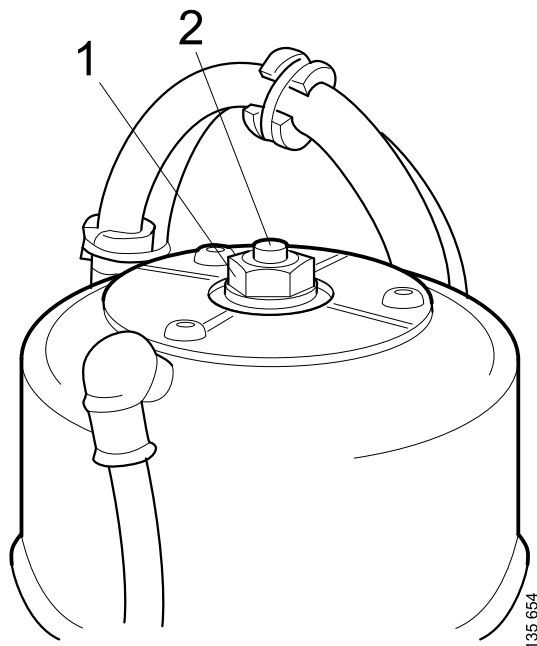
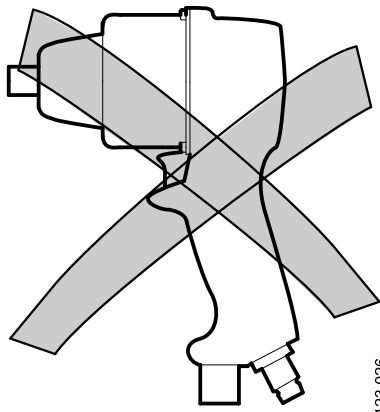


## Disabling the parking brake

If there is no other way of releasing the parking brake or if the vehicle needs to be towed some distance, the parking brake can be disabled using the release bolt in the spring brake chamber.

### **WARNING!**

When the parking brake is put out of action in this way, there is no parking brake function. The vehicle must therefore be prevented from rolling before the release bolts are unscrewed. Use a towing bar when towing.



Unscrew the release bolt until the parking brake is fully released on the relevant wheel.

### **WARNING!**

When the release bolts are screwed out, the vehicle has no parking brake on the wheels where the release bolt has been screwed out. Therefore, use wheel chocks to prevent the vehicle from rolling.





### **IMPORTANT!**

Danger of cross-threading. Clean and oil the bolt. Do not use a nut runner. If the bolt is damaged, the parking brake will not release even though the bolt is unscrewed.

The release bolts 1 are available in different versions. The release bolt is screwed out different lengths depending on the version. Screw until it stops. On certain versions there is a red pin 2 in the release bolt centre that indicates that the bolt is screwed out from its normal position.



## Releasing the parking brake with inoperative pneumatic system

If the compressed air system is deactivated, the parking brake can be released by refilling with air from one of the tyres or from another pneumatic system.

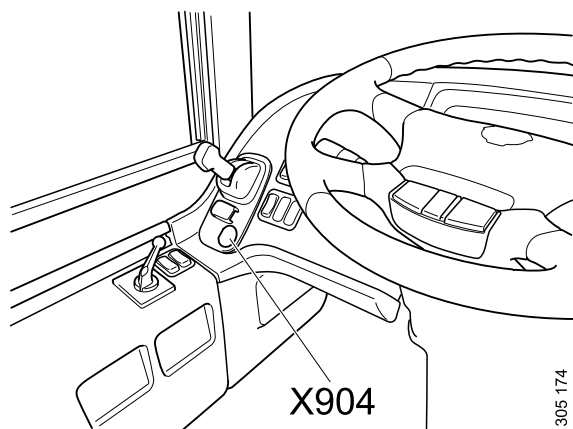
Air can be filled using the pressurising hose, which can be found in the tool equipment.

Connect the hose to one of the tyres and to the filler valve 28 or X904 on the instrument cluster. This enables the parking brake to be released for a short period of time.

### **WARNING!**

Do not tow the vehicle with the parking brake released with refilled air for long stretches because the brake will be applied if the air pressure drops.

The pressure indicator on the instrument cluster does not show the pressure in the parking brake circuit.



Position on bus.

305 174

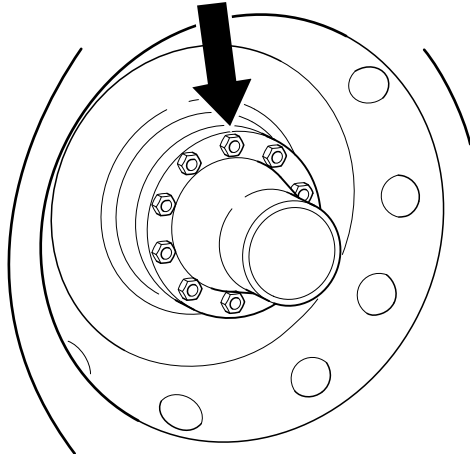


## Half shaft

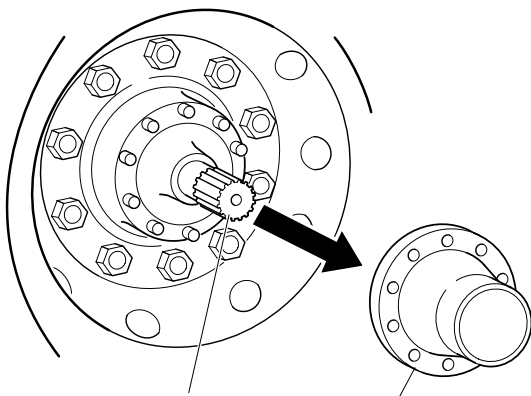
The half shafts must be removed on both the left-hand and right-hand sides.

Apply the parking brake.

Clean the area around the half shaft flange.



Remove nuts and cones. Knock the edge of the flange if the cones are stuck.



1. Half shaft flange
2. Half shaft

Remove the half shaft flange.

Remove the half shaft.

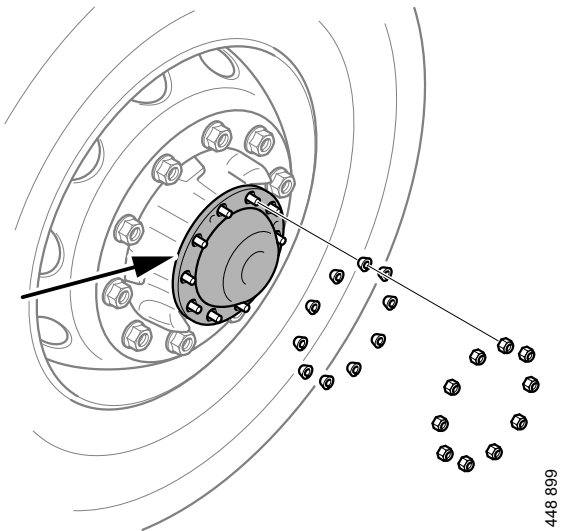
Refit the half shaft flange which keeps dirt out.

## Half shaft with built in flange

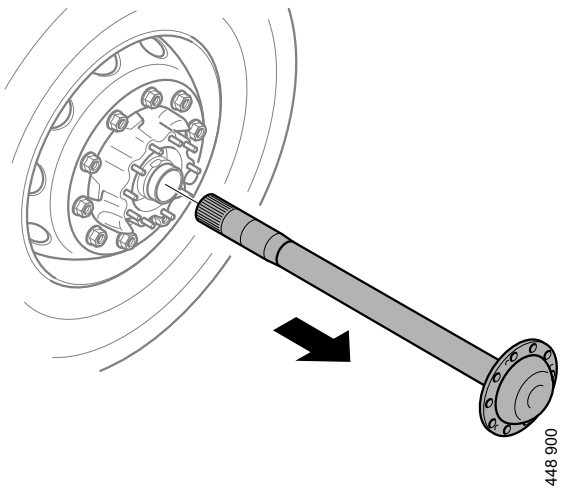
The half shafts must be removed on both the left-hand and right-hand sides.

Apply the parking brake.

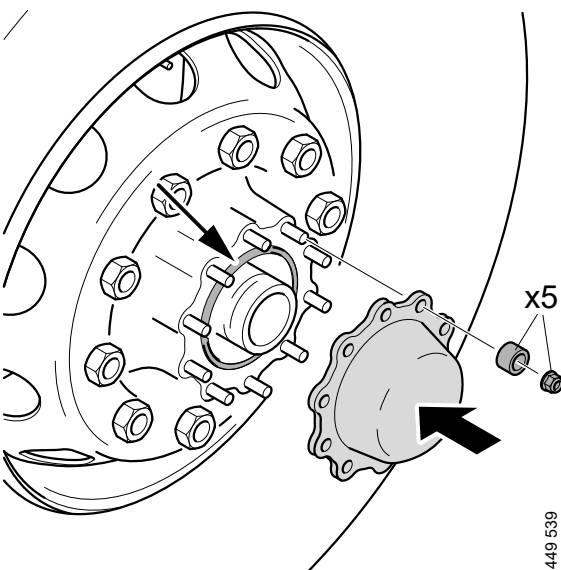
Clean the area around the half shaft flange.



Remove nuts and cones. Knock the edge of the flange if the cones are stuck.



Remove the half shaft.





**When towing:**

Fit a protection cover, e.g. 2 290 533 with O-ring and nuts.

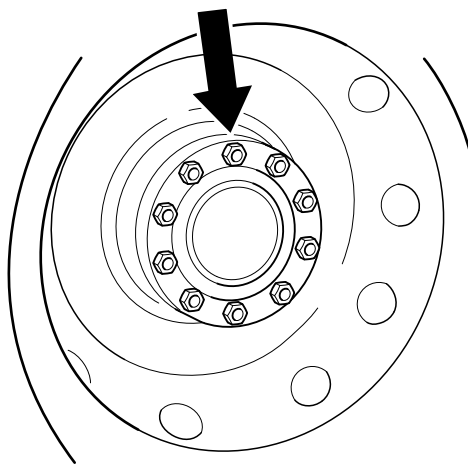
Use spacers (e.g. cones) between the nuts and the protection cover. 5 nuts per hub is sufficient.

**Portal axle**

The half shafts must be removed on both the left-hand and right-hand sides.

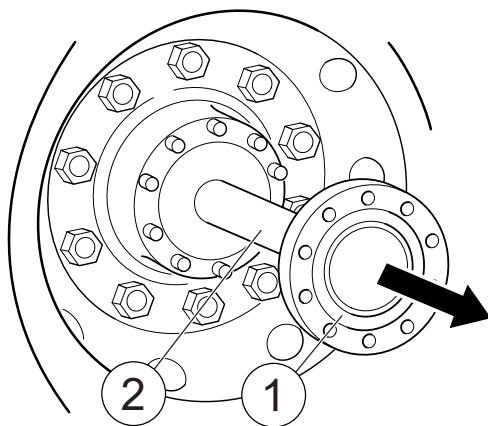
Apply the parking brake.

Clean the area around the half shaft flange.



378 932

Remove nuts and cones. Knock the edge of the flange if the cones are stuck.



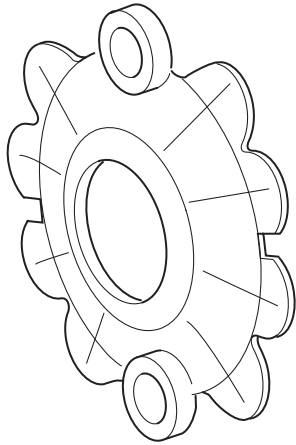
- 1. Half shaft flange
- 2. Half shaft

Remove the half shaft flange with the half shaft



## Recovery and shunting

---



Fit a cover with Scania part no. 1 850 975 to protect against dirt. Tighten the nuts to 100 Nm.