Rescue Guide

Bus

Engineering the Future - since 1758.

MAN Truck & Bus

1 Printer's imprint

If you have questions or suggestions regarding these recovery guidelines, please contact the Technical Documentation department on the following address:

MAN Truck & Bus AG
Technische Dokumentation SAWD
Dachauer Strasse 667
D-80995 München
email: virtbus@de.man-mn.com
Internet: www.mantruckandbus.com

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3.1 Preface

These rescue guidelines are a manufacturer-specific technical document; they are not a maintenance or repair manual. The concept is exclusively intended for rescue personnel in their specific field of work at the accident site.

These rescue guidelines apply to left-hand drive vehicles only.

The rescue guidelines contain information from after-sales documentation, and the descriptions provided are applicable to a vehicle functioning in perfect technical condition. External circumstances and the accident itself mean that the specific conditions and thus the risks cannot be foreseen by MAN; for this reason, they are not described explicitly. The descriptions of the technical measures on MAN vehicles are in line with the current state of the art.

Equally, the safety instructions and accident prevention regulations must be complied with in accordance with the rescue personnel's working regulations. These are not described in these rescue guidelines.

The procedures and rescue measures shown in this documentation have been carried out in cooperation with rescue personnel, and only represent one possible way of carrying them out. MAN does not accept any liability for their use. These measures are in accordance with the techniques and knowledge applied at the time of publication; they may have to be updated based on new experience as a result of new technologies and incidents.

All safety instructions are grouped together in a separate chapter in order to make it easier to read the descriptions. This is intended to make it possible to access the specific technical information efficiently when this is important. The other applicable safety instructions precede the instructions, and must be complied with depending on the particular task in hand.

MAN expressly distances itself from claims arising from the use of information in these rescue guidelines. In an accident, it is never possible to predict what damage will be incurred by vehicle components or electrical and electronic systems; consequently, it is not possible to predict the effects of accidents in a defined way. The measures derived from this description are thus always carried out under the responsibility of the operational commander in question.

MAN Truck & Bus AG

Technische Dokumentation SAWD

3 Preface and safety instructions

3.2 Safety instructions

The must important principle for rescue operations is safety as well as protection against additional dangers for occupants and rescue personnel. As a result, the following safety instructions must be read attentively and followed.

3.2.1 General notes on safety

Beware of burns!

- Do not touch an engine with your bare hands when it is at operating temperature. Danger of burns!
- Do not get close to the exhaust system when the engine is hot, since the exhaust becomes hot during operation and represents a danger of burns.
- Hot coolant can emerge if there are leaks on the cooling circuit! Keep at a safe distance and switch off the engine if necessary, otherwise there is a risk of burns. Eye and hand injuries could be caused. Wear suitable protective clothing (protective glasses, leather gloves).

Danger of accidents and injury!

If the vehicle is not secured to prevent it from rolling away, it may start to move. People could become trapped. The vehicle must be secured to prevent it from rolling away.

Danger of accident and injury when working at greater heights.

- Make sure that ladders, steps, mobile ramps, etc. are securely positioned.
- Secure them to prevent falling.

Danger of accidents and injury!

Only press the emergency off switch when stationary. The vehicle is not ready for use when the engine is stopped with the power steering, ABS, gearbox, etc. deactivated.

The parking brake must be applied, otherwise the vehicle could roll away. People could fall and become trapped. Risk of trapping body parts.

Danger of accidents!

The ECAS (electronically controlled air suspension) system continues to control the vehicle height for up to approx. 10 minutes after the ignition has been switched off. Deactivate the ECAS system before lifting the vehicle (switch off the mechanical battery isolator switch).

Do not switch on the ignition of a vehicle that is lifted. The ECAS system would attempt to regulate the height level.

This could cause the vehicle to slide off the jack or support blocks, etc., leading to injury to personnel and damage to the vehicle.

3.2.2 Handling batteries

Danger of injury!

- Keep away sources of fire, sparks and naked flames when handling batteries! Do not smoke!
- Take particular care after long journeys or after charging the batteries with a battery charger. Highly explosive oxyhydrogen gas may form. Always ensure adequate ventilation.
- Take care not to generate any sparks when connecting and disconnecting electrical consumers or measuring devices directly on the battery terminals.
- Batteries contain corrosive acid! Wear suitable protective clothing, protective glasses as well as acid-resistant rubber gloves.
- Do not tilt batteries. Acid can leak out of the ventilation holes.
- Always wear eye protection when working with batteries.
- Switch off all loads before connecting and disconnecting batteries. Switch off the battery isolator switch.
- Disconnect the earth connection (–) first.
- Avoid short circuits which might be caused by reversed polarity and establishing contact with tools.
- Do not remove terminal covers unless really necessary.
- When connecting batteries, connect the earth connection (–) last.

3.2.3 Safety precautions for protection against electrical voltages

"Hazardous Voltage" warning sign

Components and parts marked with this sign may be dangerously live.

Danger of fatal injury!
Working on the high-voltage system involves a risk of fatal injury by contact with live parts.
The electrical system in hybrid vehicles falls under voltage class B with voltages in excess of 60 VDC and 25 VAC. Disconnect the high-voltage electrical system of the vehicle from the high-voltage traction energy storage system and de-energize in case of any risk (damage to the vehicle structure, particularly in the rear, roof and underfloor areas) and before commencing work on the high-voltage system.
Work on the high-voltage electrical system of the vehicle including its disconnection from the high-voltage traction energy storage system shall be performed by trained and qualified personnel only.
Lethal voltages still prevail in the high-voltage traction energy storage system even when the high-voltage electrical system has been de-energized!
The high-voltage traction energy storage system is not discharged by de-energizing the high-voltage electrical system of the vehicle!
Never cut through orange-coloured high-voltage cables. Cutting these cables may cause fatal or irreversible injury.

Danger of fatal injury!
Danger of fatal injury by electric shock. Never touch live parts of the high-voltage system.
- Never reach inside live areas.
- Never touch or work with liquids in the vicinity of live cables or components.
- Ensure that your body is adequately isolated when working in live areas.

Danger of fatal injury!
Hazardous voltages still prevail in the high-voltage traction energy storage system and in the high-voltage electrical system of the vehicle even when the high-voltage electrical system has been disconnected.
The traction energy storage system with its six Ultracap modules, contactor box and UCM control unit is not discharged. Never attempt to perform any kind of work on this system.
The high-voltage electrical system of the vehicle discharges itself after approx. 5 to 10 minutes.
Check that no voltage is present in the high-voltage electrical system of the vehicle before commencing work. Never work on the high-voltage electrical system of the vehicle without first ensuring the absence of voltage.

Danger of accidents and injury!
Strong ultra-violet radiation resulting from electric arcing may cause electro-ophthalmia and 1st or 2nd degree burns. Never touch faulty or damaged insulation.
Uncontrolled arcing results e.g. from short-circuits, faulty or damaged cable insulation or components, and human error.
Arcing resulting from a fault in the electrical system or electrical equipment is referred to as an arcing fault.
Temperatures within the arc may exceed 4000 °C.
Metallic parts are vaporized in the fraction of a second and are expelled at high speed under the effect of the electromagnetic field.

3.2.4 Fire-fighting procedures for acetonitrile

Take special care if the high-voltage traction energy storage system (on buses with hybrid drive) is damaged by fire!

The Ultracap storage modules of the high-voltage traction energy storage system contain liquid acetonitrile. Suitable extinguishing agents are CO_2, powder and foam.

Danger of fatal injury!
The following may develop in case of fire:
– Toxic gases such as hydrogen cyanide (prussic acid) and nitrous gases.
– Explosive mixtures combined with air or oxygen.

3.2.5 Safety instructions for gas operation

Danger of fire and explosion!
Gas is highly flammable. Gaseous fuel is compressed for storage in the system. Special safety precautions must therefore be taken when working on the gas system depending on the type of fuel used:
- ▶ Smoking, naked flames and inflammable lights are strictly prohibited in the area of the tanks.
- ▶ Shut off the tank supply manually in case of leakage. Repair any leaks immediately.
- ▶ Gas is a health hazard. Avoid contact with fuel (skin and clothing).

Danger of accidents!
Take all necessary general precautions before commencing any special activities pertaining to a damaged gas system. Failure to do so may endanger human life.
Never attempt to restart the engine if gas pipework has been fractured. Restarting the engine activates the gas cylinder valves. All the gas cylinder valves are then open and gas can escape from the fractured pipework and ignite.
The flow limiter or rupture safety valve respond automatically in the event of gas pipework fracture depending on the system used.
Manually shutting off the valves on the roof prevents any gas from escaping. This is a job for trained and qualified personnel only.

3.2.6 Exhaust systems

Fire risk!
Operating the vehicle gives rise to high exhaust temperatures, and the exhaust system gets hot. Flammable materials can catch fire.
- ▶ Never stop or park the vehicle in the area of flammable materials, e.g. areas covered with grass or other vegetation, if the vehicle has been operating and the exhaust system is hot.
- ▶ Never operate the vehicle in the area of flammable materials, e.g. areas covered with grass or other vegetation, not even with the engine idling.

Fire risk!
High exhaust temperatures and the hot exhaust system of the auxiliary heater can cause flammable materials to catch fire.
- ▶ Never stop or park the vehicle in the area of flammable materials, e.g. areas covered with grass or other vegetation, if the auxiliary heater is in operation, was operating recently beforehand, or if you intend to operate the auxiliary heater.
- ▶ Make sure that the auxiliary heater will never be taken into operation by programmed start times if the vehicle is stopped or parked in the area of flammable materials, e.g. areas covered with grass or other vegetation.

3.2.7 Braking resistor

Risk of injury!
The braking resistor in the engine compartment may reach temperatures of around 100 °C.
This represents a risk of burning.
- ▶ Eliminate any risk of suffering burns by waiting until the braking resistor has cooled down to around 30 °C before commencing work on or in the vicinity of the braking resistor.
- ▶ Adopt suitable safety measures.

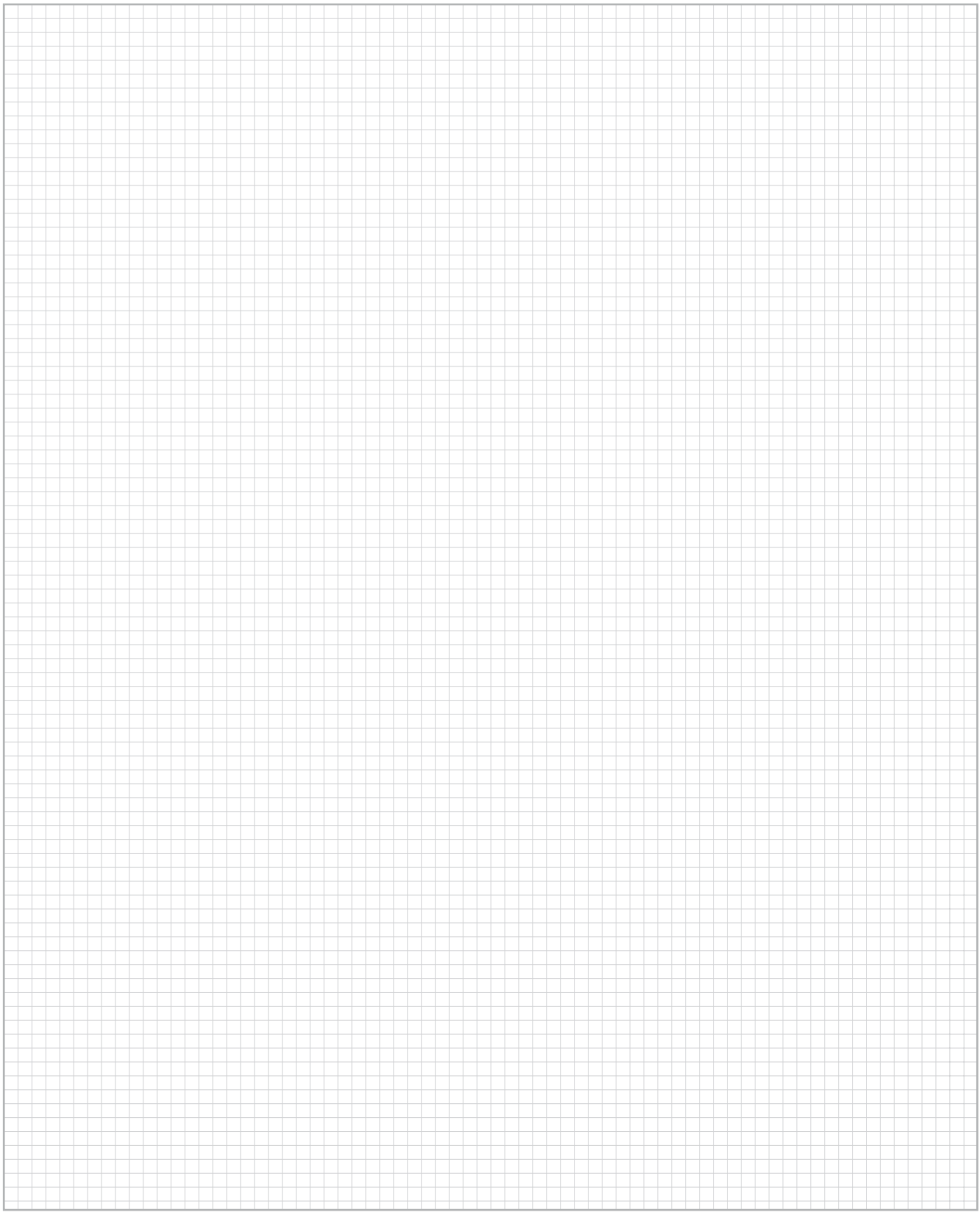
3.2.8 Rescue operations

Danger of injury!
Cutting though parts of the bodywork produces sharp cutting edges.
Danger of injury to occupants and helpers.
- ▶ Use suitable protective covers or pillar protection to cover sharp-edged cutting points.
- ▶ For the helpers' own safety, they must always wear suitable protective equipment such as protective clothing, protective glasses and gloves.

Risk of injury!
Cutting vehicle windows can lead to tiny, sharp-edged glass particles being created which can cause injury to the occupants and helpers.
- ▶ Cover the vehicle occupants with a foil.
- ▶ For the helpers' own safety, they must always wear suitable protective equipment such as protective clothing, protective glasses, gloves and mouth protection.
- ▶ Remove any residual glass from the working area immediately after removing windows. Sweep any residual glass away from the working area to preclude any risk of slipping.

Risk of injury!
Vehicle windows can burst open spontaneously when adjacent components are being cut or bent using rescue equipment. This can lead to tiny, sharp-edged glass particles being created which can cause injury to the occupants and helpers.
- ▶ Remove windows.
- ▶ Cover the vehicle occupants with a foil.
- ▶ For the helpers' own safety, they must always wear suitable protective equipment such as protective clothing, protective glasses and gloves.

Notes



4 Drive systems

4.1 Diesel drive system

4.1.1 Tank system, City/Intercity bus

Standard fuel tanks have a filling capacity of between 220 and 350 litres depending on the vehicle model. Tanks with a filling capacity of up to 450 litres are available as special equipment.

Lion‘s City 2-door
Lion‘s City Ü

The standard tanks are located in the area behind the driven axle or behind the front axle. The auxiliary tanks are located behind the driven axle. The tanks can only be filled on the right side of the vehicle.

Lion‘s City L/L LE
Lion‘s City C/C LE
Lion‘s City 3-door

The standard tanks are located in the area in front of the driven axle or behind the front axle. The auxiliary tanks are located in front of the driven axle. The tanks can only be filled on the right side of the vehicle.

Lion‘s City M
Lion‘s City Hybrid

The standard tanks are located in the area in front of the front axle (wheel housing tank) or behind the front axle. The auxiliary tanks are located behind the front axle. The tanks can only be filled on the right side of the vehicle.

Lion‘s City DD

The standard tanks are located in the area in front of the driven axle. The tanks can only be filled on the right side of the vehicle.

Lion‘s City G/G LE
Lion‘s City GL/GL LE

The standard tanks are located in the area behind the articulation. The auxiliary tanks are also located behind the articulation. The tanks can only be filled on the right side of the vehicle.

Lion‘s City T/LE
Lion‘s City TÜ/LE Ü

The standard tanks are located in the area in front of the driven axle. The tanks can only be filled on the right side of the vehicle.

4 Drive systems

4.1 Diesel drive system

4.1.2 Tank system, coach

Standard fuel tanks have a filling capacity of between 300 and 600 litres depending on the vehicle model. Auxiliary tanks with a filling capacity of between 270 and 400 litres are available as special equipment.

Cityliner/Starliner

The standard tanks are located in the area of the front axle in the middle of the vehicle. The auxiliary tanks are located behind in transverse arrangement on the left side of the vehicle. The tanks can be filled via a filler neck on the right and left sides of the vehicle respectively.

Lion‘s Coach/Tourliner

The standard tanks are located behind the filler neck on the right side of the vehicle in front of the front axle. The auxiliary tanks are located adjacently towards the middle of the vehicle.

Skyliner

Standard and auxiliary tanks are located on the right and left behind the front axle. The tanks can be filled via a filler neck on the right and left sides of the vehicle respectively.

4 Drive systems

4.1 Diesel drive system

The number, filling capacities and materials used for standard and special fuel tanks vary depending on vehicle model and use.

Overview		
	Filling capacity	
Model/series	**Standard equipment**	**Special equipment**
Lion‘s City Lion‘s City Hybrid 2-door Lion‘s City Hybrid 3-door Lion‘s City C/C LE Lion‘s City G/G LE Lion‘s City GL/GL LE Lion‘s City L/L LE Lion‘s City M/Ü	220 - 350 litres	360 - 450 litres Auxiliary tank 35 - 81 litres
Lion‘s City T/LE Lion‘s City TÜ/LE Ü	300 litres	233 + 67 litres 125 + 175 litres Heating oil tank 30 litres
Lion‘s City DD	360 litres	-
Lion‘s Coach	400 litres	525 litres Auxiliary tank 185 litres
Lion‘s Regio Lion‘s Regio C/L	300 litres	210 litres 270 litres with 47-litre auxiliary tank for auxiliary heating
NEOPLAN Cityliner NEOPLAN Cityliner C NEOPLAN Cityliner L	480 litres	Auxiliary tank 400 litres Auxiliary tank for auxiliary heater 50 litres
NEOPLAN Tourliner SHD NEOPLAN Tourliner SHDC NEOPLAN Tourliner SHDL	480 litres	Auxiliary tank 400 litres Separate tank for auxiliary heater 50 litres
NEOPLAN Skyliner	2 x 360 litres	630 litres Separate tank for auxiliary heater 48 litres
NEOPLAN Centroliner DD	600 litres	-
NEOPLAN Trendliner Ü/ÜC/ÜL	300 litres	210 litres 270 litres with 47-litre auxiliary tank for auxiliary heating
NEOPLAN Starliner C/L	480 litres	Auxiliary tank 400 litres Separate tank for auxiliary heater 50 litres

4 Drive systems

4.2 CNG drive system

4.2.1 Tank system

The Lion‘s City CNG series is equipped with a gas drive system. CNG — Compressed Natural Gas — is a naturally occurring gas which is highly compressed by means of compressors.

The gas storing system is installed on the roof.

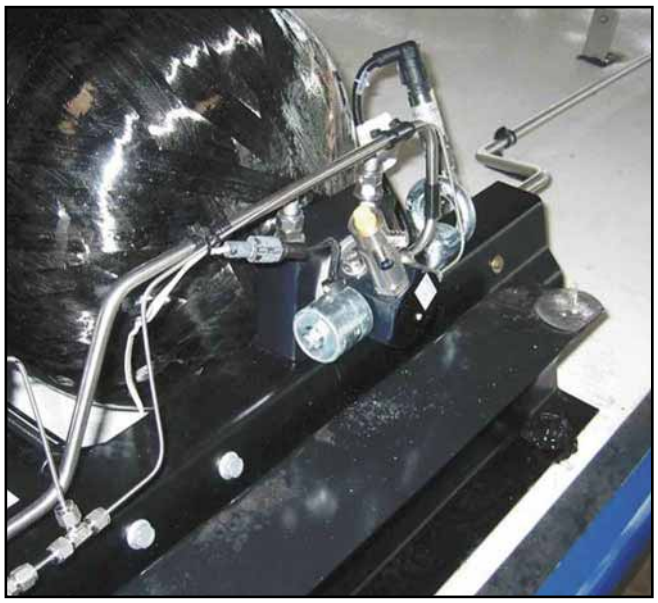
Three different types of gas tank are used:

- Aluminium composite tanks
- Steel composite tanks
- Synthetic composite tanks

Between 4 and 10 tanks with volumes ranging between 181 and 294 litres are installed depending on design.

Safety valve

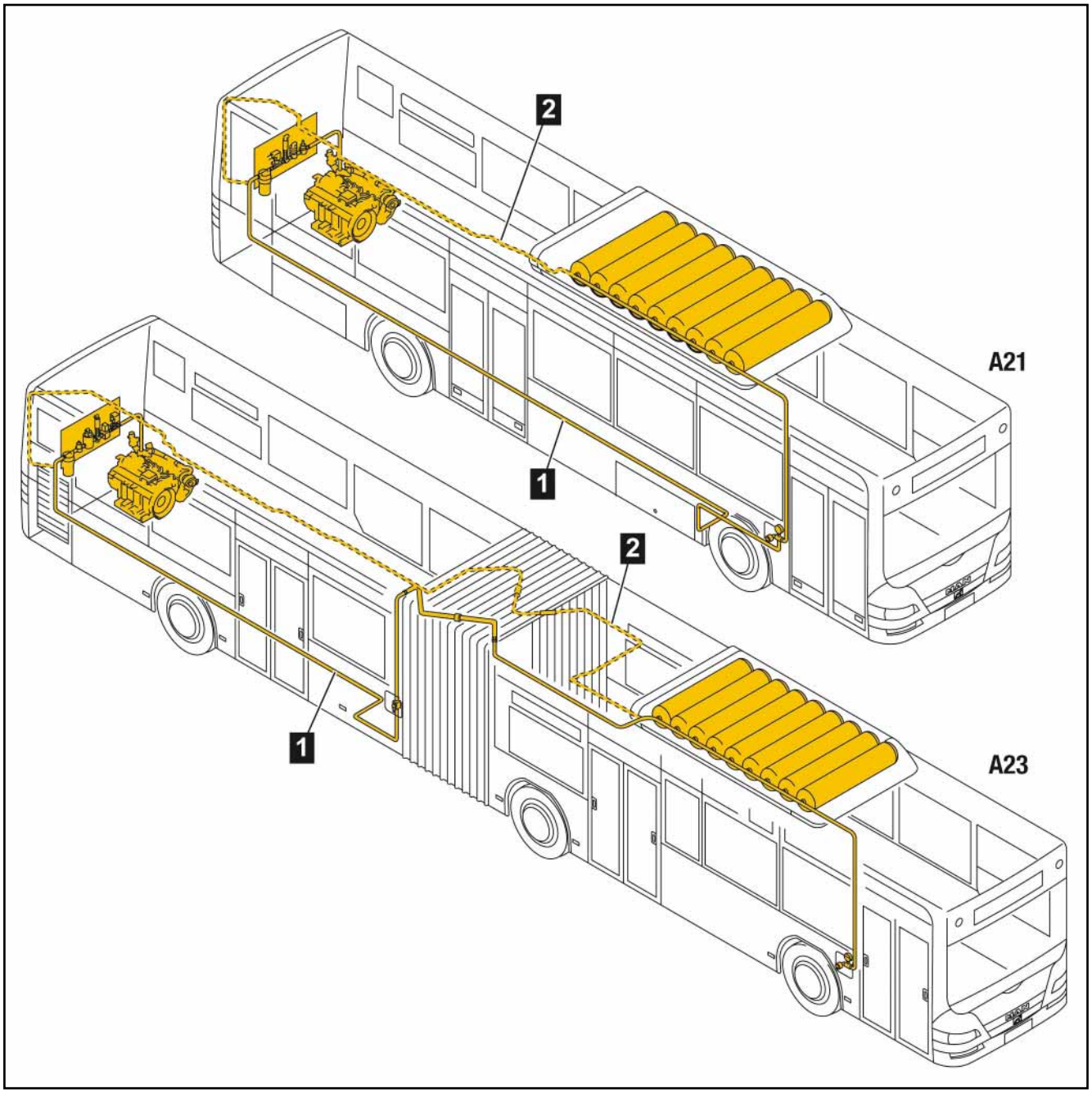
The gas tank features an electrically-actuated safety valve. The gas tank is automatically shut off on switching off the ignition.



Gas tank with safety valve

4 Drive systems

4.2 CNG drive system



Overview of a CNG drive system using Lion‘s City CNG by way of example

A21 Lion‘s City

A23 Lion‘s City G

1 up to mid-2010

2 after mid-2010

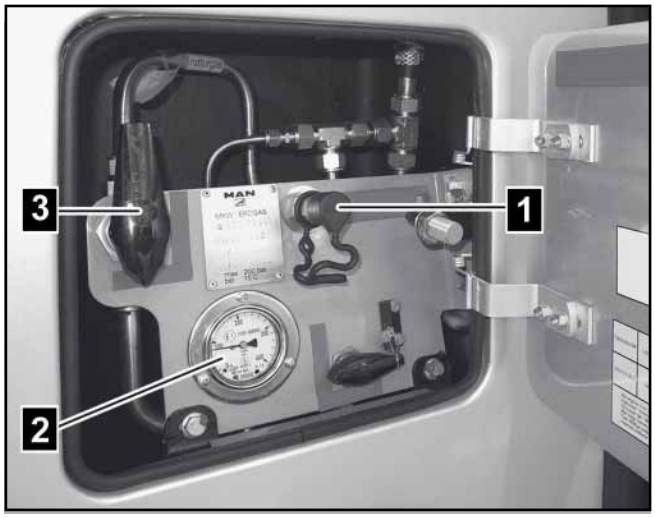
4 Drive systems

4.2 CNG drive system

Filling unit

The filling unit is located on the right or left side of the vehicle depending on design. The filler flap can be locked.

The component parts of the filling unit vary depending on the gas storing system used and whether it is installed in a solo bus or an articulated bus.



CNG filling unit (example illustrated)

1 Tank safety cap with filler connection

2 Pressure gauge

3 Shut-off valve for storing system

Heating oil tank

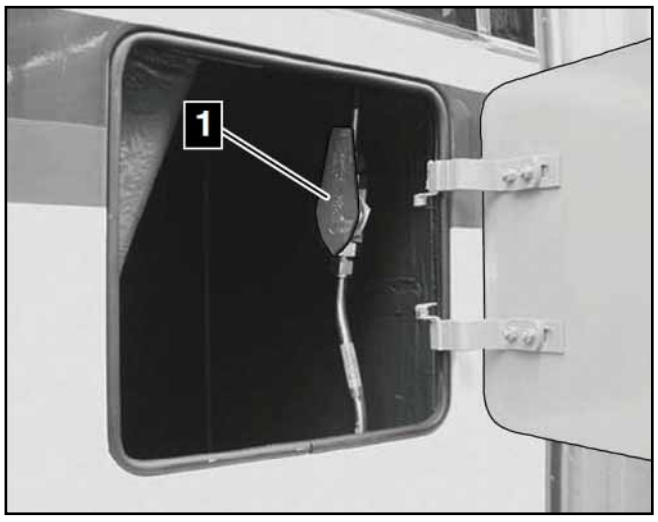
A heating oil tank for the auxiliary heater is available as special equipment for articulated buses. The heating oil filler neck is located on the right side of the vehicle behind the articulation in this case.

The filling capacity ranges between 35 - 81 litres depending on the model.

Articulated bus

On articulated buses up to mid-2010, the stopcock for the engine is installed behind a separate flap in the trailing section for reasons associated with pipework routing, regardless of the gas system used.

The stopcock is located in the engine compartment on vehicles after mid-2010.



1 Shut-off valve for engine (example illustrated)

4 Drive systems

4.3 Hybrid drive system

4.3.1 Serial hybrid drive

Lion's City Hybrid buses feature a serial hybrid drive.

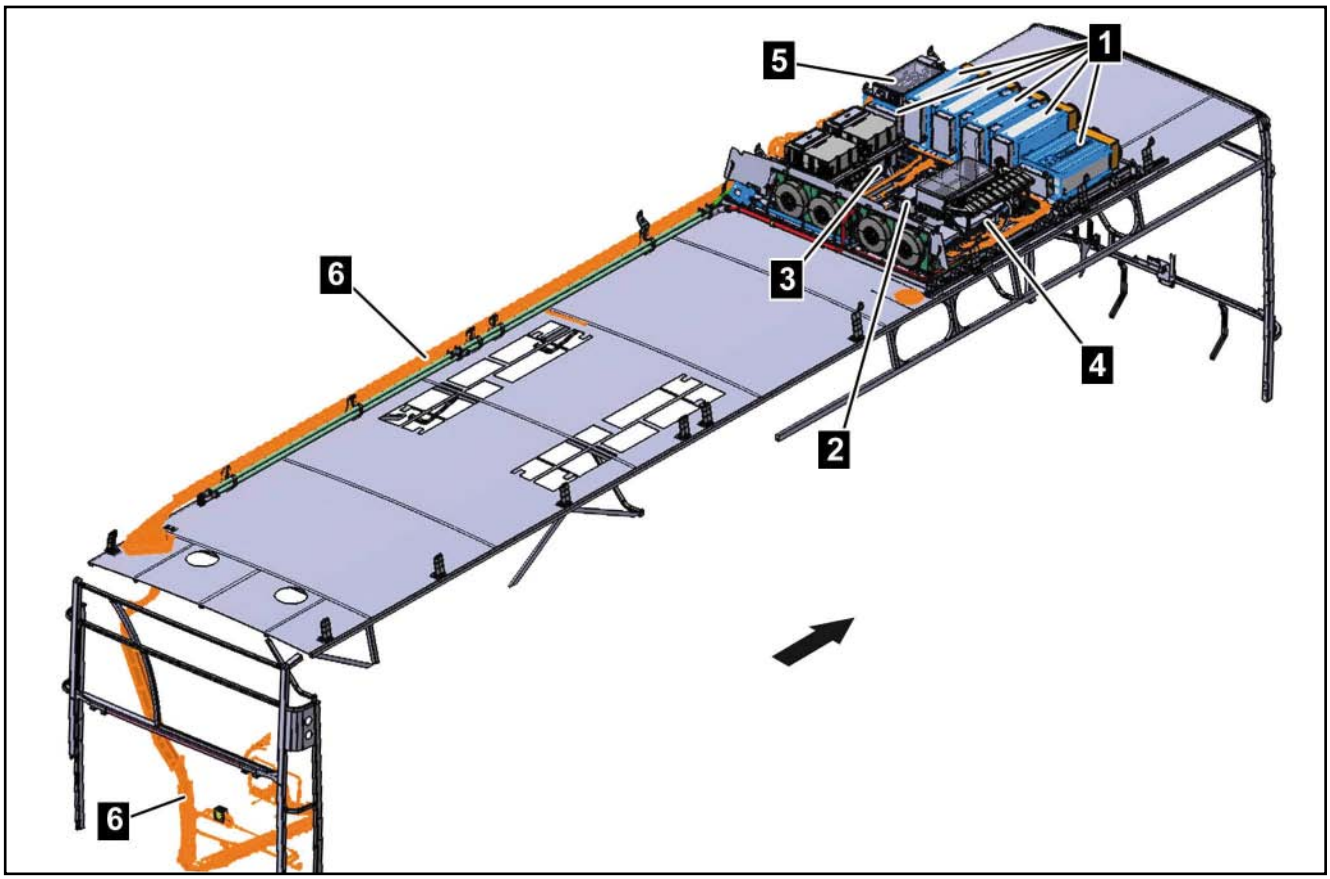
The combustion engine is not mechanically connected to the driven axle on serial hybrid drives. On diesel-electric systems the diesel engine/generator unit generates electrical power to drive the vehicle.

The wheels are driven by two drive motors coupled by a summation gearbox. The diesel engine runs in its ideal range thus optimizing consumption as vehicle speed does not depend on engine revolutions.

The drive motors convert braking energy into electrical energy when the brake is applied. This energy is stored in Ultracap storage modules, a high-voltage traction energy storage system, until required again for acceleration.

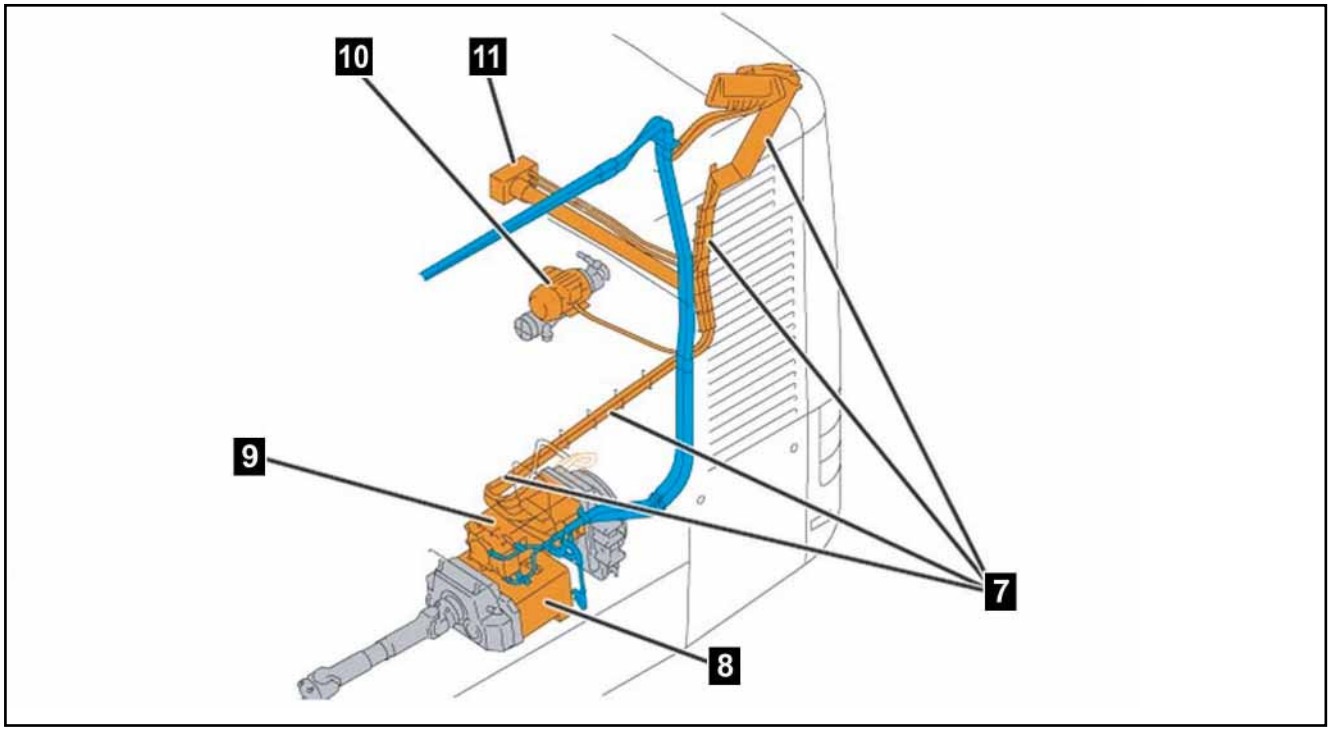
Always follow the safety instructions to avoid electric shock when dealing with high-voltage systems (see chapter 3.2 Safety instructions).

4.3.2 High-voltage components on roof



1	Traction energy storage system
2	High-voltage power distributor
3	Traction inverter and inductor box
4	Electrical system charge converter and dual inverter
5	Contactor box
6	High-voltage cables
Arrow	Direction of travel

4.3.3 High-voltage components in engine compartment



7	High-voltage cables in engine compartment
8	Drive motors 1 and 2
9	Generator
10	Electric motor LHP (power steering pump) with temperature sensor
11	Electrical braking resistor

Notes

5 Vehicle body

5.1 Shell

5.1.1 Ways of access

The overviews below depict ways of access into a Lion‘s City and NEOPLAN Cityliner by way of example.

Side panels

The side panels below the side windows can be cut out right down to the floor of the vehicle at certain points. Access cannot be gained via the side panels in the areas around the axles, behind the last axle, or in the vicinity of the filler flaps.

Do **not** cut the window pillars (vertical uprights or ring frames) for reasons of stability.

Roof

The electrical wiring harnesses are installed in the roof on the top right and left. Always de-energise the vehicle before starting rescue operations on the roof for this reason.

The entire length of the roof structure can be cut open to a width of 1300 mm in principle. However, access may be partially restricted by air-conditioning systems, roof vents or CNG tanks depending on model design.

The roof structure on coaches can only be cut open to the width of the emergency exits (roof hatches).

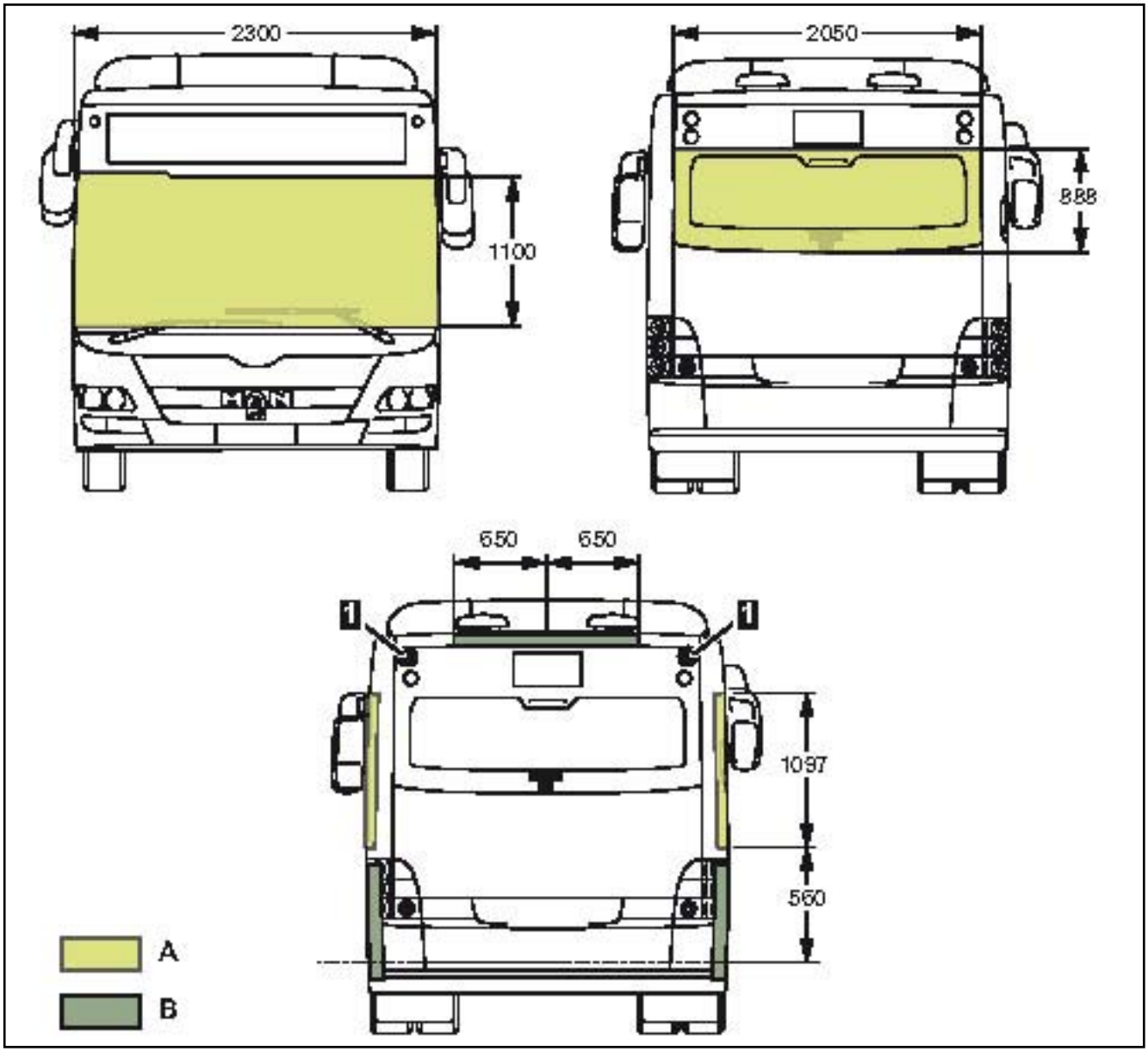
The number of roof hatches and their arrangement depend on the model concerned and its features.

5 Vehicle body

5.1 Shell

5.1.2 Access to City/Intercity bus

Front/rear



Illustrations are examples only

Dimensions in mm

1 Electrical cables

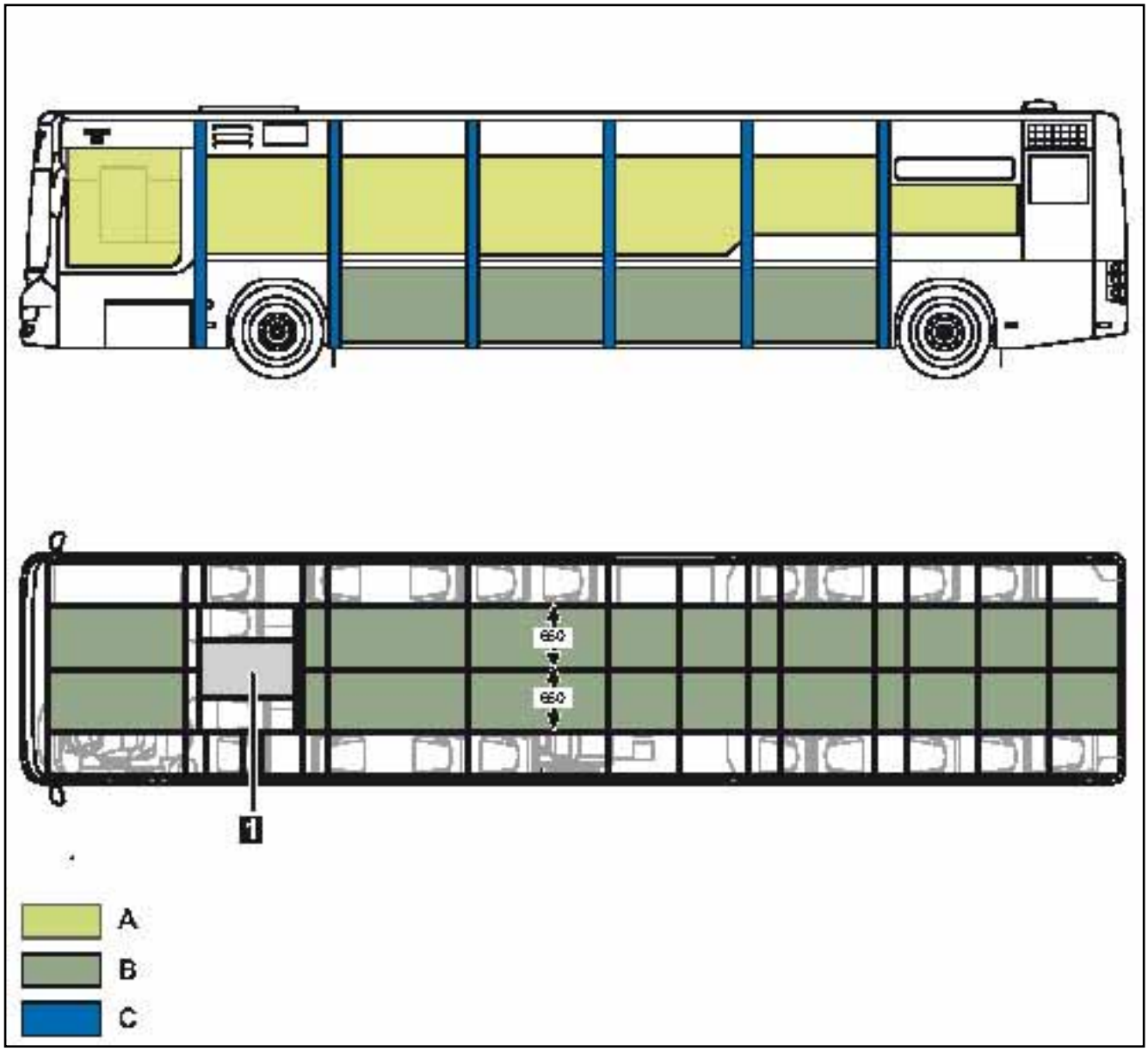
A Windows

B Body

5 Vehicle body

5.1 Shell

Side panel/roof



Illustrations are examples only

Dimensions in mm

1 Roof hatch

A Windows

B Body

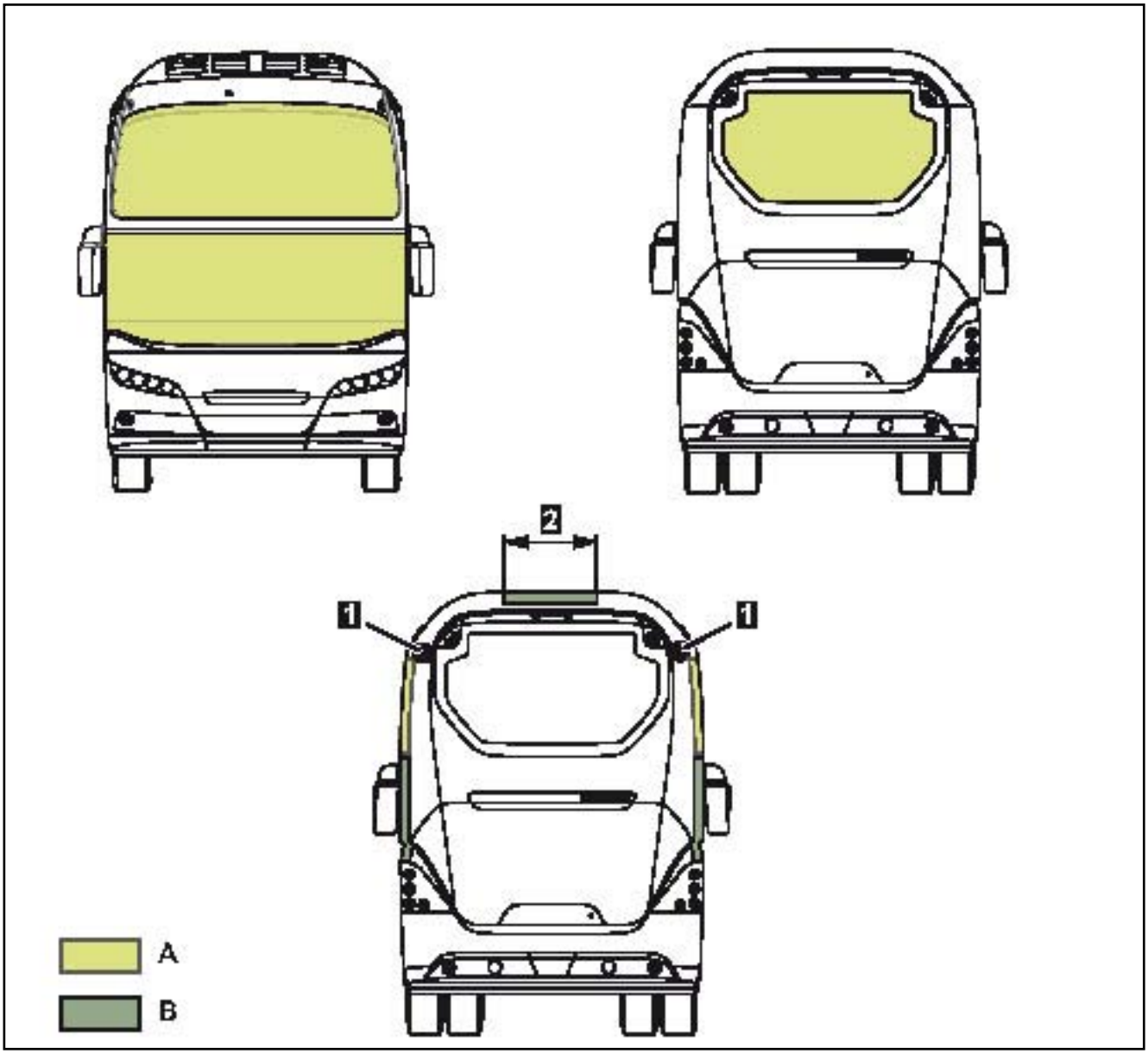
C Vertical uprights (window pillars)

5 Vehicle body

5.1 Shell

5.1.3 Access to coach

Front/rear



Illustrations are examples only

1 Electrical cables

2 Width of roof hatch

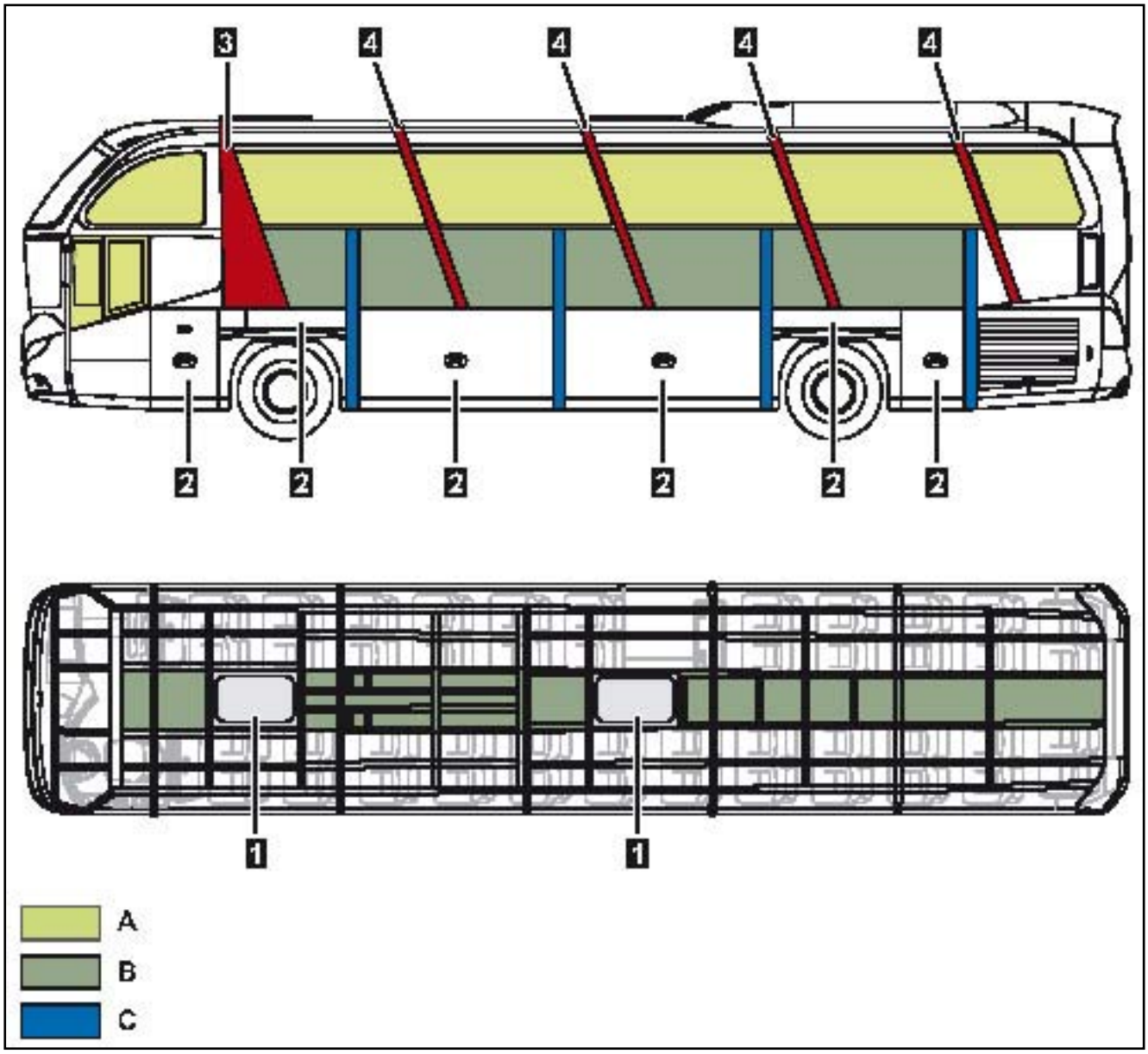
A Windows

B Body

5 Vehicle body

5.1 Shell

Side panel/roof



Illustrations are examples only

1 Roof hatch

2 Luggage compartment/maintenance flaps

3 Roll bar B-pillar

4 Ring frames (window pillars)

A Windows

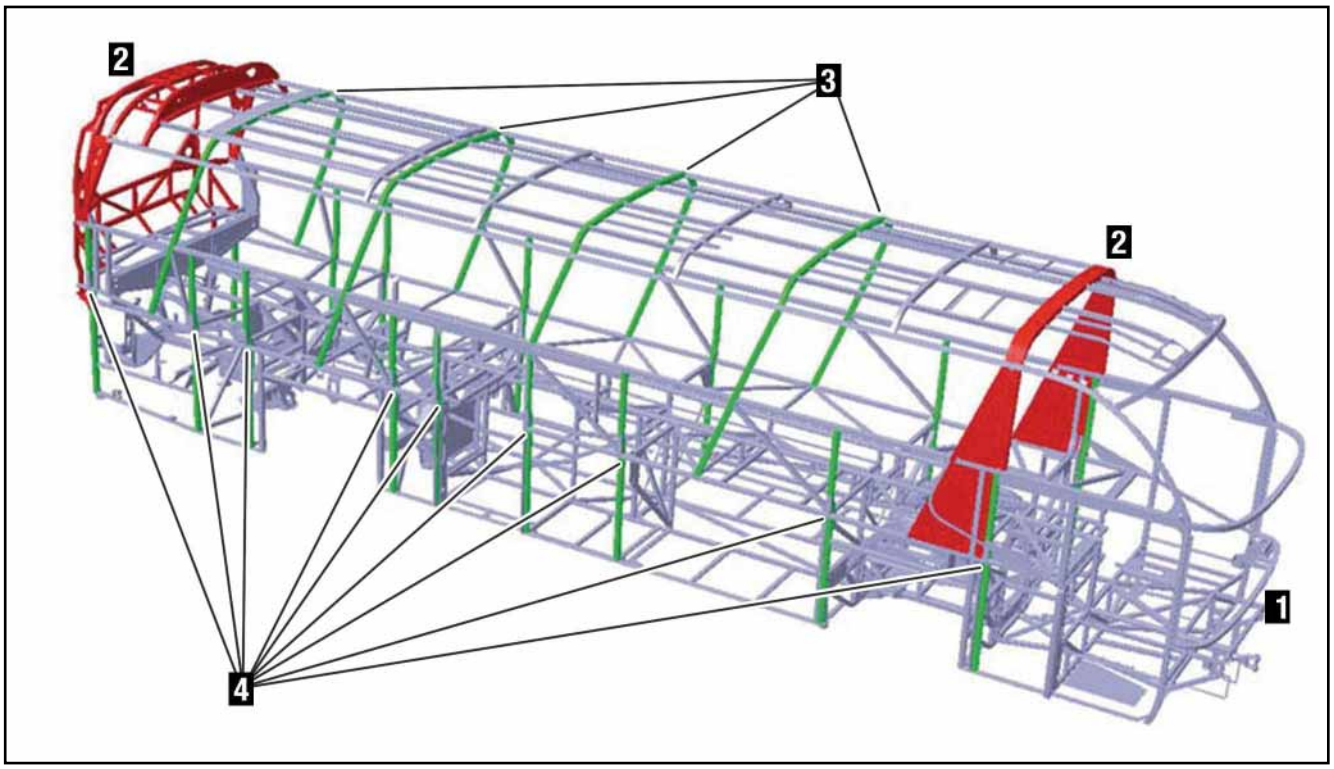
B Body

C Vertical uprights

5 Vehicle body

5.1 Shell

5.1.4 Shell structure of coach



Example NEOPLAN Cityliner – Safety cabin shell structure

1 Reinforced front structures as per ECE-R29 and ECE-R93 directives in case of frontal collision

2 Solid roll bars in B pillar and at rear as per ECE-R66 directive

3 All-round ring frames

4 Patented side panel connections

5 Vehicle body

5.2 Materials

5.2.1 Vehicle windows

Windscreen

The windscreen is made of laminated safety glass (LSG) and is glued into the frame.

Rear window

The rear window is made of toughened safety glass (TSG) and is glued into the frame.

Side windows

The side windows are made of toughened safety glass (TSG) or dual-pane safety glass (DSG).

5.2.2 Materials

Roof

On City buses, the outer skin of the roof is made of Pegulit with an underlying insulating layer of melamine (incombustible synthetic foam).

The roof is lined on the inside with foil-covered hardboard enclosed in an aluminium frame.

5 Vehicle body

5.3 Dimensions and weights

5.3.1 City and Intercity bus

	Model	Length [m]	Width [m]	Height [m]	Technically admissible gross vehicle weight [kg]	Max. passenger capacity
A47	Lion‘s City M (vertical engine)	10.50	2.50	2.88[1)]	19500	92
A37	Lion‘s City (vertical engine)	11.98	2.50	2.88[1)]	19500	106
A37	Lion‘s City Hybrid	11.98	2.50	3.28	19500	106
A21	Lion‘s City (CNG)	11.98	2.50	2.88[1)] (3.30)[2)] (3.32)[3)]	19500	109
A20	Lion‘s City Ü (CNG)	11.98	2.50	2.88[1)] (3.30)[2)] (3.32)[3)]	19500	110
A36	Lion‘s City C (CNG)	13.68	2.50	2.88[1)] (3.30)[2)] (3.32)[3)]	25685	138
A45	Lion‘s City C LE (CNG)	13.68	2.50	2.88 m[1)] (3.30 m)[2)] (3.32 m)[3)]	25685	138
A26	Lion‘s City L (CNG)	14.71	2.50 m	2.88 m (3.30 m)[2)] (3.32 m)[3)]	25685	151
A44	Lion‘s City L LE (CNG)	14.71	2.50 m	2.88 m[1)] (3.30 m)[2)] (3.32 m)[3)]	25685	151
A23	Lion‘s City G (CNG)	17.98	2.50	2.88 m[1)] (3.30 m)[2)] (3.32 m)[3)]	30000	199
A42	Lion‘s City G LE (CNG)	17.98	2.50	2.88 m[1)] (3.30 m)[2)] (3.32 m)[3)]	30000	192
A40	Lion‘s City GL (CNG)	18.75	2.50	2.88 m[1)] (3.30 m)[2)] (3.32 m)[3)]	30000	199
A49	Lion‘s City GL LE (CNG)	18.75	2.50	2.88 m[1)] (3.30 m)[2)] (3.32 m)[3)]	30000	199
	1) Height without air-conditioning system 2) Height of Lion‘s City CNG with Dynatec and MCS systems (series) 3) Height of Lion‘s City CNG with Raufoss system (special equipment)					

5 Vehicle body

5.3 Dimensions and weights

5.3.1 City and Intercity bus

	Model	Length [m]	Width [m]	Height [m]	Technically admissible gross vehicle weight [kg]	Max. passenger capacity
A39	Lion‘s City DD	13.73 m	2.55 m	4.06 m	26665	176
A78	Lion‘s City LE	11.90 m	2.55 m	3.15 m	19500	101
A78	Lion‘s City LE Ü	11.90 m	2.55 m	3.15 m	19500	84
R12	Lion‘s Regio	12.25 m	2.55 m	3.40 m	19000	82
		Luggage compartment 5.60 m^3 (without WC)				
R14	Lion‘s Regio C	13.01 m	2.55 m	3.40 m	19500	89
		Luggage compartment 6.80 m^3 (without WC)				
R13	Lion‘s Regio L	13.90 m	2.55 m	3.40 m	25530	95
		Luggage compartment 6.80 m^3 (without WC)				
488	NEOPLAN Centroliner DD	13.73 m	2.55 m	4.56 m	28000	176

5 Vehicle body

5.3 Dimensions and weights

5.3.2 Coach

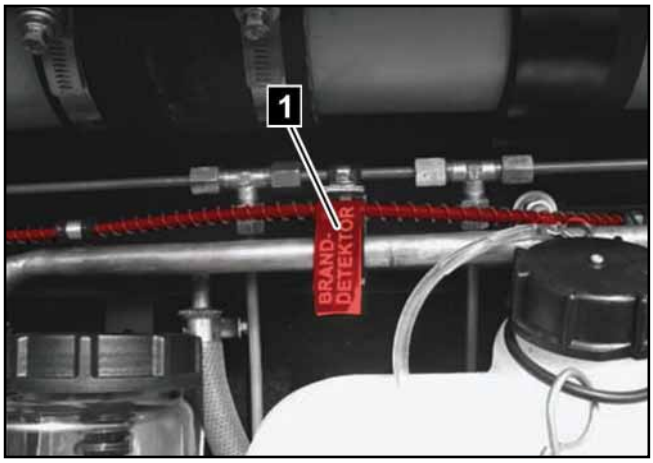
	Model	Length	Width	Height	Technically admissible gross vehicle weight	Max. passenger capacity
R07	Lion‘s Coach	12.00 m	2.55 m	3.81 m	18000 kg	49
		Luggage compartment 10.00 m³				
R09	Lion‘s Coach C	13.26 m	2.55 m	3.81 m	24900 kg	55
		Luggage compartment 10.70 m³				
R08	Lion‘s Coach L	13.80 m	2.55 m	3.81 m	24900 kg	57
		Luggage compartment 11.50 m³				
P05	NEOPLAN Skyliner	14.00 m	2.55 m	4.00 m	25800 kg	83
		Luggage compartment 11.00 m³				
P11	NEOPLAN Starliner C	12.99 m	2.55 m	3.97 m	26000 kg	59
		Luggage compartment 11.80 m³				
P12	NEOPLAN Starliner L	13.99 m	2.55 m	3.97 m	25100 kg	63
		Luggage compartment 12.60 m³				
P14	NEOPLAN Cityliner	12.24 m	2.55 m	3.68 m	18000 kg	55
		Luggage compartment 9.40 m³				
P15	NEOPLAN Cityliner C	12.99 m	2.55 m	3.68 m / 3.72 m[1)]	26000 kg	59
		Luggage compartment 10.40 m³				
P16	NEOPLAN Cityliner L	13.99 m	2.55 m	3.68 m / 3.72 m[1)]	25100 kg	63
		Luggage compartment 11.40 m³				
P21	NEOPLAN Tourliner SHD	12.00 m	2.55 m	3.80 m	18000 kg	49
		Luggage compartment 10.00 m³				
P22	NEOPLAN Tourliner SHDC	13.26 m	2.55 m	3.80 m	25100 kg	57
		Luggage compartment 10.70 m³				
P20	NEOPLAN Tourliner SHDL	13.80 m	2.55 m	3.80 m	25100 kg	57
		Luggage compartment 11.50 m³				
	1) Depending on air-conditioning system					

6 Technical rescue

6.1 Fire alarm/fire extinguisher systems

6.1.1 Fire alarm system

A fire alarm system which warns of fire at an early stage is a standard feature and is installed in the engine compartment and in the vicinity of the auxiliary heater.



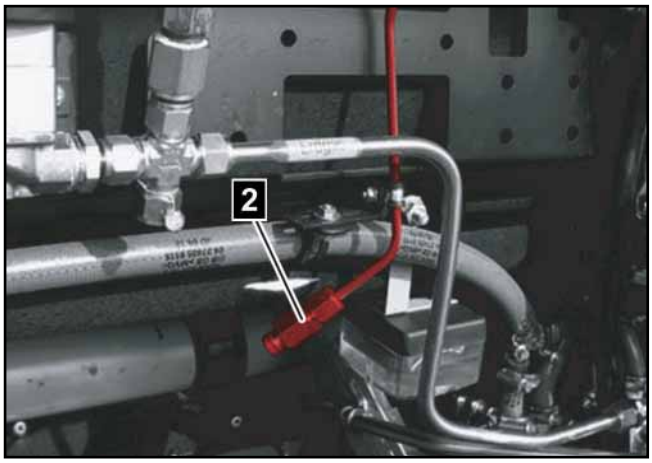
1 Fire alarm system (example illustrated)

6.1.2 Fire extinguisher system

The nozzles of an automatic fire extinguisher system are installed in areas which represent a fire hazard, such as the engine and auxiliary heater, to fight fire automatically with extinguishant from the extinguisher tank.

The fire extinguisher system operates regardless of vehicle state (ignition on, ignition off). Any fire is extinguished independently.

The alarm is raised by a warning buzzer and the horn of the fire extinguisher system.



2 Fire extinguisher system nozzle (example illustrated)

Fire extinguisher tank:

The location of the fire extinguisher tank depends on the model concerned:

Starliner:

At the rear left in the luggage compartment over the trailing axle.

Cityliner:

In the storage compartment behind the driver.

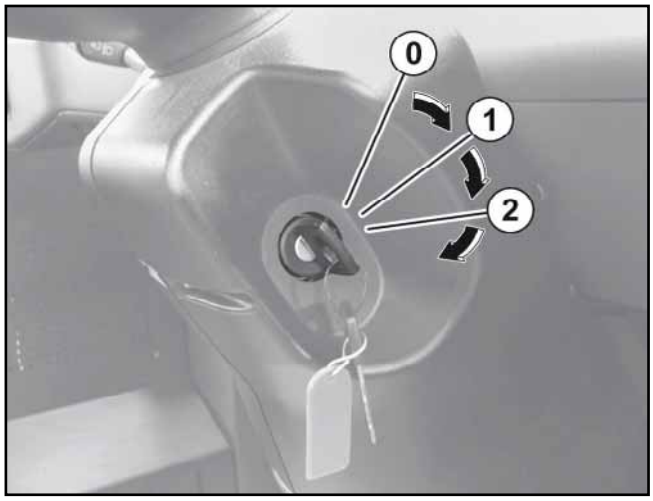
Fire extinguisher tank (example, Starliner)

6 Technical rescue

6.2 Switching off the engine

6.2.1 Removing the ignition key

To switch off the engine, turn the ignition key to position "0". Then pull out the ignition key and secure it to prevent the ignition from being switched back on.

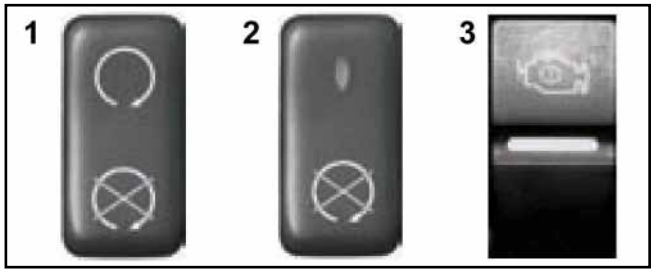


0 Ignition OFF
1 Unlocking the steering wheel
2 Driving position

6.2.2 Engine START/STOP pushbutton

The positioning of the engine START/STOP pushbutton on the left or right of the dashboard and its design may vary depending on the model and its features.

Press the pushbutton at the bottom to switch off the engine.



1 Engine START/STOP pushbutton (example, Lion's City)
2 Engine STOP pushbutton (example, Lion's City)
3 Engine START/STOP pushbutton (example, NEOPLAN Starliner)

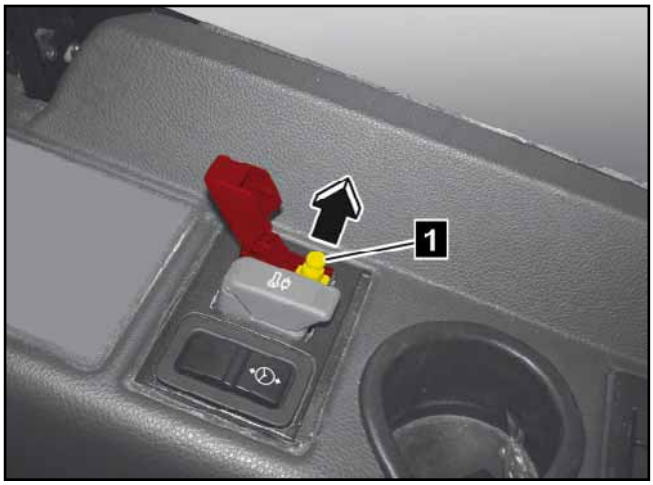
6.2.3 EMERGENCY OFF switch

The EMERGENCY OFF switch is located on the dashboard console to the left of the driver's seat.

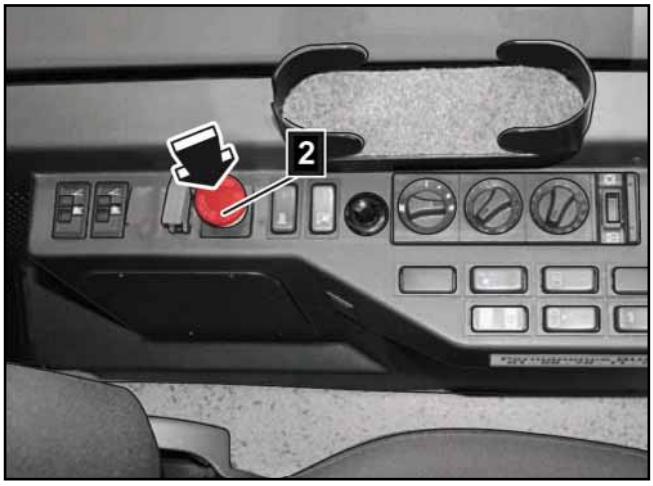
Raise the sealed cap and press the EMERGENCY OFF switch.

Pressing the EMERGENCY OFF switch shuts down the engine, the fuel supply and the electrical system. On hybrid buses, the electrical system (24 V) and the high-voltage electrical system of the vehicle are switched off. The hazard flashers and the door entrance lights are activated at the same time. The interior lighting is also switched on in some vehicles.

On buses with hybrid-drive, the high-voltage traction energy storage system is not switched off or discharged by pressing the EMERGENCY OFF switch. It remains in its currently charged state. It is merely disconnected from the high-voltage electrical system of the vehicle.



1 EMERGENCY OFF switch (example, NEOPLAN Starliner)



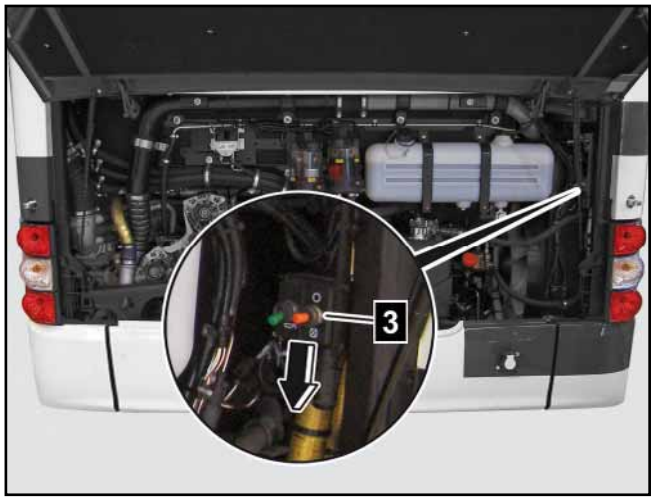
2 EMERGENCY OFF switch (example, Lion's City)

EMERGENCY OFF switch (example, Lion‘s City Hybrid)

6.2.4 Switching off the engine in the engine compartment

The optional “Engine Start/Stop” toggle switch is installed in the engine compartment on the right.

Press and hold down the "Engine Start/Stop" toggle switch in the "Stop" direction until the engine has come to a complete standstill.



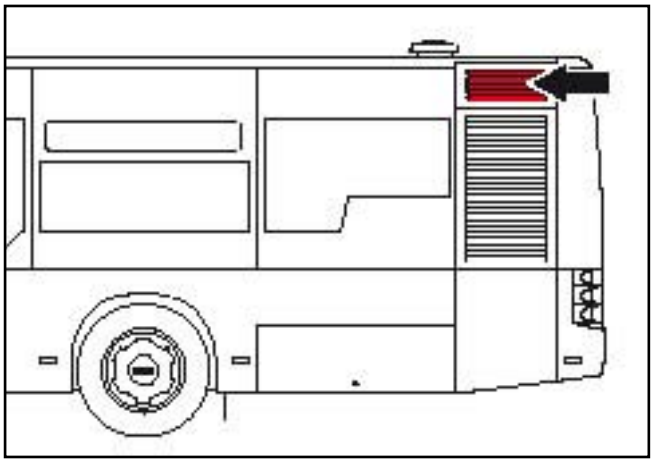
3 "Engine Start/Stop" toggle switch (example illustrated)

6.2.5 CO_2 introduction

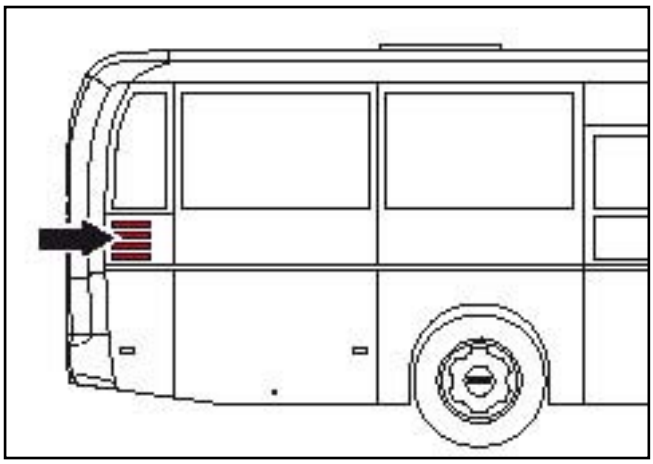
The engine can be stopped by blowing CO_2 into the air intake. The CO_2 reduces the oxygen concentration in the intake air. This lack of oxygen means the fuel/air mixture is no longer capable of supporting combustion.

- ▶ Blow spurts of CO_2 intermittently into the air intake grille/ scoop.
- ▶ Continue or repeat the process until the engine stops.

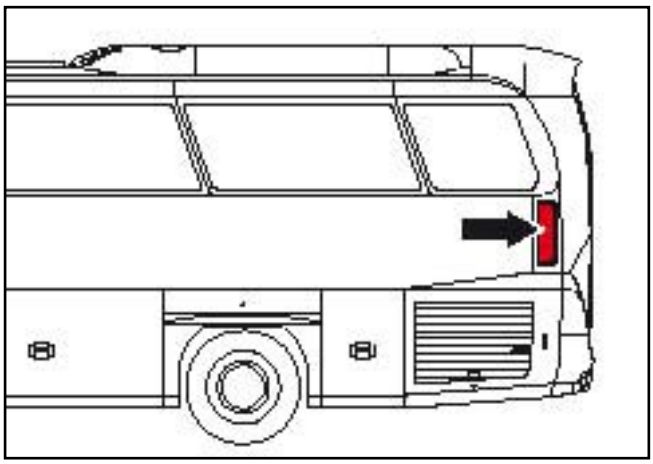
The CO_2 emerges at a temperature of -78 °C, some of it as dry ice. Hands may suffer frostbite.
Always wear safety clothing and eye protection when using a CO_2 extinguisher to shut down the engine.



Air intake grille, example showing Lion‘s City



Air intake grille, example showing Lion‘s Regio



Air intake scoop, example showing Cityliner and Starliner

6 Technical rescue

6.2 Stopping the engine

6.2.6 Switching off the gas supply

A stopcock which switches off the supply of gas to the engine is located in the engine compartment on the gas-drive Lion's City CNG series.

Open engine compartment flap

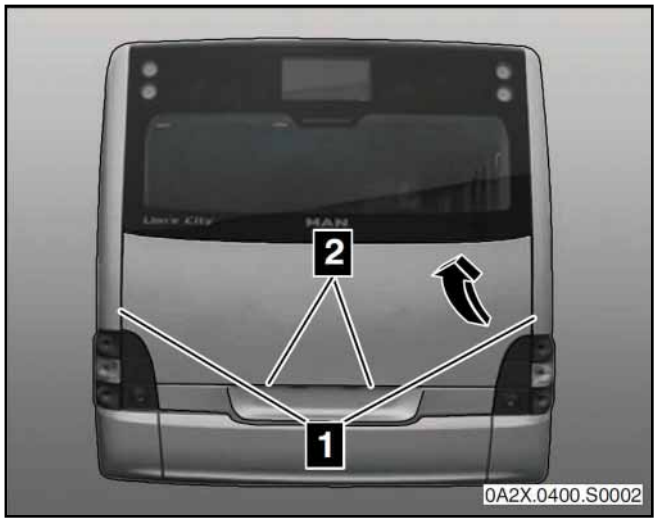
- If necessary, open the locks 1 (depending on series) with a suitable key.
- Open the engine compartment flap with both hands in the grips 2.

Actuate the stopcock 3

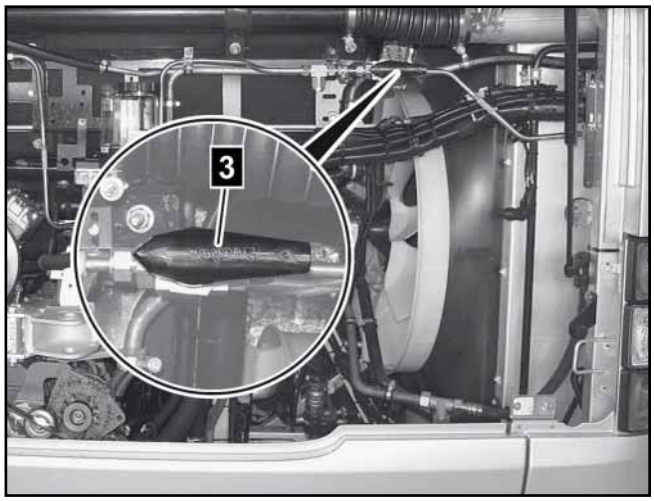
- Turn the stopcock clockwise through 90°.

The flow limiter or rupture safety valve respond automatically in the event of gas pipework fracture. This reduces the amount of gas escaping at the rupture to a minimum.

An electrical safety valve on the gas tank automatically seals off the gas tank when the ignition is switched off.



1 Locks
2 Grips



3 Stopcock in engine compartment (example illustrated)

6 Technical rescue

6.3 Securing and supporting

6.3.1 Securing the vehicle

In order to carry out the necessary repair measures quickly and safely, it is necessary for the vehicle to be secured by suitable means to prevent it from rolling away, tipping over or moving in any other ways. When attaching equipment to the vehicle in order to secure and stabilise it, make sure that rescue operations are not rendered more difficult or impaired by so doing.

6.3.2 Chocks/blocks

The jacking points are suitable for positioning chocks or blocks. These points are generally located on the chassis behind the front axle and in front of the rear axle. The points are located between the two axles in the case of double axles.

The jacking points on the vehicle are labelled.

Jacking point label

The vehicle must also be secured to avoid bending or breaking in areas in which the shell structure is deformed or cut using rescue cutters or spreaders.

6.3.3 Electronic level control (ECAS)

ECAS is an Electronically Controlled Air Suspension system. The height of the vehicle remains constant regardless of its weight. Travel sensors at the axles constantly acquire the height of the vehicle. The electronic system regulates height to the required level depending on the speed of the vehicle.

The optional "raise" and "lower" features of the vehicle are integrated in the ECAS. This allows the vehicle to be raised or lowered some 60 mm.

Deactivating ECAS system

The ECAS system continues to control the vehicle height for up to approx. 10 minutes after the ignition has been switched off. Before lifting the vehicle the ECAS system must be deactivated by switching off the mechanical battery isolator switch.

6 Technical rescue

6.4 Power supply 24 V

6.4.1 Disconnecting batteries (12 V) from the electrical system

The vehicle voltage is generally 24 V. Two 12 V batteries are installed.

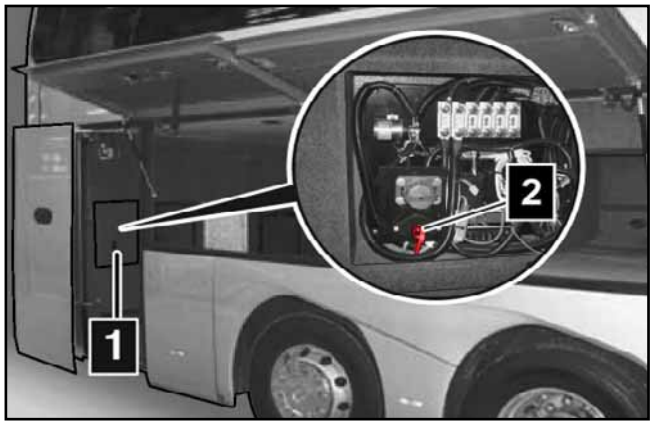
The 12 volt batteries can be disconnected from the electrical system by means of the mechanical battery isolator switch.

The location of the batteries and the battery isolator switch depend on the model concerned.

The illustrations depict examples of battery isolator switch positioning on city buses and coaches. Refer to the layout pictures in chapter 7 for details of the precise locations on the various models.

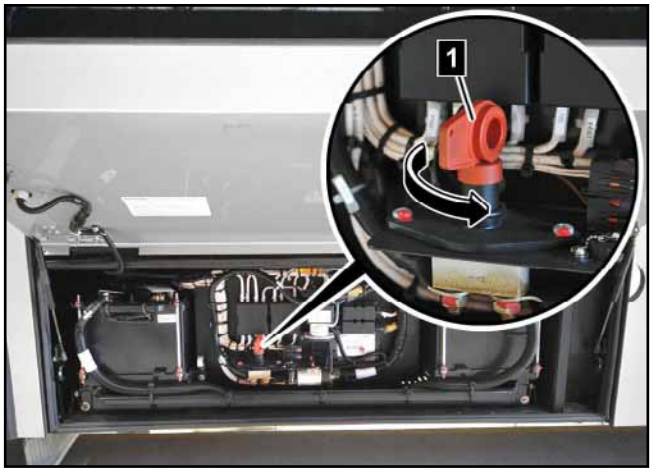
Disconnecting batteries from the electrical system:

- Switch off the ignition.
- Pull out the ignition key and secure it to prevent the ignition from being switched back on.
- Open the service flap.
- Turn the battery isolator switch anti-clockwise and remove it.

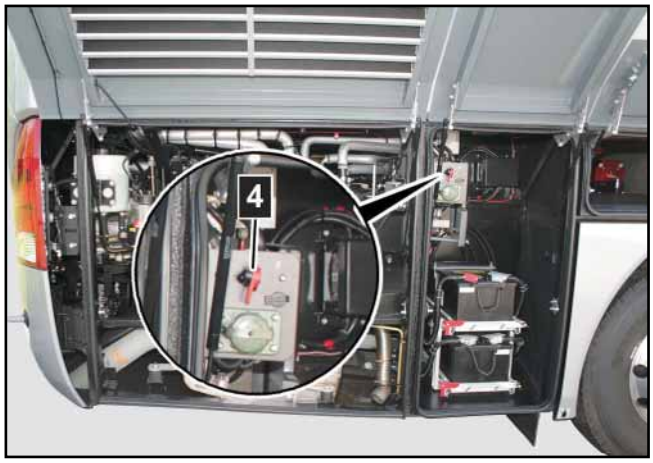


1 Cap
2 Battery isolator switch, coach (example, Skyliner)

3 Battery isolator switch, coach (example, Cityliner)



1 Battery isolator switch, City bus (example illustrated)



4 Battery isolator switch, coach (example, Starliner)

6 Technical rescue

6.5 Hybrid power supply

6.5.1 Hybrid high-voltage system

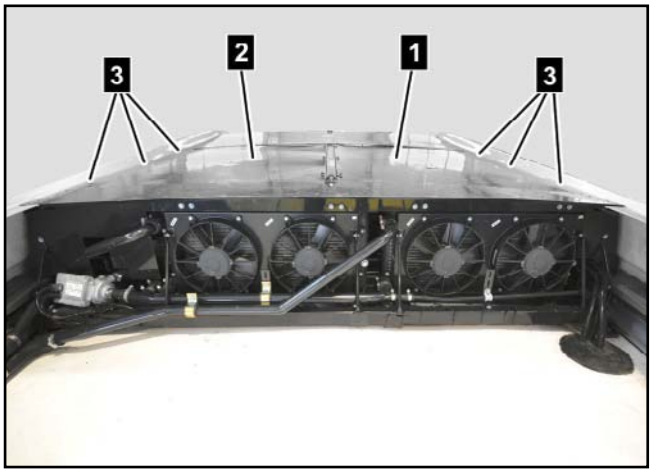
The Lion‘s City Hybrid model is equipped with a traction energy storage system (UltraCaps) located on the roof of the vehicle at the front.

Proceed as follows to disconnect the UltraCap system from the high-voltage electrical system of the vehicle:

- ▶ Switch off the ignition and remove the ignition key.
- ▶ Secure the ignition to prevent switching on.
- ▶ Switch off the battery isolator switch and remove it.
- ▶ Secure the battery isolator switch to prevent switching on.
- ▶ Open the maintenance flaps on the roof cover.
- ▶ Remove the maintenance connector.

Opening the maintenance flaps on the roof cover

Open the bayonet locks on the right and left maintenance flaps and fold up the maintenance flaps. The two maintenance flaps are each held in the open position by a gas spring.



Example illustrated
1 Maintenance flap, right
2 Maintenance flap, left
3 Bayonet locks

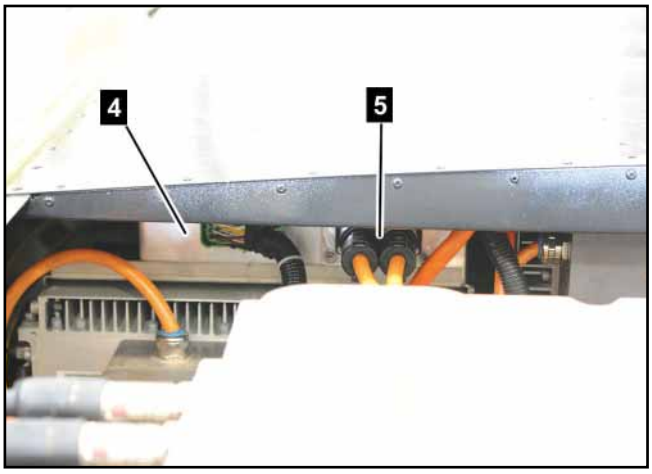
6 Technical rescue

6.5 Hybrid power supply

High-voltage electrical system maintenance connector

The maintenance connector for the high-voltage electrical system of the vehicle is located on the contactor box under the left-hand maintenance flap on the roof of the vehicle.

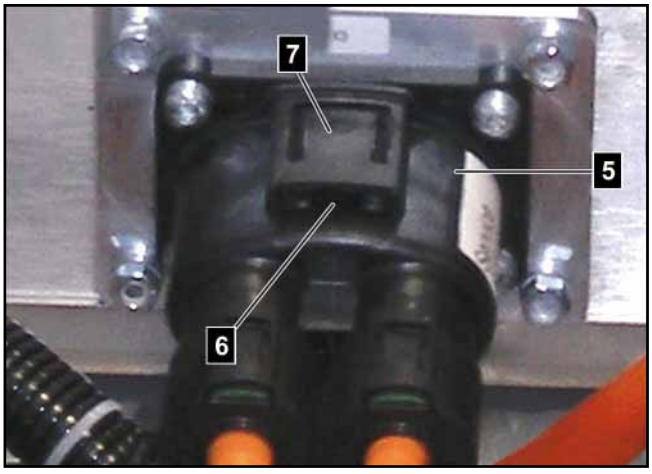
Work on the high-voltage electrical system of the vehicle including its disconnection from the high-voltage traction energy storage system shall be performed by trained and qualified personnel only!



4 Contactor box
5 Maintenance connector

Removing the maintenance connector:

Insert a suitable insulated tool (e.g. screwdriver) into the opening on the maintenance connector, raise the catch until it clears the wedge, then disconnect the maintenance connector.



5 Maintenance connector
6 Opening
7 Catch

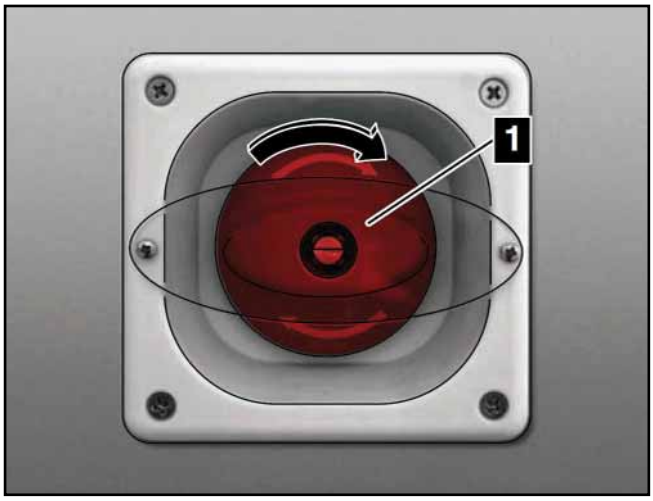
6 Technical rescue

6.6 Access to the vehicle

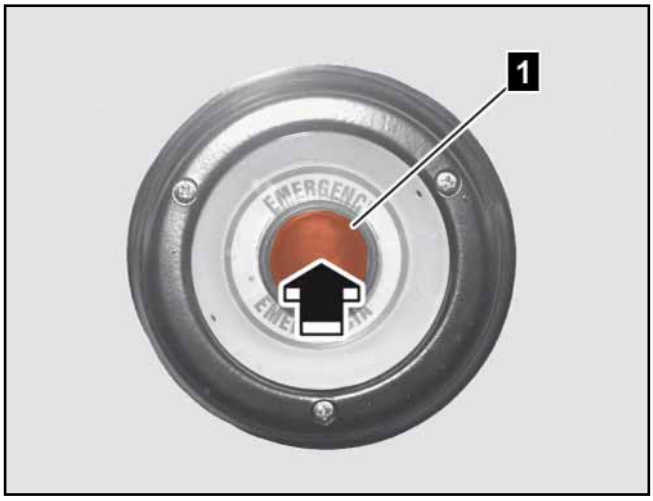
6.6.1 Vehicle doors, City/Intercity bus

City and Intercity buses are equipped with 2 or 3 doors on the right side of the vehicle depending on the model concerned.

The emergency valve on the outside is designed either as a rotary knob or as a pushbutton depending on the model.



1 Outside emergency valve (example, rotary knob)



1 Outside emergency valve (example, pushbutton)

6 Technical rescue

6.6 Access to the vehicle

Opening a front door from outside using the emergency valve

The emergency valve for the front doors is located on the left next to the associated door. Turning or pressing the emergency valve into the emergency position depressurizes the door concerned.

- ▶ Press/turn emergency valve 1
- ▶ Open the door manually.

1 Emergency valve outside front door (example)

Opening a rear door from outside using the emergency valve

The emergency valve for the rear doors is located on the left next to the associated door. Turning or pressing the emergency valve into the emergency position depressurizes the door concerned.

- ▶ Press/turn emergency valve 1
- ▶ Open the door manually.

1 Emergency valve outside rear door (example)

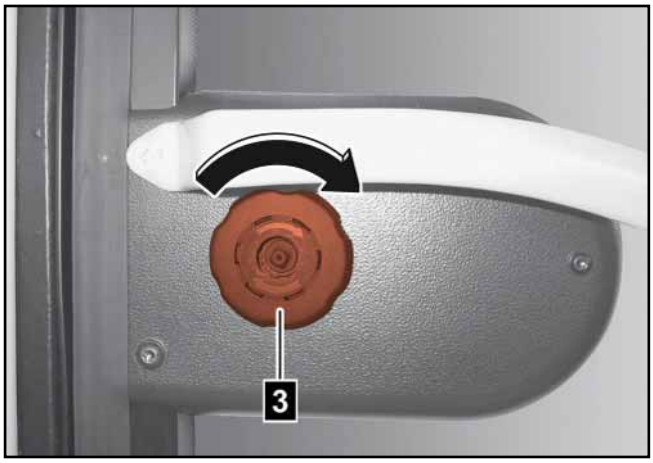
6 Technical rescue

6.6 Access to the vehicle

Unlocking the front door from inside

The front doors are unlocked from the inside using the rotary knob.

- ▶ Turn rotary knob 3 in the direction indicated by the arrow and release it.
- ▶ The door is unlocked and ready for opening.



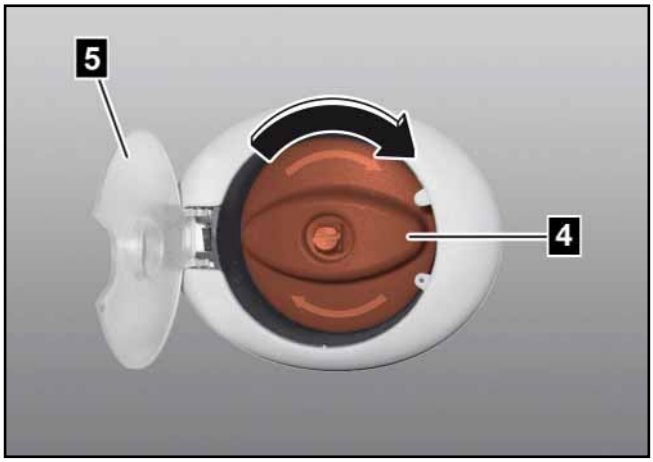
3 Rotary knob (example)

Opening doors from inside with the emergency valve

The emergency valve on the inside is designed either as a rotary knob or as a pushbutton depending on the model.

The emergency valve is located above the associated door. Turning or pressing the emergency valve into the emergency position depressurizes the door concerned.

- ▶ Tear open the transparent cap 5.
- ▶ Turn the emergency valve 4 as far as it will go in the direction indicated by the arrow, or press the push-button in.
- ▶ Push the door open.



4 Inside emergency valve (example, rotary knob)

4 Inside emergency valve (example, pushbutton)

6.6.2 Vehicle doors, coach

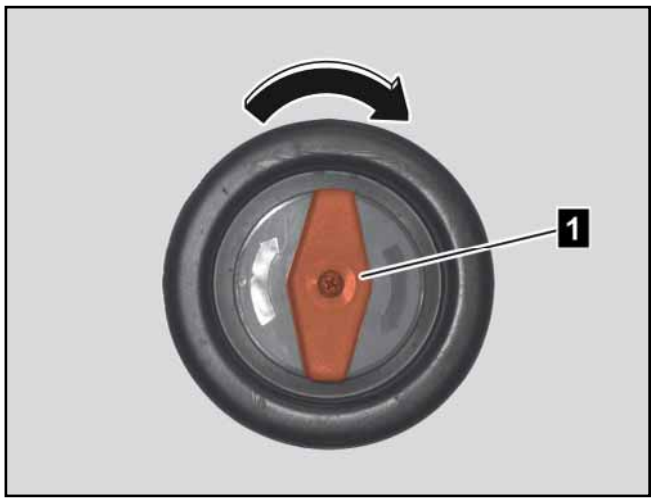
Coaches feature 2 outer pivoting doors on the right side of the vehicle.

Example, NEOPLAN Tourliner

Opening a pivoting door from outside using the emergency valve

The outside emergency valves are located next to the pivoting doors at the front and rear. Turning the emergency valve into the emergency position depressurizes the pivoting door concerned.

- ▶ Turn the emergency valve 1 as far as it will go in the direction indicated by the arrow.
- ▶ Pull the pivoting door outwards.



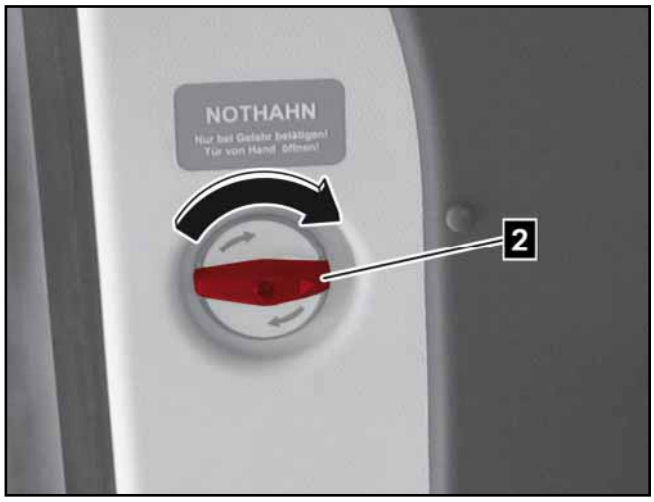
1 Emergency valve

Opening a pivoting door from inside using the emergency valve

The emergency valves are located next to the front pivoting door and above the rear pivoting door, or on the inner side of the rear pivoting door. Turning the emergency valve into the emergency position depressurizes the pivoting door concerned.

Front pivoting door:

- ▶ Turn the emergency valve 2 as far as it will go in the direction indicated by the arrow.
- ▶ Push the pivoting door outwards.



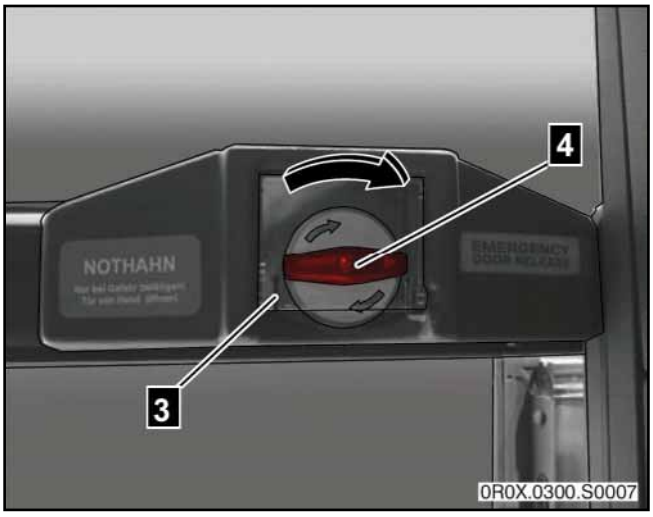
2 Emergency valve, front pivoting door

6 Technical rescue

6.6 Access to the vehicle

Rear pivoting door:

- ▶ Open cover 3, if applicable.
- ▶ Turn the emergency valve 4 as far as it will go in the direction indicated by the arrow.
- ▶ Push the pivoting door outwards.



3 Cover
4 Emergency valve, rear door

Actuating the emergency valve in the rest compartment

The emergency valve to open the rear pivoting door is located on the right next to the roller blind. The rear pivoting door can be opened from inside the rest compartment in case of emergency.

- ▶ Open up the cover 5.
- ▶ Turn the emergency valve 6 as far as it will go in the direction indicated by the arrow.
- ▶ Push the pivoting door outwards.

5 Cover
6 Emergency valve

6 Technical rescue

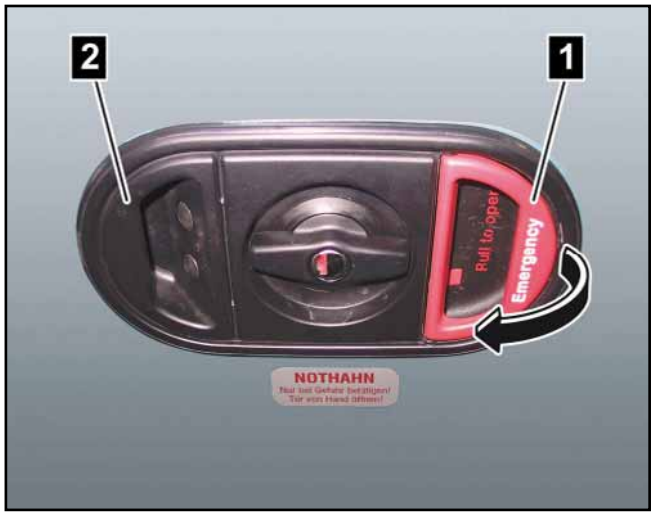
6.6 Access to the vehicle

Example, NEOPLAN Starliner

Opening a pivoting door from outside using the emergency handle

The outer emergency handles are located in the handle recess on the front and rear pivoting doors. Pulling the emergency handle depressurizes the pivoting door concerned.

- ▶ Pull emergency handle 1 in the direction indicated by the arrow.
- ▶ Pull the pivoting door out by the handle recess 2.

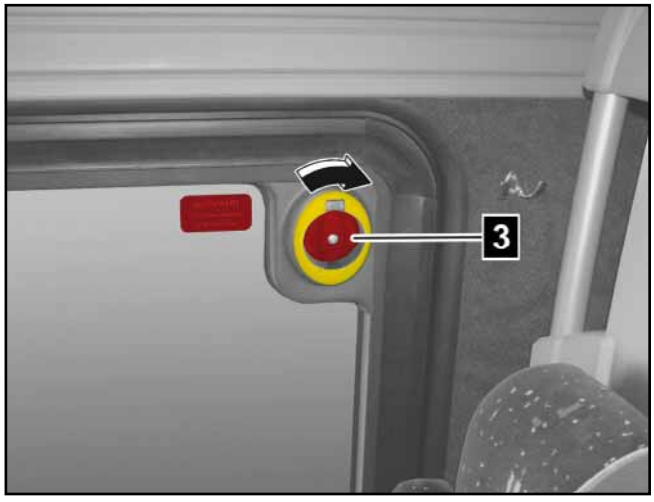


1 Emergency handle
2 Handle recess

Opening a pivoting door from inside using the emergency valve

The emergency valves are located at the front and rear pivoting doors. Turning the emergency valve into the emergency position depressurizes the pivoting door concerned.

- ▶ Open up the cover and turn the emergency valve 3 of the pivoting door concerned through 90° to the right as far as it will go.
- ▶ Push the pivoting door outwards.



3 Emergency valve

6.6.3 Emergency exits

Emergency exit through rear and side windows

Two or three emergency hammers are located on each side of the vehicle as a standard feature depending on the vehicle model. One additional emergency hammer is located behind the rear seats.

The appropriately labelled windows serve as emergency exits. Generally, these are all side windows and the rear window.

- In case of emergency, pull one of the hammers out of its holder.
- If necessary, tip the backs of the rear passenger seats forwards.
- Smash one of the side windows marked as emergency exits, or the rear window, with short, forceful blows in order to exit the bus.

Roof hatches

The roof hatches serve as emergency exits through the roof in case of emergency.

Opening the roof hatch from the outside:

The roof hatches can be opened from the outside of the roof.

- Pull the handle 1 straight upwards.
- Lift off the roof hatch and place it on one side.

Danger of falling when working on the roof of the vehicle. Comply with the relevant regulations and take appropriate measures for personal safety.

Roof hatch (example, coach)
1 Handle

6.6.4 Vehicle windows

Windscreen

The windscreen made of laminated safety glass (LSG) is glued into the frame and can be cut out with a glass saw. The windscreen is very heavy. Take appropriate measures to prevent it falling.

Side windows/rear window

The rear window is made of toughened safety glass (TSG), the side windows of toughened or dual-pane safety glass (TSG/DSG).

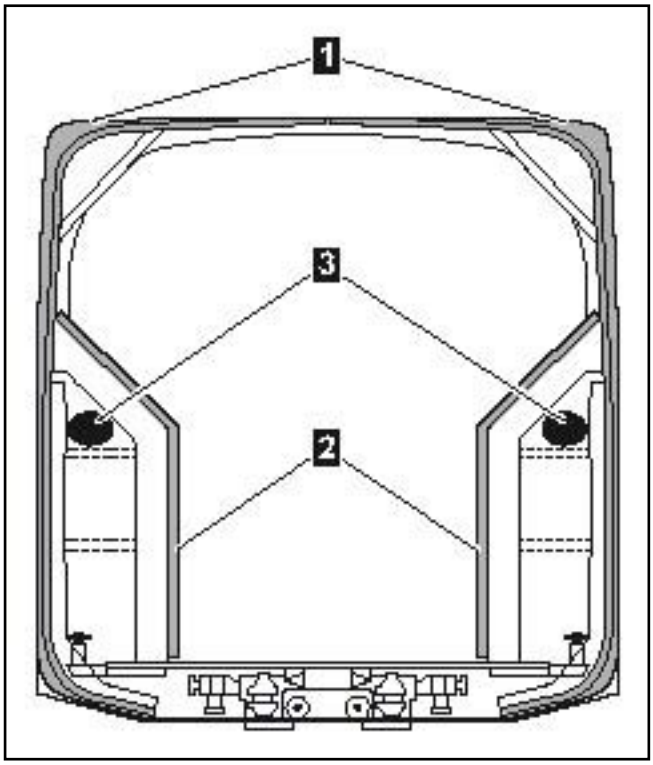
These windows can be smashed with the emergency hammer or punched with a spring centre punch and then removed from their frames.

6.6.5 Articulated bus bellows

The bellows can be cut open at the side.

Note that the electrical supply cables are suspended in the space between the inner and outer bellows.

Bellows with supply lines (inside view)



Bellows cross-section (schematic)
1 Outer bellows
2 Inner bellows
3 Supply line routing

6.7.1 Occupant restraint systems

Driver and co-driver

The driver's seat features a 3-point safety belt. The fold-down co-driver's seat (single or double seater) in coaches is equipped with a lap belt.

Passenger seats

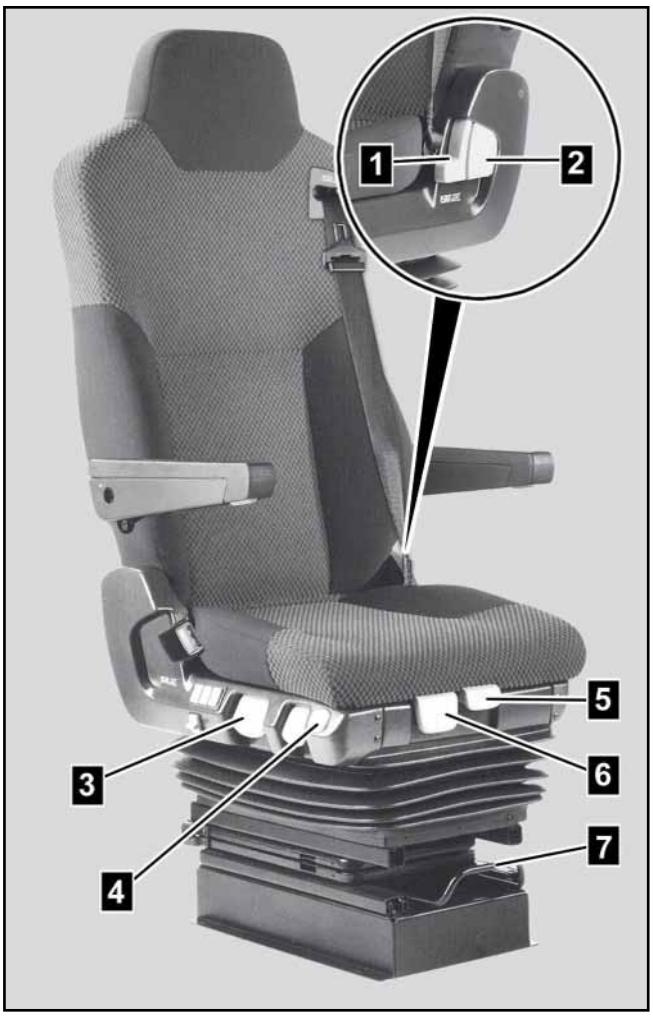
Passengers are obliged to wear seat belts in coaches. The passenger seats are equipped with lap belts.

6.7.2 Seats

Driver's seat

The seat adjustment controls are illustrated using a driver's seat (ISRI 6860/885 NTS) by way of example.

1 Shoulder support adjustment lever
2 Backrest adjustment lever
3 Seat height adjustment lever
4 Vertical lowering adjustment lever
5 Seat base depth adjustment lever
6 Seat inclination adjustment lever
7 Seat forwards/backwards adjustment bar



Driver's seat (example)

6.8.1 On-board toilet, coach

The on-board toilet is located on the right next to the rear entrance.

The toilet may be designed as a chemical toilet (CC) or water closet (WC).

On entering and locking the door the toilet lights are switched on at full brightness and the fan starts running at full power. The waste water tank extractor fan is also switched on. The "WC engaged" sign lights up in the passenger compartment and a red lamp over the toilet cabin indicates that it is occupied.

The wash basin is supplied with water from the fresh water tank.

The WC toilet is flushed with waste water from the wash basin collector tank.

The chemical toilet operates on the recirculation principle. It draws fluid from the waste water tank to clean the toilet bowl.

Waste water tank

The waste water tank for WC toilets is located behind the service flap in front of the rear pivoting door.

The waste water tank for chemical toilets (closed system) is located in the toilet.

On-board toilet
1 Wash basin water button
2 Toilet flush button

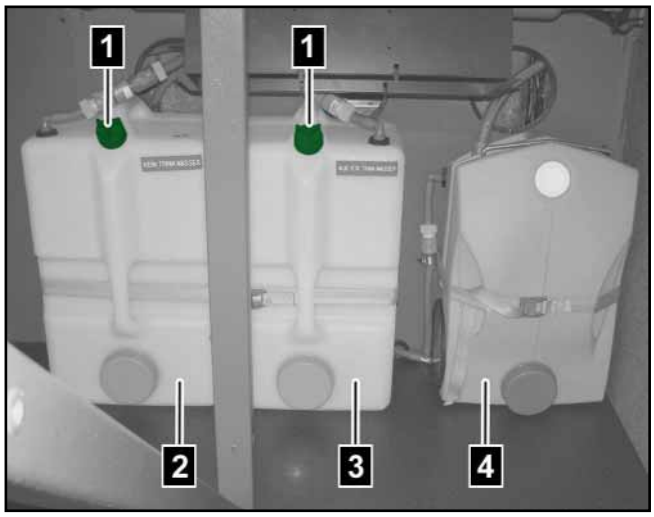
6 Technical rescue

6.8 Special compartments

Fresh and waste water tanks

The rolling fresh water tanks and the waste water tank for the kitchenette are located in the luggage compartment.

The tanks may vary in arrangement and design depending on the optional accessories included. Standard equipment is depicted here.



1 Cap
2 Fresh water tank, toilet (wash basin)
3 Fresh water tank, kitchenette
4 Waste water tank, kitchenette

Filling capacities

	For all models
Fresh water tank, kitchenette	33 litres
Waste water tank, kitchenette	22 litres
Fresh water tank, toilet	66 litres
Waste water tank, toilet	78 litres

6.8.2 On-board kitchenette

Coaches are equipped with an on-board kitchenette (pedestal or stand-up galley).

The on-board kitchenette is located on the left next to the rear entrance on the Cityliner, Starliner and Tourliner .

The on-board kitchenette is located on the right next to the stairs at the rear on the Skyliner.

The kitchenette is de-energised when the battery isolator switch has been actuated.

On-board kitchenette Starliner/Cityliner, example

6.8.3 Rest compartment

The rest compartment for the driver or co-driver is located behind the rear entrance. It is accessible through a door below the kitchenette or from the outside through the emergency exit flap.

Rest compartment label

Be sure to check that nobody is inside the rest compartment when investigating the damaged vehicle. The windowed emergency exit flap is labelled on the outside as is the door inside the vehicle.

Opening the rest compartment

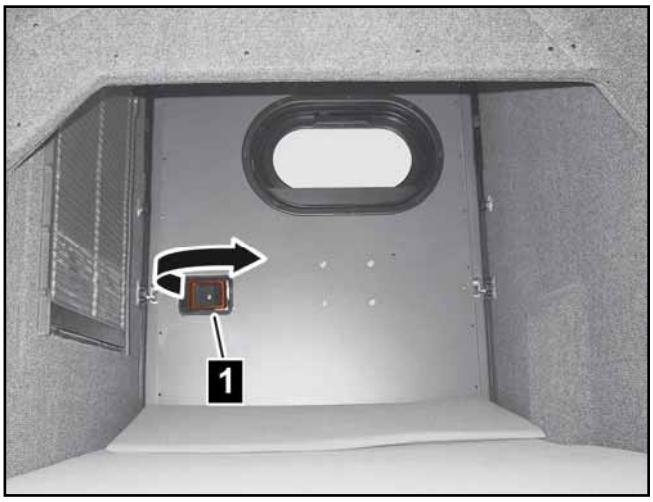
▶ Raise the roller blind 1.

Rest compartment (example illustrated)

1 Roller blind

Opening the emergency exit flap from inside

▶ Pull the emergency exit release handle 1 and open up the flap outwards.



Emergency exit flap

1 Emergency exit release handle

6.8.4 Suitcase compartment, service and luggage flaps

The suitcase flaps, luggage flaps and service flaps feature gas springs to facilitate opening and closing.

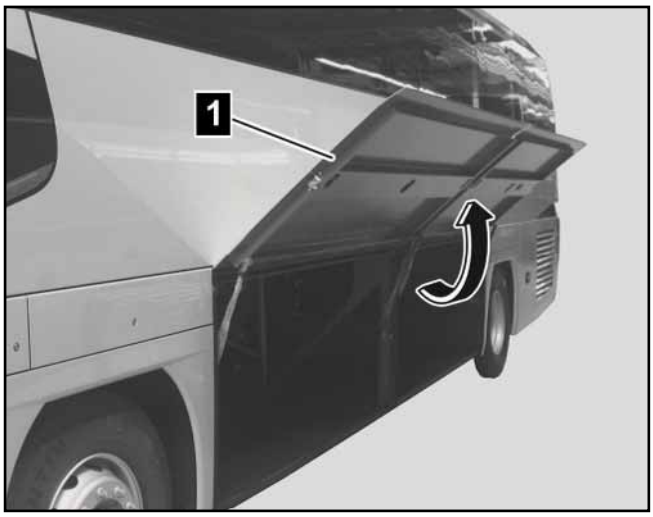
Two different types of flap mechanism are available for the luggage flaps to meet customer requirements.

Normal pivoting mechanism

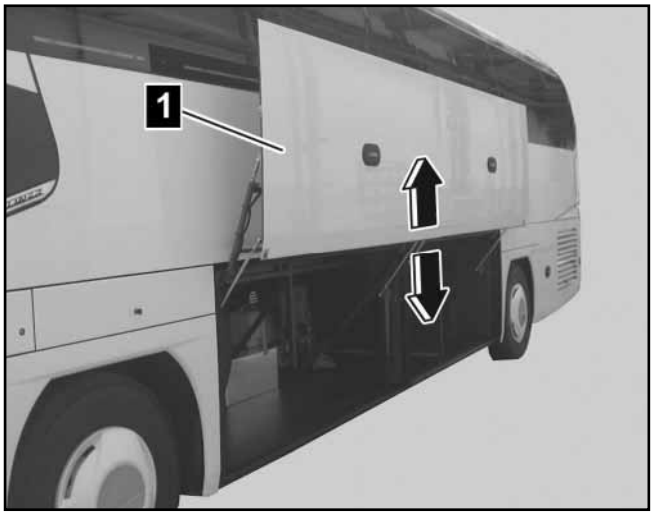
The luggage flaps 1 open up over a large radius when the normal pivoting mechanism is used.

Parallel pivoting mechanism

The luggage flaps 1 pivot up parallel to the side panel of the bus. They thus require less space for opening.



Normal pivoting mechanism
1 Luggage compartment flap



Parallel pivoting mechanism
1 Luggage compartment flap

6.8.6 Ski rack

An enclosed ski rack can be attached to the fixtures on the back of the vehicle to transport skis, ski boots, cases etc. as an optional accessory.

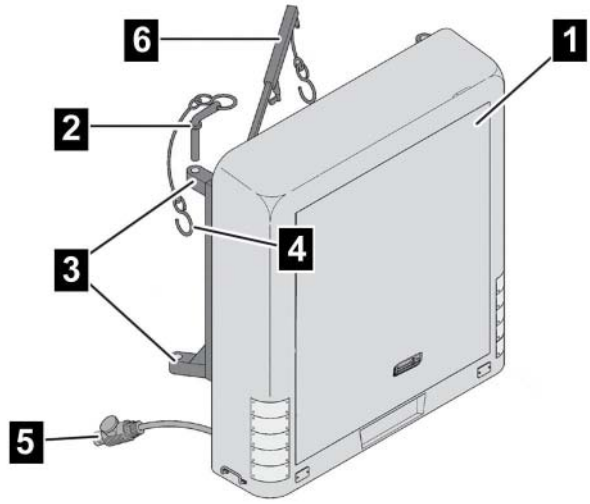
The fixtures on the back of the vehicle are designed for an admissible gross load of 600 kg.

Do not pivot the ski rack out when loaded. The fixtures are not designed to withstand the leverage thus exerted and may be damaged.

Pivoting out the ski rack

- Empty the ski rack.
- Remove the safety hooks 4 on both handle pins 2 on the left.
- Remove both handle pins 2 on the left.
- Pivot the ski rack out to the right and secure it with the telescopic bar 6.

1 Ski rack



1 Ski rack
2 Handle pin
3 Four-point mount
4 Safety hook
5 Connector plug
6 Telescopic bar

7 Layout pictures

7.1 General

MAN Lion‘s City LE

MAN Lion‘s Regio

NEOPLAN Skyliner

The illustrations below are schematic representations of the most important vehicle components. They are intended to facilitate orientation and allow rapid location on the vehicle.

The illustrations depict examples of the various models and show the maximum possible scope of features. They are shown in the following order:

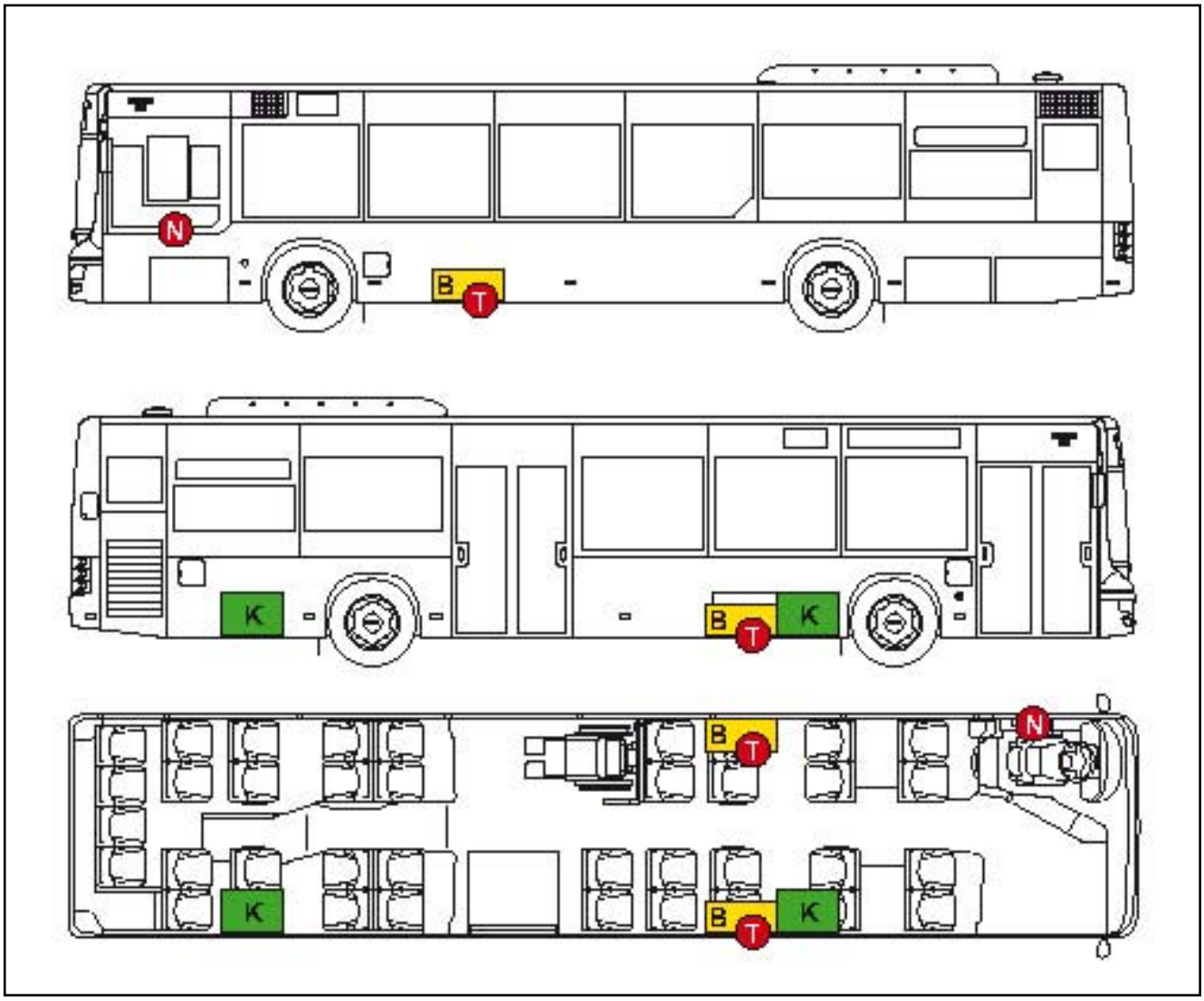
7.2 City bus

7.3 Intercity bus

7.4 Coach.

Section 7.5 includes a schematic representation of the components of the compressed air system showing examples of a City bus, Intercity bus, articulated bus and a coach.

Lion‘s City (A21)
Lion‘s City Ü (A20)



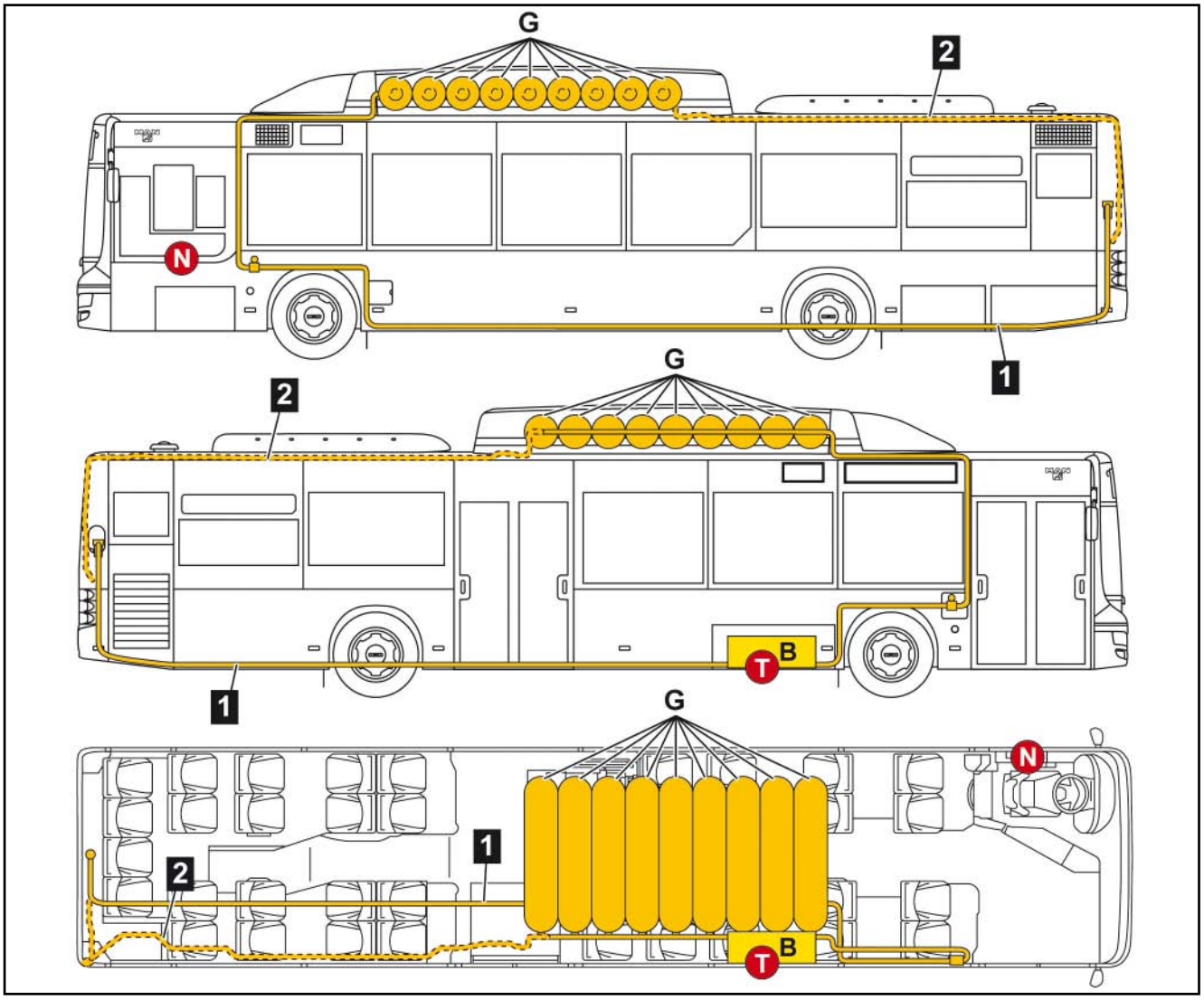
B Battery (2 x 12 V) (left or right depending on design)

N Emergency engine off switch

K Fuel tank

T Battery isolator switch

Lion‘s City CNG (A21)
Lion‘s City Ü CNG (A20)



B Battery (2 x 12 V)

G Gas tanks (example showing Dynetek 9 x 181 litres)

N Emergency engine off switch

T Battery isolator switch

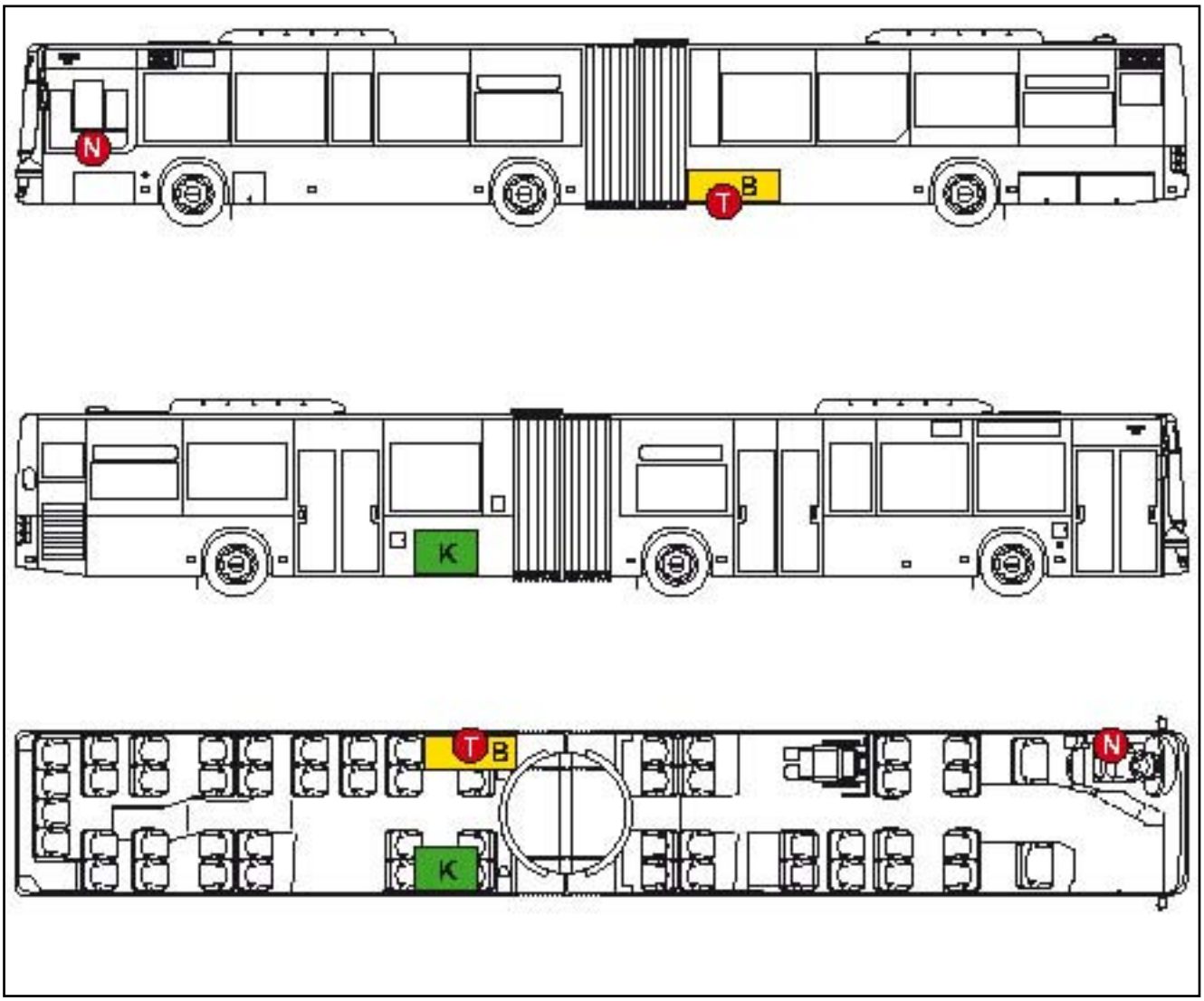
1 up to mid-2010

2 after mid-2010

7 Layout pictures

7.2 City bus

Lion‘s City G (A23)
Lion‘s City GL (A23/A40)
Lion‘s City G LE (A42)
Lion‘s City GL LE (A49)



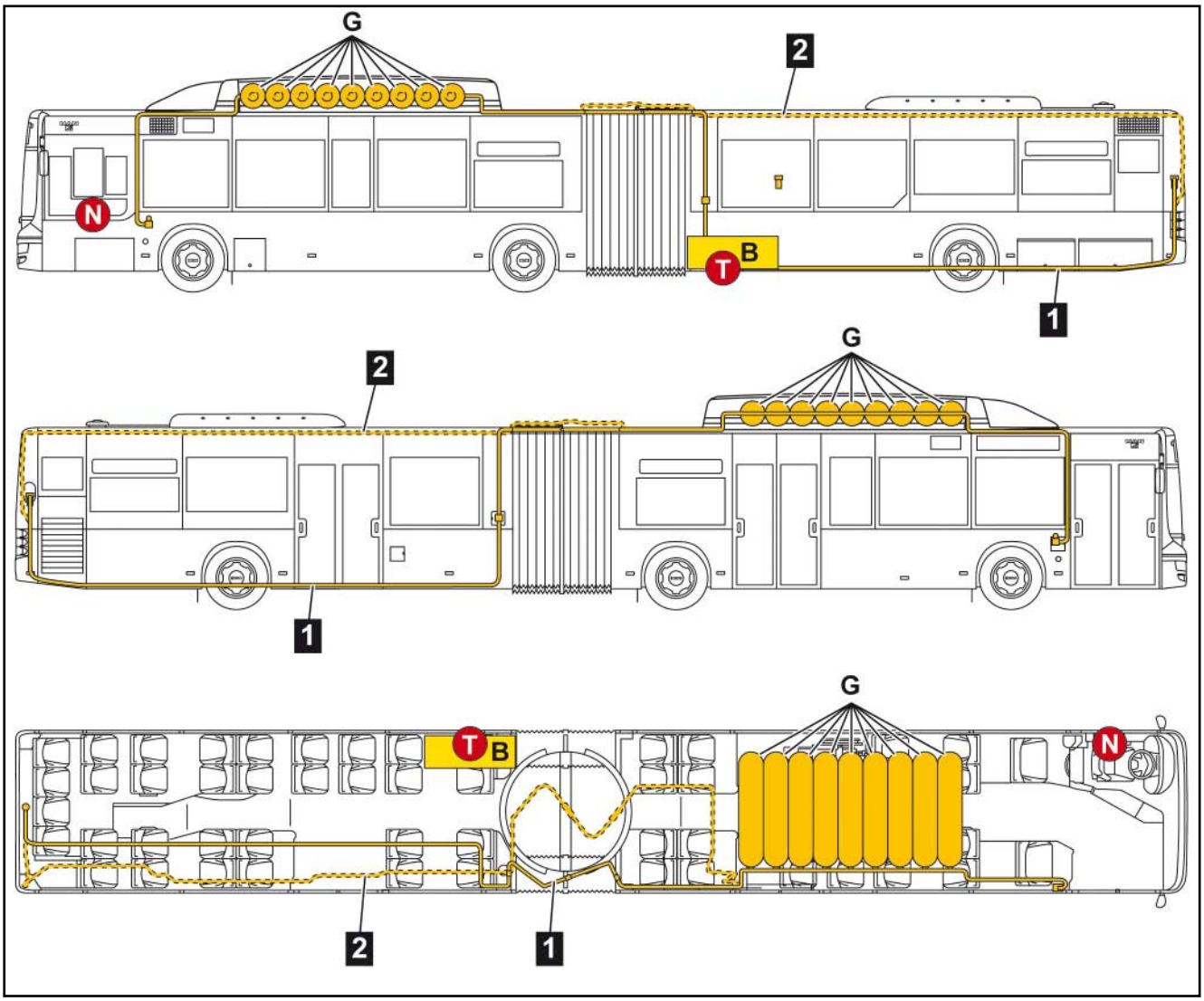
B Battery (2 x 12 V)

N Emergency engine off switch

K Fuel tank

T Battery isolator switch

Lion‘s City G CNG (A23)



B Battery (2 x 12 V)

G Gas tanks (example showing Dynetek 9 x 181 litres)

N Emergency engine off switch

T Battery isolator switch

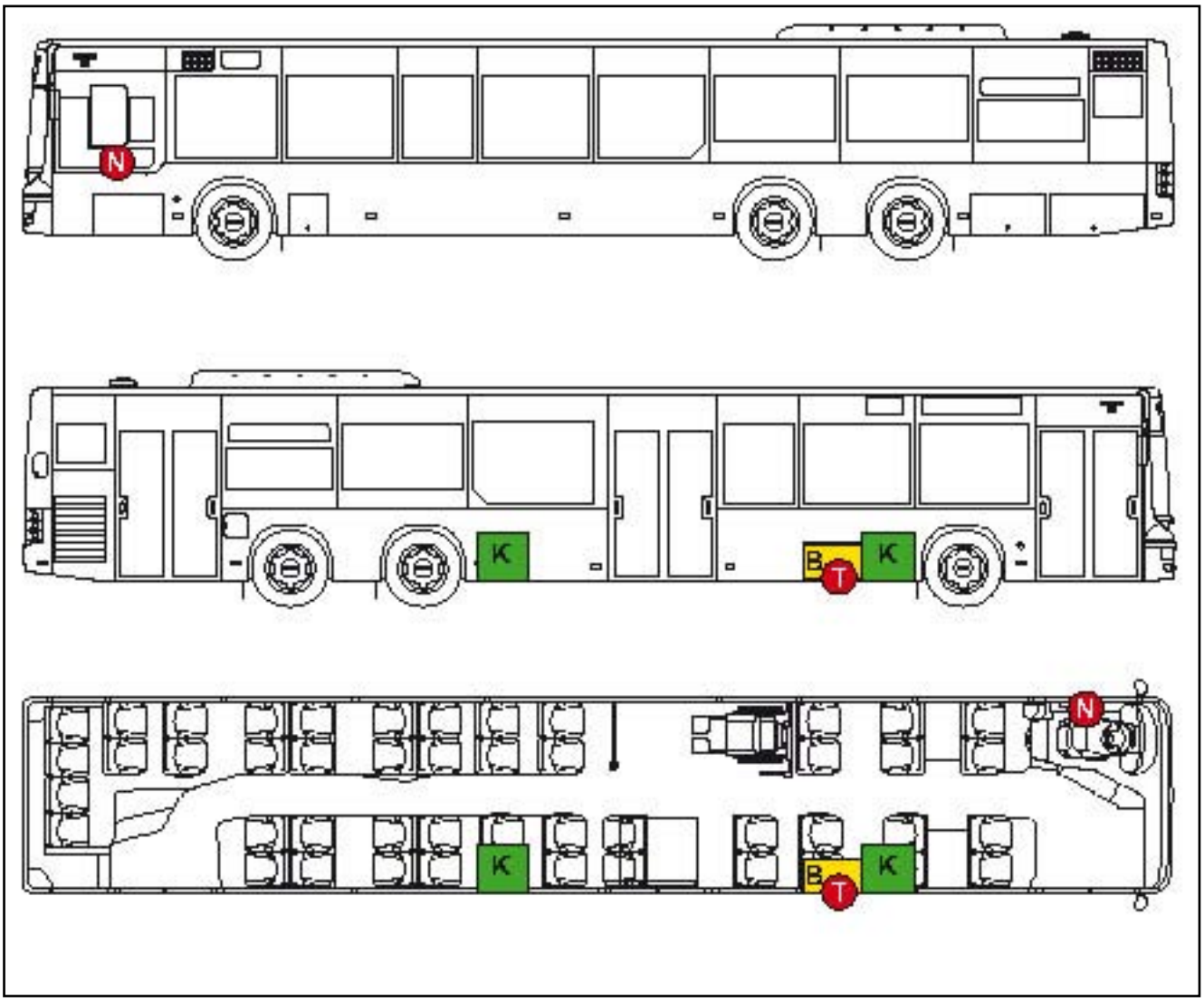
1 up to mid-2010

2 after mid-2010

7 Layout pictures

7.2 City bus

Lion‘s City C (A26/A36)
Lion‘s City L (A26)
Lion‘s City C LE (A45)
Lion‘s City L LE (A44)



B Battery (2 x 12 V)

N Emergency engine off switch

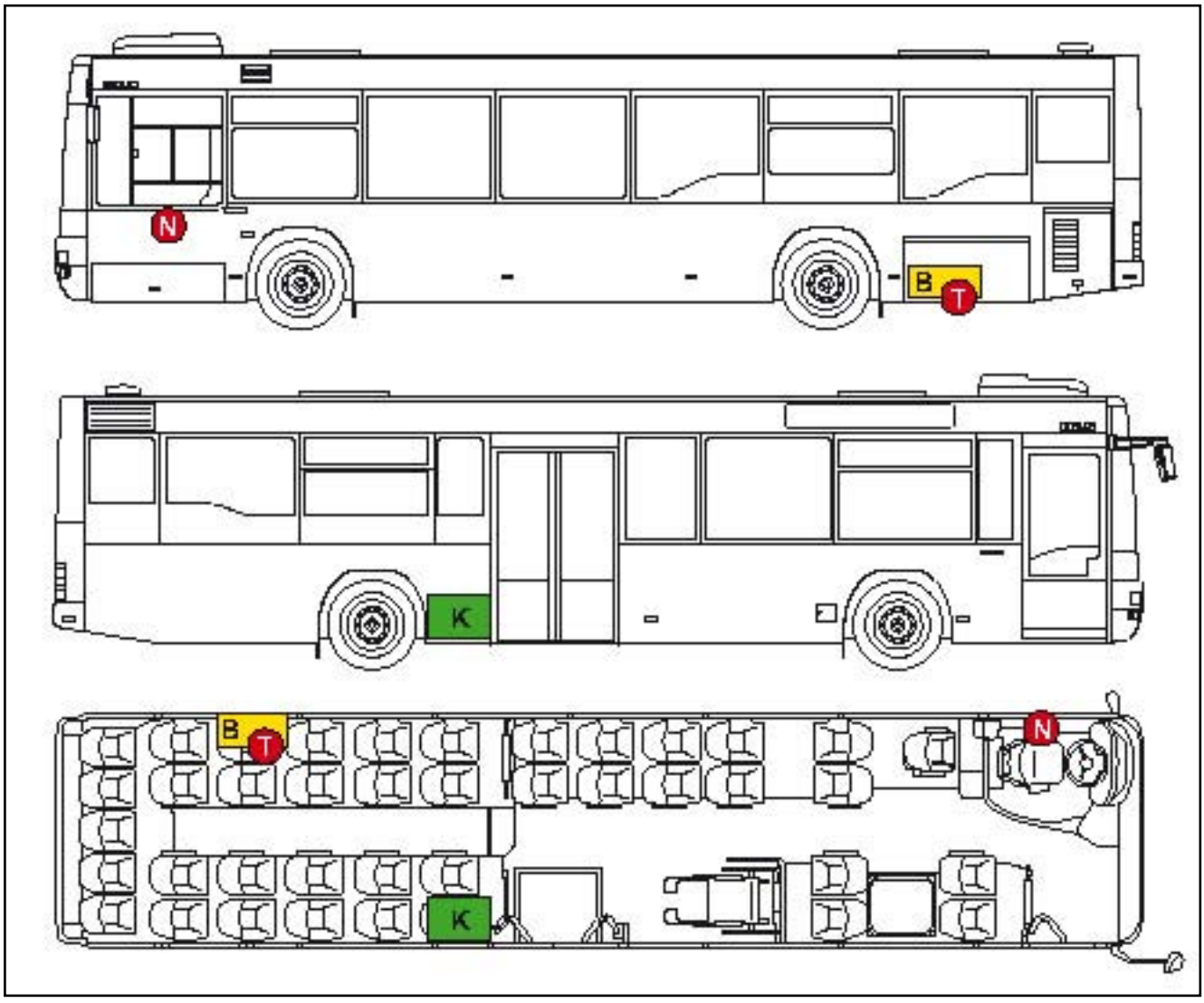
K Fuel tank

T Battery isolator switch

7 Layout pictures

7.2 City bus

Lion‘s City T / LE (A78)
Lion‘s City TÜ / LE Ü (A78)



B Battery (2 x 12 V)

N Emergency engine off switch

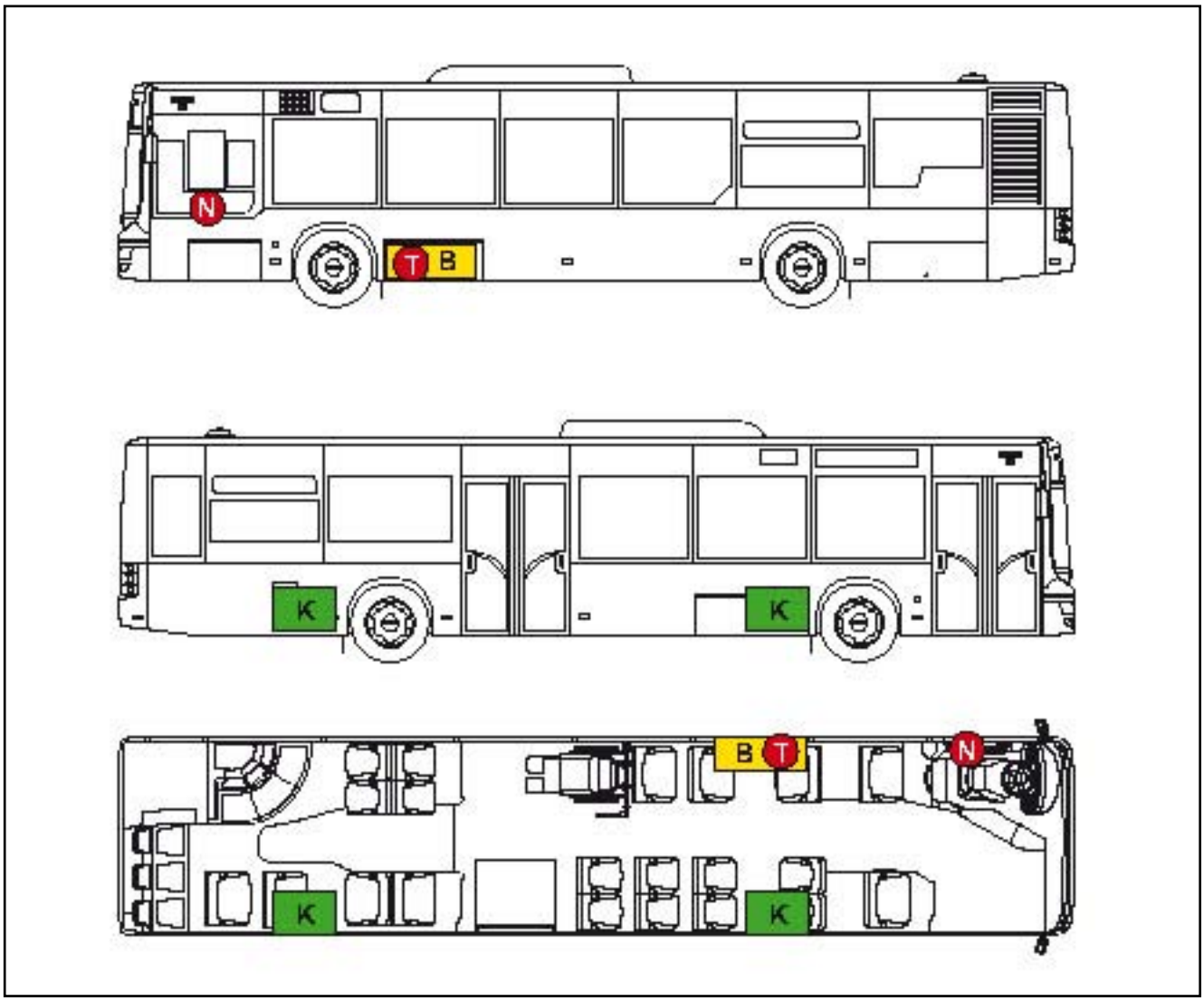
K Fuel tank

T Battery isolator switch

7 Layout pictures

7.2 City bus

Lion‘s City (A37) 2-door



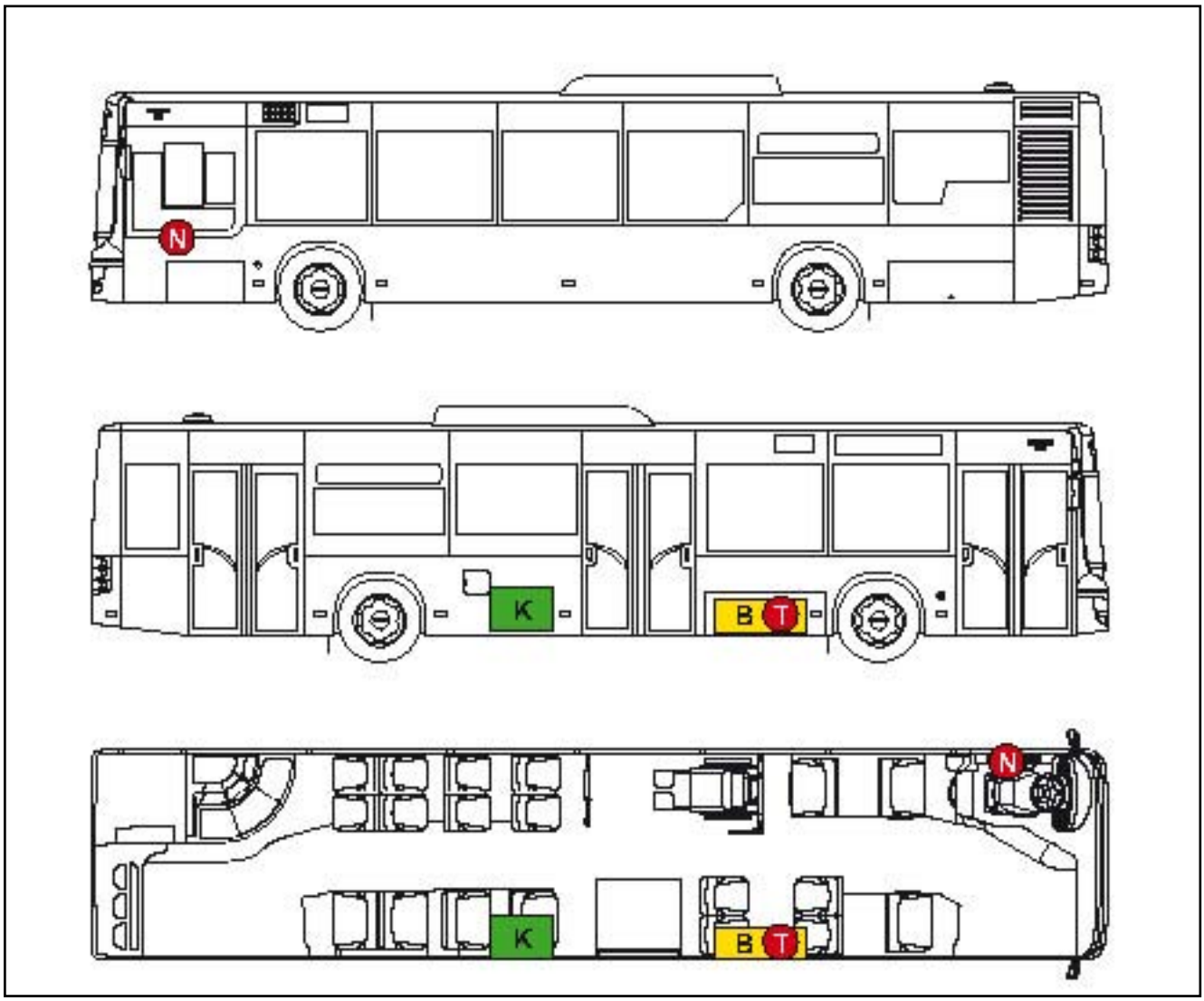
B Battery (2 x 12 V)

N Emergency engine off switch

K Fuel tank

T Battery isolator switch

Lion‘s City (A37) 3-door



B Battery (2 x 12 V)

N Emergency engine off switch

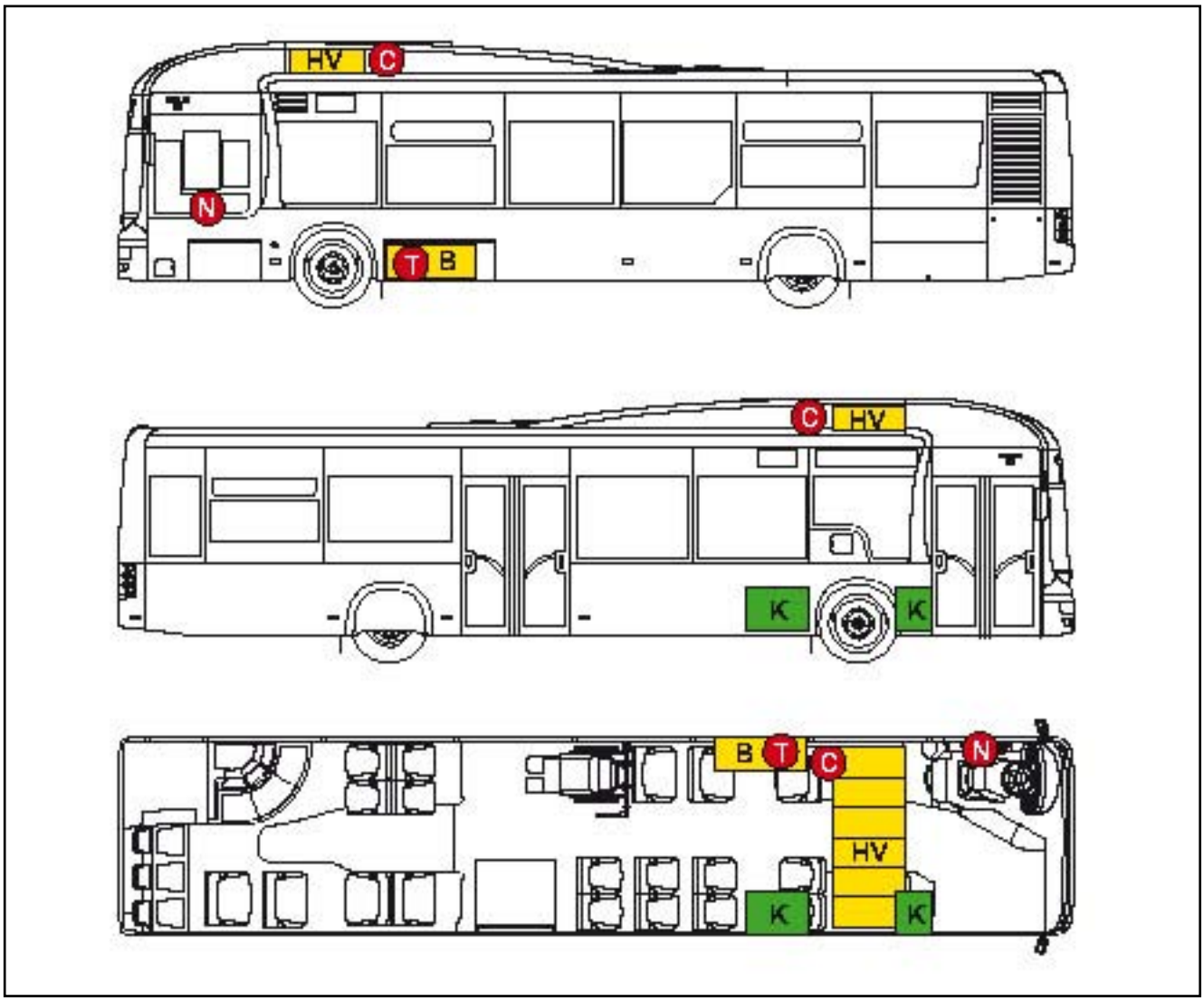
K Fuel tank

T Battery isolator switch

7 Layout pictures

7.2 City bus

Lion‘s City Hybrid (A37)



B Battery (2 x 12 V)

C High-voltage electrical system maintenance connector

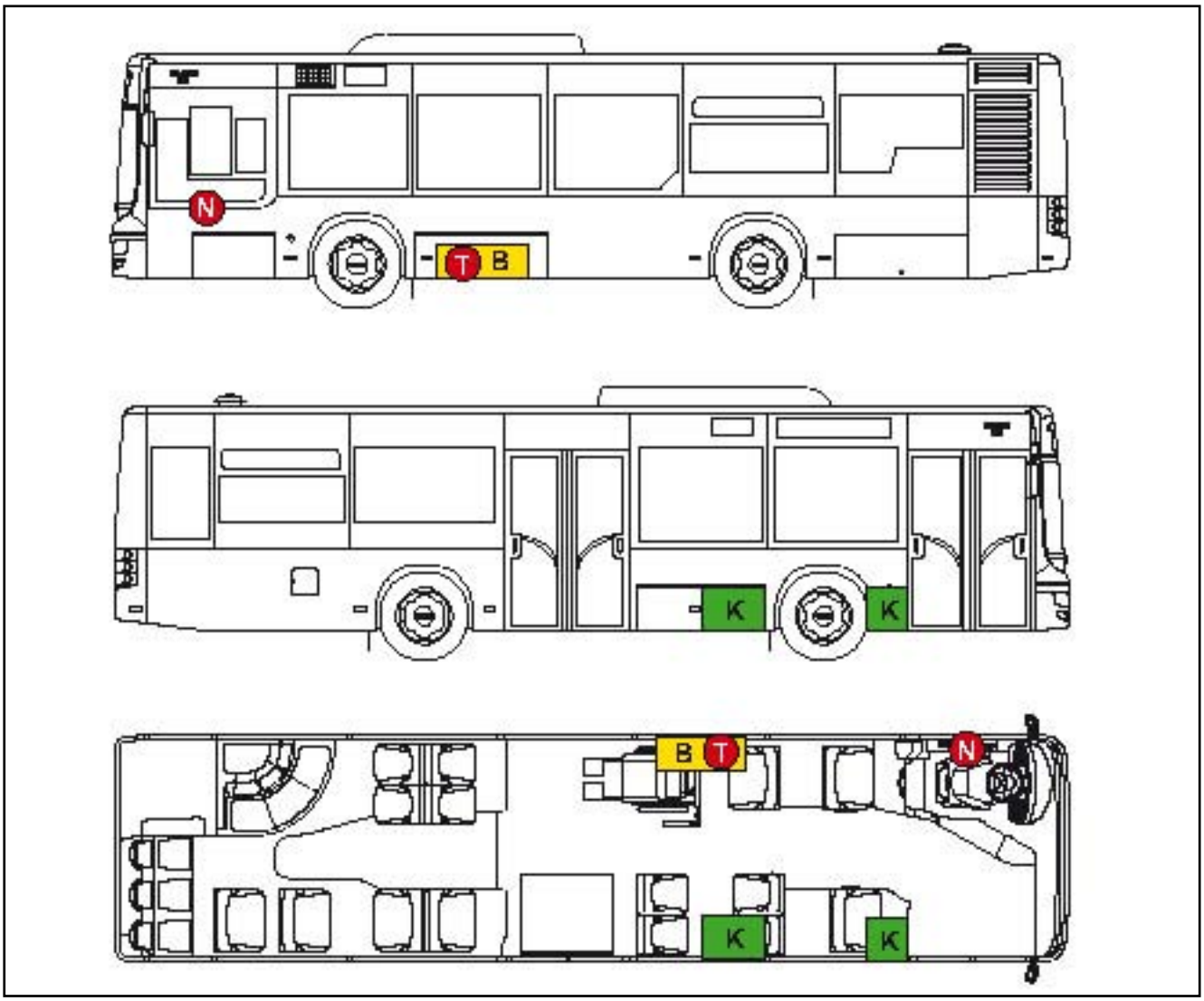
HV High-voltage traction energy storage system

N Emergency hybrid off switch

K Fuel tank

T Battery isolator switch

Lion‘s City M (A47) 2-door



B Battery (2 x 12 V)

N Emergency engine off switch

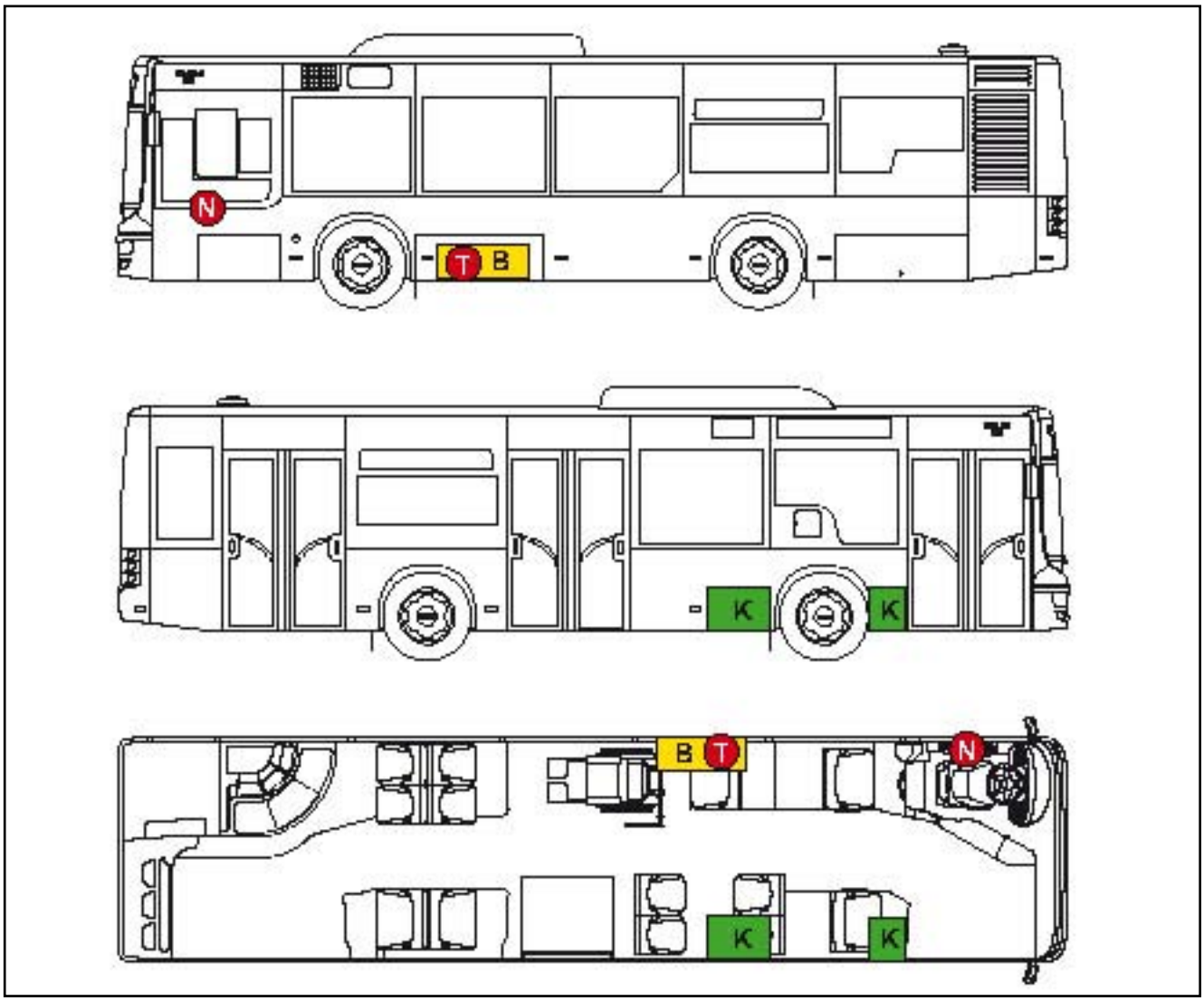
K Fuel tank

T Battery isolator switch

7 Layout pictures

7.2 City bus

Lion‘s City M (A47) 3-door



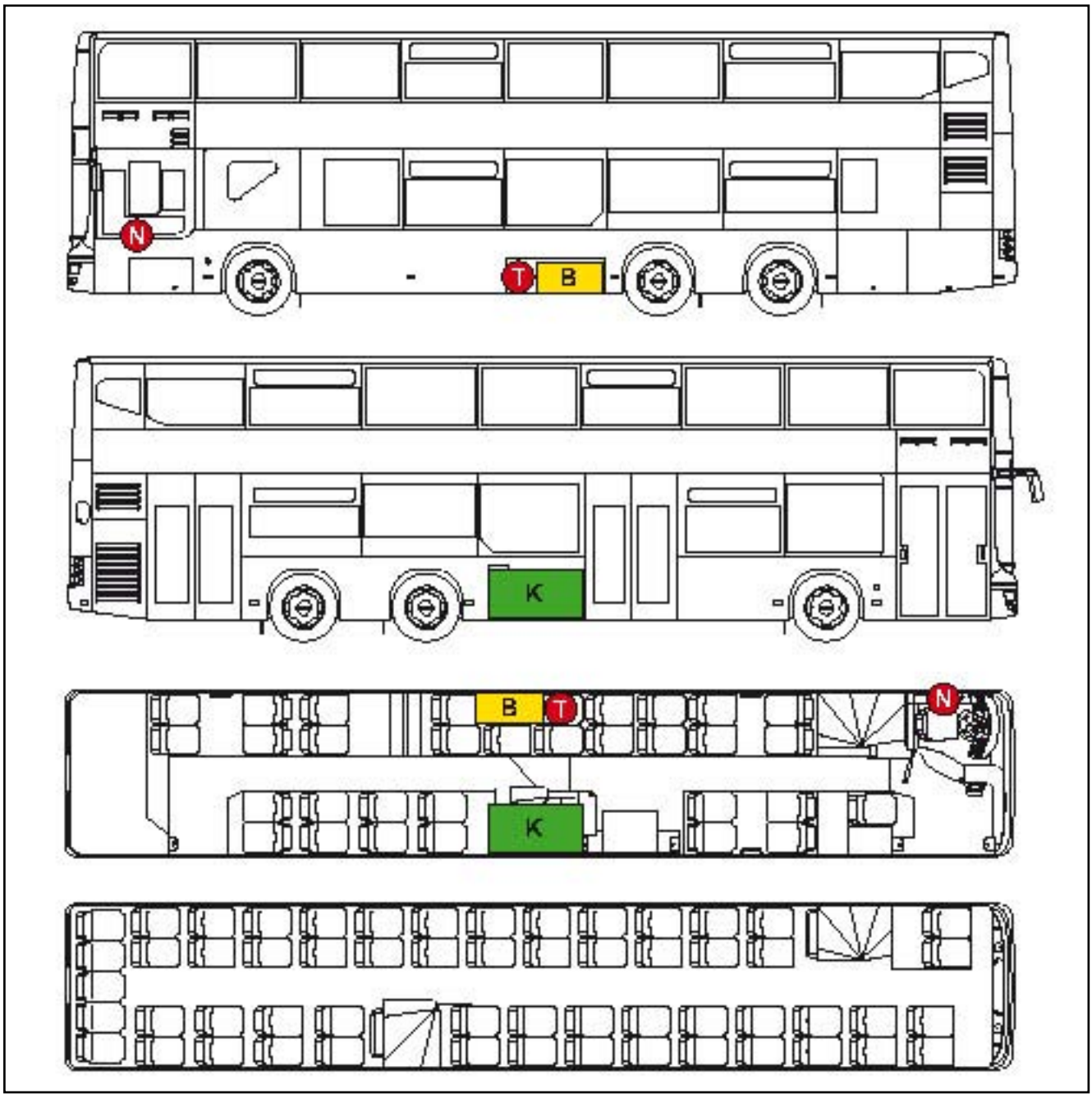
B Battery (2 x 12 V)

N Emergency engine off switch

K Fuel tank

T Battery isolator switch

Lion‘s City DD (A39)



B Battery (2 x 12 V)

N Emergency engine off switch

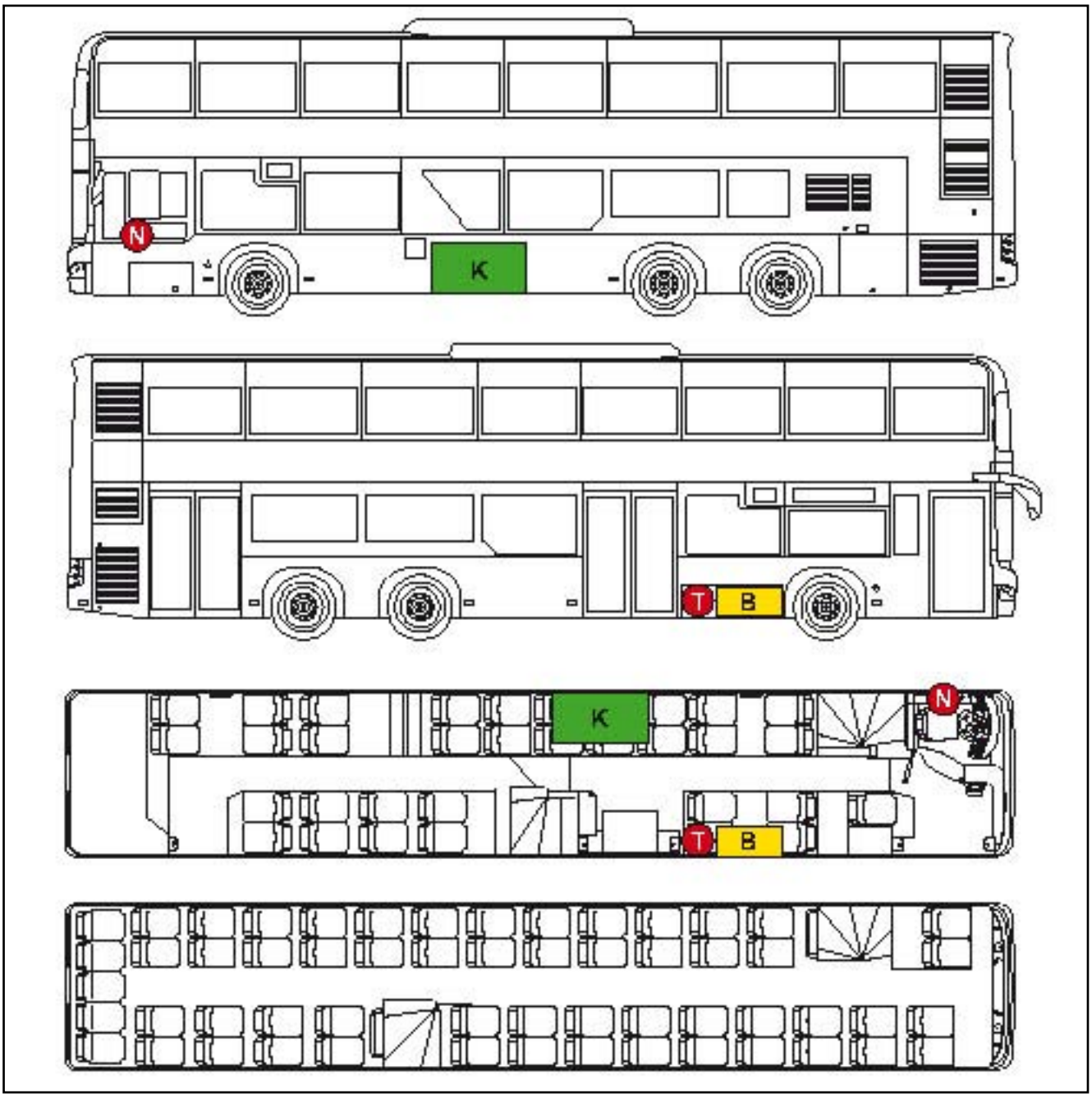
K Fuel tank

T Battery isolator switch

7 Layout pictures

7.2 City bus

NEOPLAN Centroliner DD



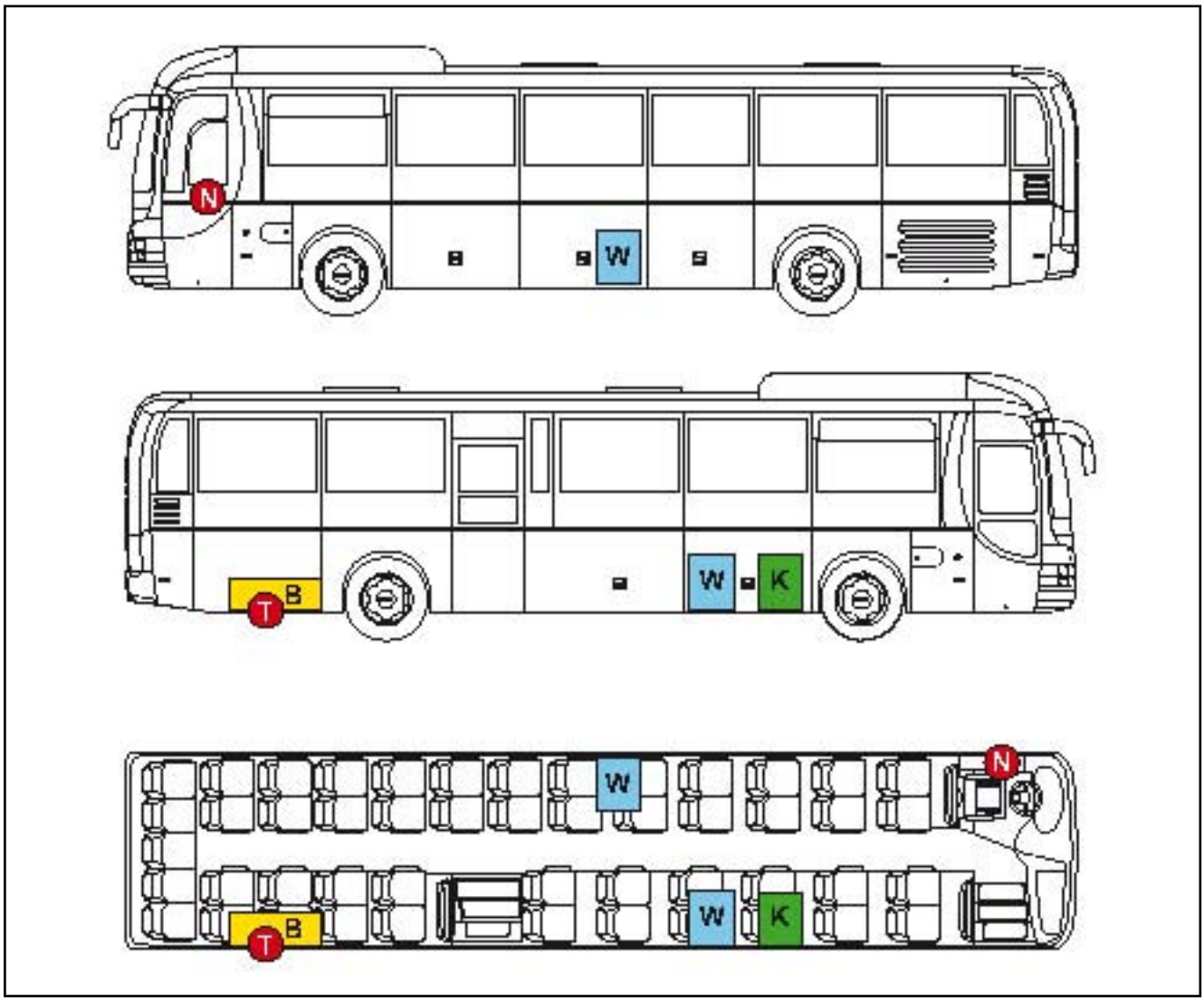
B Battery (2 x 12 V)

N Emergency engine off switch

K Fuel tank

T Battery isolator switch

Lion‘s Regio (R12)



B Battery (2 x 12 V)

N Emergency engine off switch

K Fuel tank

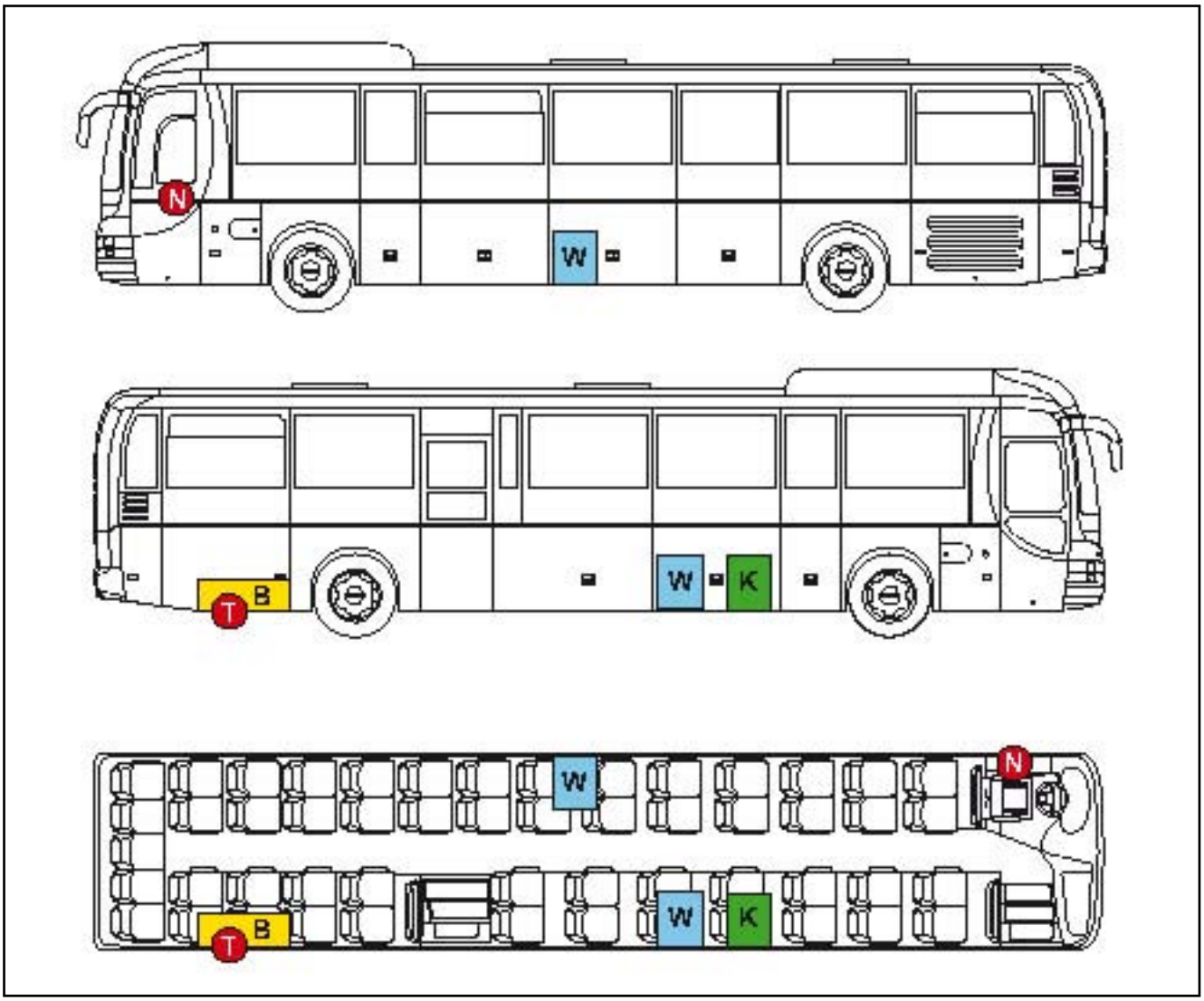
T Battery isolator switch

W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.3 Intercity bus

Lion‘s Regio C (R14)



B Battery (2 x 12 V)

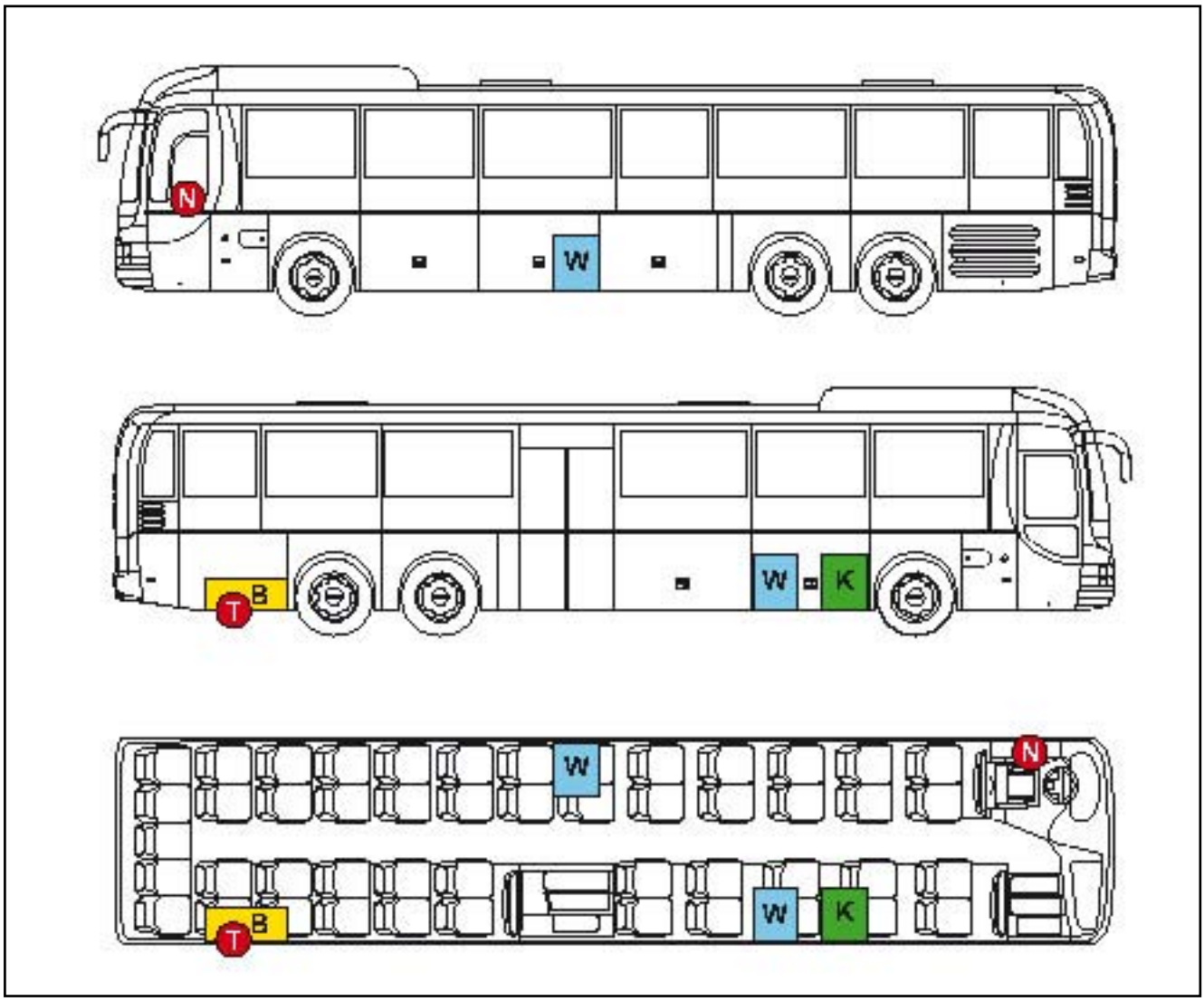
N Emergency engine off switch

K Fuel tank

T Battery isolator switch

W Fresh water tank (kitchenette/WC)

Lion‘s Regio L (R13)



B Battery (2 x 12 V)

N Emergency engine off switch

K Fuel tank

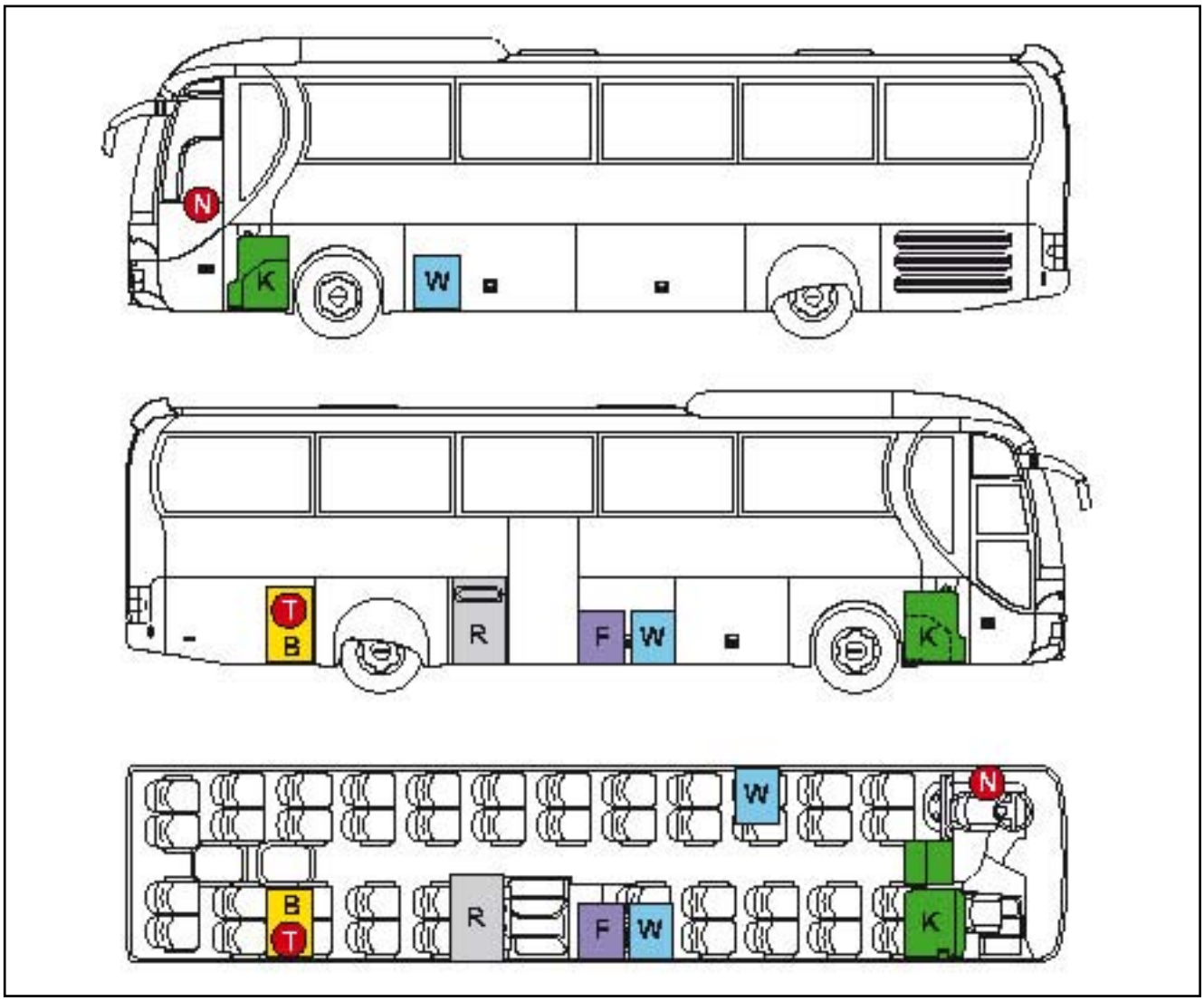
T Battery isolator switch

W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.4 Coach

Lion‘s Coach (R07)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

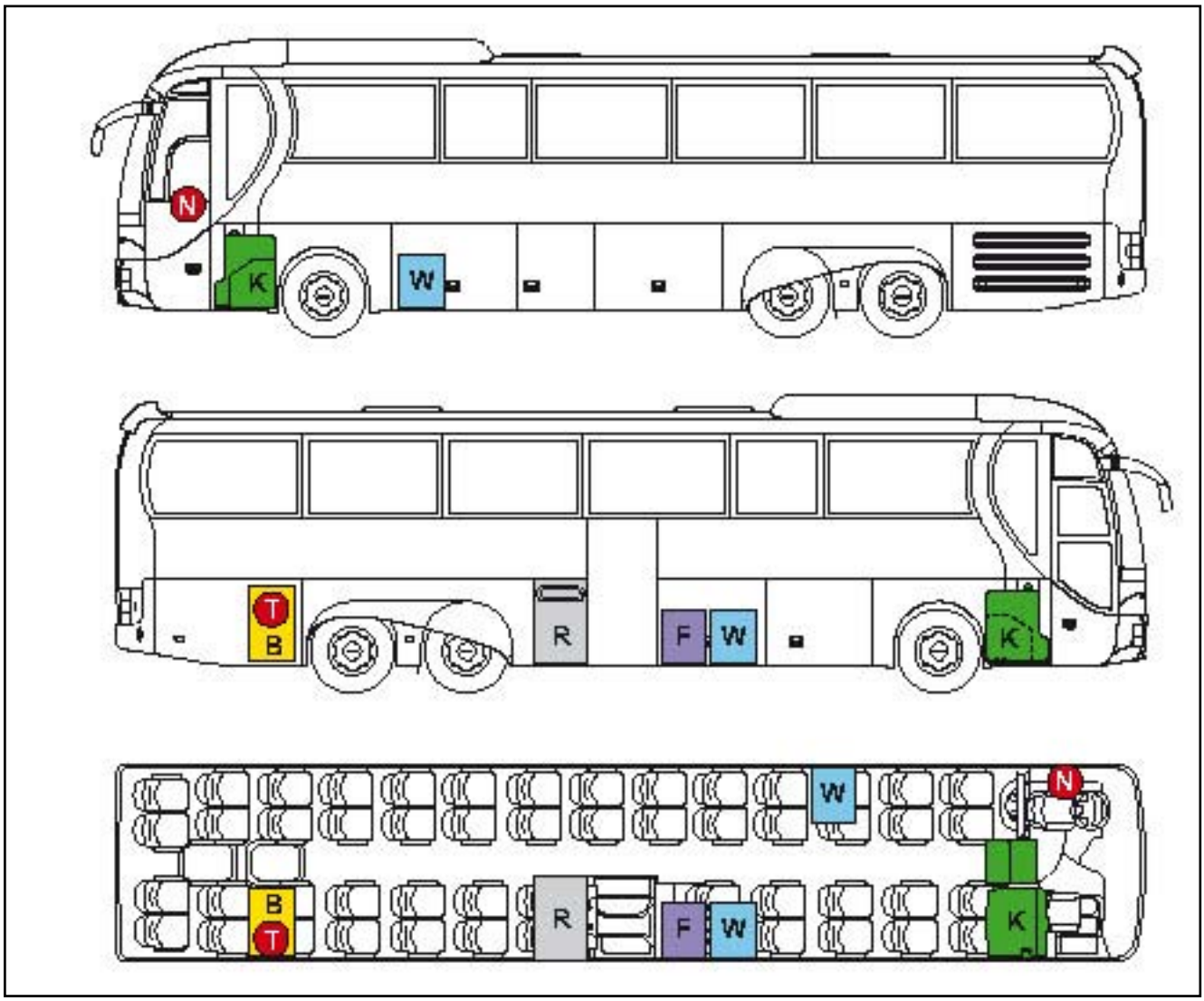
K Fuel tank

R Rest compartment

T Battery isolator switch

W Fresh water tank (kitchenette/WC)

Lion‘s Coach C (R09)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

R Rest compartment

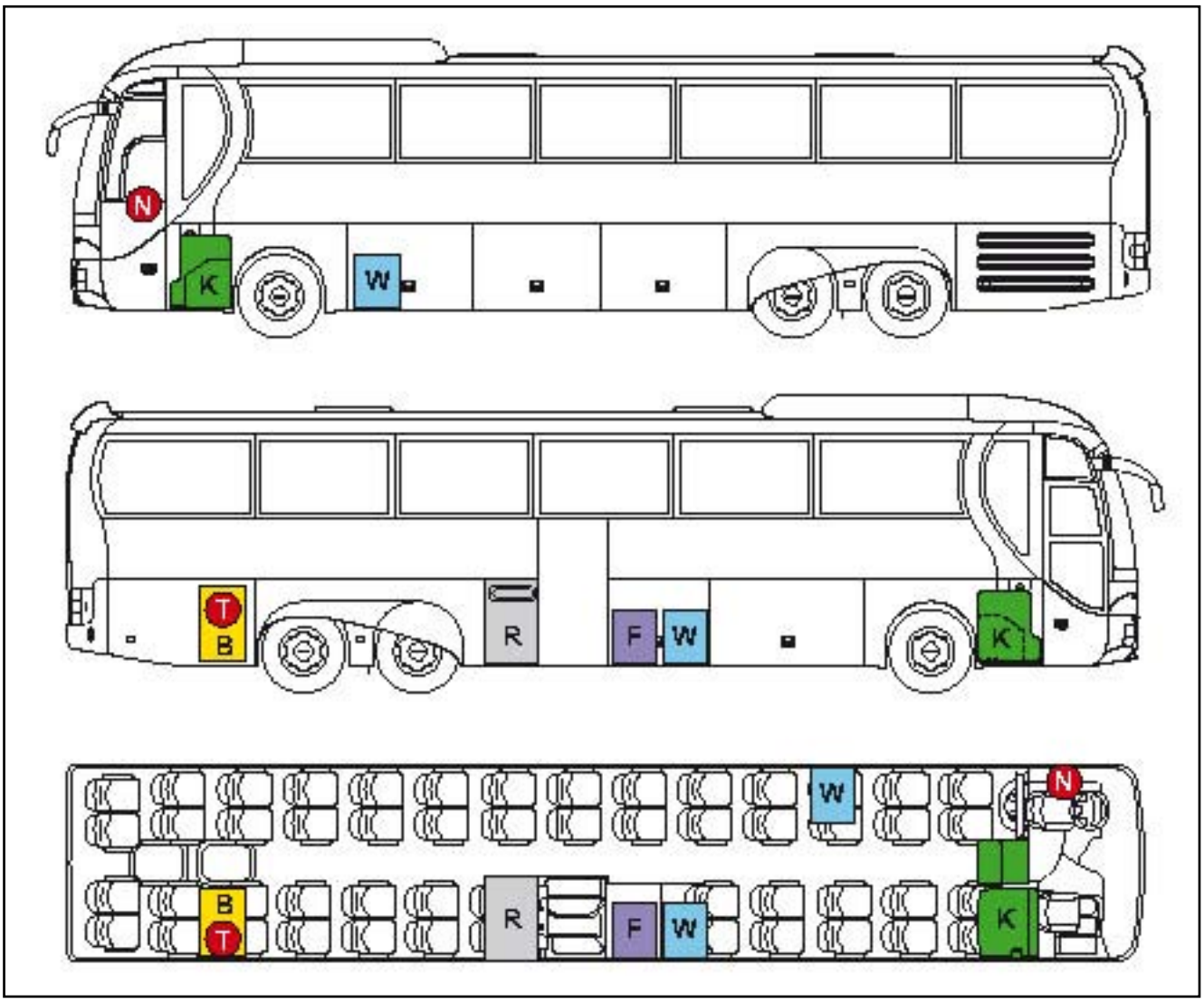
T Battery isolator switch

W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.4 Coach

Lion‘s Coach L (R08)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

R Rest compartment

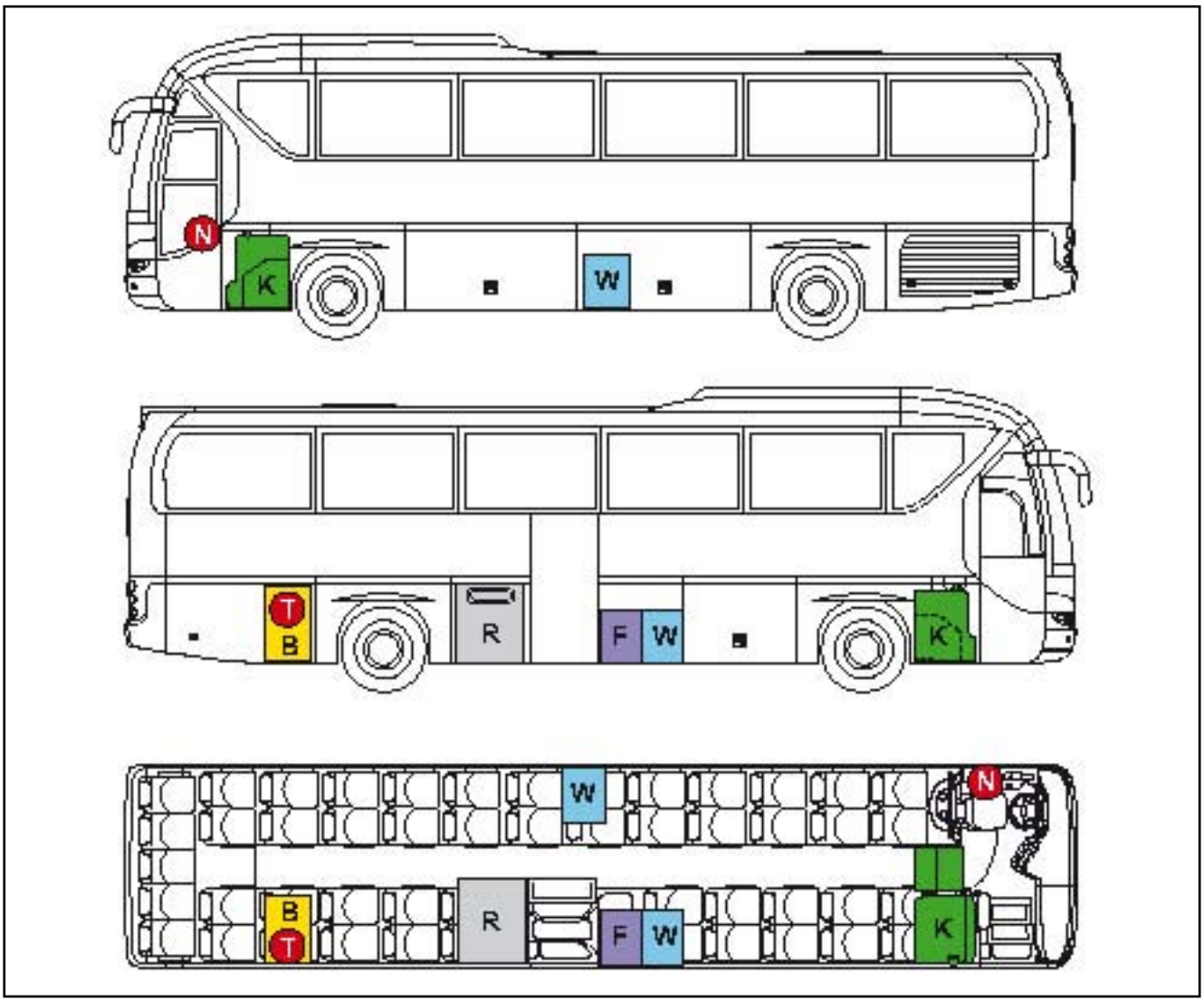
T Battery isolator switch

W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.4 Coach

NEOPLAN Tourliner (P21)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

R Rest compartment

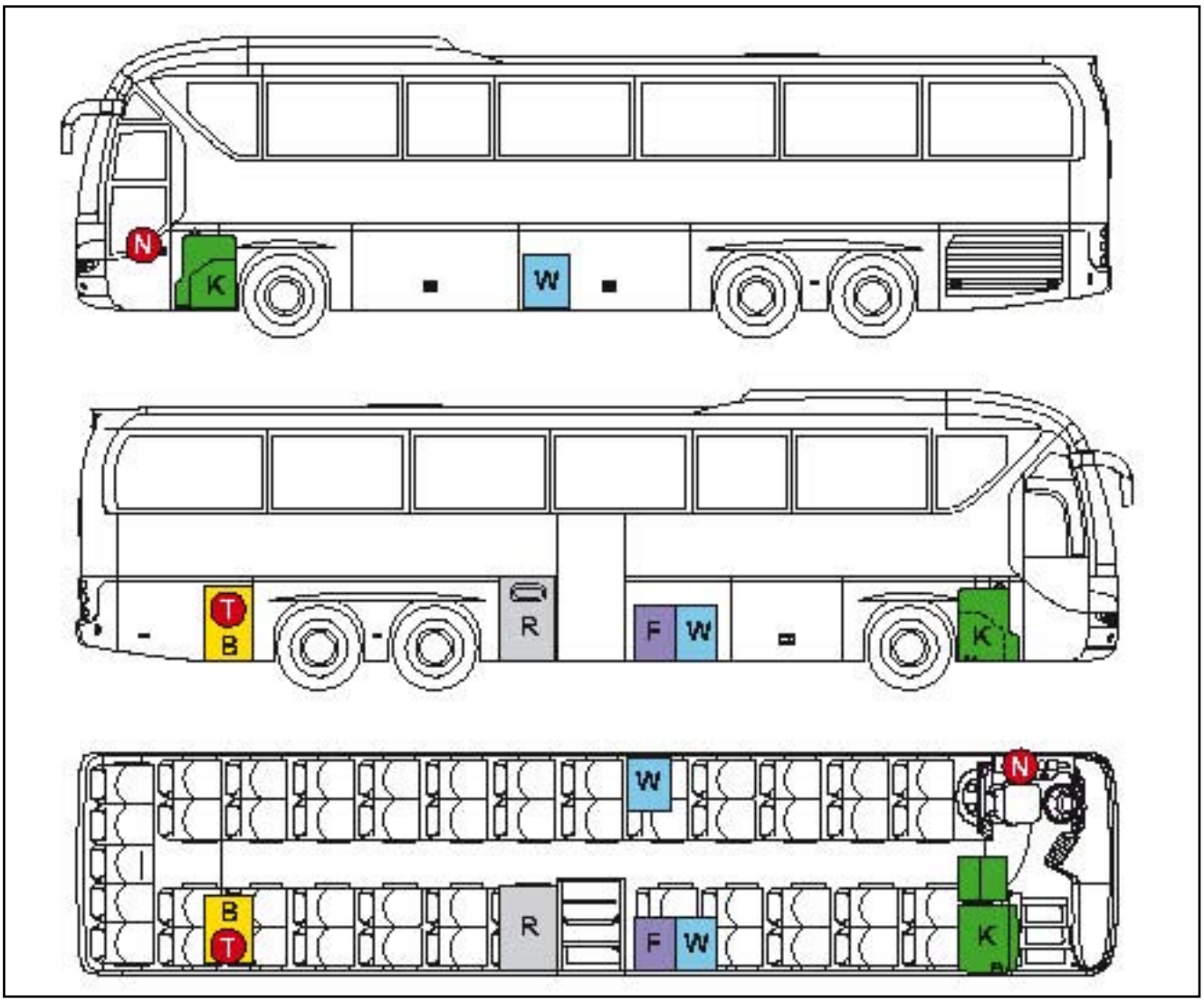
T Battery isolator switch

W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.4 Coach

NEOPLAN Tourliner C (P20)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

R Rest compartment

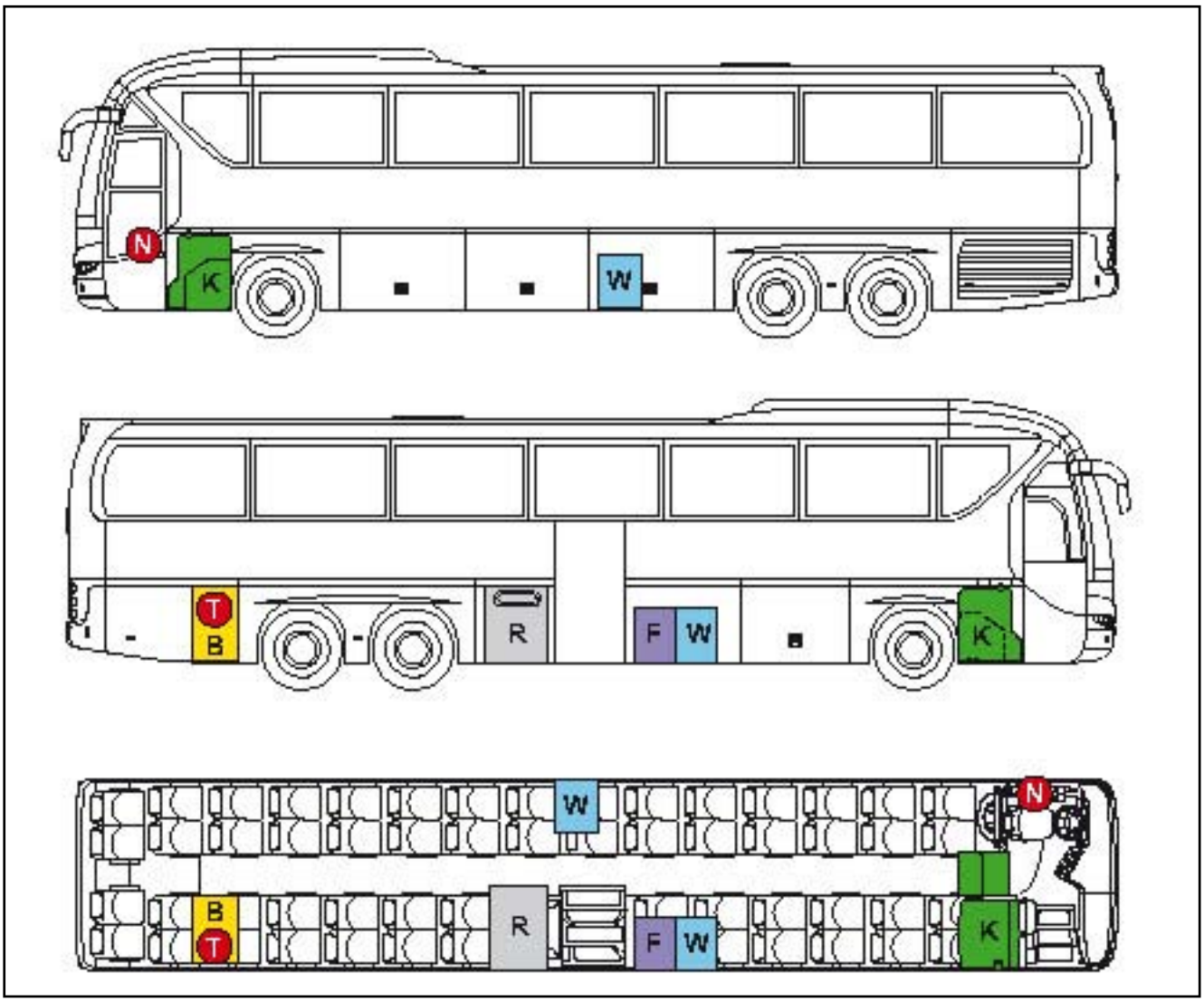
T Battery isolator switch

W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.4 Coach

NEOPLAN Tourliner L (P22)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

R Rest compartment

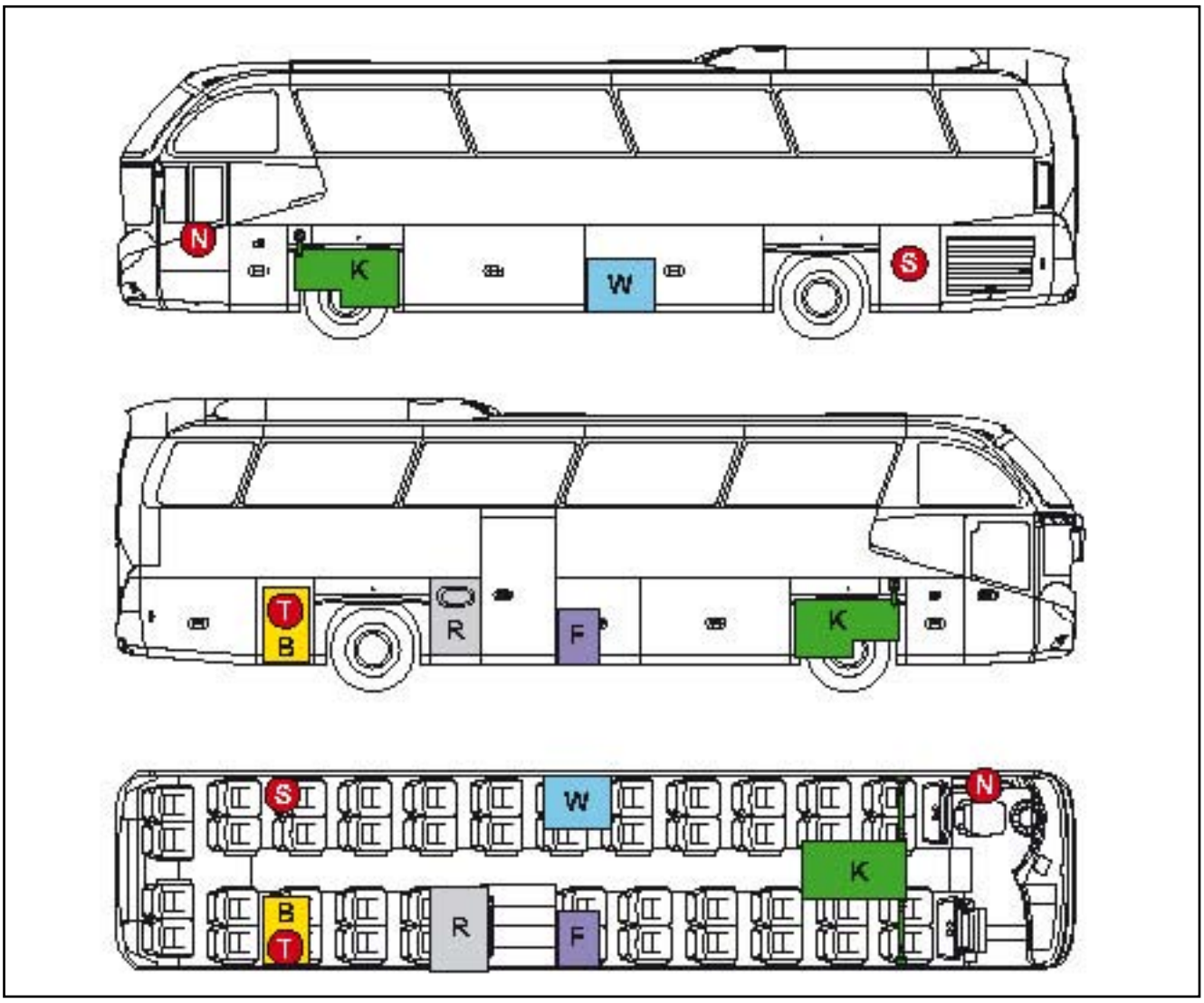
T Battery isolator switch

W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.4 Coach

NEOPLAN Cityliner (P14)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

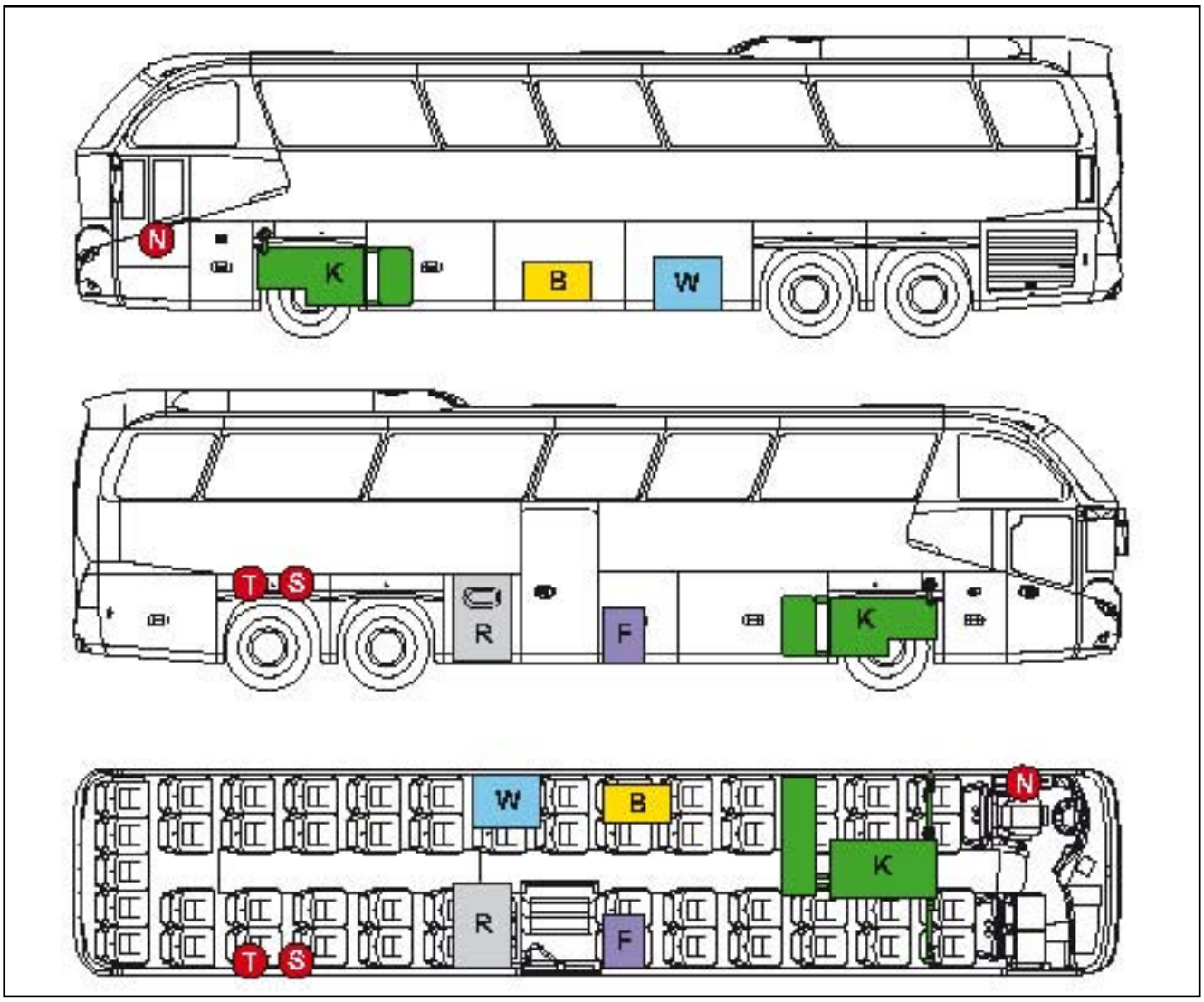
R Rest compartment

S Voltage transformer

T Battery isolator switch

W Fresh water tank (kitchenette/WC)

NEOPLAN Cityliner C (P15)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

R Rest compartment

S Voltage transformer

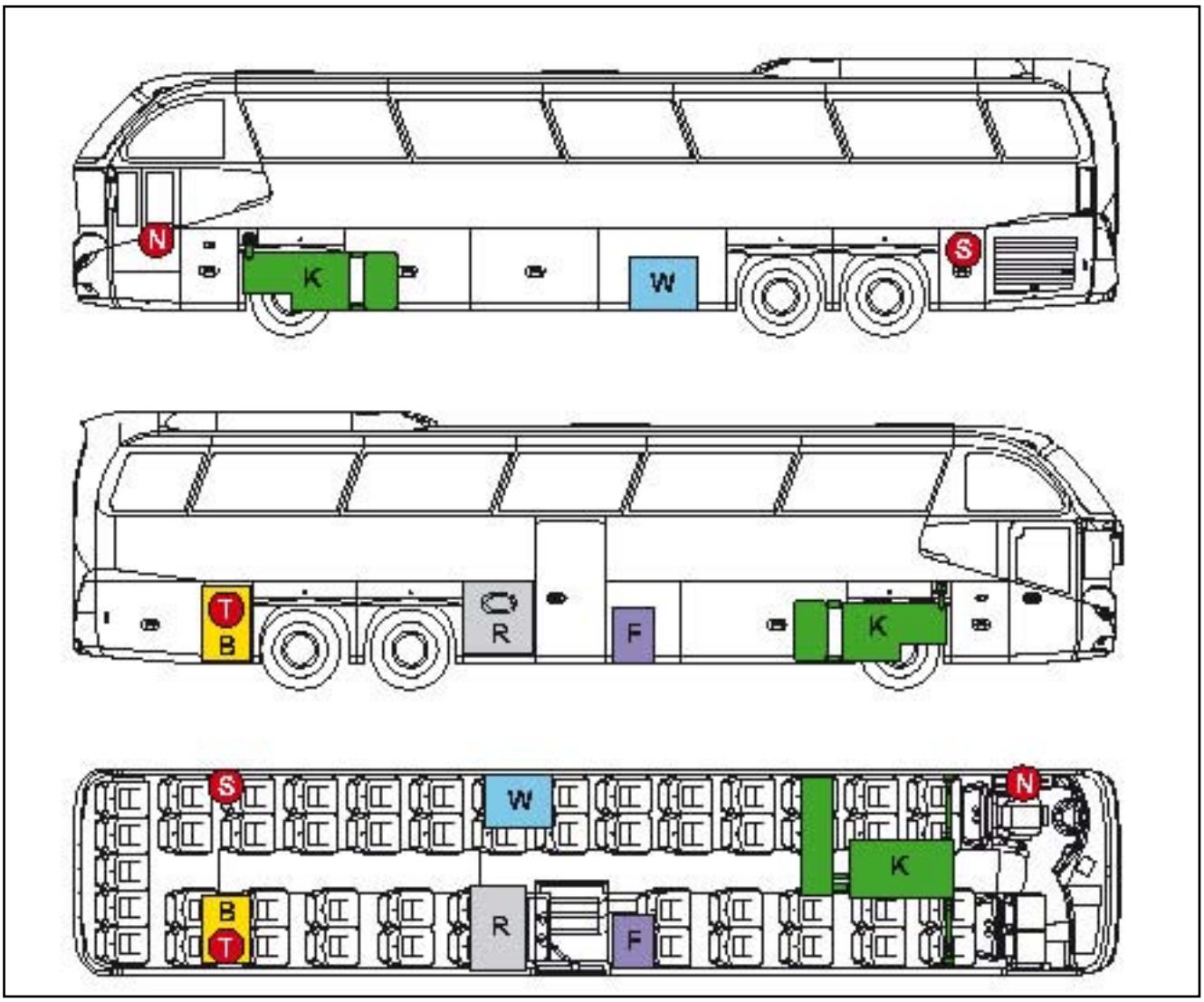
T Battery isolator switch

W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.4 Coach

NEOPLAN Cityliner L (P16)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

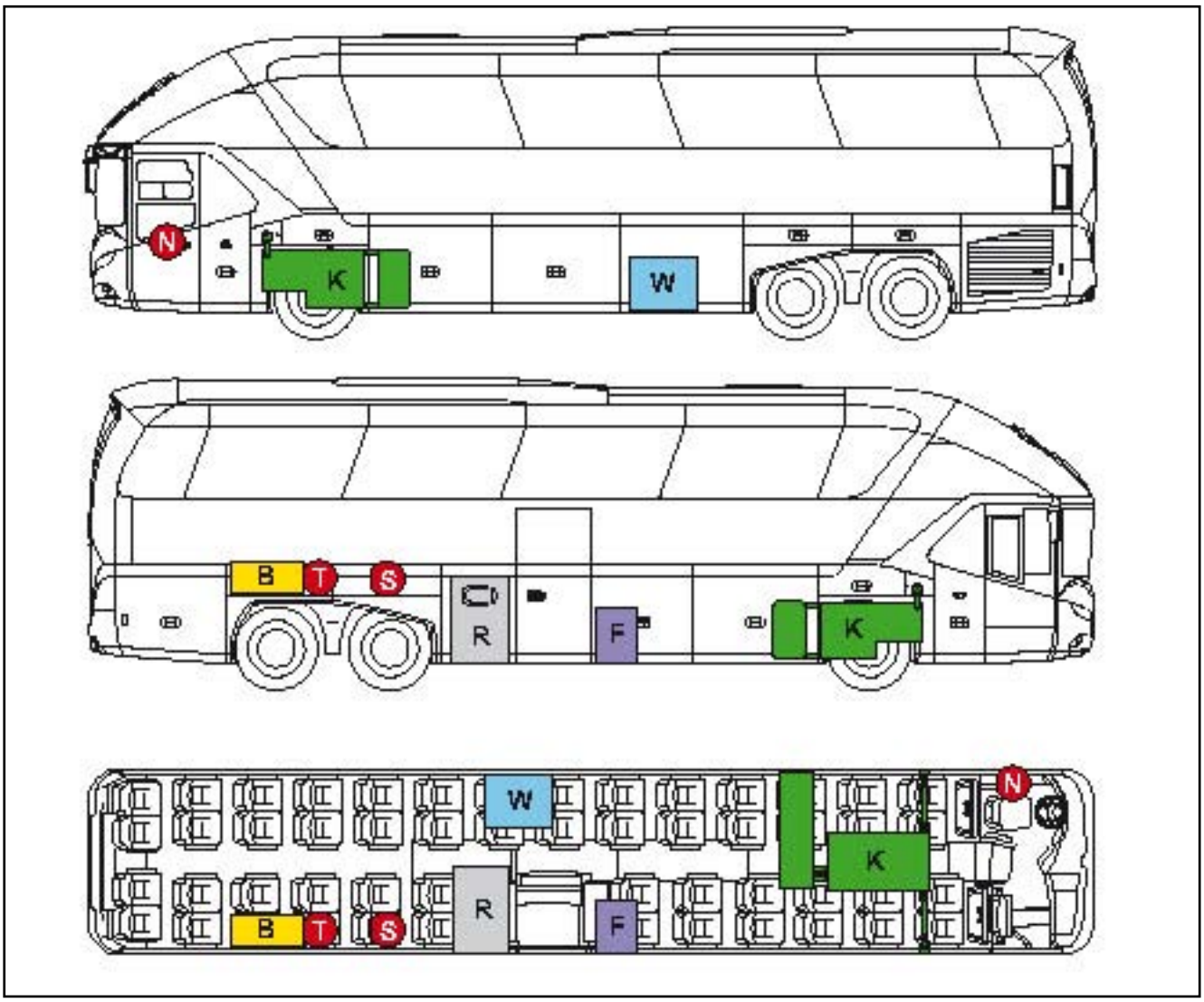
R Rest compartment

S Voltage transformer

T Battery isolator switch

W Fresh water tank (kitchenette/WC)

NEOPLAN Starliner C (P11)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

R Rest compartment

S Voltage transformer

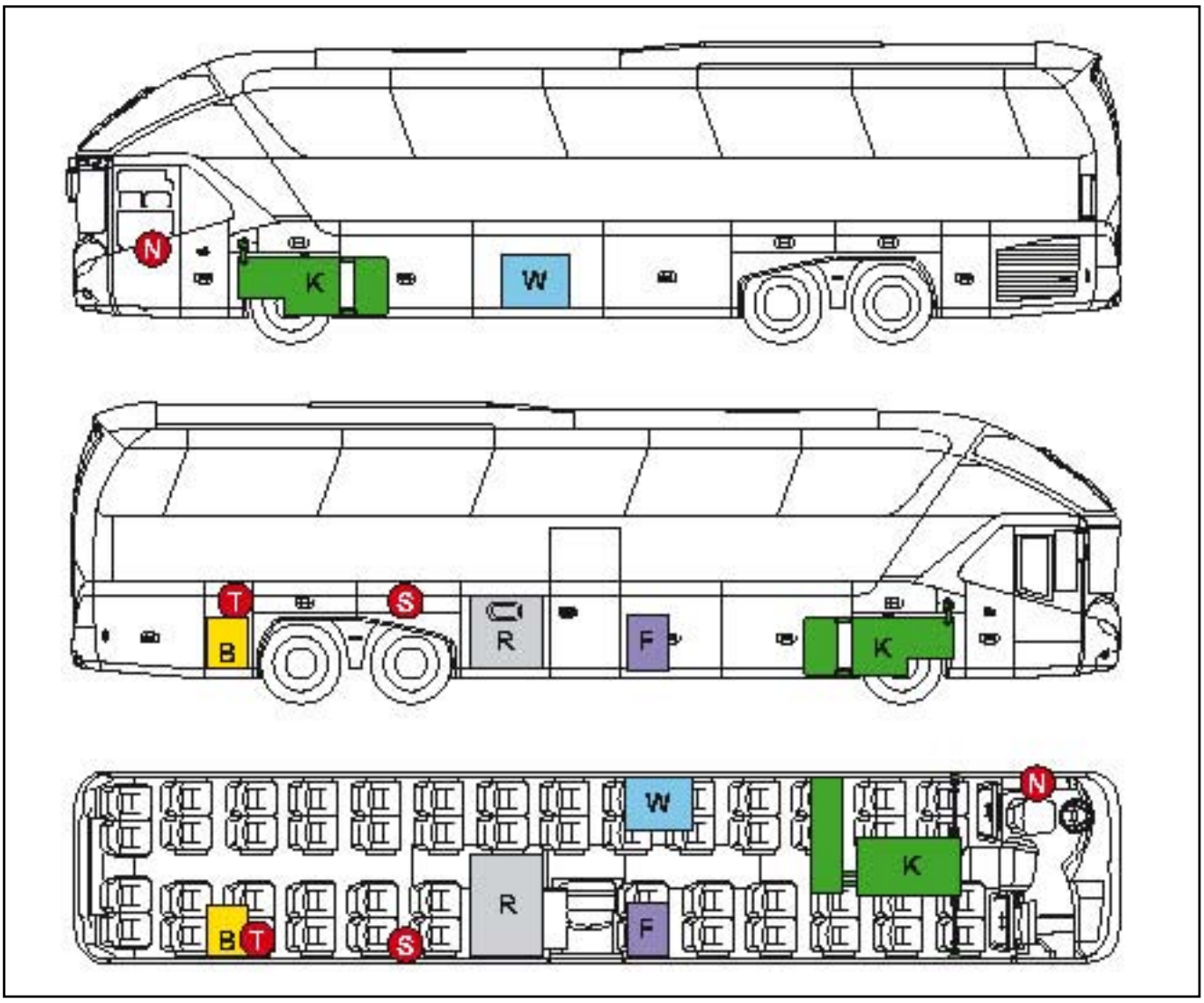
T Battery isolator switch

W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.4 Coach

NEOPLAN Starliner L (P12)



B Battery (2 x 12 V)

F Waste water tank

N Emergency engine off switch

K Fuel tank

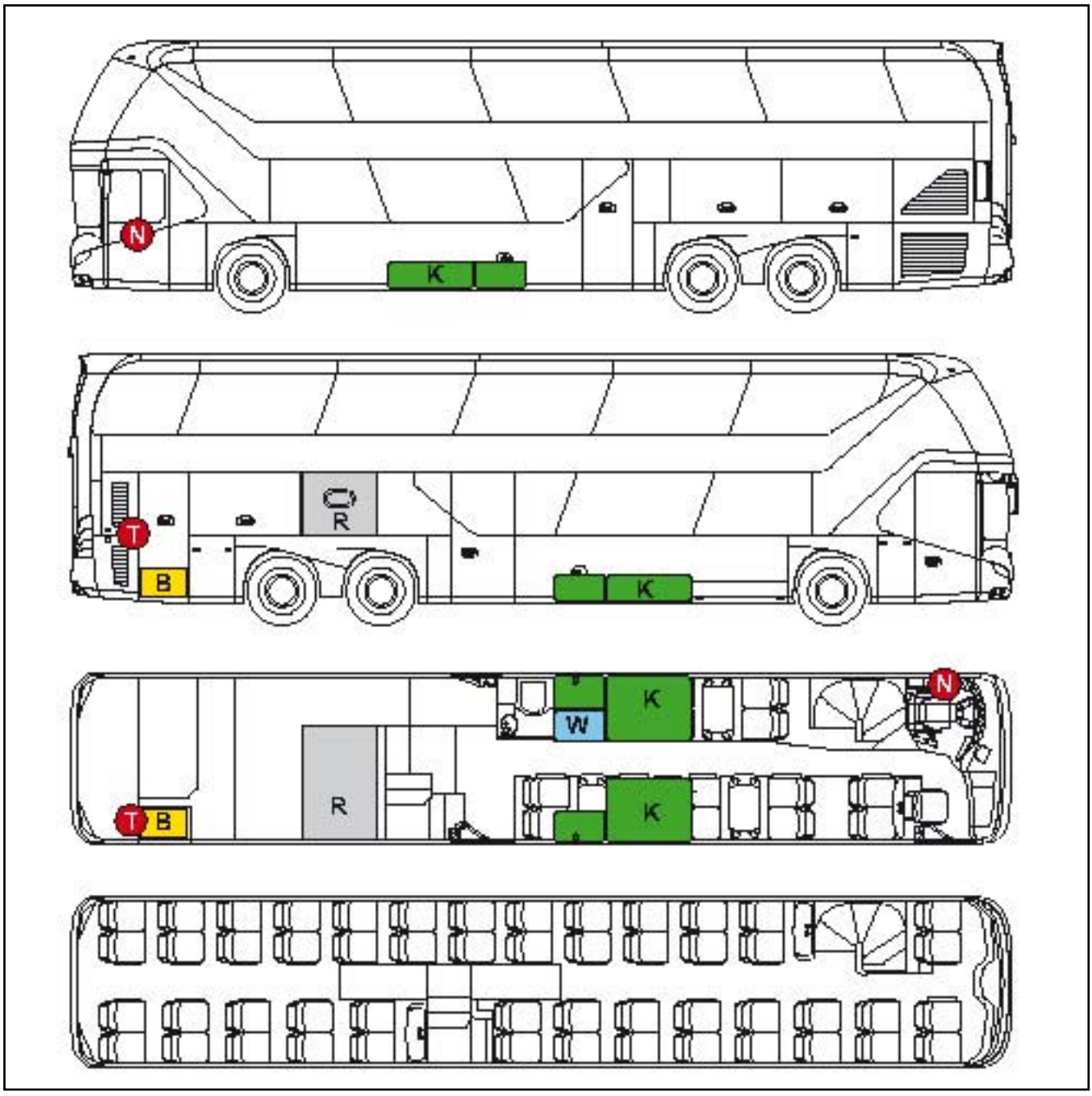
R Rest compartment

S Voltage transformer

T Battery isolator switch

W Fresh water tank (kitchenette/WC)

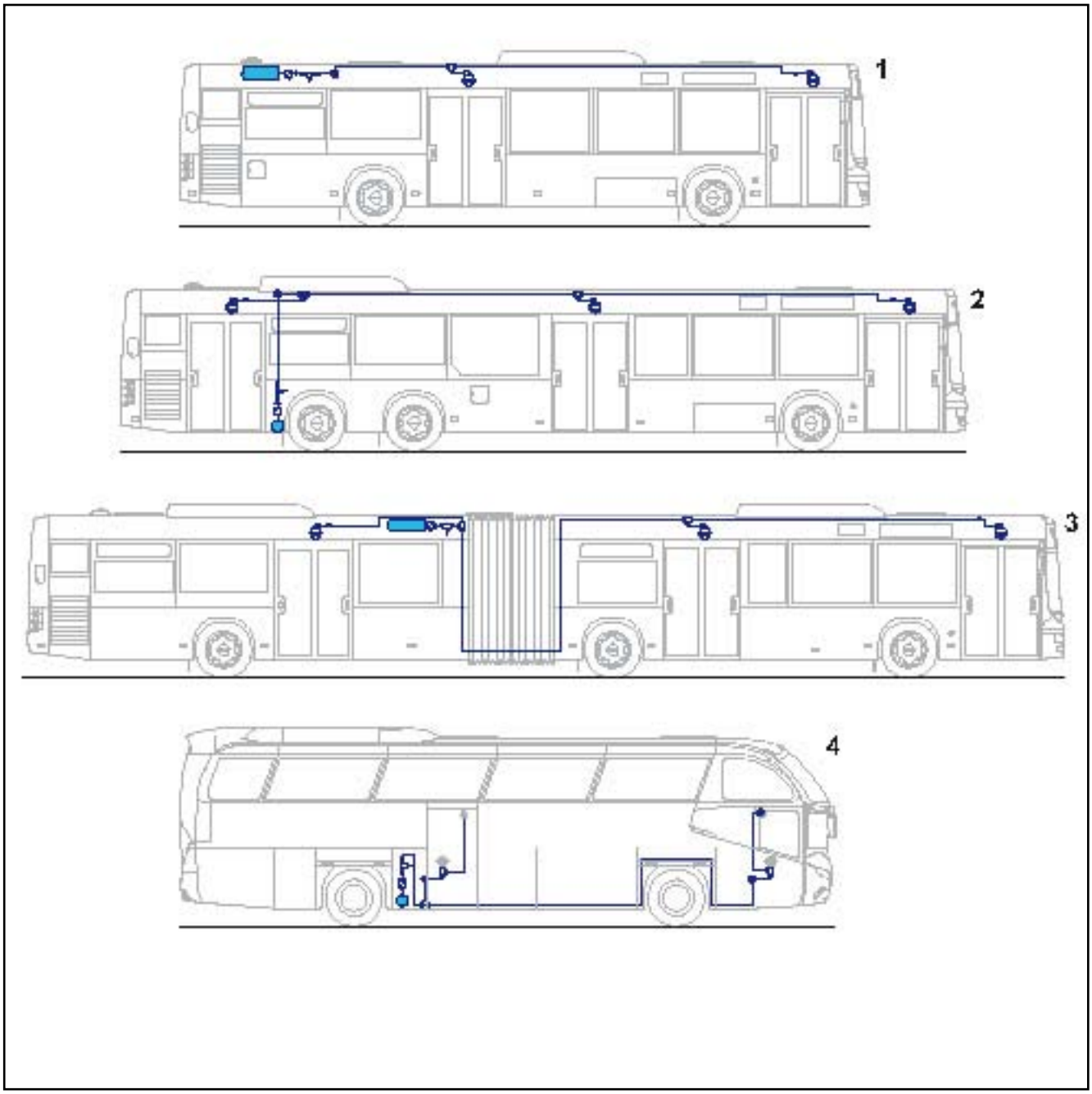
NEOPLAN Skyliner (P05)



B Battery (2 x 12 V)
N Emergency engine off switch
K Fuel tank
R Rest compartment
T Battery isolator switch
W Fresh water tank (kitchenette/WC)

7 Layout pictures

7.5 Compressed air system



Overview Compressed air system

1 City bus

2 Intercity bus

3 Articulated bus

4 Coach

8 Appendix

8.1 Catchwords

8 Appendix

8.1 Catchwords

Notes

36.99296-5032
Text and Illustrtations are not binding.
Cahanges, caused by technical process reserved.

MAN Truck & Bus AG
Dachauer Strasse 667
80995 München
www.mantruckandbus.com