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Please read this instruction manual completely before using the vehicle for the first time!

Always keep this instruction manual in the vehicle. Also inform all other users of the safety regulations.



- ▶ The non-observance of this symbol can lead to personal injury.



- ▷ The non-observance of this symbol can lead to damage being caused to, or inside the vehicle.



- ▷ This symbol indicates recommendations or special aspects.



- ▷ This symbol indicates actions which lead to environmental awareness.

With your motorhome you will receive a file with the following vehicle manuals and documents:

- Operating and installation instructions of various appliances
- Complete set of documents from the chassis manufacturer
- Test certificate for the gas system in accordance with German regulations

This instruction manual contains sections which describe model-specific equipment or special equipment. These sections are not specially marked. It may be that your vehicle has not been fitted with this special equipment. In some cases, the actual equipment of your vehicle may therefore be different from that shown in some illustrations and descriptions.

However, your vehicle may be fitted with other special equipment not described in this instruction manual.

Special equipment is described when an explanation is required.

Adhere to the instruction manuals which are separately enclosed.



- ▷ The details "right", "left", "front" and "rear" always refer to the vehicle in direction of travel.
- ▷ All dimensions and weight details are "approximate".

Should the vehicle be subjected to damage due to a failure to follow the instructions in this instruction manual, then the warranty claim is deemed invalid.

Our vehicles are subjected to continuous development. Please understand that we reserve the right to alter the form, equipment and technology. Therefore, no claims can be made against the manufacturer as a result of the contents of this instruction manual. The equipment which was known and included at the time of going to press is described.

The reprinting, translation and copying, including extracts is not permitted without prior written authorisation from the manufacturer.



1.1 General

The vehicle is constructed in accordance with the latest technology and the recognised safety regulations. Nevertheless, personal injury may result and the vehicle may be damaged if the safety instructions in this instruction manual are not followed.

Before using the vehicle for the first time, equip it with the legally prescribed equipment (e.g. first aid kit, warning vest, hazard warning triangle etc.). Observe the relevant equipment regulations when travelling abroad.

Only use the vehicle in a technically impeccable condition. Follow the instructions in the instruction manual.

Malfunctions which impair the safety of persons or the vehicle should be immediately remedied by qualified personnel. To avoid further damages, observe the duty to avert, minimise or mitigate loss for the user during faults.

Have the vehicle's braking and gas systems inspected and repaired by an authorised specialist workshop only.

Alterations to the body are only to be carried out with the authorisation of the manufacturer.

The vehicle is designed for the exclusive transport of persons. Luggage and accessories may only be transported up to the maximum permissible gross weight.

Observe the test and inspection periods stipulated by the manufacturer.

1.2 Technical data



- ▷ Only the details provided in the actual vehicle documentation shall be binding with regard to the technical data.
- ▷ The measurements as well as the net weight of the vehicle may change when mounting accessories or special equipment. Differences due to manufacturing tolerances (+/- 5 %) are possible and admissible.

Further information can be found in the operating manual of the base vehicle. The technical data are not a component of the instruction manual.

The technical data can be obtained from the manufacturer's documentation. Alternatively, the authorised dealer or service centre will also be happy to advise you.



1.3 Environmental tips



- ▷ Be considerate of the environment.
- ▷ Remember that: All kinds of waste water and household waste are not to be disposed of in drains or in the open countryside.
- ▷ On board, collect waste water only in the waste water tank or – if necessary – in other containers designed for that purpose.
- ▷ Only empty the waste water tank and toilet cassette or sewage tank at disposal stations at the camping or caravan sites, which are especially provided for this purpose. When stopping in towns and communities, observe the instructions at caravan sites or ask where there are disposal stations.
- ▷ Empty waste water tank as often as possible, even when it is not completely full (hygiene).
- ▷ If possible, flush out waste water tank and, if necessary, drainage pipe with fresh water every time it is emptied.
- ▷ Never allow the toilet cassette or sewage tank to become too full. Empty the toilet cassette or sewage tank frequently, at the latest as soon as the level indicator lights up.
- ▷ Separate household waste according to glass, tin cans, plastic and wet waste also when on a journey. Enquire at the town or community authority about disposal points. Household waste is not to be disposed of in waste paper baskets which are situated at car parks.
- ▷ When parked, do not allow the engine to run more than necessary. When running idle, a cold engine releases more contaminants than usual. The running temperature of the engine is achieved more quickly whilst the vehicle is in motion.
- ▷ Use an environmentally-friendly WC chemical agent for the WC which can also be biologically degraded and only use small doses.
- ▷ When staying in towns and communities for long periods, search for parking areas which are specially reserved for motorhomes. Enquire at the town or community authority about parking spaces.
- ▷ Always leave the parking places in a clean condition.





Chapter overview

This chapter contains important safety instructions. The safety instructions are for the protection of persons and property.

2.1 Fire prevention

2.1.1 Avoidance of fire risks



- ▶ Never leave children in the vehicle unattended.
- ▶ Keep flammable materials clear of heating and cooking appliances.
- ▶ Never use portable heating or cooking appliances.
- ▶ Only authorised qualified personnel may make changes to the electrical system, gas system or appliances.

2.1.2 Fire-fighting



- ▶ Always carry a dry powder fire extinguisher in the vehicle. The fire extinguisher must be approved, tested and close at hand.
- ▶ The fire extinguisher is not included in the scope of delivery.
- ▶ Have the fire extinguisher tested at regular intervals by authorised qualified personnel. Observe the date of testing.
- ▶ Always keep a fire blanket near the cooker.

2.1.3 In case of fire



- ▶ Evacuate all passengers.
- ▶ Cut off the electrical power supply and disconnect from the mains.
- ▶ Close regulator tap on the gas bottle.
- ▶ Sound the alarm and call the fire brigade.
- ▶ Fight the fire if this is possible without risk.



- ▷ Acquaint yourself with the position and operation of the emergency exits.
- ▷ Keep escape routes clear.
- ▷ Observe the fire extinguisher instructions for use.

All windows and doors which meet the following requirements are considered as emergency exits:

- Open to the outside or can be shifted in horizontal direction
- Opening angle at least 70°
- Minimum diameter of clearance = 450 mm
- Maximum distance from the vehicle floor = 950 mm



2.2 General



- ▶ The oxygen in the vehicle interior is used up by breathing and the use of gas operated appliances. That is why the used air must be replaced permanently. For this purpose, forced ventilation options (e.g. skylights with forced ventilation) are fitted to the vehicle. Never cover or block forced ventilations from the inside or outside with objects such as e.g. a winter mat. Keep forced ventilations clear of snow and leaves. There is a danger of suffocation due to increased CO₂ levels.
- ▶ Observe the headroom of the doors.



- ▷ As far as the fitted appliances (heater, cooker, refrigerator, etc.) and the base vehicle (engine, brakes, etc.) are concerned, the instruction manuals are authoritative. It is imperative that they be observed.
- ▷ Fitting accessories or special equipment can alter the dimensions, weight and road behaviour of the vehicle. Some of the add-on parts must be entered in the vehicle documents.
- ▷ Only use wheel rims and tyres which are approved for the vehicle. Information concerning the size of the approved wheel rims and tyres is included in the vehicle documents or can be obtained from authorised dealers and service centres.
- ▷ Firmly apply the handbrake when parking the vehicle.



- ▷ When leaving the vehicle, it is imperative that all doors, external flaps and windows are closed.
- ▷ Always carry the legally prescribed equipment (e.g. first aid kit, warning vest, hazard warning triangle etc.) with you. The regulations of the host country apply when travelling abroad.
- ▷ The vehicle may only be driven by drivers who hold a driving licence which is valid for the respective vehicle class.
- ▷ When selling the vehicle, hand over all instruction manuals for the vehicle and the fitted appliances.

2.3 Road safety



- ▶ Before commencing the journey, carry out a functional check of indicating and lighting equipment, the steering and the brakes.
- ▶ If the vehicle has been stationary for a long period (approx. 10 months) have the braking and gas systems checked by an authorised specialist workshop.
- ▶ Before commencing the journey and after short interruptions of the journey, ensure that the entrance step is completely retracted.
- ▶ Before commencing the journey, rotate all swivel seats in the direction of travel and lock in position. During the journey, the swivel seats must remain locked in place in the direction of travel.
- ▶ Carefully store all moving parts and all loose objects before starting your journey.
- ▶ Before commencing the journey, store the flat screen securely.



- ▶ During the journey, persons are only to sit on the permitted seats (see chapter 4). The authorised number of seats is stipulated in the vehicle documents.
- ▶ Seat belts must be worn by all passengers.
- ▶ Fasten your seat belts before the beginning of the journey and keep them fastened during the journey.
- ▶ Always secure children with the children safety equipment prescribed for the respective height and weight.
- ▶ Only attach the child restraint system to seats that are specified for this purpose. Only forward-facing child restraint systems are permitted.
- ▶ The base vehicle is a commercial vehicle (small truck). Adjust your driving technique accordingly.
- ▶ In case of underpasses, tunnels or similar obstacles, note the total height of the vehicle (including the roof load).
- ▶ In winter, the roof must be free of snow and ice before commencing the journey.
- ▶ Check tyre pressure before a journey or every 2 weeks. Wrong tyre pressure causes excessive wear and can lead to damage or even to tyre burst. You can lose control of the vehicle (see section 13.6).
- ▶ Do not operate the heater at petrol stations. Danger of explosion!
- ▶ Do not operate the heater in closed spaces. Danger of suffocation!



- ▷ Before commencing the journey, distribute the payload evenly within the vehicle (see chapter 3).
- ▷ When loading the vehicle and when taking a rest from driving, in order to load luggage or food, for example, observe the maximum permissible gross weight and axle loads (refer to vehicle documents).
- ▷ Before commencing the journey, ensure that all cupboard doors, the toilet compartment door and all drawers and flaps are secure. Engage the refrigerator door securing device.
- ▷ Before commencing the journey, close windows and skylights.
- ▷ Before commencing the journey, close all external flaps and lock them.
- ▷ Remove external supports (if installed) before commencing the journey.
- ▷ During the initial journey and each time after changing a wheel, retighten the wheel bolts/wheel nuts after 50 km (30 miles). Subsequently inspect them at regular intervals in order to ensure that they are firmly seated. See chapter 13 for tightening torque.
- ▷ Tyres must not be older than 6 years as the material becomes brittle over time (see chapter 13).
- ▷ When using snow chains, the tyres, wheel suspension and steering are subjected to an additional load. When using snow chains, drive slowly (maximum speed 50 km/h) and only on streets which are completely covered with snow. Otherwise the vehicle could be damaged.



2.4 Towing



- ▶ Care is to be taken when connecting and detaching a trailer. Risk of accident and injury!
- ▶ No persons are to be between the motorhome and the trailer during positioning for connecting and detaching.

2.5 Gas system

2.5.1 General instructions



- ▶ The operator of the gas system is responsible for the performance of recurring inspections and for complying with the maintenance intervals.
- ▶ Before commencing the journey, when leaving the vehicle or when gas equipment is not in use, close all gas isolator taps and the main regulator tap on the gas bottle.
- ▶ All gas-operated devices (heater, cooker) must be switched off for refuelling, on ferries or in the garage. Danger of explosion!
- ▶ Do not use gas-operated devices in closed spaces (e.g. garages). Danger of poisoning and suffocation!
- ▶ Only have the gas system maintained, repaired or altered by an authorised specialist workshop.
- ▶ Have the gas system checked by an authorised specialist workshop according to the national regulations before commissioning. This also applies for not registered vehicles. For modifications to the gas system have the gas system immediately checked by an authorised specialist workshop.
- ▶ The gas pressure regulator, the gas tubes, and the exhaust gas pipes must also be inspected. The gas pressure regulator and the gas tubes must be replaced observing the nationally defined deadlines (the latest after 10 years). The vehicle owner is responsible for seeing that this is carried out.
- ▶ In case of a defect of the gas system (gas odour, high gas consumption) there is danger of explosion! Close regulator tap on the gas bottle immediately. Open doors and windows and ventilate well.
- ▶ If the gas system is defective: Do not smoke; do not ignite any open flames, and do not operate electric switches (light switches etc.). Check the tightness of gas-conducting parts and lines with leakage search spray. Do not check with an open flame.
- ▶ Only the stipulated devices may be connected to internal connections. Do not operate any device outside the vehicle if it is connected to an internal connector.
- ▶ Cooking is prohibited during the journey.
- ▶ Before using the cooker make sure that there is sufficient ventilation. Open a window or the skylight.
- ▶ Do not use the gas cooker for heating purposes.
- ▶ If there are several gas devices, each gas device must have its own gas isolator tap. If individual gas devices are not in use, close the respective gas isolator tap.



- ▶ Ignition safety valves must close within 1 minute after the gas flame has extinguished. A clicking sound is audible. Check function from time to time.
- ▶ The built-in gas devices are exclusively meant for use with propane or butane gas or a mixture of both. The gas pressure regulator as well as all built-in gas devices are designed for a gas pressure of 30 mbar.
- ▶ Propane gas is capable of gasification up to -42 °C, whereas butane gas gasifies at 0 °C. Below these temperatures no gas pressure is available. Butane gas is unsuitable for use in winter.
- ▶ Due to its function and construction, the gas bottle compartment is a space which is open to the exterior. Never cover or block up the standard forced ventilations. Otherwise gas that is emitted can not be diverted to the outside.
- ▶ The gas bottle compartment must not be used as storage space.
- ▶ Secure the gas bottle compartment against unauthorised access. To do this, lock the compartment.
- ▶ The regulator tap on the gas bottle must be accessible.
- ▶ Only connect gas-operated devices (e.g. gas grill) which have been designed for a gas pressure of 30 mbar.
- ▶ The exhaust gas pipe must be fitted tightly to the heating system and to the vent and must be sealed. The exhaust gas pipe must not show any evidence of damage.
- ▶ Exhaust fumes must be able to escape into the atmosphere unhindered and fresh air must be able to enter unhindered. For this reason, keep the exhaust pipe and intake openings clean and unobstructed (e.g. free from snow and ice). For this reason, no snow walls or aprons may lie against the vehicle.

2.5.2 Gas bottle



- ▶ Handle full or emptied gas bottles outside the vehicle only with closed regulator tap and attached protective cap.
- ▶ Gas bottles are only to be transported within the designated gas bottle compartment.
- ▶ Place the gas bottles in vertical position in the gas bottle compartment.
- ▶ Fasten the gas bottles so that they are unable to turn or tilt.
- ▶ Connect the gas tube to the gas bottle without tension.
- ▶ If the gas bottles are not connected to the gas tube, always place the protective cap on top.
- ▶ Close the regulator tap on the gas bottle before the gas pressure regulator or gas tube are removed from the gas bottle.
- ▶ Depending on the connection, unscrew the gas tube from the gas bottle and screw it on the gas bottle again by hand or using a suitable special spanner. The screw connection on the gas bottle generally has a left-hand thread. **Do not** tighten too firmly.
- ▶ Only use special gas pressure regulators with a safety valve designed for vehicle use. Other gas pressure regulators are not permitted and cannot meet the demanding requirements.



- ▶ Use the gas pressure regulator defroster if the temperature falls below 5 °C.
- ▶ Use only 11 kg or 5 kg gas bottles. Camping gas bottles with built-in check valve (blue bottle with max. 2.5 or 3 kg content) are can be used in exceptional cases with a safety valve.
- ▶ Use the shortest possible tube lengths (150 cm max.) for external gas bottles.
- ▶ Never block the floor ventilation openings below the gas bottles.

2.6 Electrical system



- ▶ Only allow qualified personnel to work on the electrical system.
- ▶ Prior to carrying out work on the electrical system, switch off all devices and lights, disconnect the battery and disconnect the vehicle from the mains.
- ▶ Only use original fuses with the stipulated values.
- ▶ Only replace defective fuses when the cause of the defect is known and has been remedied.
- ▶ Never bridge or repair fuses.

2.7 Water system



- ▶ Water left standing in the water tank or in the water pipes becomes undrinkable after a short period. Therefore, before each use of the vehicle, thoroughly clean the water pipes and the water tank. After each use of the vehicle completely empty the water tank and the water pipes.
- ▶ In the case of lay-ups lasting more than a week disinfect the water system before using the vehicle (see chapter 11).



- ▷ If the vehicle is not used for several days or if it is not heated when there is a risk of frost, empty the entire water system. Make sure that the 12 V power supply on the panel is switched off. Otherwise, the water pump will overheat and may get damaged. Leave the water taps on in central position. Leave all drain cocks open. Frost damage to appliances, frost damage to the vehicle and deposits in water-carrying components can be avoided in this way.



Chapter overview

This chapter contains important information which has to be noted before commencing your journey or carrying out any tasks before the journey.

At the end of the chapter there is a checklist which once again summarises the most important points.

3.1.1 Initial start-up



- ▷ During the initial journey and each time after changing a wheel, re-tighten the wheel bolts/wheel nuts after 50 km (30 miles). Subsequently inspect them at regular intervals in order to ensure that they are firmly seated. See chapter 13 for tightening torque.

The motorhome is supplied with a set of keys, consisting of keys for the base vehicle and keys for the body.

Always deposit a replacement key outside the vehicle. Make a note of the key number. Our authorised dealers and workshops can offer assistance in case of loss.

3.2 Payload



- ▶ Overloading the vehicle and wrong tyre pressure can cause tyres to burst. You can lose control of the vehicle (see section 13.6).
- ▶ The maximum permissible gross weight and the weight including special equipment fitted at the factory (actual weight) is shown in the vehicle documents, but not the weight of the loaded vehicle (see section 3.2.1). For your own safety, we recommend that you have your loaded vehicle (with all passengers, luggage and personal objects) weighed on a public weighbridge before you set out on your journey.
- ▶ Adapt the speed to the payload. The stopping distance is increased if the payload is high.



- ▷ Do not exceed the maximum permissible gross weight (permissible total weight) stated in the vehicle documents and the maximum axle loads as a result of the payload.
- ▷ Built-in accessories and special equipment reduce the payload.

On loading, make sure that the payload's centre of gravity is as low as possible (directly above the floor of the vehicle). Otherwise this may affect the driving characteristics of the vehicle.

3.2.1 Terms



- ▷ Technically speaking, the term "mass" has now replaced the term "weight". However, "weight" is still the term more frequent in common use. For better understanding, "mass" is therefore only used in the following sections for fixed formulations.



Maximum permissible gross weight in a laden condition

The maximum permissible gross weight in a laden condition is the weight that a vehicle may never exceed.

The maximum permissible gross weight in a laden condition consists of the **actual weight** and the **payload**.

In the vehicle documents, the manufacturer has specified the maximum permissible gross weight in a laden condition.

Actual weight

The actual weight consists of the mass in ready-to-drive condition and the weight of the special equipment fitted at the factory.

Mass in ready-to-drive condition

The mass in ready-to-drive condition is the weight of the ready-to-drive standard vehicle (excluding special equipment fitted at the factory).

The mass in ready-to-drive condition is made up as follows:

- Unladen weight (mass of the empty vehicle) with factory-installed standard equipment (excluding special equipment fitted at the factory)
- Driver's weight
- Basic equipment weight

Unladen weight includes lubricants such as oils and coolants which have been filled, the on-board tool set, the spare wheel or the tyre repair kit and a fuel tank which has been filled up to 90 %.

75 kg are calculated for the weight of the driver, regardless of how much the driver really weighs.

Basic equipment includes all equipment and fluids required for safe and proper vehicle use. The weight of the basic equipment includes:

- A full fresh water system
- A gas bottle filled up to 90 %
- A full heating system
- The power cables for the 230 V power supply
- A full toilet flushing system
- The installation kit for an auxiliary battery if an auxiliary battery can be used

The waste water and sewage tanks are empty.

The weight in ready-to-drive condition and the actual weight are shown by the manufacturer in the vehicle documents.

Payload

The payload is made up as follows:

- Conventional load
- Additional equipment
- Personal equipment



- ▷ The vehicle's payload can be increased by reducing the actual weight. To do this, it is allowed for example to empty the fluid containers or to remove the gas bottles.

You will find explanations on the individual components of the payload in the following text.



Conventional load The conventional load is the weight specified by the manufacturer for the passengers.

Conventional load means: 75 kg are calculated for every seat specified by the manufacturer, regardless of how much the passengers actually weigh. The driver's seat is already included as part of the mass in ready-to-drive condition and must **not** be calculated as part of the conventional load.

In the vehicle documents, the manufacturer specifies the number of seats.

Additional equipment Additional equipment includes accessories and special equipment. Examples of additional equipment include:

- Caravan coupling
- Roof rail
- Awning
- Bike or motorcycle rack
- Satellite unit

Information about the weights of the various special equipment devices can be obtained from the manufacturer.

Personal equipment Personal equipment includes all items in the vehicle that are not included in the conventional load or in the additional equipment. For example, personal equipment can include the following:

- Foodstuffs
- Crockery
- Clothes
- Bedding
- Toys
- Books
- Toiletries
- Small electrical appliances (e.g. coffee machine)

No matter where kept, personal equipment also includes:

- Animals
- Bikes
- Sports equipment

For the personal equipment, according to the applicable regulations, the manufacturer must use a minimum weight that is determined according to the following formula:

Formula Minimum weight M (kg) = $10 \times N + 10 \times L$

Explanation N = maximum number of people including the driver, as stated by the manufacturer

L = total length of the vehicle in metres



3.2.2 Calculating the payload



- ▶ The payload calculation at the factory is partly based on all-inclusive weights. For safety reasons, the maximum permissible gross weight in a laden condition must not be exceeded.
- ▶ The maximum permissible gross weight and the weight including special equipment fitted at the factory (actual weight) is shown in the vehicle documents, but not the weight of the loaded vehicle (see section 3.2.1). For your own safety, we recommend that you have your loaded vehicle (with all passengers, luggage and personal objects) weighed on a public weighbridge before you set out on your journey.

The payload (see section 3.2.1) is the difference in weight between

- the maximum permissible gross weight in a laden condition and
- the actual weight.

Example for calculating the payload

	Mass in kg to be calculated	Calculation
Maximum permissible gross weight according to vehicle documents	3300	
Actual weight including basic equipment according to vehicle documents	- 2720	
This results in a permissible payload of	580	
Conventional load e.g.: 3 persons each weighing 75 kg	- 225	
Additional equipment	- 40	
For the personal equipment this results in	= 315	

The calculation of the payload from the difference between the maximum permissible gross weight in laden condition and the actual weight specified by the manufacturer is however only a theoretical value.

Only if the vehicle is weighed with full tanks (fuel and water), full gas bottles and complete additional equipment on a public weighbridge, can the actual payload be determined.

To do this, proceed as follows:

- First only drive the vehicle on to the weighbridge with the front wheels and have it weighed.
- Then drive the vehicle on to the weighbridge with the back wheels and have it weighed.

The individual values give the current axle loads. These are important for the correct loading of the vehicle (see section 3.2.3). The sum of these values is the current weight of the vehicle.

The actual payload is the difference between the maximum permissible gross weight in laden condition and the weighed vehicle weight.

This can be used to determine the weight that remains for the personal equipment:


- Determine the weight of the passengers and subtract it from the value for the actual payload.

The result is the weight that is permitted for the actual load of the personal equipment.



3.2.3 Loading the vehicle correctly



- ▶ For safety reasons, never exceed the maximum permissible gross weight in a laden condition.
- ▶ Distribute the load evenly on the left and right sides of the vehicle.
- ▶ Distribute the load evenly on both axles. In doing so, observe the axle loads specified in the vehicle documents. Observe the permissible load-carrying capacity of the tyres (see chapter 13).
- ▶ Heavy loads behind the rear axle can reduce the load on the front axle due to the leverage effect (). This applies especially to long rear extensions, if a motorbike is transported on the rear carrier or if there is a heavy load in the rear storage space. The release of the front axle negatively affects the driving quality, especially for front-driven vehicles.
- ▶ Store all objects in such a way that they cannot slip.
- ▶ Store heavy objects (awning, tin cans, etc.) close to the axles. Low-lying storage spaces whose doors do not open in the direction of travel are particularly suited for storing heavy objects.
- ▶ Stack light objects (laundry) in the roof storage cabinets.



- ▷ Only load the drawers with a maximum of 10 kg.

However, the individual axles may not be overloaded under any circumstances. That is why it is important, at which distance to the axles the load is stored.

To distribute the load correctly, you will need a scale, a tape measure, a calculator and some time.

Two simple formulas are needed to calculate the effect of the weight of the load on the axles:

Formulas

$A \times G : R = \text{weight on the rear axle}$

$\text{Weight on the rear axle} - G = \text{weight on the front axle}$

Explanation

A = distance between storage space and front axle in cm

G = weight of the load in the storage space in kg

R = wheelbase of the vehicle (distance between axles) in cm



- ▷ Measure the external distances horizontally from the centre of the front wheel to the centre of the storage space or to the centre of the back wheel.

Calculating axle loads:

- Multiply the distance between storage space and front axle (A) with the weight of the load in the storage space (G) and divide the result by the wheelbase (R). The result is the weight of the load in the storage space on the rear axle. Make a note of this weight and of the storage space.
- In a second step, subtract the weight in the storage space (G) from the weight calculated beforehand. If the result is a **positive** value (example 1), this means that the load on the front axle is **reduced** by this value. If the result is a **negative** value (example 2), this means that the load on the front axle is **increased**. Make a note of this value, too.



- Calculate all storage spaces of the vehicle in the same way.
- In a last step, add all weights calculated for the rear axle to the rear axle load and add (or subtract) all weights calculated for the front axle to (from) the front axle load.
How to determine rear axle load and front axle load is described in section 3.2.2.

If the calculated value exceeds the permissible axle load, the load must be distributed in a different way.

If the load on the front axle is too low, the grip of the tyres on the road is reduced (traction). This applies in particular to vehicles with front-wheel drive. In this case, the load must be redistributed, too.

Example calculation

		Example 1	Example 2
Distance to the front axle	A	(A1) 450 (cm)	(A2) 250 (cm)
Weight in the storage space	G	x 100 (kg)	x 50 (kg)
Wheelbase of the vehicle	R	÷ 325 (cm)	÷ 325 (cm)
Load on the rear axle (add to the axle load)		138.5 (kg)	38.5 (kg)
Weight in the storage space		- 100 (kg)	- 50 (kg)
Load relief to the front axle (subtract from the axle load)		38.5 (kg)	
Load on the front axle (add to the axle load)			-11.5 (kg)

3.3 Towing



- ▶ Care is to be taken when connecting and detaching a trailer. Risk of accident and injury!
- ▶ No persons are to be between the towing vehicle and the trailer during positioning for connecting and detaching.
- ▶ Observe the permissible nose weight and rear axle load of the motorhome. Refer to the vehicle documents for the rear axle load.



- ▷ Trailer with an overrun brake: Do not connect or detach trailer with the overrun brake on.
- ▷ Caravan coupling with detachable ball neck: If the ball neck is mounted incorrectly, there is the danger of the trailer breaking away. Observe the instruction manual for the caravan coupling.



3.4 Entrance step



- ▶ Before commencing the journey and after short interruptions of the journey, ensure that the entrance step is completely retracted.
- ▶ Do not step on the entrance step until it has extended completely. There is a risk of injury!
- ▶ Do not under any circumstances raise or lower persons or loads with the entrance step.



- ▷ The rocker switch to operate the entrance step is installed on the bottom right in the area of the sliding door.
- ▷ If the entrance step has not been properly retracted and locked into place, a warning tone is heard when the ignition is switched on.

The vehicles have a one-step, electrically extendable entrance step.

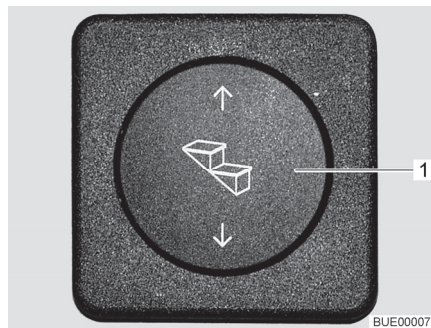


Fig. 1 Operating switch entrance step

Before stepping on the entrance step, fully extend it.

- Extending:**
- Press the rocker switch (Fig. 1,1) down until the entrance step has extended completely.
- Retracting:**
- Press the rocker switch (Fig. 1,1) up until the entrance step has retracted completely.

Emergency operation

If the entrance step does not retract electrically due to a defect, it must be pushed in by hand and secured against sliding out.



- ▷ The entrance step may only be moved by hand when the drive rods have been released.

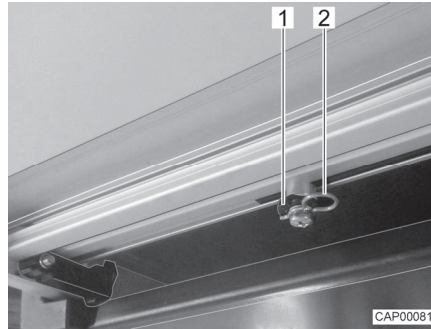


Fig. 2 Drive rod (entrance step)

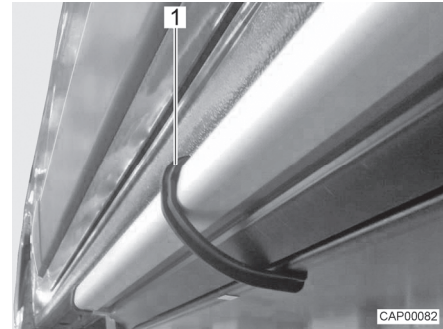


Fig. 3 Fixing clamp (entrance step)

- On the bottom of the entrance step, pull off both locking clips (Fig. 2,2) on the drive rods (Fig. 2,1).
- Release both drive rods from the retaining bolts.
- Connect drive rods with each other (e.g. with string, rubber ring). Such you prevent the drive rods from slipping into the housing.
- By hand, push the entrance step in as far as it will go.
- Secure the entrance step against sliding out using the included fixing clamp (Fig. 3,1).
- Contact a dealer or service centre.

3.5 Removable partition wall



- ▶ Insert the removable partition wall before commencing your journey. The partition wall protects against objects that can be thrown through the vehicle from the rear area.

The removable partition wall also serves as access assistance to the rear bed.



Fig. 4 Partition wall



3.6 Flat screen



► Before commencing the journey, store the flat screen securely.

3.7 Gas regulator



► Operating gas-operated appliances during the journey is permitted only if the gas system has the relevant equipment. The hose break guard and crash sensor prevent an escape of gas in the event of an accident.

Depending on the equipment, different gas regulators can be installed in the vehicle.

If a gas regulator other than one of those listed below is installed in the vehicle, the regulator tap on the gas bottle and the gas isolator taps must be closed during the journey.

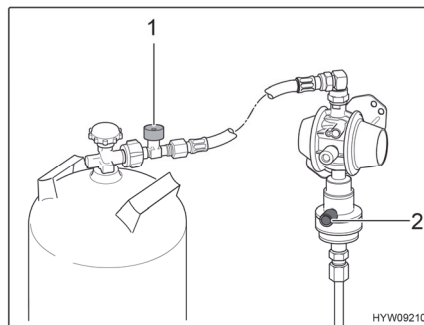


Fig. 5 Gas regulator (MonoControl)

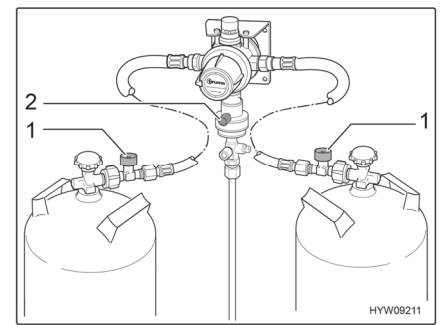


Fig. 6 Gas regulator (DuoControl)

Gas regulator with crash sensor and hose break guard

If a gas regulator with a crash sensor (Fig. 5,2 and Fig. 6,2) and hose break guard (Fig. 5,1 and Fig. 6,1) is installed in the vehicle:

The regulator tap on the gas bottle and the "Heater" gas isolator tap may remain open during the journey. Gas-operated appliances may be on during the journey.

The design details of the MonoControl (Fig. 5) and DuoControl (Fig. 6) gas regulators can vary (straight or angled).



► If in doubt, get the relevant information from authorised dealers or service centres.



3.8 Snow chains



- ▷ Only mount snow chains if there is a clearance of at least 50 mm between the tyres and the vehicle body.
- ▷ When using snow chains, the tyres, wheel suspension and steering are subjected to an additional load. When using snow chains, drive slowly (maximum speed 50 km/h) and only on streets which are completely covered with snow. Otherwise the vehicle could be damaged.
- ▷ Observe the fitting instructions issued by the manufacturer of the snow chains.
- ▷ Do not fit snow chains on alloy wheel rims.

The use of snow chains is subject to the legal regulations of the individual countries.

- Always mount snow chains to the drive wheels.
- After a few metres, check the tension of the snow chains.

3.9 Road safety



- ▶ Check tyre pressure before a journey or every 2 weeks. Wrong tyre pressure causes excessive wear and can lead to damage or even to tyre burst. You can lose control of the vehicle (see section 13.6).

Before commencing the journey, work through the checklist:

Base vehicle


No.	Checks	Checked
1	All vehicle documents are on board	
2	Tyres in proper condition and tyre pressure correct	
3	Vehicle lighting, brake lights and reversing lights function	
4	Oil levels for engine, gearbox and power steering controlled	
5	Coolant and fluid for windscreen washers filled up	
6	Brakes function	
7	Brakes react evenly	
8	When braking, the vehicle remains in the lane	

Housing body, outside


9	Awning completely retracted	
10	Roof free of snow and ice (in winter)	
11	External connections and lines disconnected and stored away	
12	External supports removed	
13	Wheel chocks removed and stored away	
14	Entrance step retracted (observe warning tone)	
15	External flaps closed and locked	
16	Sliding door and rear door closed	
17	Awning light switched off	
18	Overall height of the vehicle including roof rack when loaded measured and noted. Keep the height information close at hand in the driver's cabin	




Housing body, inside

No.	Checks	Checked
19	Windows and skylights closed and locked	
20	Television securely stored	
21	Television antenna retracted (if one is built in)	
22	Loose parts stored away or fixed in position	
23	Open storage spaces empty	
24	Sink cover closed	
25	Refrigerator door secured	
26	Refrigerator set to 12 V operation	
27	All drawers and flaps closed	
28	Living area doors and sliding doors secured	
29	Partition wall fitted between the bedding boxes	
30	Children's seats mounted to seats with three-point safety belts  ► Only forward-facing child restraint systems are permitted.	
31	Swivel seat locking device for driver's seat and front passenger's seat locked	
32	Shades in the driver's cabin opened and secured	

Gas system

33	Gas bottles firmly fixed in the gas bottle compartment so that they are unable to turn	
34	If the gas bottles are not connected to the gas tube, always place the protective cap on top	
35	Regulator tap on the gas bottle and gas isolator taps are closed  ► When there is a MonoControl / DuoControl regulating system: When heating is required during travel the gas isolator tap "Heater" and the regulator tap can remain open.	

Electrical system

36	Check the battery voltage of the starter and living area battery (see chapter 8). If the panel indicates that the battery voltage is too low, the respective battery will need to be recharged. Observe the notes and instructions in chapter 8  ► Commence journey with fully charged starter and living area batteries.	
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Chapter overview

This chapter contains instructions on how to drive the motorhome.

4.1 Driving the motorhome



- ▶ The base vehicle is a commercial vehicle (small truck). Adjust your driving technique accordingly.
- ▶ Before commencing the journey and after short interruptions of the journey, ensure that the entrance step is completely retracted.
- ▶ When you start the engine, warning signals such as "entrance step extended" can sound. Under certain conditions (a cold start in winter) after the engine is started it can take up to 15 seconds for these warning signals to sound.
- ▶ A seat belt is fitted for each seat which is permitted for travel. Please keep your seat belt fastened during the journey.
- ▶ Never open your seat belts when travelling.
- ▶ Passengers must remain in the seats provided.
- ▶ The doors must remain locked.
- ▶ Avoid braking with a jerk.
- ▶ If a navigation system is used, only change the destination when the vehicle is stationary. Drive to a car park or stop in a safe area when changing the destination.
- ▶ Do not play DVDs using the monitor of the navigation system during the journey.



- ▷ Drive slowly on poor roads.



- ▷ If an accident occurs as a result of these instructions not being observed, the manufacturer will not be responsible for damages caused.
- ▷ The safety measures stipulated in chapter 2 have to be observed.

4.2 Driving speed



- ▶ The vehicle is equipped with a powerful engine. This means there are sufficient reserves in difficult traffic situations. This high power enables a high maximum speed and requires above-average driving ability.
- ▶ The vehicle provides a large contact surface for wind. A sudden cross-wind can be especially dangerous.
- ▶ Uneven or one-sided loading affects road performance.
- ▶ Driving on unknown streets, you may encounter hazardous road conditions and unexpected driving situations. Therefore, in the interest of safety, make sure your driving speed is appropriate to any given driving situation and environment.
- ▶ Adhere to the national legal speed limits.



4.3 Brakes



- ▶ Have defects on the braking system immediately remedied by an authorised specialist workshop.

Before each journey

Before each journey, check by means of a braking test:

- Do the brakes function?
- Do the brakes react evenly?
- Does the vehicle remain in the lane when braking?

4.4 Seat belts

4.4.1 General

The vehicle is equipped with seat belts in the living area on the seats for which seat belts are compulsory by law. National regulations apply to fastening of seat belts.



- ▶ Fasten your seat belts before the beginning of the journey and keep them fastened during the journey.
- ▶ Do not damage or trap belts. Have damaged seat belts changed by an authorised specialist workshop.
- ▶ Do not alter the belt fixing devices, automatic seat belt winders and the seatbelt locks.
- ▶ Only use one seat belt for **one** adult person.
- ▶ Do not belt in objects together with persons.
- ▶ Seat belts are not sufficient for persons who are less than 150 cm tall. In these cases use additional restraining devices. Observe test certificate.
- ▶ Only attach the child restraint system to seats that are specified for this purpose. Only forward-facing child restraint systems are permitted.
- ▶ After an accident, replace the seat belts (have it replaced).
- ▶ During the journey, do not tilt the backrest too far backwards. Otherwise the functionality of the seat belt is no longer guaranteed.

4.4.2 Fastening the seat belts correctly



- ▶ Do not twist the belt. The belt must be positioned smoothly against the body.
- ▶ When fastening the seat belt, adopt the correct sitting position.

The seat belt is correctly fastened when the lap belt passes below your stomach and across the hip bone. The shoulder belt must pass across the chest and shoulder (not across your neck). The belt must always be taut against your body. Any bulky or padded clothing should therefore be removed before you start your journey.



4.5 ISOFIX child safety seat mounting system

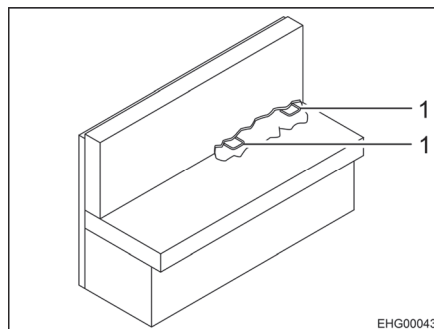


Fig. 7 ISOFIX child safety seat mounting system

If the vehicle is equipped with the ISOFIX child safety seat mounting system, the vehicle seats suitable for it are marked with the ISOFIX symbol. These vehicle seats have retaining clips (Fig. 7, 1). Use child restraint system suitable for ISOFIX. The child restraint systems possess connectors which are latched to the retaining brackets of the vehicle seat.

The bench with the special equipment ISOFIX child safety seat mounting system is suitable for child seats with ISOFIX system, which are specially authorised for this vehicle type according to the standard ECE-R 44.

Child restraint systems of the groups 0, 0+, and 1 with ISOFIX child safety seat mounting system can be fastened at the ISOFIX anchorage points on the bench.

Fastening a child seat

- Push the connectors of the child seat into the ISOFIX anchorage points until they engage audibly.
- By pulling the child seat, check whether both sides have engaged correctly.



- ▷ Also observe the instruction manual of the child restraint system manufacturer.

4.6 Driver's seat and front passenger's seat



- ▶ Before commencing the journey, rotate all swivel seats in the direction of travel and lock in position.
- ▶ The seats must remain fixed in position during the journey and are not to be rotated.

The driver's seat and the front passenger's seat are part of the base vehicle. The adjustment of the seats is described in the operating manual of the base vehicle.

4.7 Headrests

Before commencing the journey, adjust the headrests so that the back of the head is supported at approximately ear height.



4.8 Seating arrangement



- ▶ During the journey, persons are only to sit on the permitted seats. The authorised number of seats is stipulated in the vehicle documents.
- ▶ Seat belts must be worn by all passengers.

Seats which may be used during travel are equipped with a seat belt.

4.9 Filling up with diesel



- ▶ All gas-operated devices (heater, cooker) must be switched off for re-fuelling, on ferries or in the garage. Danger of explosion!

The fuel filler neck is situated on the exterior of the vehicle, at the front left.



Chapter overview

This chapter contains instructions on how to pitch the vehicle.



- ▷ Pitch the vehicle so that it is as horizontal as possible. Use ramps where necessary. Otherwise, the water from the shower tray will not be able to drain properly.
- ▷ Secure the vehicle to prevent it from rolling.
- ▷ Animals (especially mice) can cause great damage to the interior of the vehicle. To prevent this from happening, regularly check the vehicle for damages or animal traces after pitching.

5.1 Handbrake

Firmly apply the handbrake when parking the vehicle.

5.2 Entrance step

In order to exit the vehicle, first fully extend the entrance step.

5.3 Ramps



- ▷ Ramps are not included in the scope of delivery. Different models are available at the accessories shop.

To enable the vehicle to be parked on the level, ramps can be used for height compensation when the vehicle is parked on a hill or on uneven ground.

5.4 230 V connection

The vehicle can be connected to a 230 V power supply (see chapter 8).

5.5 Refrigerator



- ▷ Continuous operation of the refrigerator without external 230 V power supply can discharge the living area battery.

Check the charging condition of the living area battery on the panel. If possible, connect external 230 V power supply.





Chapter overview

This chapter contains instructions about living in the vehicle.

6.1 Doors



- ▶ Only drive with locked doors.



- ▷ Locking the doors can prevent them from opening of their own accord, e.g. during an accident.
- ▷ Locked doors also prevent forced entry, e.g. when waiting at traffic lights. However, in an emergency, locked doors make it more difficult for helpers to enter the vehicle.
- ▷ When leaving the vehicle, always lock the doors.
- ▷ The locks on the vehicle doors are a part of the base vehicle. The opening and closing of the vehicle doors is described in the instruction manual of the base vehicle.

6.1.1 Insect screen on the sliding door, extendable



- ▷ Open the insect screen completely before closing the sliding door.



Fig. 8 Insect screen

- Closing:**
- Pull out the insect screen completely by the bar (Fig. 8,1).
- Opening:**
- Push the insect screen into its initial position by the bar (Fig. 8,1).

6.1.2 Rear doors



- ▷ If the rear doors are opened too far, add-on parts on the vehicle may get damaged. The opening angle of the rear doors was limited for this reason at the factory. When releasing this limitation: continue opening the rear door only carefully and ensure that the rear door does not hit any add-on parts.



The opening angle of both rear doors is limited to approx. 90° at the factory. This limitation can be released if necessary.

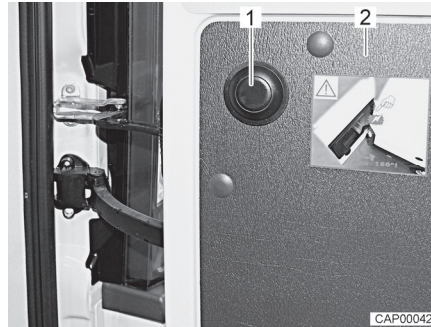


Fig. 9 Push button to release the limitation

Releasing the opening angle limitation:

- Open the rear door (Fig. 9,2) as far as it will go.
- Press the push button (Fig. 9,1), hold rear door and continue opening carefully.

6.2 External flaps



- ▷ Before commencing the journey, close all external flaps and lock them.
- ▷ To open and close the external flap, open or close all locks that are fitted to the external flap.



- ▷ When leaving the vehicle, close all external flaps.

The external flaps fitted to the vehicle are all fitted with identical locking cylinders. Therefore, all locks can be opened with a single key.

6.3 Ventilation



- ▶ The oxygen in the vehicle interior is used up by breathing and the use of gas operated appliances. That is why the used air must be replaced permanently. For this purpose, forced ventilation options (e.g. skylights with forced ventilation) are fitted to the vehicle. Never cover or block forced ventilations from the inside or outside with objects such as e.g. a winter mat. Keep forced ventilations clear of snow and leaves. There is a danger of suffocation due to increased CO₂ levels.



- ▷ Although sufficient ventilation is provided, in certain weather conditions, condensation can form on metal objects (e.g. screwed connections in the floor).
- ▷ Additional cold spots can occur at thermal "bridges" (e.g. skylight edges, filler necks, flaps, etc.).

**Condensation**

Ensure that there is a continuous exchange of air by providing frequent and efficient ventilation. This is the only method for ensuring that condensation is not formed during cool weather. During the colder season, a pleasant living climate is created if heating output, air distribution and ventilation are synchronised. To avoid draft close the air outlet nozzles on the dashboard and set the air distribution of the base vehicle to air circulation. If the vehicle is laid up for a longer period, occasionally ventilate it well, especially in summer as heat accumulation can occur.

6.4 Windows

- ▷ Do not keep blinds closed over a longer period of time as that can cause increased material wear.
- ▷ If the blind is completely closed, exposure to direct sunlight can cause heat to accumulate between the blind and the glass window. The window could be damaged. For that reason, close the blind only 2/3 of the way in direct sunlight.
- ▷ Before commencing the journey, close the windows.
- ▷ Depending on the weather, close the windows far enough to prevent moisture from entering.
- ▷ To open and close the hinged window, open or close all catch levers which are fitted to the hinged window.



- ▷ When leaving the vehicle, always close the windows.
- ▷ In extreme weather conditions or if the temperature fluctuates strongly, a light condensation film can form on the double-glazed acrylic glass. The glass is designed in such a way that condensation can evaporate when the external temperature increases. There is no danger of the double-glazed acrylic glass being damaged by condensation.

6.4.1 Hinged window

- ▷ If windows with automatic hinges are fitted, open the window fully in order to release the lock. If the locking device is not released and the window is closed nevertheless, there is the danger of the window breaking due to the massive counter-pressure.
- ▷ When opening the hinged windows, ensure that there are no torsional forces. Open and close the hinged windows evenly.

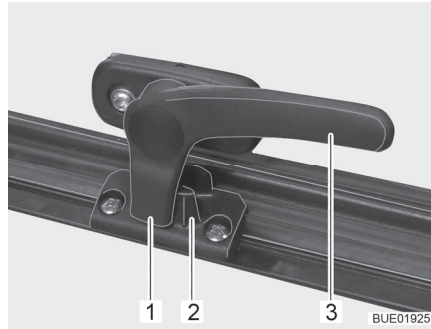


Fig. 10 Catch lever in "closed" position

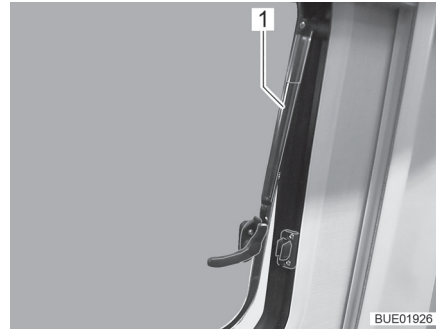


Fig. 11 Hinged window with automatic hinges, open

- Opening:**
- Turn the catch lever (Fig. 10,3) a quarter turn towards the centre of the window.
 - Open hinged window half up to the required position. Allow the hinged window to engage automatically with the automatic hinge (Fig. 11,1).
- The hinged window remains locked in the required position.

- Closing:**
- Open the hinged window as wide as necessary until the latch releases.
 - Close the hinged window.
 - Turn the catch lever (Fig. 10,3) a quarter turn towards the window frame. The locking catch (Fig. 10,1) is located on the inside of the window catch (Fig. 10,2).

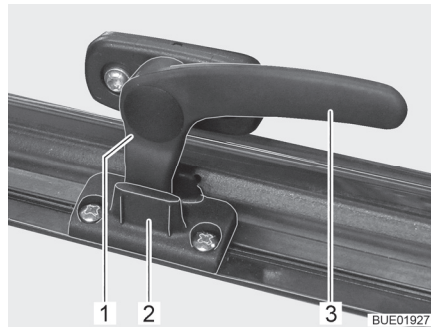


Fig. 12 Catch lever in "continuous ventilation" position

Continuous ventilation

With the catch lever, the hinged window can be placed in two positions:

- "Continuous ventilation" (Fig. 12)
- "Firmly closed" (Fig. 10).

To place the hinged window into the "continuous ventilation" position:

- Turn the catch lever (Fig. 12,3) a quarter turn towards the centre of the window.
- Slightly open the hinged window outwards.
- Turn the catch lever a quarter turn towards the window frame. The locking catch (Fig. 12,1) has to be moved into the recess of window catch (Fig. 12,2).

During the journey, the hinged window may not be in "continuous ventilation" position.



If it rains, the "continuous ventilation" hinged window position could lead to splashing water penetrating the living area. Therefore, close the hinged windows completely.

6.4.2 Roman shade and insect screen

The windows are fitted with a Roman shade and an insect screen. Roman shade and insect screen are fixed to each other.

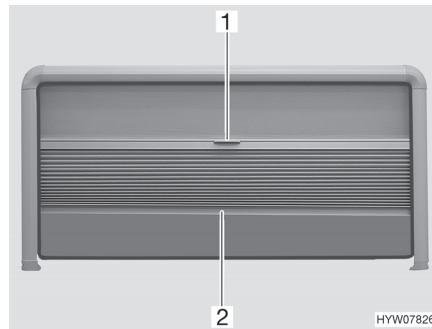


Fig. 13 Roman shade and insect screen (hinged window)

Roman shade The Roman shade is located in the upper window frame.

Closing: ■ Hold the Roman shade in the centre of the bottom rod (Fig. 13,2) and carefully draw it downwards.

Opening: ■ Hold the bottom rod (Fig. 13,2) of the Roman shade in the centre and carefully slide the Roman shade upwards.

Insect screen The insect screen is located in the upper window frame.

Closing: ■ Pull insect screen at the handle (Fig. 13,1) downwards.

■ Move the insect screen continuously.

If the insect screen is not drawn fully to the bottom, the Roman shade can be stretched up to the end of the side window frame.

Opening: ■ Move insect screen at the handle (Fig. 13,1) fully upwards.



6.4.3 Cabin black-out shade



- ▷ Open cabin black-out shade before commencing the journey.

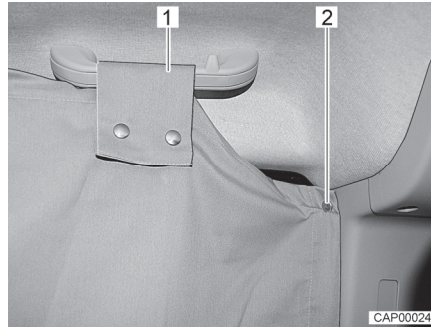


Fig. 14 Cabin black-out shade on side pane



Fig. 15 Cabin black-out shade on windscreen

- Closing:**
- Take cabin black-out shade out of the storage compartment above the driver's cabin.
 - Fasten cabin black-out shade on one side of the driver's cabin. In order to do this, fasten two snap fasteners (Fig. 14,2) behind the side pane, on the B column.
 - Guide loop (Fig. 14,1) over the handle above the side pane and fasten with snap fasteners.
 - Push pockets (Fig. 15,1) of cabin black-out shade over the two sun visors.
 - On the other side of the driver's cabin: also fasten the cabin black-out shade with loop on the handle and snap fasteners on the B column.
- Opening:**
- Release the cabin black-out shade at all fastening points.
 - Store cabin black-out shade in the storage compartment above the driver's cabin.

6.5 Skylights

Skylights with and without forced ventilation are installed in the vehicle. The smaller skylights in the living area and in the bathroom are equipped with forced ventilation.



- ▶ The apertures for forced ventilation must always be kept open. Never cover or block forced ventilations with objects such as e.g. a winter mat. Keep forced ventilations clear of snow and leaves.



- ▷ Do not keep blinds closed over a longer period of time as that can cause increased material wear.
- ▷ If the blind or the Roman shade is completely closed, exposure to direct sunlight can cause heat to accumulate between the blind/the Roman shade and the skylight. The skylight could be damaged. For that reason, close the blind/Roman shade only 2/3 of the way in direct sunlight. Open the skylight slightly or move it to ventilation position.



- ▷ Depending on the weather, close the skylights far enough to prevent moisture from entering.
- ▷ Do not climb on the skylights.
- ▷ Before commencing the journey, close the skylights.
- ▷ Before commencing the journey, check that the skylights are closed and locked.



- ▷ When leaving the vehicle, always close the skylights.
- ▷ The upholstery will fade over time, if it is exposed to sunlight. If the temperature within the vehicle rises rapidly as well, the colour will change at an accelerated rate.
Therefore, we recommend closing the shades on the skylights of the parked vehicle by 2/3 when there is strong sunlight.

6.5.1 Skylight with snap latch

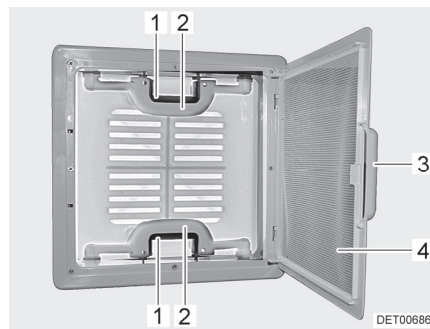


Fig. 16 Skylight with snap latch

The skylight can be pushed upwards either from one side or from both sides.

- Opening:**
- Pull on the handle (Fig. 16,3).
 - Fold insect screen (Fig. 16,4) downward.
 - Push the snap latch (Fig. 16,1) towards the inside of the skylight. At the same time use the handle (Fig. 16,2) to press the skylight upwards.
 - Swing insect screen (Fig. 16,4) upwards until it latches in place.
- Closing:**
- Pull on the handle (Fig. 16,3).
 - Fold insect screen (Fig. 16,4) downward.
 - Using both handles (Fig. 16,2), pull down the skylight with force until the two snap latches (Fig. 16,1) lock into place.
 - Swing insect screen (Fig. 16,4) upwards until it latches in place.



6.5.2 Heki skylight

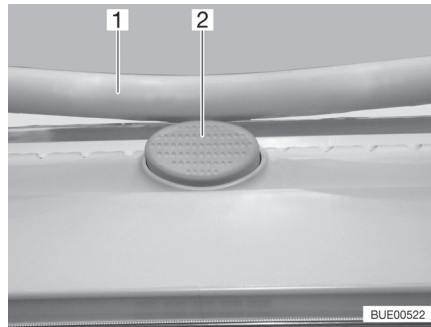


Fig. 17 Safety knob (Heki skylight)

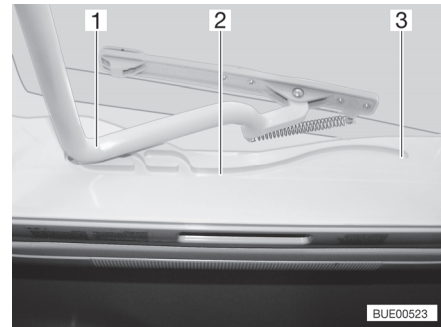


Fig. 18 Guide (Heki skylight)

The Heki skylight is opened on one side only.

- Opening:**
- Press the safety knob (Fig. 17,2) and pull the bar (Fig. 17,1) down with both hands.
 - Pull the bar (Fig. 18,1) in the guides (Fig. 18,2) to the rearmost position (Fig. 18,3).
- Closing:**
- Use both hands to push the bar (Fig. 18,1) slightly upwards.
 - Push the bar back in the guides.
 - Push the bar upwards with both hands until it is above the safety knob (Fig. 17,2).

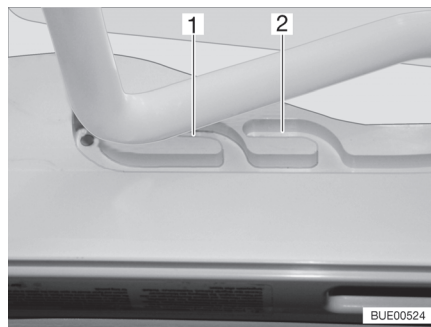


Fig. 19 Guide (ventilation position)

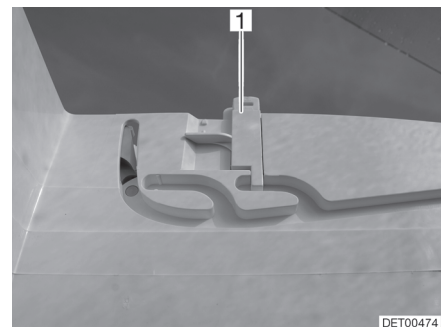


Fig. 20 Lock (ventilation position)

Ventilation position

The Heki skylight can be put in two ventilation positions: Bad weather position (Fig. 19,1) and central position (Fig. 19,2). Depending on the model, the skylight can be locked in the central position with the latch (Fig. 20,1).

- Press the safety knob (Fig. 17,2) and pull the bar (Fig. 17,1) down with both hands.
- Pull the bar in the guides (Fig. 18,2) to the desired position.
- Push the bar slightly upwards and into the selected guide (Fig. 19,1 or 2) and lock if necessary.

Roman shade

To close and open the Roman shade:

- Closing:**
- Pull out Roman shade at the handle and release in the required position. The Roman shade will stay in that position.
- Opening:**
- Slowly push the Roman shade at the handle to its initial position.



Insect screen To close and open the insect screen:

- Closing:*
- Pull the insect screen by the handle to the opposite handle of the Roman shade.
- Opening:*
- Press the rear part of the handle of the insect screen. The latch is released.
 - Use handle to return the insect screen slowly to its initial position.

6.5.3 Wind-up skylight

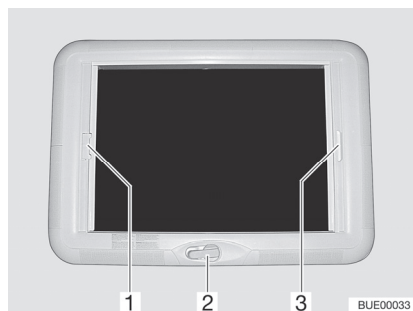


Fig. 21 Wind-up skylight

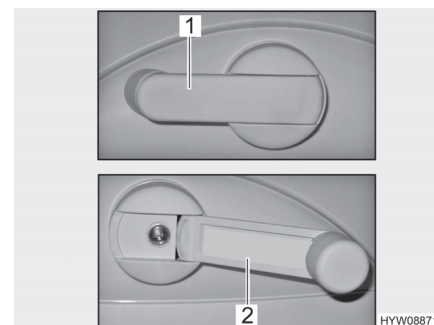


Fig. 22 Hand crank

The wind-up skylight can be opened using the hand crank. The hand crank is folded out (Fig. 22,2) for opening and closing. The hand crank is folded in (Fig. 22,1) when in resting position.

- Opening:*
- Rotate the hand crank (Fig. 21,2) until a resistance can be felt.
- Closing:*
- Rotate the hand crank until the wind-up skylight is closed. The wind-up skylight can be locked after rotating two or three more times.
 - Check the locking mechanism. To do so, press your hand against the acrylic glass.

Roman shade The Roman shade can be closed in any position, as desired. If the Roman shade is locked with the insect screen, the insect screen is also moved along on closing the Roman shade.

- Closing:*
- Pull the handle of the Roman shade (Fig. 21,3) in the direction of the arrow and release it in the desired position. The Roman shade will stay in that position.
- Opening:*
- Slowly push the Roman shade at the handle to its initial position.

Insect screen If the insect screen is locked with the Roman shade, the Roman shade is also moved along on closing the insect screen.

- Closing:*
- Use the handle to pull the insect screen (Fig. 21,1) in the direction of the arrow to the opposite handle of the Roman shade (Fig. 21,3) and allow it to engage.
- Opening:*
- Press the handle of the insect screen (Fig. 21,1) at the back upwards and detach the insect screen from the Roman shade (Fig. 21,3).
 - Use handle to return the insect screen slowly to its initial position.



6.6 Tables

6.6.1 Suspension table with separable support leg



- ▷ The maximum permissible load on the swung-out table-top extension is 3 kg.



Fig. 23 Suspension table with separable support leg

The suspension table size can be enlarged by swinging out a table top extension.

- Extending:*
- Pull the knob (Fig. 23,2) of the lock down and swing out the table top extension (Fig. 23,1).

- Reducing size:*
- Swing the table top extension (Fig. 23,1) under the table top (Fig. 23,6) until the lock latches in place audibly.

The suspension table's separable support leg enables it to be used as a bed foundation.

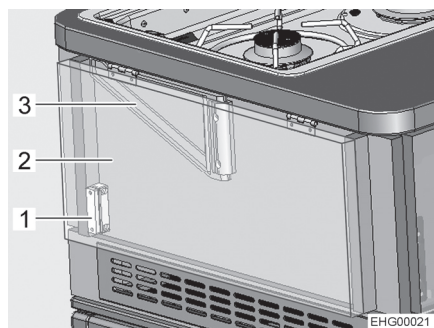
- Conversion to bed foundation:*
- Lift the front of the table top (Fig. 23,6) by approx. 45°.
 - Pull out the lower part of the support leg (Fig. 23,4) down and lay aside.
 - Remove the table top from the upper retainer.
 - Hook the table top at a 45° angle to the supports into the lower retainer (Fig. 23,3) and place on the floor with the upper part of the support leg (Fig. 23,5).



6.6.2 Folding worktop



- ▷ The folding worktop is designed only for minimal loads (e.g. kitchen utensils). Do not use the folding worktop as a repository for heavy objects.



- 1 Magnet
- 2 Worktop
- 3 Holder

Fig. 24 Folding worktop (driving position)

To increase the size of the kitchen work surface, a folding worktop can be folded out at the side of the kitchen counter.

Bringing the folding worktop into the work position:

- Fold worktop (Fig. 24,2) up.
- Lock worktop. In order to do this, swivel out the holder (Fig. 24,3).

Bringing the folding worktop into the travel position:

- Swivel holder (Fig. 24,3) away.
- Fold worktop (Fig. 24,2) down. A magnet (Fig. 24,1) holds the worktop in driving position.

6.7 PVC-floor covering



- ▶ Gas pipes and electric lines are laid in the floor. Never drill holes in the floor or insert any screws. That could cause a gas explosion, an electrical shock or a short circuit due to damage to a cable.



- ▷ Shoes with pointed heels can leave permanent impressions in the PVC-floor covering. Never wear shoes with pointed heels in the vehicle.
- ▷ Rubber mats or long exposure to ketchup, carrot juice, ink, blood or lipstick can discolour the PVC-floor covering. If possible, remove stains from the floor immediately.

6.8 Lamps



- ▷ The light switches have different layouts according to the model. The light switches are located either in the entrance area, directly on the corresponding lamp or next to the lamp, e.g. in the vicinity of the seating group.

The light switches for the lamps on the ceiling of the living area are installed in the rear area and in the entrance area (at the sliding door).



6.8.1 Lighting system and USB socket



- ▶ Bulbs and light fittings can be extremely hot.
- ▶ Allow the light bulbs and lamp holders to cool down before touching them.
- ▶ If the light is switched on or still hot, there must always be a safety distance of at least 30 cm between stores or curtains and flammable objects. Fire hazard!

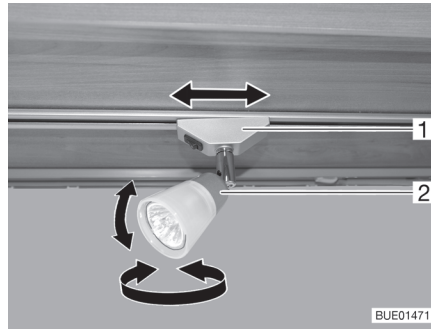


Fig. 25 Spotlight

Turning spotlight:

- Turn housing (Fig. 25,2) of the spotlight to the desired direction. The housing can be turned in following directions:
 - To the left and to the right
 - Up and down

Shifting spotlight:

- Turn holder (Fig. 25,1) through approx. 45°.
- Shift spotlight along the rail system to the desired position.

Removing spotlight:

- Turn holder (Fig. 25,1) through 90°.
- Remove spotlight from rail.

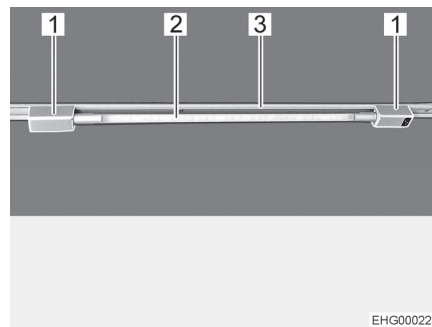


Fig. 26 Fluorescent tube

Inserting fluorescent tube:

- Insert both brackets (Fig. 26,1) into the rail (Fig. 26,3). In order to do this, turn bracket through 90°.
- Plug lamp body (Fig. 26,2) into one of the brackets.
- Shift the other bracket up to the lamp body until a firm connection has been made.

Turning fluorescent tube:

- Turn lamp body handle (Fig. 26,2) until the desired lighting effect is achieved.



- Removing fluorescent tube:*
- Release and shift one of the brackets away from the lamp body.
 - Remove lamp body.
 - Turn both brackets through 90° and remove from rail.

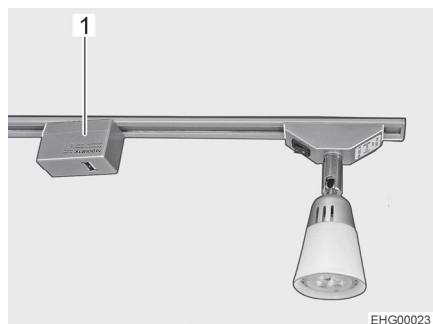


Fig. 27 USB socket element

The USB socket element (Fig. 27,1) can be inserted, turned, and removed in the same way as the spotlight.

6.8.2 Lamp in the rear area

A lamp is installed on the side in the rear area.



Fig. 28 Lamp, rear area

- Switching on/off:*
- Press the transparent cover of the lamp on the side.



6.9 TV unit



- ▶ Before commencing the journey, store the flat screen securely.



- ▷ The information about the operation of the TV unit can be obtained in the manufacturer's instruction manual.

The flat screen is attached to a pull-out above the headrests of the bench.

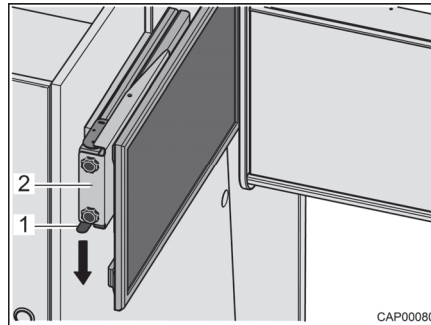


Fig. 29 Pull-out with flat screen

Bringing the flat screen into the television position:

- Press catch spring (Fig. 29,1) downwards and pull pull-out (Fig. 29,2) with flat screen out horizontally towards the centre of the vehicle.
- Rotate the flat screen into the desired position. The flat screen can be turned such that it can also be watched from the rear area.

Bringing the flat screen into the driving position:

- Return the flat screen into its initial position.
- Push the pull-out (Fig. 29,2) with flat screen horizontally as far as it will go. The catch spring (Fig. 29,1) engages audibly.



6.10 Beds

6.10.1 Transverse rear bed



- ▶ The maximum load of the rear bed is 200 kg.
- ▶ But in particular with regard to small children less than 6 years of age, users should ensure that they cannot fall out of the bed.

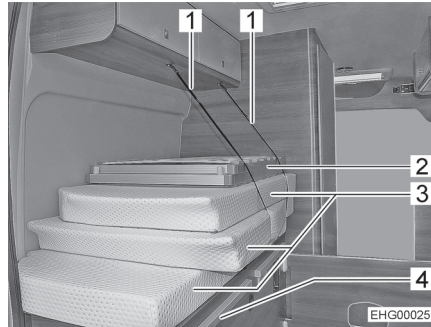


Fig. 30 Rear bed (transport position)

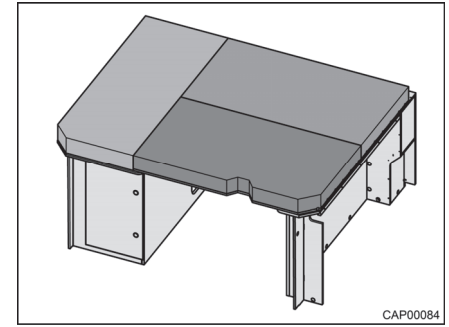


Fig. 31 Rear bed (converted for sleeping)

Conversion for sleeping:

- Release retaining belts (Fig. 30,1).
- Fold bed base (Fig. 30,2) out and set down on bars (Fig. 30,4) above the central aisle.
- Distribute the cushions (Fig. 30,3) on the lying surface as shown in Fig. 31.

Conversion after sleeping:

- Stack the cushions and the bed base on the left-hand bottom cupboard as shown in Fig. 30.
- Secure the cushions and the bed base with retaining belts (Fig. 30,1).

6.10.2 Longitudinal rear beds

The centre bed base can be folded up or taken out in order to transport larger objects (e.g. bicycles).



- ▷ The windows of the rear doors are equipped with a fall out protection (Fig. 32,1). The garage door can always be unlocked from the interior via the opening (Fig. 33,2).

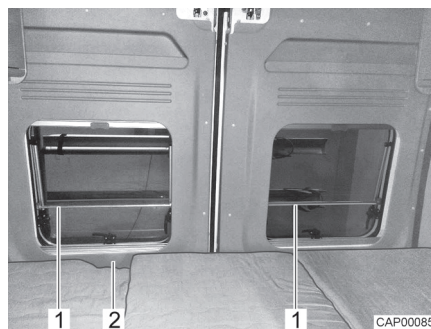


Fig. 32 Fall out protection (longitudinal rear bed)



Conversion for sleeping:

- Fold bed base down or insert bed base.
- Distribute the cushions on the lying surface.

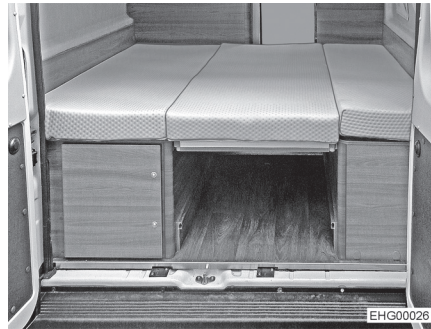


Fig. 33 After the conversion (variant with 3 cushions)



Fig. 34 After the conversion (variant with 4 cushions)

Conversion for transporting larger objects:

- Stack the cushions on the left-hand bottom cupboard.
- Fold the folding bed base up or remove the removable bed base.
- Secure the cushions and the bed base with retaining belts.



Fig. 35 Transport position (folding bed base)



Fig. 36 Transport position (removable bed base)



6.10.3 Bunk bed in the rear



- ▷ Only use the bunk bed in the rear with fall out protection.

The bunk bed consists of 2 removable bed bases, 4 cushions, a fall out protection, and an attachable ladder.

The maximum permitted load on each bed base of the bunk bed is 100 kg.



Fig. 37 Bunk bed

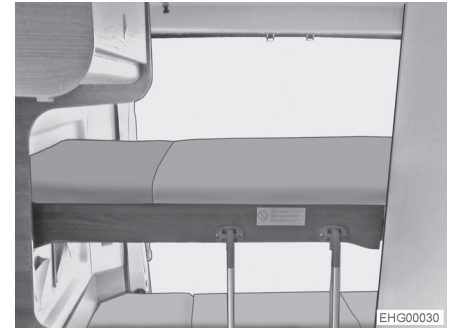


Fig. 38 Bunk bed with attached ladder

A ladder (Fig. 38) can be attached to the bunk bed to make the access to the bunk bed easier.

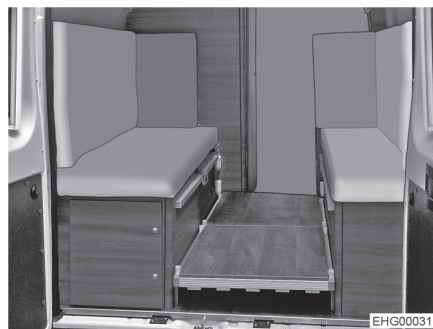


Fig. 39 Bunk bed, converted into seating group

The bunk bed can be converted into a seating group (Fig. 39). In order to do this, set the bed bases down on the clamping rails upside down, and use the cushions of the rear bed as backrests.



6.11 Converting seating group for sleeping

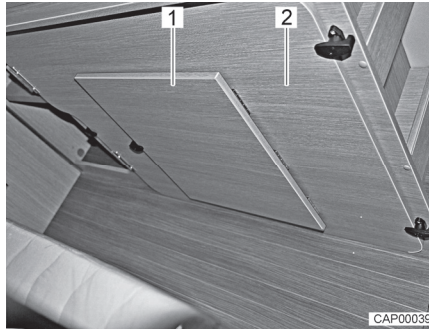


Fig. 40 Removable board on the right-hand bedding box

- Push both seats in the driver's cabin fully forwards.
- Convert the table to a bed foundation (see section 6.6.1).
- Remove additional removable board (Fig. 40,2) from the right-hand bedding box in the rear.
- Fold footrest (Fig. 40,1) out on the removable board.

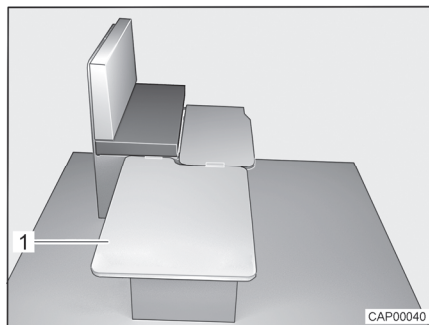


Fig. 41 During conversion

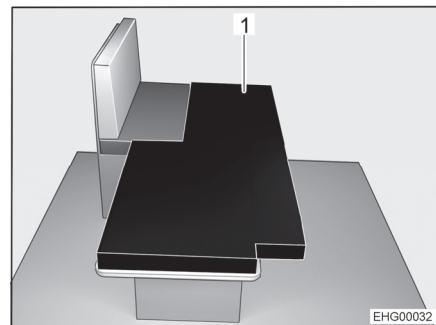


Fig. 42 After conversion

- Hook removable board (Fig. 41,1) in on the side of the bench and place it on the table.
- Place additional cushion (Fig. 42,1) on the lowered table as shown in the image.



Chapter overview

This chapter contains instructions regarding the gas system of the vehicle. The operation of the gas operation appliances of the vehicle is described in chapter 9.

7.1 General instructions



- ▶ The operator of the gas system is responsible for the performance of recurring inspections and for complying with the maintenance intervals.
- ▶ Before commencing the journey, when leaving the vehicle or when gas equipment is not in use, close all gas isolator taps and the main regulator tap on the gas bottle.
- ▶ All gas-operated devices (heater, cooker) must be switched off for refuelling, on ferries or in the garage. Danger of explosion!
- ▶ Do not use gas-operated devices in closed spaces (e.g. garages). Danger of poisoning and suffocation!
- ▶ Only have the gas system maintained, repaired or altered by an authorised specialist workshop.
- ▶ Have the gas system checked by an authorised specialist workshop according to the national regulations before commissioning. This also applies for not registered vehicles. For modifications to the gas system have the gas system immediately checked by an authorised specialist workshop.
- ▶ The gas pressure regulator, the gas tubes, and the exhaust gas pipes must also be inspected. The gas pressure regulator and the gas tubes must be replaced observing the nationally defined deadlines (the latest after 10 years). The vehicle owner is responsible for seeing that this is carried out.
- ▶ In case of a defect of the gas system (gas odour, high gas consumption) there is danger of explosion! Close regulator tap on the gas bottle immediately. Open doors and windows and ventilate well.
- ▶ If the gas system is defective: Do not smoke; do not ignite any open flames, and do not operate electric switches (light switches etc.). Check the tightness of gas-conducting parts and lines with leakage search spray. Do not check with an open flame.
- ▶ Only the stipulated devices may be connected to internal connections. Do not operate any device outside the vehicle if it is connected to an internal connector.
- ▶ Cooking is prohibited during the journey.
- ▶ Before using the cooker make sure that there is sufficient ventilation. Open a window or the skylight.
- ▶ Do not use the gas cooker for heating purposes.
- ▶ If there are several gas devices, each gas device must have its own gas isolator tap. If individual gas devices are not in use, close the respective gas isolator tap.
- ▶ Ignition safety valves must close within 1 minute after the gas flame has extinguished. A clicking sound is audible. Check function from time to time.



- ▶ The built-in gas devices are exclusively meant for use with propane or butane gas or a mixture of both. The gas pressure regulator as well as all built-in gas devices are designed for a gas pressure of 30 mbar.
- ▶ Propane gas is capable of gasification up to -42 °C, whereas butane gas gasifies at 0 °C. Below these temperatures no gas pressure is available. Butane gas is unsuitable for use in winter.
- ▶ Due to its function and construction, the gas bottle compartment is a space which is open to the exterior. Never cover or block up the standard forced ventilations. Otherwise gas that is emitted can not be diverted to the outside.
- ▶ The gas bottle compartment must not be used as storage space.
- ▶ Secure the gas bottle compartment against unauthorised access. To do this, lock the compartment.
- ▶ The regulator tap on the gas bottle must be accessible.
- ▶ Only connect gas-operated devices (e.g. gas grill) which have been designed for a gas pressure of 30 mbar.
- ▶ The exhaust gas pipe must be fitted tightly to the heating system and to the vent and must be sealed. The exhaust gas pipe must not show any evidence of damage.
- ▶ Exhaust fumes must be able to escape into the atmosphere unhindered and fresh air must be able to enter unhindered. For this reason, keep the exhaust pipe and intake openings clean and unobstructed (e.g. free from snow and ice). For this reason, no snow walls or aprons may lie against the vehicle.

7.2 Gas bottles



- ▶ Handle full or emptied gas bottles outside the vehicle only with closed regulator tap and attached protective cap.
- ▶ Gas bottles are only to be transported within the designated gas bottle compartment.
- ▶ Place the gas bottles in vertical position in the gas bottle compartment.
- ▶ Fasten the gas bottles so that they are unable to turn or tilt.
- ▶ Connect the gas tube to the gas bottle without tension.
- ▶ If the gas bottles are not connected to the gas tube, always place the protective cap on top.
- ▶ Close the regulator tap on the gas bottle before the gas pressure regulator or gas tube are removed from the gas bottle.
- ▶ Depending on the connection, unscrew the gas tube from the gas bottle and screw it on the gas bottle again by hand or using a suitable special spanner. The screw connection on the gas bottle generally has a left-hand thread. **Do not** tighten too firmly.
- ▶ Only use special gas pressure regulators with a safety valve designed for vehicle use. Other gas pressure regulators are not permitted and cannot meet the demanding requirements.
- ▶ Use the gas pressure regulator defroster if the temperature falls below 5 °C.



- ▶ Use only 11 kg or 5 kg gas bottles. Camping gas bottles with built-in check valve (blue bottle with max. 2.5 or 3 kg content) are can be used in exceptional cases with a safety valve.
- ▶ Use the shortest possible tube lengths (150 cm max.) for external gas bottles.
- ▶ Never block the floor ventilation openings below the gas bottles.



- ▷ The screw connections on the gas bottles generally have a left-hand thread.
- ▷ For gas-operated units the gas pressure must be reduced to 30 mbar.
- ▷ Connect gas pressure regulator complete with safety valve directly to bottle valve.
- ▷ For filling and connecting the gas bottles in Europe the accessories shops have corresponding Euro filling sets and Euro bottle sets.
- ▷ Information available at the dealers or service centre.

The gas pressure regulator reduces the gas pressure in the gas bottle down to the operating pressure of the gas devices.

The gas pressure regulator is permanently installed in the gas bottle compartment. The gas bottle is connected to the gas pressure regulator via a high-pressure gas hose.

The high-pressure gas hoses and their connections are different in the various countries. The accessories shop offers the respective country-specific models and adapters.

7.3 Gas pressure regulating system DuoControl CS



- ▷ The regulating system and the hose lines shall be changed at the latest 10 years after manufacturing date. The operator is responsible for this.
- ▷ Also read the manufacturer's instruction manual.

DuoControl CS is a safety gas pressure regulating system with automatic switching for a two-bottle gas system and with crash sensor. The DuoControl regulating system automatically switches the gas supply from the primary bottle to the reserve bottle as soon as the primary bottle is either empty or no longer ready for operation. The gas appliances may still continue operation. The DuoControl regulating system is suitable for all commercial gas bottles with liquefied gas (propane/butane) and a pressure of 0.6 bar to 16 bar.

The DuoControl regulating system ensures a constant gas pressure for the gas-operated devices, no matter which gas bottle is supplying the gas.

In the event of an accident, the crash sensor in the DuoControl regulating system will interrupt the gas flow.

The gas bottles are connected via high pressure hoses. A hose break guard prevents gas leakage in the event of a damaged hose.

The operation of gas-operated devices during the journey is permitted in all of Europe if the vehicle is equipped with a gas pressure regulating system with crash sensor and high-pressure hoses with hose break guard.

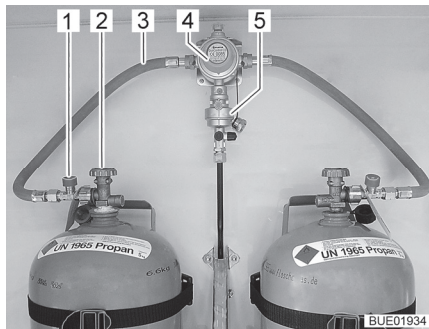


Fig. 43 Gas bottles with DuoControl

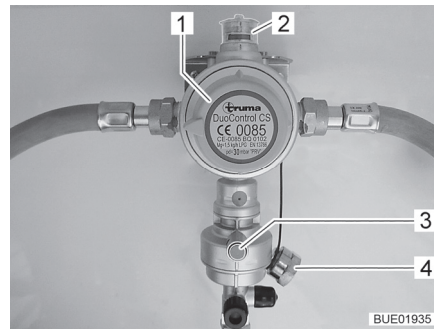


Fig. 44 DuoControl regulating system

Construction of the unit

The DuoControl regulating system consists of a reversing valve (Fig. 43,4) and a crash sensor (Fig. 43,5). The DuoControl regulating system is installed between the gas tubes (Fig. 43,3) with hose break guard (Fig. 43,1). The knob (Fig. 44,1) on the reversing valve is used to select which of the gas bottles is to be used as primary bottle and which is to be used as reserve bottle.

The status of the gas supply is indicated in the inspection window (Fig. 44,2):

- Green: Gas is taken out of the primary bottle.
- Red: Gas is taken out of the reserve bottle.

The operation with only one gas bottle is allowed but in this case the open connection must be closed with a blind cover (Fig. 44,4).

Crash sensor

The crash sensor blocks the gas supply in the event of a significant impact (e.g. accident). The crash sensor is put into operation with the green reset button (Fig. 44,3).

Hose break guard

The hose break guard (Fig. 43,1) blocks the gas flow if the connected hose breaks. The hose break guard must be activated by pressing the green button.

Defroster

The DuoControl regulating system can be heated (defroster). If winter operation is set at the operating unit, the DuoControl regulating system will be heated automatically. Thus, faults of the gas system due to frost in winter are prevented.

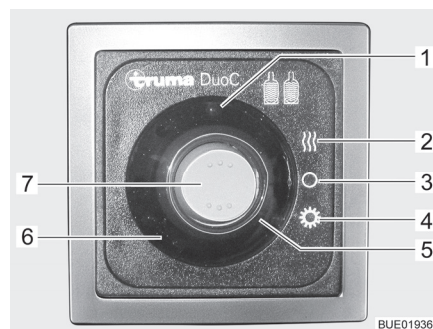


Fig. 45 Operating unit (DuoControl)

- 1 Yellow indicator lamp, defroster
- 2 Winter operation position
- 3 OFF position
- 4 Summer operation position
- 5 Red indicator lamp, primary bottle empty
- 6 Green indicator lamp, supply from primary bottle
- 7 Rocker switch



Operating unit

At the operating unit (Fig. 45), the gas supply via the DuoControl regulating system is switched on and off. The regulator taps (Fig. 43,2) of the gas bottles and the gas isolator taps of the devices must be opened manually.

Summer and winter operation are switched with the rocker switch (Fig. 45,7) on the operating unit.

The two indicator lamps on the operating unit indicate the level of the primary bottle. When the green indicator lamp (Fig. 45,6) is lit, the primary bottle is sufficiently filled. When the red indicator lamp (Fig. 45,5) illuminates, the primary bottle is empty. In this case, the reserve bottle is used for the gas supply.

Putting into operation:

- Connect the gas bottles.
- Use the knob (Fig. 44,1) on the reversing valve to select the gas bottle which is to be the primary source of gas (primary bottle). Always turn the knob as far as it will go.
- Open regulator taps (Fig. 43,2) on the gas bottles.
- Press the green button of the hose break guard (Fig. 43,1). The green marking is shown in the inspection window (Fig. 44,2).

Switching on summer/winter operation:

- Switch on the DuoControl regulating system at the operating unit (Fig. 45). To do so, set the rocker switch (Fig. 45,7) to winter operation (Fig. 45,2) or to summer operation (Fig. 45,4). The yellow defroster indicator lamp (Fig. 45,1) is lit when winter operation is selected.

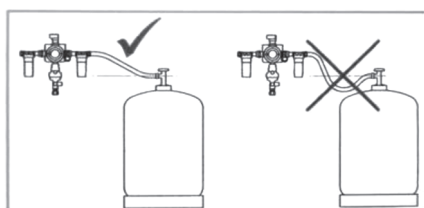
Switching off:

- Set the rocker switch (Fig. 45,7) to the OFF position (Fig. 45,3). The indicator lamps go out.
- Close regulator taps (Fig. 43,2) on the gas bottles.

Changing gas bottles



- ▶ When changing gas bottles, do not smoke or create any open fire.
- ▶ When you have changed the gas bottle, check whether gas escapes at the connection points and unions. Use a leakage search spray to spray the relevant connection point or union. These agents are available at the accessories shop.
- ▶ Connect gas pipe such that it rises from the gas bottle towards the regulating system (see Fig. 46).



EHG00019

Fig. 46 Correct connection of the gas bottle

If the green indicator lamp (Fig. 45,6) goes out during operation and the red indicator lamp (Fig. 45,5) lights up, the primary bottle is empty and must be changed. The red marking is shown in the inspection window (Fig. 44,2). The reserve bottle continues supplying the gas appliances with gas.



You may also change an empty gas bottle while gas-operated devices are in operation.

Changing the gas bottle:

- Turn the knob (Fig. 44,1) a half turn in the direction of the currently used gas bottle. In this way, this gas bottle is the primary bottle now, and the empty gas bottle becomes the reserve bottle. The marking in the inspection window (Fig. 44,2) changes from red to green.
- Close regulator tap (Fig. 43,2) on the empty gas bottle. Pay attention to the direction of the arrow.
- Unscrew the gas tube from the empty gas bottle (normally a left-hand thread).
- Release the fixing belts and remove the empty gas bottle.
- Place a filled gas bottle in the gas bottle compartment and retain with the fixing belts.
- Connect gas tube to the filled gas bottle (normally a left-hand thread).
- Open the regulator tap on the gas bottle.
- Press the green button of the hose break guard (Fig. 43,1).

7.4 Changing gas bottles



- ▶ When changing gas bottles, do not smoke or create any open fire.
- ▶ When you have changed the gas bottle, check whether gas escapes at the connection points and unions. Use a leakage search spray to spray the relevant connection point or union. These agents are available at the accessories shop.



- ▷ The procedure described below applies to vehicles that are equipped with a single gas connection. If the vehicle is equipped with an regulating system: When changing the gas bottle, proceed as described for the regulating system.

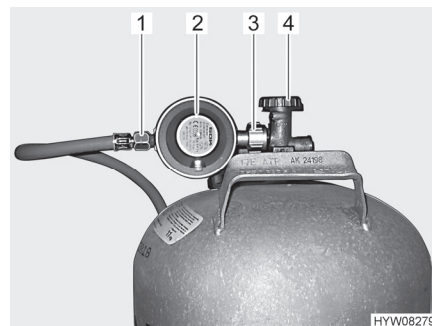


Fig. 47 Gas bottle connection

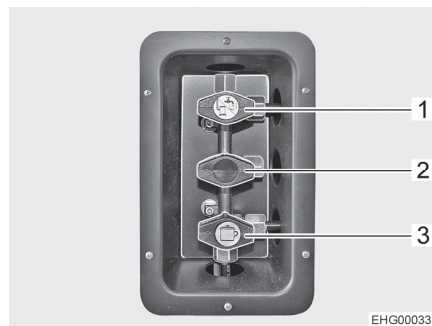
- Open flap for the gas bottle compartment.
- Close the regulator tap (Fig. 47,4) on the gas bottle. Pay attention to the direction of the arrow.
- Hold the gas pressure regulator (Fig. 47,2) and open the knurled nut (Fig. 47,3) (normally a left-hand thread).
- Remove the gas pressure regulator and the gas tube (Fig. 47,1) from the gas bottle.
- Release the fixing belts and remove the gas bottle.



- Place a filled gas bottle in the gas bottle compartment.
- Fix gas bottle in place with the fixing belts.
- Position the gas pressure regulator (Fig. 47,2) with gas tube (Fig. 47,1) on the gas bottle and tighten the knurled nut (Fig. 47,3) (normally a left-hand thread). **Do not** tighten too firmly.
- Close flap for the gas bottle compartment.

7.5 Gas isolator taps

For every gas-operated device there is a gas isolator tap installed in the vehicle. The gas isolator taps are installed on the left side in the rear area.



- 1 Heater / hot water gas isolator tap, open
- 2 Gas isolator tap, not assigned
- 3 Cooker gas isolator tap, open

Fig. 48 Gas isolator taps position (example)

Opening: ■ Set gas isolator tap in the direction of the gas pipe.

Closing: ■ Set gas isolator tap perpendicular to the gas pipe.





Chapter overview

This chapter contains instructions regarding the electrical system of the vehicle.

The operation of the electrical appliances of the housing body is described in chapter 9.

8.1 General safety instructions



- ▶ Only allow qualified personnel to work on the electrical system.
- ▶ All electronic devices (e.g. mobile telephones, radios, televisions or DVD players) which have been retrofitted to the vehicle and are operated during the journey must have certain features: These are the CE certification, the EMC inspection (electromagnetic compatibility) and the "e"-inspection.

Only in this way can the functional reliability of the vehicle be ensured. Otherwise the airbag may be triggered or interference to the on-board electronics may result.



- ▷ During a storm, to protect the electrical devices disconnect the 230 V connection and retract the antennae.

8.2 Terms

Off-load voltage

The off-load voltage is the voltage of the battery in idle condition, i. e. no current is consumed and the battery is not being charged.



- ▷ The battery must remain idle for a while before measuring. After charging the last time, or after the last current has been drained by appliances, wait approximately 2 hours before measuring the off-load voltage.

Closed circuit current

Some electrical appliances, such as the clock and the indicator lamps, require continuous electric current, for this reason they are referred to as inactive appliances. This closed circuit current flows even if the device has been switched off.

Total discharge

Total discharge of the battery is imminent, if a battery is completely discharged by an active appliance and by closed circuit current and the off-load voltage falls below 12 V.



- ▷ Total discharge damages the battery.

Capacity

Capacity refers to the amount of electricity which can be stored in a battery. The capacity of a battery is given in ampere hours (Ah). The so-called K20 value is normally used.

The K20 value indicates how much current a battery is able to dispense over a time period of 20 hours without causing damage, or how much current is required to charge a flat battery within 20 hours.



For example, if a battery can dispense 4 amps for 20 hours, then it has a capacity of $4 \text{ A} \times 20 \text{ h} = 80 \text{ Ah}$.

If more current flows, the discharging time of the battery will decrease proportionately.

External influences, such as temperature and age may alter the storage capacity of the battery. Capacity details refer to new batteries operating at room temperature.



- ▷ Depending on battery technology, capacity details have a conversion factor of 1.3 to 1.7, which lowers the real capacity by this value.

8.3 12 V power supply



- ▷ To disconnect **all** electrical 12 V appliances from the power supply, disconnect the living area battery from the 12 V power supply. In order to do this, actuate the switch on the transformer/rectifier.

When the vehicle is not connected to the 230 V power supply or the 230 V power supply is switched off, the living area battery supplies the living area with 12 V DC. The living area battery has a limited power supply only. For this reason, electrical appliances such as the refrigerator and the heater (circulation fan) should not be operated for a long time without using the 230 V power supply.

During heater operation, the circulation fan is switched on and off by a thermostat control. As a result the living area battery is loaded if no 230 V power supply is connected.

In the case of longer lay-ups of the vehicle, all 12 V appliances must be switched off to avoid discharging the living area battery.

Switching off all 12 V appliances:

- Switch off battery cut-off switch on the transformer/rectifier. Thus, the living area battery is fully disconnected from all electrical appliances.

If you leave the vehicle briefly and the refrigerator and/or the heater shall continue working, it suffices to switch off all 12 V appliances not required. Yet nevertheless, observe the charging condition of the living area battery.

Switching off 12 V appliances that are not required:

- Switch off 12 V main switch on the panel. Heater, refrigerator, entrance step / basic light are still supplied with power.

8.3.1 Living area battery



- ▷ Disconnecting and connecting the terminals, as well as changing the living area battery shall only be carried out by qualified personnel. In the event of an incorrect connection, there is the risk of short circuit and fire due to rubbing cables. To reach the living area battery, the seat as well as its turning device must be removed. These components are security related and shall be fitted professionally with screw lock and complying with defined tightening torques.
- ▷ Prior to commencing a journey ensure the living area battery is fully charged. For this reason charge the living area battery for at least 20 hours before commencing the journey.
- ▷ During the trip, use every opportunity to charge the living area battery.
- ▷ After the trip, charge the living area battery fully.



- ▷ Charge the battery for at least 20 hours before laying up.
- ▷ Use the charger module provided on the transformer/rectifier to charge the living area battery. When charging externally, use a regulated charger that is suitable for the battery type and the capacity of the living area battery.
- ▷ For long periods of inactivity (4 weeks or more), either disconnect the living area battery from the 12 V power supply or recharge it regularly.
- ▷ When changing the living area battery, only use batteries of the same type with the same specification as the originally installed battery. Only use a different battery after authorisation by the manufacturer of the vehicle.
- ▷ Before disconnecting or connecting the terminals of the battery, switch off the vehicle engine as well as the 230 V and 12 V power supplies and all appliances. Danger of short circuit!
- ▷ Do not actuate the ignition if the terminals of the battery are disconnected. Danger of short circuit!
- ▷ Take note of the battery manufacturer's users and maintenance instructions.



- ▷ The battery is maintenance-free. Maintenance-free means:
 - It is not necessary to check the acid level.
 - It is not necessary to lubricate the battery poles.
 - It is not necessary to refill the distilled water.Even a maintenance-free battery must be recharged.
Recommendation: Perform a full charging cycle every 6 to 8 weeks. Depending on the battery capacity and the charger, the charging cycle will last 24 to 48 hours.

Position The living area battery is installed in the driver's area below the right-hand seat.

Discharging The living area battery is discharged by the closed circuit current which some electrical appliances continuously require.



- ▷ Total discharge damages the battery.
- ▷ Recharge battery in good time.

Note that even a fully charged living area battery can be fully discharged by closed circuit currents (inactive appliances).

Low temperatures outside reduce the capacity available.

The self-discharge rate of the battery is also dependant on temperature. At 20 to 25 °C the self-discharge rate is approx. 3 % of the capacity per month. The self-discharge rate will increase with rising temperatures: At 35 °C the self-discharge rate is approx. 20 % of the capacity per month.

An older battery no longer has the complete capacity available.

The higher the number of active electrical appliances, the faster the energy of the living area battery is consumed.



- ▷ Appliances such as the refrigerator, charger, solar charge regulator, panel, or similar, take power from the battery, even when the 12 V main switch is turned off. Therefore disconnect the living area battery from the 12 V power supply, if the vehicle will not be used for a long period of time.

8.3.2 Charging batteries via a 230 V power supply

If the vehicle is connected to the 230 V power supply, the living area battery and the starter battery are automatically charged by the charger module on the transformer/rectifier. The starter battery is only charged with a float charge. The charging current is adapted to suit the charging condition of the battery. This ensures that it is not possible to overload the battery.

To make use of the maximum output from the charger module on the transformer/rectifier, switch off all electrical appliances during charging.

8.3.3 Charging batteries via the vehicle engine

When the vehicle engine is running, the vehicle alternator recharges the living area battery and the starter battery. When the vehicle engine is switched off, the batteries are automatically disconnected from one another by a relay in the transformer/rectifier. This prevents the starter battery from being run down by electrical appliances in the living area. The starting capability of the vehicle is thus preserved. The charging condition of the living area battery or the starter battery can be read on the panel.

8.3.4 Charging the starter battery



- ▶ The acid in the battery is poisonous and corrosive. Any contact with the skin or the eyes is to be avoided. In the event of contact, rinse immediately with plenty of water (skin, eyes, clothes, objects) and seek medical attention if necessary.
- ▶ In the case of charging with an external charger there is danger of explosion. Sparks can be caused by attaching the battery terminals. Only charge the battery in a well ventilated area and away from naked flames or possible sources of sparks. Batteries can develop and release gases when they are charged.
- ▶ Always remove the starter battery from the vehicle when charging it using an external charger.



- ▷ Do not connect the battery cables to the wrong poles (red cable -> positive pole, black cable-> negative pole).
- ▷ Do not actuate the ignition if the terminals of the battery are disconnected. Danger of short circuit!
- ▷ Before disconnecting or connecting the terminals of the battery, switch off the vehicle engine as well as the 230 V and 12 V power supplies and all appliances. Danger of short circuit!
- ▷ Before charging the battery, check whether the external charger is approved for the battery type.



- ▷ Observe the instruction manuals for the base vehicle and the charger.
- ▷ Irreparable damage to the battery will result if it is overcharged.

Charging with an external charger

When charging the starter battery with an external charger, proceed as follows:

- Turn off the vehicle engine.
- Switch off all electrical appliances.
- Switch off 12 V main switch on the panel. The indicator lamp will go off.
- Switch off battery cut-off switch on the transformer/rectifier.
- Disconnect the mains plug from the transformer/rectifier.
- Switch off all gas appliances, all gas isolator taps and close the regulator tap on the gas bottle.
- There is a danger of short circuit when disconnecting the battery poles. For this reason, first disconnect the negative terminal on the starter battery and then the positive.
- Remove starter battery from the vehicle.
- Check that the external charger is turned off.
- Connect the external charger to the starter battery. Pay attention to the polarity: First connect the positive terminal "+" to the positive pole of the battery, then connect the negative terminal "-" to the negative pole of the battery.
- Switch on the external charger.
- See the instructions for use of the connected charger for information concerning charge period required for the battery.
- See the specifications on the battery for information concerning its strength.
- Disconnect the external charger in reverse order.

8.4 Transformer/rectifier (EBL 119)



- ▷ Do not cover the ventilation slots. Danger of overheating!



- ▷ Depending on the model, not all slots for the fuses are occupied.
- ▷ Deviating from the default assignment, the following fuse values are inserted:
 - "Basic light / step": 20 A
 - "Spare 3": 10 A (fuse for USB socket)
- ▷ Further information can be obtained in the manufacturer's instruction manual.

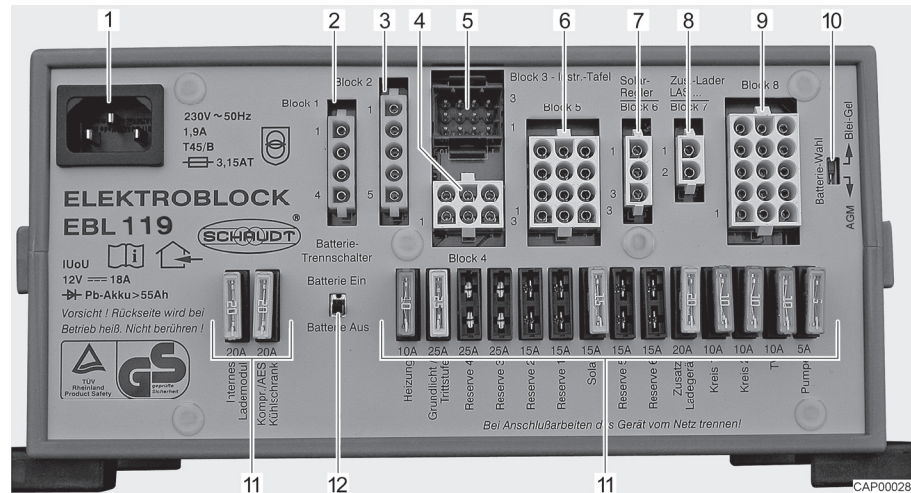


Fig. 49 Transformer/rectifier (EBL 119)

- 1 Main supply socket 230 V~
- 2 Output: Block 1 – refrigerator
- 3 Input: Block 2 – control lines
- 4 Output: Block 4 - heater, safety/drainage valve, basic light (lighting in the entrance area), entrance step
- 5 Output: Block 3 – panel
- 6 Output: Block 5 – solar cell (if fitted), spare 2, spare 3, spare 4
- 7 Output: Block 6 – solar charge regulator (if fitted)
- 8 Output: Block 7 – auxiliary charging unit
- 9 Output: Block 8 – consumer circuit 1, consumer circuit 2, 12 V socket, water pump, spare 1, spare 5, spare 6
- 10 Battery selector switch (lead-gel/AGM)
- 11 Fuses
- 12 Battery cut-off switch ("Batterie Ein/Aus" (battery On/Off))

Functions The transformer/rectifier has the following functions:

- The transformer/rectifier charges the living area battery. The transformer/rectifier charges the starter battery with a float charge only.
- The transformer/rectifier monitors the voltage in the living area battery.
- The transformer/rectifier distributes the current to the 12 V circuits and secures them. Devices with a maximum of 10 A can be connected to the sockets.
- The transformer/rectifier provides connections for a solar charge regulator, an auxiliary charging unit, as well as other control and monitoring functions.
- When the vehicle engine is turned off, the transformer/rectifier separates the starter battery electrically from the living area battery. This prevents the 12 V living area appliances from discharging the starter battery.
- The battery cut-off switch in the transformer/rectifier separates all the appliances from the living area battery.

The transformer/rectifier only works in conjunction with a panel.

When the transformer/rectifier is subject to a heavy load, the fitted charger module reduces the charging current. This protects the charger from overheating. The transformer/rectifier is subject to a heavy load when e.g. an empty living area battery is being charged, additional electrical appliances are turned on and the ambient temperatures are high.

Position The transformer/rectifier is installed in the driver's area below the left-hand seat.



8.4.1 Battery cut-off switch



- ▷ After switching the battery cut-off switch back on again: Put the basic light (lighting in the entrance area), entrance step, heater and spare 4 back into service (depending on the model). To do so, switch on the 12 V main switch briefly. This also applies if the living area battery was disconnected and then reconnected.

The battery cut-off switch disconnects all the living area 12 V appliances. This prevents the living area battery from slowly discharging if the vehicle is not used for a longer period of time (e.g. temporary lay-up).

The batteries can still be charged by the transformer/rectifier when the battery cut-off switch is turned off.

Switching on/off:

- Push the battery cut-off switch upwards: Battery On ("Batterie Ein").
- Push the battery cut-off switch downwards: Battery Off ("Batterie Aus").

8.4.2 Battery selector switch



- ▶ If the battery selector switch is set incorrectly, there is a risk of generating oxyhydrogen gas. Danger of explosion!



- ▷ Incorrect setting of the battery selector switch damages the living area battery.
- ▷ The factory settings of the battery selector switch must not be changed.

8.4.3 Battery monitor



- ▷ You must fully recharge a discharged living area battery as soon as possible.

The battery monitor in the transformer/rectifier monitors the voltage in the living area battery.

If the voltage of the batteries falls below 10.5 V, the battery monitor in the transformer/rectifier switches off all the 12 V appliances.

Measures:

- Switch off all electrical appliances that are not absolutely essential at the corresponding switch.
- If necessary, use the 12 V main switch to switch the 12 V power supply back on for a short while. This is only possible, however, when the battery voltage is above 11 V. If the voltage is below this level, the 12 V power supply cannot be switched on again until the living area battery has been recharged.



8.4.4 Charging the battery

When the vehicle engine is running, a relay in the transformer/rectifier alternator switches on the living area battery and the starter battery together and recharges them with the vehicle generator. When the vehicle engine is switched off, the batteries are automatically disconnected from one another again by the transformer/rectifier. This prevents the starter battery from being run down by electrical appliances in the living area. The starting capability of the vehicle is thus preserved. The terminal voltage of the living area battery or the starter battery can be read on the panel.

If the vehicle is connected to the 230 V power supply via the CEE socket outlet, the living area battery and the starter battery are charged by the charger module on the transformer/rectifier. The starter battery is only charged with a float charge. The charging current is adapted to suit the charging condition of the battery. This ensures that it is not possible to overload the battery.

To make use of the maximum output from the charger module on the transformer/rectifier, switch off all electrical appliances during charging.

8.5 Panel (LT 100)

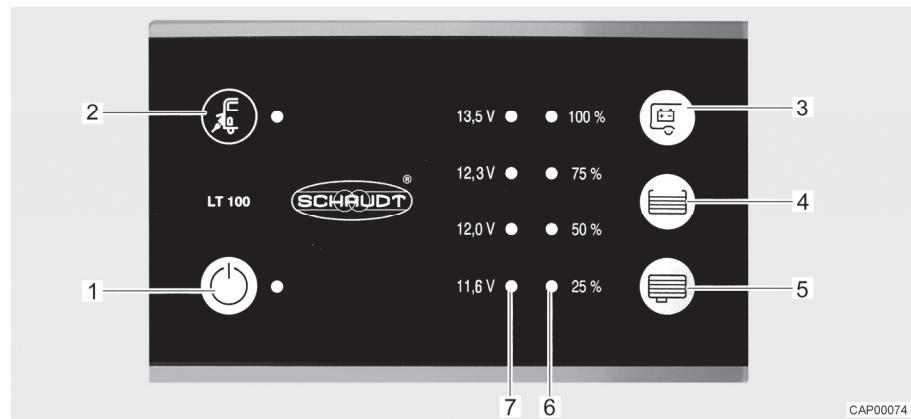


Fig. 50 Panel (LT 100)

- 1 12 V main switch and green LED
- 2 Mains connection symbol and yellow LED
- 3 Button to query the voltage of the living area battery
- 4 Button to query the fill level in the fresh water tank
- 5 Button to query the fill level in the waste water tank
- 6 LED array to display the tank fill level
- 7 LED array to display the battery voltage

The switches and push buttons of the panel are sensor touchpads. The switching function is triggered by touching.

Mains connection

The yellow LED at the mains connection symbol "⚡" (Fig. 50,2) is lit when the vehicle is connected to an external mains supply. In this case, the LED will also be lit when the panel is switched off.



8.5.1 12 V main switch

The 12 V main switch (Fig. 50,1) switches the panel and the 12 V power supply of the living area on and off.

Exception: Depending on the model, basic light (lighting in the entrance area), and entrance step remain ready to operate.

Switching on:

- Press switch "⏻" (Fig. 50,1): The 12 V living area power supply is switched on. The LED lights up green.

Switching off:

- Press switch "⏻" (Fig. 50,1) again: The 12 V living area power supply is switched off. The LED goes out.



- ▷ When leaving the vehicle, switch off the main 12 V power supply at the panel. This prevents any unnecessary discharge of the living area battery.
- ▷ Appliances, such as control units (e.g. solar charge regulator, defroster or panel) or fitted appliances (e.g. step) continue to take power from the battery capacity, even if the 12 V power supply on the panel is switched off. Therefore disconnect the living area battery from the 12 V power supply via the switch on the transformer/rectifier if the vehicle will not be used for a long period of time.

8.5.2 LED array for battery voltage

The LED array (Fig. 50,7) displays the battery voltage of the living area battery as follows:

- All LEDs are lit: battery is sufficiently charged.
- Yellow and red LEDs are lit: battery is partly discharged.
- Only red LED is lit: battery is discharged.
- Red LED is flashing: battery is totally discharged.

Displaying the battery voltage:

- Press the button "⏻" (Fig. 50,3): the battery voltage of the living area battery is displayed.

The following tables will help you correctly interpret the battery voltage of the living area battery displayed on the panel.

Battery voltage (values during operation)	Mobile operation (vehicle moving, no mains connection)	Battery operation (vehicle stationary, no mains connection)	Power operation (vehicle stationary, mains connection)
Below 11.6 V (red LED is flashing)	Battery is totally discharged, no charging via the alternator	Battery is fully discharged	Battery is totally discharged, no charging via the power supply
12 V or less Danger of total discharge (battery alarm) (red LED is lit)	12 V power supply overload	If appliances are switched off: Battery flat	12 V power supply overload
	The battery is not charged by the alternator	If appliances are switched on: Battery overload	The battery is not charged by the transformer/rectifier, the transformer/rectifier is defective



Battery voltage (values during operation)	Mobile operation (vehicle moving, no mains connection)	Battery operation (vehicle stationary, no mains connection)	Power operation (vehicle stationary, mains connection)
12.3 V to 13.5 V (red, yellow, and green LED are lit)	12 V power supply overload ¹⁾	Normal range	12 V power supply overload ¹⁾
	The battery is not charged by the alternator ¹⁾		The battery is not charged by the transformer/rectifier, the transformer/rectifier is defective ¹⁾
13.5 V (all LEDs are lit)	Battery being charged	Occurs only briefly after charging	Battery being charged

¹⁾ If the voltage does not exceed this range for several hours.

Off-load voltage

Measuring the off-load voltage is a simple method to check the condition of the battery. The off-load voltage is the voltage of the battery in idle condition, when current is neither supplied nor consumed.

The following table helps to correctly interpret the displayed battery off-load voltage. The specified values are guide values for dryfill batteries.

LT 100 indicator	Off-load voltage values	Battery charge
Red LED flashes	11.6 V or less	Battery is fully discharged
Red and yellow LED are lit	11.6 V to 12.0 V	Battery is discharged to totally discharged
Red and yellow LED are lit	12 V to 12.3 V	Battery is empty or charged up to approx. 50 %
Red, yellow, and lower green LED are lit	12.3 V to 13.5 V	Battery is charged from approx. 50 % to fully charged
All LEDs light up	Over 13.5 V	(Only appears while charging)



▷ Total discharge causes irreparable damage to the battery.

- Measures:**
- When the battery alarm comes on, switch off the appliances and charge the living area battery, either by mobile operation or by connection to a 230 V power supply.

8.5.3 LED array for tank fill level

The LED array (Fig. 50,6) displays the fill level of the fresh water tank or of the waste water tank.

Display fill level:

Press the button "☰" (Fig. 50,4): The fill level of the fresh water tank is displayed by lit LEDs.

Press the button "☷" (Fig. 50,5): The fill level of the waste water tank is displayed by lit LEDs.



Level indicator

LED indicator	Tank fill level
All LEDs light up	Full tank
3 LEDs light up	Tank approx. 3/4 full
2 LEDs light up	Tank approx. 1/2 full
1 LED lights up	Tank approx. 1/4 full
Bottom LED flashes	Tank empty



▷ Further information can be obtained in the manufacturer's instruction manual.

8.6 230 V power supply



- ▶ Only allow qualified personnel to work on the electrical system.
- ▶ Have the vehicle's electrical system checked by a qualified electrician at least once every 3 years. If the vehicle is used frequently, an annual check is recommended.

The 230 V power supply provides electricity for:

- sockets with earth contact for appliances with maximum 10 A
- transformer/rectifier

The electrical appliances connected to the 12 V power supply of the living area are supplied with voltage by the living area battery.

Connect the vehicle to an external 230 V power supply system as often as possible. The charger module in the transformer/rectifier automatically charges the living area battery. In addition to this, the starter battery is charged with a float charge.

8.6.1 230 V connection (CEE socket outlet)



▷ Overvoltage can damage connected devices. Overvoltage can be caused by lightning, irregular voltage sources (e.g. petrol-operated generators) or power connections on ferries for example.

Requirements concerning the 230 V connection

- The connecting cable, the plug connectors at the point of supply and the plug connector to the vehicle must comply with IEC 60309. The standard designation for the plug connectors is "CEE blue".
- Use H07RN-F rubber sheathed cable with a minimum cable cross-section of 2.5 mm² and a maximum length of 25 m.
- Earth contact connectors (safety) are not permitted. The interconnection of CEE/safety adapters is also prohibited.



8.6.2 Connecting the 230 V power supply



- ▶ The external 230 V power supply must be protected by fuse with a fault current protection switch (FI-switch, 30 mA).
- ▶ To prevent overheating, the cable must be fully uncoiled from the cable reel.
- ▶ In case of doubt or if the 230 V supply is not available or is faulty, contact the operator of the power supply device.



- ▷ The 230 V connection in the vehicle is equipped with a fault current protection switch (FI-switch).
- ▷ For the connection points on camp sites (camping distributors) fault current protection switches (FI-switches, 30 mA) are obligatory.

The vehicle can be connected to an external 230 V power supply. As a principle, only use the 230 V connection on the vehicle (CEE socket outlet) for connecting.

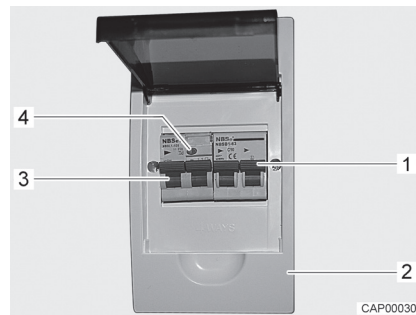


Fig. 51 Safety cut-out and FI-switch (230 V fuse box)

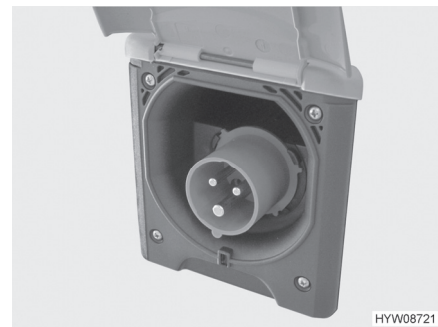


Fig. 52 230 V connection on the vehicle (CEE socket outlet)

Connecting the vehicle:

- Check whether the power supply device is suitable regarding connection, voltage, frequency and current.
- Check whether the cables and connections are suitable.
- Check the plug connectors and cables for visible damage.
- Switch off the safety cut-out (Fig. 51,1) in the fuse box (Fig. 51,2).
- Open the cover of the 230 V connection on the vehicle (Fig. 52) and insert the plug connector. Ensure that the detent of the spring-mounted pivoting cover is engaged in position.
- Plug the connector of the connecting cable into the socket of the camping distributor. Ensure that the detent of the spring-mounted flap is also engaged here.
- Switch on the safety cut-out in the fuse box.

Checking the fault current protection switch:

- When the vehicle is connected to the 230 V supply, press the test button (Fig. 51,4) of the fault current protection switch (FI-switch) (Fig. 51,3) in the fuse box (Fig. 51,2). The fault current protection switch must trip.
- Switch the fault current protection switch (Fig. 51,3) back on again.



Unplugging the connection:

- Switch off the safety cut-out (Fig. 51,1) in the fuse box (Fig. 51,2).
- Loosen the detent on the camping distributor and unplug the connecting cable from the socket.
- Loosen the detent on the vehicle unplug the plug connector and close the cover of the 230 V connection.

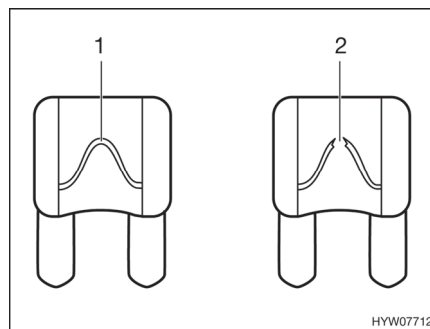
8.7 Fuses



- ▶ Only replace defective fuses when the cause of the defect is known and has been remedied.
- ▶ Replace defective fuses only after the power supply has been turned off.
- ▶ Never bridge or repair fuses.
- ▶ Only replace faulty fuses with a new fuse with the same rating.

8.7.1 12 V fuses

The appliances connected to the 12 V power supply in the living area are fused individually. The fuses are accessible at different positions in the vehicle.



- 1 Unbroken fuse element
- 2 Broken fuse element

Fig. 53 12 V fuse

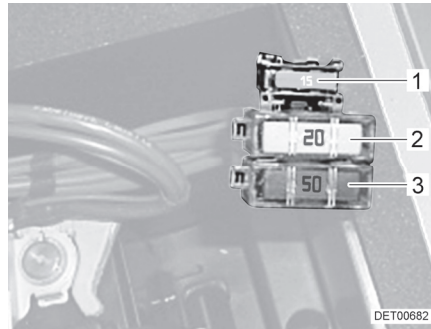
An intact 12 V fuse can be detected by the unbroken fuse element (Fig. 53,1). If the fuse element is broken (Fig. 53,2), change the fuse.

Before changing fuses, take the function, value and colour of the relevant fuses from the following specifications. When changing fuses, only use flat fuses with the values shown below.



Fuses on the starter battery

The fuses are installed in the vicinity of the starter battery. The starter battery is on the floor between the seats in the driver's cabin and can be accessed under a cover.

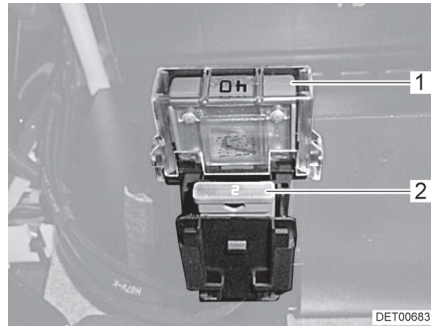


- 1 Flat fuse 15 A/blue
(control for relay)
- 2 Jumbo flat fuse 20 A/yellow
(back-up fuse for refrigerator)
- 3 Jumbo flat fuse 50 A/red
(fuse protection for starter battery)

Fig. 54 Fuses on the starter battery

Fuses on the living area battery

The fuses are installed in the console of the right-hand seat in the driver's area.



- 1 Jumbo flat fuse 40 A/orange
(fuse protection for living area battery)
- 2 Flat fuse 2 A/grey
(control 12 V/control unit)

Fig. 55 Fuses on the living area battery

Fuse for the Thetford toilet

The toilet has a maintenance-free fuse which resets automatically.



8.7.2 230 V fuse



- ▷ Check the fault current protection switch for each connection to the 230 V power supply, at least once every 6 months.

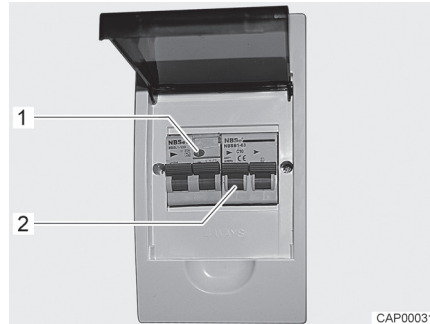


Fig. 56 230 V fuse box with safety cut-out and FI-switch

A fault current protection switch (FI-switch) in the fuse box protects the complete vehicle from fault current (0.03 A). A downstream safety cut-out (10 A) (Fig. 56,2) secures the 230 V power supply.

Checking the fault current protection switch:

- When the vehicle is connected to the 230 V power supply, press the test button (Fig. 56,1). The fault current protection switch must trip.

Position The fuse box is installed behind the service flap in the seat box.





Chapter overview

This chapter contains instructions regarding the appliances of the vehicle. The instructions refer exclusively to the operation of the appliances. Further information about the appliances can be found in the instruction manuals for the appliances, included separately with the vehicle.

9.1 General



- ▷ For safety reasons, spare parts for pieces of heating appliances must correspond with manufacturer's instructions and be permitted by the manufacturer as a spare part. These spare parts may only be fitted by the manufacturer or an authorised specialist workshop.

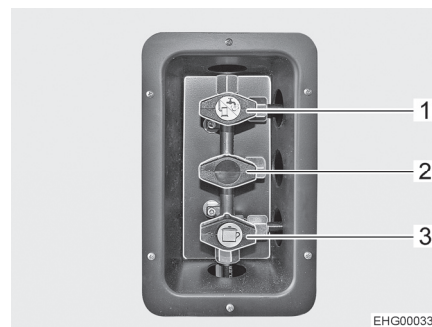


- ▷ Further information can be obtained in the instruction manual for the respective appliance.

The heater, boiler, cooker and refrigerator are fitted depending on the model of the vehicle.

In this instruction manual a description is given only for the operation of the appliances and their particular features.

To operate gas appliances, first open the regulator tap on the gas bottle and the gas isolator tap corresponding to the appliance.



- 1 Heater / hot water gas isolator tap, open
- 2 Gas isolator tap, not assigned
- 3 Cooker gas isolator tap, open

Fig. 57 Gas isolator taps position (example)

9.2 Heater / production of hot water

The heater can both heat up the vehicle interior (heating the room air) and heat up the domestic water (boiler function). The following instructions are also valid if the heater is only used as boiler.



- ▶ Never let gas escape unburned due to danger of explosion.
- ▶ Never run the heater in gas operation when refuelling, on ferries or in the garage. Danger of explosion!
- ▶ Never operate the heater in gas operation in closed spaces (e.g. garages). Danger of poisoning and suffocation!
- ▶ Do not use the space above and behind the heater as a storage space.
- ▶ The domestic water can be heated up to 65 °C. Risk of scalding!



- ▷ The circulation fan is automatically switched on when the hot-air heater is activated, and it stays on. This puts an immense strain on the living area battery, if the vehicle is not connected to an external 230 V power supply. Take into consideration that the living area battery only has limited reserves of energy.
- ▷ Never use the production of hot water without water inside it.
- ▷ When the production of hot water of the heater is not used, empty the domestic water container if there is a risk of frost.
- ▷ Only operate the production of hot water with the maximum temperature setting if you require a large quantity of warm water. This protects the appliance against the build-up of limescale.



- ▷ Do not use the water heated by the heater as drinking water.
- ▷ Operate the heater a few minutes under full load at regular intervals (at least every 3 months) to remove condensation. This prevents odours.

Initial start-up

When lighting the heater for the first time a small amount of smoke and odour will occur. Immediately set the operating switch of the heater to its highest position. Open doors and windows and ventilate well. Smoke and odour will disappear by themselves after a while.

9.2.1 To heat properly



Fig. 58 Air outlet nozzle (hot-air heater)

Hot air distribution

Several air outlet nozzles (Fig. 58) are built into the vehicle. Pipes conduct the warm air to the air outlet nozzles. Turn the air outlet nozzles in a suitable position so the air can escape as required. To avoid draft close the air outlet nozzles on the dashboard and set the air distribution of the base vehicle to air circulation.

Adjusting the air outlet nozzles

- Fully open: Full hot air stream
- Half or partially open: Reduced hot air stream

When five air outlet nozzles are completely opened, less warm air escapes through each nozzle. However, if only three air outlet nozzles are opened, more warm air flows out of each nozzle.



9.2.2 Heater and production of hot water (Truma Combi)



- ▷ If the heater is not in operation when there is a risk of frost, empty the domestic water container.

The power supply of the heating control system cannot be interrupted by means of the 12 V main switch.

The heater is operated with gas.



Fig. 59 Operating unit

- 1 Summer operation water temperature 60 °C
- 2 Summer operation water temperature 40 °C
- 3 Off
- 4 Winter operation "Only heater"
- 5 Winter operation "Heater and production of hot water"
- 6 Rotary switch (external ring)
- 7 Indicator lamp "Heater operation" (green)
- 8 Temperature control knob
- 9 Indicator lamp "Heating up period of production of hot water" (yellow)/ "Fault" (red)

Operating modes

The heater can be operated in different operating modes:

- Winter operation (with or without production of hot water)
- Summer operation (only production of hot water)

Selecting operating mode:

- Set the operating mode using the rotary switch (Fig. 59,6).

Heater with gas operation

The heater is operated exclusively with gas.

Winter operation

In winter operation "Heater and production of hot water" (Fig. 59,5) the domestic water is automatically heated up when the heater is switched on. If the heater switches off after the required room temperature has been reached, the domestic water will continue to heat up until the set water temperature has been reached.

A temperature sensor next to the panel measures the room temperature.

In the operating mode "Only heater" (Fig. 59,4) the heater can be operated with an empty domestic water container.

Switching on:

- Open the regulator tap on the gas bottle and the gas isolator tap "Heater/boiler".
- Turn the temperature control knob (Fig. 59,8) on the operating unit to the desired heating level.
- Set rotary switch (Fig. 59,6) to winter operation "Only heater" (Fig. 59,4) or to winter operation "Heater and production of hot water" (Fig. 59,5).

The green indicator lamp (Fig. 59,7) is on.

The circulation fan automatically switches on when the heater is activated.



- Switching off:*
- Turn the rotary switch (Fig. 59,6) to "O" (Fig. 59,3).
 - Close the gas isolator tap "Heater/boiler" and the regulator tap on the gas bottle.

After switching off the heater, the circulation fan may still run for a moment to use up the residual heat.

Summer operation

It is not possible to heat the vehicle in "Summer" operating mode. In this operating mode, only the domestic water is heated up to 40 °C or 60 °C.

- Switching production of hot water on:*
- Open the regulator tap on the gas bottle and the gas isolator tap "Heater/boiler".
 - Set the rotary switch (Fig. 59,6) on the operating unit (Fig. 59) to "Summer operation" (Fig. 59,1 or 2).

The yellow indicator lamp (Fig. 59,9) is illuminated during the heating up period. When the set water temperature is reached, the period of heating up is finished and the yellow indicator lamp fades.

In case of fault, the indicator lamp (Fig. 59,9) on the operating unit glows red (see section 14.5).

- Switching production of hot water off:*
- Set the rotary switch (Fig. 59,6) on the operating unit (Fig. 59) to "O".
 - Close the gas isolator tap "Heater/boiler" and the regulator tap on the gas bottle.

Safety/drainage valve

The heater is equipped with a safety/drainage valve (Fig. 60). The safety/drainage valve prevents water for the production of hot water from freezing, when there is frost and the heater is not switched on.



- ▷ When the vehicle is not used for a long period of time, open the safety/drainage valve and empty the heater.
- ▷ At temperatures below 2 °C the safety/drainage valve opens automatically. Only if the temperature of the safety/drainage valve lies above 6 °C can it be shut again.
- ▷ The water pump and the water fittings are not protected against freezing by the safety/drainage valve.



- ▷ The drainage neck of the safety/drainage valve has to be free of dirt (e.g. leaves, ice) at all times.

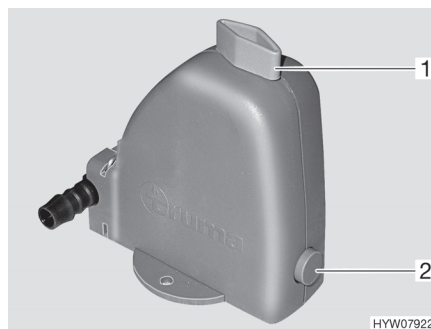


Fig. 60 Safety/drainage valve

**Filling/emptying domestic water container**

The domestic water container can be supplied with water from the water tank.

Filling the domestic water container with water:

- Switch on the 12 V power supply on the panel.
- Close the safety/drainage valve. Turn the knob (Fig. 60,1) perpendicular to the safety/drainage valve and push the push button (Fig. 60,2) in.
- Set all the water taps to "Hot" and open them. The water pump is turned on. The warm water pipes are filled with water.
- Keep the water taps open until the water flowing out of the water taps has no bubbles in it. This is the only way to ensure that the domestic water container is full of water.
- Close all water taps.

Emptying the domestic water container:

- Set the rotary switch (Fig. 59,6) on the operating unit (Fig. 59) to "O".
- Open the safety/drainage valve. To do this turn the knob (Fig. 60,1) parallel to the safety/drainage valve. The push button (Fig. 60,2) jumps out. The domestic water container is emptied to the outside through the safety/drainage valve.
- Check whether the water has been drained completely from the domestic water container (approx. 12 litres).



- ▷ Further information can be obtained in the manufacturer's instruction manual.

9.2.3 Heater and production of hot water (Truma Combi D)

The heater and production of hot water Truma Combi D is operated with diesel.

The functions and the operation is the same as in the case of the heater Truma Combi operated with gas, see section 9.2.2.

See the manufacturer's documentation for further information.



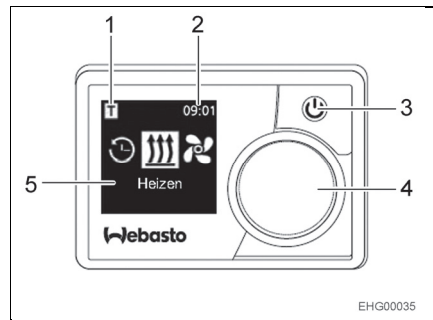
9.2.4 Independent vehicle heater (Webasto)



- ▶ Do not operate the heater in closed spaces. Danger of suffocation!
- ▶ Do not operate the heater at petrol stations. Danger of explosion!

The inside and the engine can be heated with the independent vehicle heater.

The heating function can be switched on and off manually or via a timer.



- 1 Symbol, pre-set time activated
- 2 Time
- 3 Start button with status indicator
- 4 Control button
- 5 Menu display

Fig. 61 Operating unit (independent vehicle heater)

Switching on the heater for the base vehicle:

- Set the heater control to "Warm".
- Switch on the fan.
- For continuous operation: Set the fan to the lowest fan setting (due to battery capacity).
- To quickly heat up the vehicle: Set the fan to a higher fan setting.
- Open and close the base vehicle's air outlet nozzles as desired.

Switching on the independent vehicle heater:

- Press the button (Fig. 61,3).
- Set desired function by turning the control button (Fig. 61,4).

See the manufacturer's documentation for further information.

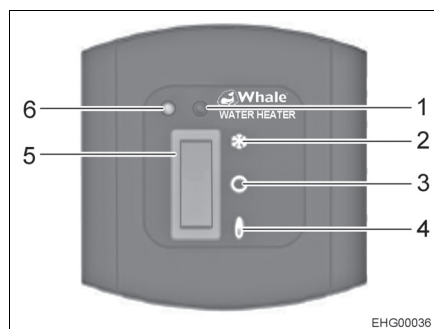
9.2.5 Boiler (Whale)



- ▶ Make sure that the operating pressure of the gas supply for the boiler is between 28 and 30 mbar.



- ▷ Empty the boiler if there is risk of frost or when the boiler is not used for more than 3 days.



- 1 Diagnostics LED
- 2 Frost protection
- 3 Gas OFF
- 4 Gas ON
- 5 Switch
- 6 Control LED, gas flame ignited

Fig. 62 Boiler operating panel

Switching on the boiler:

- Open the regulator tap on the gas bottle and the gas isolator tap "Heater/boiler".
- Make sure that the drain cock has been closed.
- Set all the water taps to "Hot" and open them. The water pump is turned on. The water pipes are filled with water.
- Keep the water taps open until the water flowing out of the water taps has no bubbles in it. This is the only way to ensure that the boiler is full of water.
- Close all water taps.
- Set the switch (Fig. 62,5) to the position "Gas ON" (Fig. 62,4). When the flame has successfully been ignited, the control LED "Gas flame ignited" (Fig. 62,6) glows green.

Switching the boiler off:

- Set the switch (Fig. 62,5) to the position "Gas OFF" (Fig. 62,3).
- Close the gas isolator tap "Heater/boiler" and the regulator tap on the gas bottle.

Switching on frost protection:

- Set the switch (Fig. 62,5) to the position "Frost protection" (Fig. 62,2).



- ▷ Do not use the frost protection function for more than 3 days.

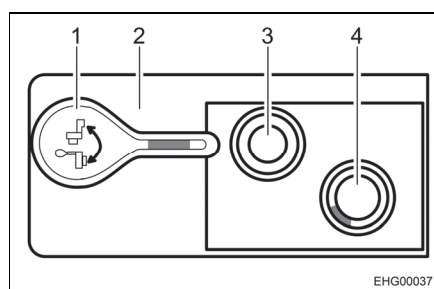


Fig. 63 Drain cock, closed

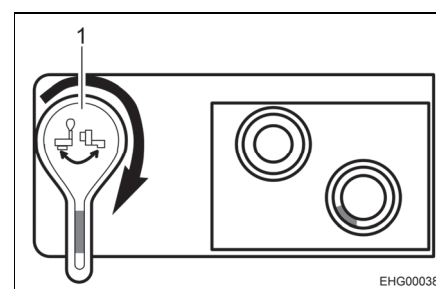


Fig. 64 Drain cock, open

- 1 Drain cock lever, closed
- 2 Boiler top
- 3 Cold water connection
- 4 Hot water connection

- 1 Drain cock lever, open

Emptying the boiler:

- Switch off the boiler.
- Open the drain cock. In order to do this, turn the lever of the drain cock through 90° in a clockwise direction (see Fig. 64,1).



- ▷ While heating, water drips from the drain pipe of the pressure relief valve. In order to protect the pressure relief valve from calcifications: actuate the pressure relief valve at least twice a year. In order to do this, turn the lever of the drain cock through 90° in an anticlockwise direction.

Observe instructions for maintenance in section 12.4.

9.2.6 Wall flue

Fresh air and exhaust gases of the heater system are conducted in a two-chamber wall flue.



- ▷ Park the vehicle such that the wall flue gets enough fresh air.
- ▷ The wall flue must be free at all times. Do not cover the wall flue.
- ▷ When camping in winter, maintain wall flue free of snow and ice.
- ▷ Check the wall flue periodically depending on the weather (snow, leaf fall, dirt, etc.). If necessary, clean the wall flue.
- ▷ When washing the vehicle do not aim the water jet directly at the wall flue.
- ▷ When disregarding this, the flawless operation of the heater can not be guaranteed.



Fig. 65 Wall flue (hot-air heater)

The wall flue is mounted on the left side wall.

9.3 Gas cooker



- ▶ During operation of the gas cooker, do not leave the gas cooker unattended. Even if the gas cooker cannot be overseen for only a short time (e.g. Visit to the toilet), switch the gas cooker off.
- ▶ Never let gas escape unburned due to danger of explosion.
- ▶ Before using the cooker make sure that there is sufficient ventilation. Open a window or the skylight.
- ▶ Do not use the gas cooker for heating purposes.
- ▶ Do not fit any curtains in the immediate proximity of the cooker. Fire hazard!
- ▶ Always protect your hands with cooking gloves or potholders when handling hot pots, pans and similar items. There is a risk of injury!



- ▶ During activation and operation of the gas cooker, no flammable objects or highly inflammable objects such as dishcloths, napkins etc. must be near the gas cooker. Fire hazard!
- ▶ The process of ignition must be visible from above and must not be covered by cooking pans placed on the cooker.
- ▶ The gas cooker cover is held closed by a spring. When closing there is danger of getting injured!



- ▷ Do not use the glass gas cooker cover as a hob.
- ▷ Do not close the gas cooker cover while the gas cooker is in operation.
- ▷ Do not apply pressure on the gas cooker cover when it is closed.
- ▷ Do not place hot cooking pans either on the gas cooker or on the sink cover.
- ▷ Keep the gas cooker cover open after cooking until the burners are cool. Otherwise the glass plate could shatter.



- ▷ Only use pots and pans whose diameter is appropriate for the gas cooker burners.
- ▷ When the flame goes out, the thermocouple automatically cuts the gas supply.
- ▷ Further information can be obtained in the device manufacturer's instruction manual.

The vehicle kitchen unit is fitted with a two-burner gas cooker.

The operating controls for the gas cooker are located directly at the gas cooker.



Fig. 66 Gas cooker

Switching on:

- Open the regulator tap on the gas bottle and the gas isolator tap "Cooker".
- Open the gas cooker cover.
- Turn the control knob (Fig. 66,1) on the burner you wish to use to the ignition position (large flame).
- Press the control knob down and hold it.
- Press the push button (Fig. 66,2). An ignition spark is created at the burner. If necessary, press the push button several times.
- Once the flame is burning, the control knob must be held down for another 10 to 15 seconds, until the thermocouple automatically keeps the gas supply open.



- Release the control knob and turn to the desired setting.
 - If ignition is unsuccessful, repeat the entire procedure.
- Switching off:*
- Turn the control knob to the 0-position. The flame fades.
 - Close the gas isolator tap "Cooker" and the regulator tap on the gas bottle.

9.4 Refrigerator

During the journey, the refrigerator is only operated via the 12 V power supply. At high ambient temperatures the refrigerator is unable to reach its full cooling power.

9.4.1 Thetford T1000



- ▶ Always keep the ventilation openings unobstructed.
- ▶ Due to technical reasons, the temperature in the refrigerator and in the freezer compartment cannot always be maintained at a constant level. Under adverse conditions, the food in the freezer compartment may thaw.



- ▷ Do not use any objects or hot air devices to accelerate defrosting.
- ▷ When the vehicle is exposed to intense sunlight: ventilate vehicle adequately.
- ▷ Before setting off, secure the products in the refrigerator against sliding.



- ▷ The refrigerator temperature depends on the ambient temperature (room temperature), the frequency the door is opened with, and the filling of the refrigerator. If required, readjust the cooling level.
- ▷ The living area battery has a limited power supply only. When the vehicle is stationary, do not use the refrigerator for long periods without it being connected to the 230 V connection.
- ▷ Check the collection tray for condensation before setting off and periodically during operation of the refrigerator.
- ▷ Further information can be obtained in the manufacturer's instruction manual.

Operating modes

The refrigerator is only operated with 12 V DC.

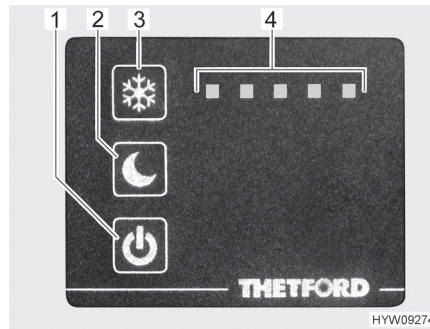
The 12 V power supply is always fed via the transformer/rectifier.

When the vehicle is in motion, the transformer/rectifier feeds the power from the vehicle generator to the refrigerator.

When the vehicle is stationary and **not** connected to the 230 V power supply, the transformer/rectifier supplies the refrigerator with power from the living area battery.

When the vehicle is stationary and connected to the 230 V power supply, the transformer/rectifier transforms the input voltage to 12 V and then supplies this current to the refrigerator.

Conversion between the individual supply types is automatic.



- 1 On/off button with blue indicator lamp
- 2 Night mode button
- 3 Temperature setting button
- 4 Display of the cooling level

Fig. 67 Operating controls (refrigerator)

- Switching on:**
- Press on/off button (Fig. 67,1) and hold for approximately 2 seconds. The blue indicator lamp shows that the refrigerator is working. The display (Fig. 67,4) shows the set cooling level. This display is dimmed after approximately 10 seconds.

- Switching off:**
- Press on/off button (Fig. 67,1) and hold for approximately 2 seconds. The blue indicator lamp will go out slowly.

The cooling levels, with which the refrigerator cools, must be selected depending on the room temperature. A high room temperature requires a higher cooling level. At a low room temperature, a lower cooling level would be enough.

- Setting the cooling level:**
- Press the temperature setting button (Fig. 67,3) and hold for approximately 1 second. The currently set cooling level (Fig. 67,4) is displayed.
 - Press the temperature setting button (Fig. 67,3) as often as necessary until the desired cooling level is reached.

The refrigerator has a night mode. When the night mode is switched on, the refrigerator works silently with low power.

- Switching on the night mode:**
- Press the night mode button (Fig. 67,2). The blue indicator lamp shows that the night mode is active.

- Switching off the night mode:**
- Press the night mode button (Fig. 67,2). The blue indicator lamp will go out. The refrigerator is working in normal mode again.

During operation, condensation may collect in the collection tray underneath the freezer compartment. The collection tray must be emptied periodically.

- Emptying the collection tray:**
- Push two pins (on the left-hand and the right-hand side of the collection tray) inwards.
 - Pull collection tray out and empty it.

If an ice layer thicker than 3 mm has formed in several places of the freezer compartment, the refrigerator must be defrosted.

- Defrosting:**
- Switch off the refrigerator.
 - Take all products out of the refrigerator.
 - Leave the refrigerator door open.
 - Place a suitable container underneath the drainage opening of the collection tray.
 - Remove the stopper from the drainage opening.
 - Wipe up the defrosting water with a sponge or cloth.



- When the refrigerator is defrosted: insert the stopper of the drainage opening again.
- Clean the refrigerator.

9.4.2 Refrigerator door locking mechanism



- ▷ During the journey the refrigerator door must always be closed and locked in the closed position.
- ▷ Turn the locking wheel on the refrigerator door only when the refrigerator door is open.



- ▷ Lock the refrigerator door in ventilation position when the refrigerator is switched off. This prevents mould forming.

There are two positions for locking the refrigerator door in place:

- Closed refrigerator door during travel and when the refrigerator is in operation
- Slightly opened refrigerator door as a ventilation position when the refrigerator is switched off

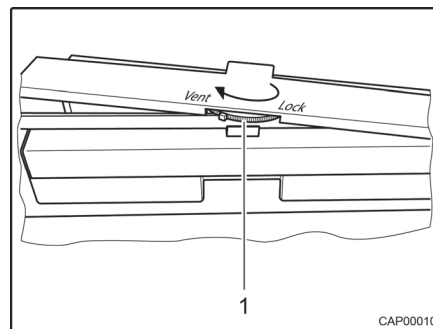


Fig. 68 Refrigerator door locking mechanism

Opening: ■ Pull the door handle upward and open the refrigerator door.

Closing: ■ Turn the locking wheel (Fig. 68,1) as far as possible clockwise ("Lock"). The "Lock" position remains permanently set during operation.
 ■ Fully close the refrigerator door.

Locking in the ventilation position: ■ Turn the locking wheel (Fig. 68,1) as far as possible anticlockwise ("Vent").
 ■ Close the door until it engages in the ventilation position.



Chapter overview

This chapter contains instructions regarding the sanitary fittings of the vehicle.

10.1 Water supply, general



- ▶ Fill water tank from supply systems that have been verified to provide drinking water quality.
- ▶ Only use such hoses or containers when filling that have been approved for use with drinking water.
- ▶ Thoroughly rinse filling hose or container with drinking water before use (2 to 3 times capacity).
- ▶ Empty filling hose or container completely after use and close openings of the filling hose or container.
- ▶ Water left standing in the water tank or in the water pipes becomes undrinkable after a short period. Therefore, before each use of the vehicle, thoroughly clean the water pipes and the water tank. After each use of the vehicle completely empty the water tank and the water pipes.
- ▶ In the case of lay-ups lasting more than a week disinfect the water system before using the vehicle (see chapter 11).



- ▷ If the vehicle is not used for several days or if it is not heated when there is a risk of frost, empty the entire water system. Make certain that the water pump is switched off. Otherwise, the water pump will overheat and may get damaged. Leave the water taps on in central position. Leave all drain cocks open. Frost damage to appliances, frost damage to the vehicle and deposits in water-carrying components can be avoided in this way.
- ▷ The water pump will overheat without water and can get damaged after one minute at the latest. Never operate water pump when the water tank is empty.

The vehicle is equipped with a fitted water tank. An electric water pump pumps the water to the individual water taps. Opening a water tap automatically switches on the water pump and pumps water to the tap.

The waste water tank collects the waste water. The water level in the water and waste water tanks can be checked on the panel.



- ▷ Before using the water fittings, the 12 V power supply on the panel must be switched on. Otherwise the water pump will not work.

Position of the water pump

The submerged pump is located in the water tank.



10.2 Water tank

The water tank holds 90 l.



- ▷ For driving safety and for regulatory reasons, when the vehicle is motion the fill quantity must be reduced. If the water is drained using the safety drainage rotary handle (see section 10.2.4), a residual quantity of approximately 20 litres will remain in the water tank.

Position The water tank is installed on the right side in the rear area and accessible via 2 flaps.



Fig. 69 Water tank

10.2.1 Drinking water filler neck with cap



Fig. 70 Cap for the drinking water filler neck

The drinking water filler neck is on the right or left side of the vehicle, depending on the model.

The drinking water filler neck is indicated by the symbol "☰" (Fig. 70,1). The cap is opened and closed using the key for the external flap locks.

- Opening:**
- Insert key into locking cylinder (Fig. 70,2) and turn a quarter turn in an anticlockwise direction.
 - Remove the cap.
 - Fill the water tank with drinking water.
- Closing:**
- Place cap on the drinking water filler neck.
 - Turn key one quarter turn in a clockwise direction.
 - Remove the key.
 - Check that the cap sits firmly on the drinking water filler neck.



10.2.2 Filling the water system



- ▶ When filling the water tank, observe the maximum permissible gross weight of the vehicle. Luggage must be reduced accordingly when the water tank is full.



- ▷ The water pump will overheat without water and can get damaged after one minute at the latest. Never operate water pump when the water tank is empty.



- ▷ The water quantity can be monitored on the panel while the water tank is filled.

- Position the vehicle horizontally.
- Switch on the 12 V power supply on the panel.

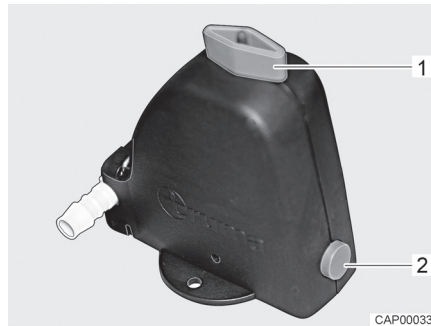


Fig. 71 Safety/drainage valve open

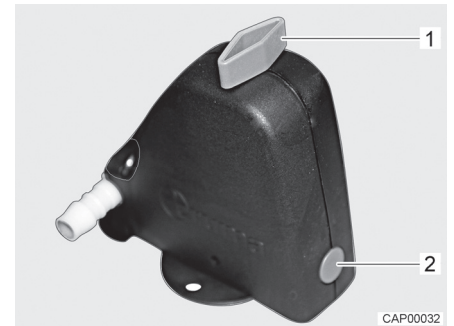


Fig. 72 Safety/drainage valve closed

- Close the safety/drainage valve. Turn the knob (Fig. 71,1) perpendicular to the safety/drainage valve and push the push button (Fig. 71,2) in. The closed safety/drainage valve is shown in Fig. 72. If the temperature is below 6 °C, the safety/drainage valve cannot be closed.
- Close all water taps.
- Close the drainage opening of the water tank.
- Open the drinking water filler neck on the outside of the vehicle.
- Fill the water tank with drinking water. Use a water hose, a water canister with a funnel or similar for filling.
- Set all the water taps to "Hot" and open them. The water pump is turned on. The warm water pipes are filled with water.
- Keep the water taps open until the water flowing out of the water taps has no bubbles in it. This is the only way to ensure that the boiler is full of water.
- Set all water taps to "Cold" and leave them open. This will fill the cold water pipes with water.
- Keep the water taps open until the water flowing out of the water taps has no bubbles in it.
- Close all water taps.
- Close drinking water filler neck.
- Check that the cap on the water tank is not leaking.



10.2.3 Topping up the water



- ▶ When filling the water tank, observe the maximum permissible gross weight of the vehicle. Luggage must be reduced accordingly when the water tank is full.

To fill the water tank with drinking water, proceed as follows:

- Open drinking water filler neck (Fig. 70).
- Fill the water tank with drinking water. Use a water hose, a water canister with a funnel or similar for filling.
- Close drinking water filler neck.

10.2.4 Reducing the water quantity for mobile operation



- ▶ When filling the water tank, observe the maximum permissible gross weight of the vehicle. Luggage must be reduced accordingly when the water tank is full.

Rotary handle

The rotary handle is installed on the water tank.

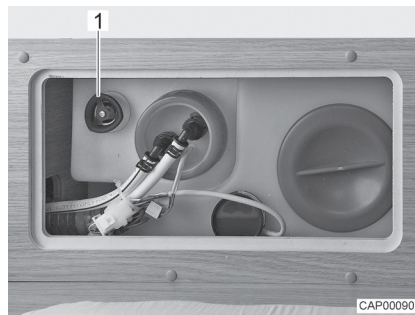


Fig. 73 Water tank with rotary handle

- Closing:*
- Turn the rotary handle (Fig. 73,1) on the water tank in a clockwise direction as far as it will go.
 - Fill the water tank with drinking water.
- Opening:*
- Turn the rotary handle (Fig. 73,1) on the water tank in an anticlockwise direction as far as it will go. Excess water will drain away leaving approx. 20 litres in the tank.



10.2.5 Draining water

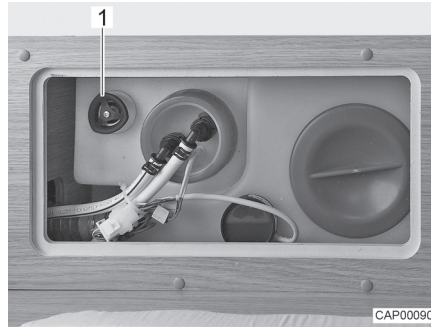


Fig. 74 Water tank with rotary handle

- Turn the rotary handle (Fig. 74,1) on the water tank in an anticlockwise direction as far as possible beyond the resistance to fully open the drainage opening.

10.2.6 Emptying the water system



- ▷ If the vehicle is not used for several days or if it is not heated when there is a risk of frost, empty the entire water system. Make sure that the 12 V power supply on the panel is switched off. Otherwise, the water pump will overheat and may get damaged. Leave the water taps on in central position. Leave the safety/drainage valve (if there is one) and all drain cocks open. Frost damage to appliances, frost damage to the vehicle and deposits in water-carrying components can be avoided in this way.

To empty and ventilate the water system, proceed as follows. This prevents frost damage and deposits:

- Position the vehicle horizontally.
- Switch off 230 V power supply. In order to do this, switch off the 230 V fuse (see section 8.7.2). The external 230 V connection can remain connected to charge the batteries.
- Switch off the 12 V power supply on the panel.
- Shut off the production of hot water (see section 9.2.2).

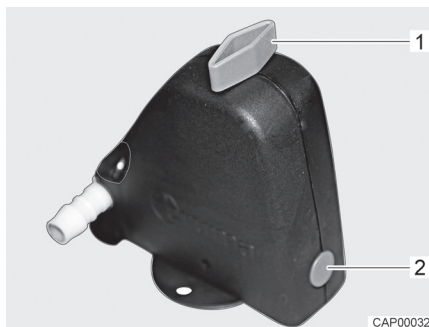


Fig. 75 Safety/drainage valve closed

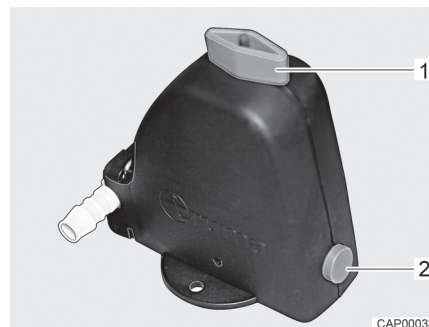


Fig. 76 Safety/drainage valve open

- Open the safety/drainage valve (Fig. 75). To do this, turn the knob (Fig. 75,1) parallel to the safety/drainage valve. The push button (Fig. 75,2) jumps out. The open safety/drainage valve is shown in Fig. 76.
- Open the water tank drain (see section 10.2.5).
- Open all water taps and set to the central position.
- Hang the shower handset up in the shower position.
- Hold the water pump up until the water pipes are completely empty.
- Check whether the water tank is completely empty.
- Blow out the remaining water in the water pipes (max. 0.5 bar). To do this, remove the pipe from the water pump and blow into the pipe.
- Clean the water tank and then rinse it out thoroughly.
- Let the water system dry for as long as possible.
- After emptying, leave all water taps on in the central position.
- Keep the safety/drainage valve open.

10.3 Waste water tank



- ▷ In case of frost add so much anti-freeze (such as kitchen salt) to the waste water tank so that the waste water cannot freeze.
- ▷ Never pour boiling water directly into the sink outlet. Boiling water could cause deformation and leaks in the waste water pipe system.



- ▷ Only empty the waste water tank at disposal stations, camping sites or caravan sites especially provided for this purpose.

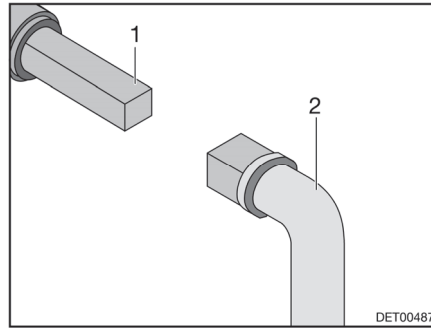


Fig. 77 Operation of the waste water tap

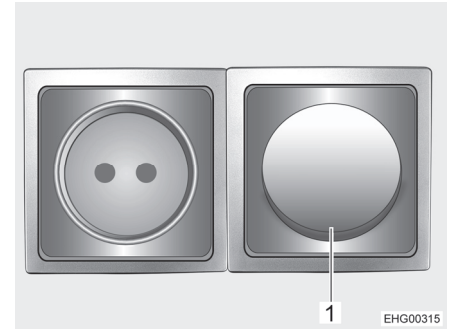


Fig. 78 Switch for waste water tank heater

The waste water tap for the waste water disposal is installed on the left-hand side of the vehicle.

The square bolt for opening the waste water tap is directly accessible under the vehicle floor.

Emptying:

- Place key (Fig. 77,2) onto the square bolt (Fig. 77,1).
- In order to open the waste water tap, turn the square bolt a quarter turn.
- Completely empty waste water tank.
- To close the waste water tap, turn the square bolt back as far as it will go.

In vehicles equipped with a waste water tank heater (special equipment), the switch for the waste water tank heater is located below the sink.

To switch on the waste water tank heater: Press the lower part of the switch (Fig. 78,1).

To switch off the waste water tank heater: Press the upper part of the switch (Fig. 78,1).

10.4 Toilet compartment



- ▷ Do not transport any loads in the shower tray. The shower tray or other items of equipment in the toilet compartment can be damaged.

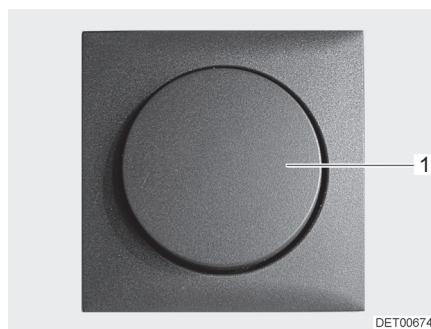


Fig. 79 Light switch for toilet compartment

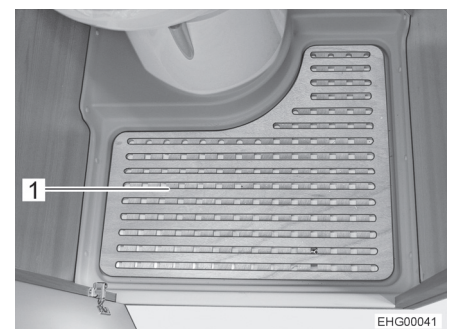


Fig. 80 Removable floor plate

The light switch (Fig. 79,1) for the toilet compartment is located in the toilet compartment.

- Take out the removable floor plate (Fig. 80,1) for showering.

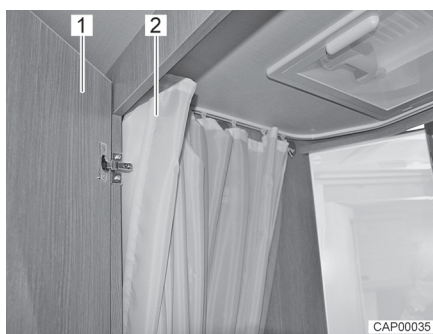


Fig. 81 Toilet compartment with shower

- For showering, close the door (Fig. 81,1) and completely close the shower curtain (Fig. 81,2) so that all walls are protected.
- Pull shower handset out and hook it into the opening provided for this purpose on the shower curtain.
- For ventilation purposes during or after a shower, and for drying wet clothing, close the toilet compartment door and open the window or the toilet compartment skylight. This improves the air circulation.
- After taking a shower, rinse soap residue from the shower tray, otherwise cracks can appear in the shower tray over time.
- After using the shower, wipe it dry to prevent moisture from collecting.



- ▷ Further information about cleaning the toilet compartment can be found in the section 11.2.

10.5 Toilet



- ▷ Do not load the toilet with more than a maximum of 120 kg.
- ▷ If there is any risk of frost and the vehicle is not heated, empty the sewage tank.
- ▷ Do not sit on the lid of the toilet. The lid is not designed to bear the weight of a person and could break.
- ▷ Use a suitable chemical for this toilet. The ventilation will merely remove the odour but not germs and gases. Germs and gases will have a detrimental effect on the sealing rubbers.



- ▷ Further information can be obtained in the manufacturer's instruction manual.



- ▷ Only empty the sewage tank at disposal stations, at camping sites or caravan sites, that are especially provided for this purpose.



10.5.1 Swivel toilet

The flushing of the Thetford toilet is fed directly from the water system of the vehicle. The toilet bowl can be moved into the optimal position.

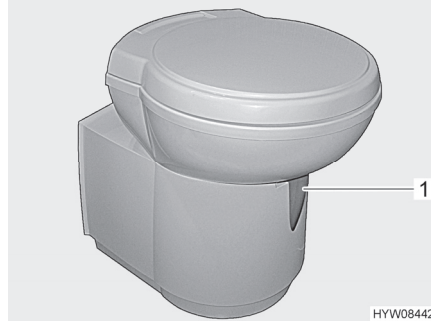


Fig. 82 Thetford toilet bowl (swivelling)

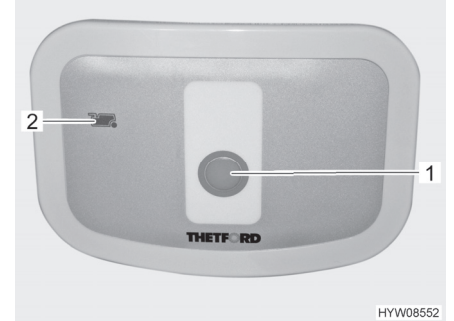


Fig. 83 Flush button/indicator lamp (Thetford toilet)

The operating unit is located close to the toilet bowl.

Flushing:

- Before flushing open the sliding trap of the Thetford toilet. To do this, push the slide lever (Fig. 82,1) in an anticlockwise direction.
- For flushing, press the blue flush button (Fig. 83,1).
- After flushing close the sliding trap. To do this, push the slide lever in a clockwise direction.

The indicator lamp (Fig. 83,2) lights up whenever the sewage tank has to be emptied.

10.5.2 Emptying the sewage tank



- ▷ The sewage tank can only be taken out if the sliding trap is closed.



Fig. 84 Flap for the sewage tank



Fig. 85 Sewage tank

- Slide the slide lever on the toilet bowl in a clockwise direction. The sliding trap is closed.
- Open the flap for the sewage tank on the outside of the vehicle. Insert the key into the locking cylinder (Fig. 84,1) of the push-button lock and turn a quarter turn in a clockwise direction.
- Remove the key.



- Press both push-button locks (Fig. 84,2) simultaneously with your thumb and open the flap for the sewage tank.
- Swivel flap fully upwards and carefully set on the exterior wall. The flap is kept open magnetically.
- Pull the retaining clip (Fig. 85,2) upwards and pull out the sewage tank (Fig. 85,1).
- Completely empty the sewage tank at disposal stations that are especially provided for this purpose.



- ▷ Actuate the aeration knob on the sewage tank with your thumb to empty it completely.

10.5.3 Winter operation



- ▷ Do not use anti-freeze. Anti-freeze can damage the toilet.

If the toilet, the water tank and the sewage tank (cassette) are in a frost-protected part of the vehicle, the toilet can also be used in the winter.

If the toilet, the water tank and the sewage tank (cassette) are not in a frost-protected part of the vehicle, empty the water tank, the sewage tank and the water pipes if there is a risk of frost. This prevents frost damage.

10.5.4 Temporary lay-up



- ▷ If the toilet is not to be used for an extended period, empty the water tank, the sewage tank and the water pipes.

Laying up the toilet:

- Empty the water tank.
- Flush the toilet until no more water runs into the toilet. Note that the pump can get damaged after one minute at the latest if it runs dry.
- Empty the sewage tank.
- Rinse the sewage tank thoroughly.
- Leave the drainage neck on the sewage tank open.
- Let the sewage tank dry for as long as possible.



Chapter overview

This chapter contains instructions regarding the care of the vehicle.

At the end of the chapter there is a checklist of measures you must carry out if you are not going to use the vehicle for an extended period of time.

11.1 External care

11.1.1 General

Standard external care consists of regular washing. The use and the environmental conditions will determine how often the vehicle needs to be washed. Wash the vehicle more frequently in areas which are exposed to heavy air pollution or heavy traffic or roads treated with de-icing salts. If the vehicle is exposed to salty and humid air (coastal areas, humid climates), wash the vehicle more frequently.

Do not park under trees if at all possible. The resin-like discharge which many trees secrete, give the paintwork a matt look and can promote the onset of corrosion.

Wash off bird droppings straight away and thoroughly, as the acid it contains is extremely corrosive.

11.1.2 Washing with a high-pressure cleaner



- ▷ Do not clean the tyres with a high-pressure cleaner. The tyres might be damaged.
- ▷ Do not spray external applications (deco-films) directly with the high-pressure cleaner. The external applications could come off.

Before cleaning the vehicle with a high-pressure cleaner, observe the operating manual of the high-pressure cleaner.

When cleaning with the nozzle for circular jet between the vehicle and the cleaning nozzle, maintain a minimum distance of approx. 700 mm.

Take into consideration that the jet of water comes out of the cleaning nozzle with pressure. The vehicle may be damaged by incorrect handling of the high-pressure cleaner. The temperature of the water should not be above 60 °C. Keep the jet of water in constant movement during the washing process. Do not direct the water jet at clearances, built-in electrical parts, plugs, seals, the ventilation grill or the skylights. The vehicle may be damaged or water may enter the interior.

11.1.3 Washing the vehicle



- ▷ Never clean the vehicle in the car wash. The brush rollers can damage the external applications. Water can enter the waste gas vents or the forced ventilations. The vehicle could be damaged.
 - Wash the vehicle only on a washing site intended for this purpose.
 - Avoid full sunshine. Observe environmental measures.
 - Only clean external applications and synthetic parts with plenty of warm water, dish washing liquid and soft cloth.



- Wash down the vehicle with plenty of water, a clean sponge or a soft brush. In the case of stubborn dirt add dish washing liquid to the water.
- Painted exterior walls may also be cleaned with a caravan cleaner.
- Add-on parts made of glass-fibre reinforced plastic (GRP) require a regular follow-up treatment with a polisher. This way these parts will not turn yellow and the sealing of the surface remains intact.
- Treat rubber seals on doors and storage flaps with a conventional rubber care product.
- Treat locking cylinder of doors and storage flaps with graphite dust.

11.1.4 Windows of acrylic glass

Acrylic glass windows are delicate and require very careful handling.



- ▷ Never rub acrylic glass windows dry as dust particles might damage the surface.
- ▷ Only clean acrylic glass windows with plenty of warm water, some dish washing liquid and a soft cloth.
- ▷ Never use glass cleaning agents with chemical, abrasive or alcohol-containing additives. Premature brittleness of the panes and associated cracks may result from their use.
- ▷ Avoid contact of cleansing agents used for the body (e.g. tar- or silicone-removing agents) with acrylic glass.
- ▷ Do not clean vehicle in car wash.
- ▷ Do not attach stickers to the acrylic glass windows.
- ▷ Having cleaned the vehicle rinse acrylic glass with sufficient clear water.
- ▷ Treat rubber seals with a conventional rubber care product.



- ▷ An acrylic glass cleanser with antistatic effect is suitable for a follow-up treatment. Small scratches can be treated with an acrylic glass polish. These agents are available at the accessories shop.



11.1.5 Underbody

The underbody of the vehicle is partly coated with an age-resistant underbody protection. Should the underbody protection be damaged, repair immediately. Do not treat areas coated with underbody protection with spray oil.



- ▷ Only use products approved by the manufacturer. Our authorised dealers and service centres will be happy to advise you.

11.1.6 Cleaning the entrance step



- ▷ The entrance step may only be moved by hand when the drive rods have been released.

If necessary, the entrance step can be removed completely for cleaning.

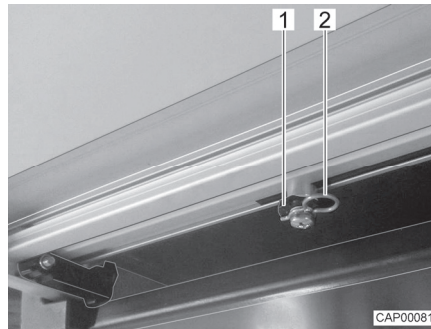


Fig. 86 Drive rod (entrance step)



Fig. 87 End stop (entrance step)

- Fully extend the entrance step.
- On the transformer/rectifier, switch off the battery cut-off switch.
- On the bottom of the entrance step, pull off both locking clips (Fig. 86,2) on the drive rods (Fig. 86,1).
- Release both drive rods from the retaining bolts.
- Unscrew one screw (Fig. 87,1) on each side of the entrance step. Such, the end stop of the entrance step is separated.
- Pull entrance step outwards by hand, out of the guide.
- Dust entrance step off with a dry brush or suck dust away with a vacuum cleaner. Do not use any water nor a high-pressure cleaner.
- Install the entrance step again by proceeding conveniently in reverse order.



11.2 Interior care



- ▷ If possible, treat stains immediately.
- ▷ Acrylic glass windows are delicate and require very careful handling (see section 11.1.4).
- ▷ Synthetic parts in the toilet and living area are very delicate and should be treated with care. Do not use solvents, alcohol-containing cleansers or scourers. This procedure will help you to avoid brittleness and formation of cracks.
- ▷ Hair colourants, nail varnish, cigarette ash and similar substances may cause permanent stains or discolouration. For this reason, you should prevent these substances from getting onto plastic parts. If they do get onto plastic parts, you should remove these substances immediately.
- ▷ Do not pour any corrosive agents into the drain holes. Never pour boiling water directly into the drain holes. Corrosive agents and boiling water cause damage to drainage pipes and siphon traps.
- ▷ Do not use vinegar based products to clean the toilet and water system, or for descaling the water system. Vinegar-based products may cause damage to seals or parts of the installation. Use standard descaling products for descaling.
- ▷ Save water. Mop up all remaining water.
- ▷ Vacuum off carpets and cushions with a suitable brush attachment.



- ▷ For information about the use of maintenance products, our representatives and service centres will be glad to advise.
 - Surface and knobs of furniture, lamps and synthetic parts in the toilet and living area should be cleaned with water and a wool cloth. A mild cleanser may be added to the water. If required, use furniture polish for the painted surfaces.
 - Clean upholstery with dry foam specially manufactured for the use on upholstery or with the foam of a mild detergent. Protect cushions from direct sunlight so that they do not lose their colour.
 - Curtains and net curtains should be dry cleaned.
 - Vacuum clean the carpet, if necessary clean with carpet shampoo.
 - Clean PVC-floor covering with a mild, soapy cleaning agent for PVC floors. Do not place carpet on wet PVC-floor covering. The carpet and the PVC-floor covering may stick together.
 - Never clean the sink or the gas cooker with a scourer. Avoid anything which may cause scratching or grooves.
 - Clean gas cooker only with a moist cloth. Prevent any water from penetrating the gas cooker. Water may damage the gas cooker.
 - Insect screen fabric on the door, windows, and skylights: Always remove insect residues or dirt immediately. Otherwise the fabric could be damaged. Wasps and birds could cause damages when feeding on the adhered residues. A microfibre cloth is recommended for the cleaning of the insect screen fabric. Only use cleaning agents if they are pH neutral and do not contain any solvents. If required, you can carry out a careful previous cleaning using a soft brush or a fine brush attachment on a vacuum cleaner.



- Brush blinds with a soft brush or vacuum with the brush attachment of the vacuum cleaner. Grease or stubborn dirt may be removed with a mild soap at 30 °C (curd soap).
- Brush Roman shades with a soft brush or vacuum with the brush attachment of the vacuum cleaner. Grease or stubborn dirt may be removed with a mild soap at 30 °C (curd soap).
- Unrolled seat belts can be cleaned with warm soapsuds. The seat belt must be completely dry before being rolled up.

11.2.1 Refrigerator

- Clean the exterior and interior of the refrigerator with a soft cloth and lukewarm water (containing a mild cleaning agent).
- Then, wash the refrigerator out with clear water and let it dry.
- Keep the defrosted water drain channel free of sediments.
- To prevent material changes, do not use any soap, nor any sharp, granular or soda containing cleaning agents.
- Keep oil and grease away from the door seal.

11.3 Stainless steel surfaces



- ▷ Do not clean the stainless steel surfaces with bleaching agents, with products that contain chloride or hydrochloric acid, baking powder nor with silver polish.
- ▷ Do not use scouring agent nor coarse sponges.



- ▷ Prior to cleaning, test the suitability of the cleaning product for the surface on an unobtrusive spot.
- ▷ Dry the surfaces thoroughly after cleaning to prevent scale deposits.
- ▷ In the case of brushed stainless steel surfaces, wipe in a direction of the grinding.

Removing scratches from the surface:

- Treat the stainless steel surface with a soft cleaning cloth and with a special stainless steel cleaner.
- Rinse the stainless steel surface and dry it with household wipes.

Removing stubborn dirt and burnt-in fat:

- Clean the stainless steel surface with an ordinary household sponge and with cleanser.
- Rinse the stainless steel surface and dry it with household wipes.

Removing fingerprints:

- Clean the stainless steel surface with a soft cleaning cloth and soapy water or a glass cleaning agent.
- Rinse the stainless steel surface and dry it with household wipes.

Removing coffee or tea stains:

- Treat the stainless steel surface with a baking soda solution. Allow the baking soda solution to work in for 15 minutes.
- Rinse the stainless steel surface and dry it with household wipes.



- Removing rust stains:*
- Clean the stainless steel surface with an ordinary household sponge and with cleanser. If necessary, use a soft cleaning cloth and stainless steel cleaner.
 - Rinse the stainless steel surface and dry it with household wipes.

11.4 Water system

11.4.1 Cleaning the water tank

- Empty the water tank and close the drainage opening.
- Remove the cap of the water tank.
- Fill water tank with water and some washing-up liquid (do not use any scourers).
- Using a trade standard brush for washing dishes, scrub the water tank until there is no longer any visible deposit.
- Scrub also the pump housing.
- If possible, clean fresh water sensors through the cleaning openings by hand.
- Rinse water tank with copious amounts of drinking water.



- ▷ If, due to the design of the water tank, it is not possible to clean the water tank mechanically: Use a suitable chemical cleaning agent.

The authorised dealers would be happy to assist you in choosing a suitable cleaning agent.

Follow the cleaning agent manufacturer's instructions.

11.4.2 Cleaning the water pipes



- ▷ Only use suitable cleaning agents as sold by the specialist trade.
- ▷ The cleaning agent must meet national regulations and be approved (if required).



- ▷ Collect any emerging mixture of water and cleaning agent for correct disposal.

- Empty the water system.
- Close all drainage openings and drain cocks.
- Fill mixture of water and cleaning agent into the water canister or water tank.
Observe the manufacturer's instructions regarding the mixing ratio.
- Open the drain cocks one by one.
- Leave the drain cocks open until the mixture of water and cleaning agent has reached the respective drain.
- Close the drain cocks.
- Set all the water taps to "Hot" and open them.
- Leave the water taps open until the mixture of water and cleaning agent has reached the drain.
- Set all water taps to "Cold" and open them.



- Leave the water taps open until the mixture of water and cleaning agent has reached the drain.
- Close all water taps.
- Flush the toilet several times.
- Allow the cleaning agent to act in accordance with the manufacturer's instructions.
- Empty the water system. Collect the mixture of water and cleaning agent for correct disposal.
- For rinsing fill the entire water system with drinking water and empty again several times over.

11.4.3 Disinfecting the water system



- ▷ Only use suitable disinfectants as sold by the specialist trade.
- ▷ The disinfectant must meet national regulations and be approved (if required).



- ▷ Collect any emerging mixture of water and disinfectant for correct disposal.

When disinfecting the water system, proceed the same way as when cleaning the water pipes (see section 11.4.2). Simply use disinfectant instead of cleaning agent.

11.4.4 Cleaning the waste water tank

Clean the waste water tank after every use.

- Empty the waste water tank.
- Open the cleaning opening on the waste water tank and the drain cock.
- Thoroughly rinse out the waste water tank with fresh water.
- If possible, clean waste water sensors through the cleaning opening by hand.



11.5 Winter care

De-icing salt damages the underbody and the parts open to water spray. We recommend that you wash the vehicle more frequently during wintertime. Mechanical and surface treated parts and the underside are under particular strain, and should therefore be cleaned thoroughly.



- ▷ If there is any risk of frost, always run heater at a minimum of 15 °C. Switch the circulation fan (if there is one) to automatic. In the case of extreme external temperatures, the furniture flaps and doors should be left slightly open. The inflowing warm air can help prevent the freezing of water pipes, for example, and counteract the formation of condensation in the storage spaces.
- ▷ If there is any risk of frost, cover the outside surface of the windows with winter insulation mats.

11.5.1 Preparations

- Check the vehicle for paint and rust damage. Repair damage as necessary.
- Use a wax-based rust inhibitor to protect the metal parts of the underbody.
- Use appropriate protection for external painted surfaces.

11.5.2 Winter operation

During winter operation, condensation develops when the vehicle is occupied under low-temperature conditions. To ensure good interior air quality and avoid vehicle damage from condensation, sufficient ventilation is essential.

- When heating the vehicle, the heater should be at the highest setting and roof storage cabinets, curtains and blinds should be opened. This ensures optimal ventilation.
- In the morning, lift up all cushions, air out storage boxes and dry any damp areas.



- ▷ If condensation has still developed, just wipe it off.

11.5.3 At the end of the winter season

- Thoroughly clean the underbody of the vehicle and the engine. When this is done, corrosion-inducing anti-freeze agents (salts, alkaline residues) are removed.
- Clean the exterior and use regular car wax to protect metal surfaces.



11.6 Lay-up

11.6.1 Temporary lay-up



- ▶ If the vehicle has been stationary for a long period (approx. 10 months) have the braking and gas systems checked by an authorised specialist workshop.
- ▶ Take into consideration that water is undrinkable after only a short time.
- ▶ Animal damage to cables can lead to short circuits. Fire hazard!

Animals (especially mice) can cause great damage to the interior of the vehicle. This is especially true if the animal remains undisturbed in a parked vehicle.


The animals can get into the vehicle at an opportune moment and hide from view.

To keep damages from animals to a minimum or to avoid them altogether, regularly check the vehicle for damage or animal traces. This is especially important approx. 24 hours after parking the car in storage.

If animal traces are found, contact the authorised dealer or service centre. If damage to cables has occurred, they can result in short circuits. The vehicle could catch fire.

Before laying up the vehicle, go through the following checklist:


Base vehicle

Activity	Done
Completely fill fuel tank. This prevents corrosion damage within the fuel tank system	
Jack up vehicle so that the wheels do not bear any load, or move vehicle every 4 weeks. This prevents any pressure points from occurring on tyres and wheel bearings	
Protect the tyres from direct exposure to the sun. Danger of formation of cracks!	
Inflate tyres up to the recommended maximum pressure	
Always provide for sufficient ventilation in the underbody area	
 ▶ Humidity or lack of oxygen e.g. by covering with plastic film may cause optical irregularities to the underbody	
In addition observe the notes in the operating manual of the base vehicle	

Body

All vents should be sealed with the appropriate caps and all other openings (apart from forced ventilations) should also be sealed. This prevents animals (e.g. mice) from gaining entry	
Air the interior, all storage spaces accessible from the outside, and the parking space (e.g. garage) every 3 weeks in order to prevent the occurrence of condensation and resulting mould formation	



	Activity	Done
Interior	Place upholstery in an upright position for ventilation, and cover	
	Clean refrigerator	
	Allow refrigerator and freezer compartment doors to remain slightly open	
	Search for traces of animals that have gained entry	
	Disconnect the flat screen from the mains and, if necessary, remove it from the vehicle	
Gas system	Close regulator tap on the gas bottle	
	Close all gas isolator taps	
	Always remove gas bottles from the gas bottle compartment, even if they are empty	
Electrical system	Fully charge living area and starter battery  ▷ Charge the battery for at least 20 hours before laying up.	
	Disconnect the living area battery from the 12 V power supply. To do this, switch off the battery cut-off switch on the transformer/rectifier (see chapter 8)	
Water system	Empty the entire water system. Blow out the residual water from the water pipes (0.5 bar max.). Leave the water taps on in central position. Leave all drain cocks open. Observe the notes in chapter 10.	

11.6.2 Winter lay-up

Additional measures are required if laying up the vehicle over winter:

	Activity	Done
Base vehicle	Clean body and underbody thoroughly and spray with hot wax or protect with varnish	
	Fill fuel tank with winter diesel	
	Check antifreeze in the cooling water	
	Rectify damage to the paintwork	
	Fill in windscreen washer fluid with frost protection	
Body	Clean vehicle from outside thoroughly	
	Keep the forced ventilation open	
	Clean and grease installed supports	
	Clean and grease all door and flap hinges	
	Brush oil or glycerine on all locking mechanisms	
	Treat all rubber seals with a conventional rubber care product	
	Use graphite dust to treat locking cylinders	




	Activity	Done
Interior	Set up the de-humidifier (granulate)	
	Remove cushions and mattresses from the vehicle and store them in a dry place	
	Air the interior every 3 weeks	
	Empty all cabinets and storage compartments, open flaps, doors and drawers	
	Thoroughly clean the interior	
	If there is a risk of frost, do not leave the flat screen in the vehicle	
Electrical system	Remove the starter battery and the living area battery and store them in a place protected from frost (see chapter 8) or connect the vehicle to a 230 V supply. Before removing, remove the fuses on the living area battery	
Water system	Clean the water system using a cleaning agent from a specialised store	
Complete vehicle	Arrange the tarpaulins in such a way that the ventilation openings are not covered, or use porous tarpaulins	

11.6.3 Starting up the vehicle after a temporary lay-up or after lay-up over winter

Go through the following checklist before start-up:

	Activity	Done
Base vehicle	Check the tyre pressure on all tyres	
	Check the tyre pressure of the spare wheel	
Body	Check the function of the entrance step	
	Check that the doors, windows and skylights are working properly	
	Check the function of all external locks	
	Remove the cover from the waste gas vent of the heater (if there is one)	



	Activity	Done
Gas system	Put the gas bottles in the gas bottle compartment, tie down and connect to the gas pressure regulator	
Electrical system	<p>Connect to 230 V external power supply</p> <p>Install the living area battery and starter battery, insert the fuses on the living area battery and fully charge the battery</p> <p> ▷ Charge the battery for at least 20 hours after lay-up.</p> <p>Connect the living area battery with the 12 V power supply. To do this, switch on the battery cut-off switch on the transformer/rectifier (see chapter 8)</p> <p>Check that the electrical system are working, e.g. interior light, socket and all installed electrical appliances</p>	
Water system	<p>Disinfect water pipes and water tank</p> <p>Check the functionality of the operating lever for the waste water tank</p> <p>Close all drain cocks and water taps</p> <p>Check water system for leaks</p>	
Appliances	Check the function of the appliances	



Chapter overview

This chapter contains instructions about official inspections and inspection and maintenance work in the vehicle.

At the end of the chapter you will find important instructions on how to obtain spare parts.

12.1 Official inspections

Depending on the national legislative provisions, the following official inspections must be carried out periodically:

- Main inspection
- Emissions test
- Inspection of the gas system

The inspection intervals in accordance with the national legislative provisions must be adhered to. The inspection stickers attached to the vehicle indicate when the next inspection is required.



- ▷ Any changes on the gas system must be carried out by an authorised specialist workshop.
- ▷ Even in the case of vehicles that are not registered, an inspection of the gas system is required.

12.2 Inspection work

Like any technical appliance, the vehicle must be inspected at regular intervals.

This inspection work must be carried out by qualified personnel.

Special technical knowledge, which cannot be taught within the framework of this instruction manual, is required for these tasks. Personnel possessing this technical knowledge are available for assistance at all service centres. Their experience and regular technical instruction by the factory as well as equipment and tools guarantee expert and up-to-date inspection of the vehicle.

The service centre in charge will confirm the work performed.

Have chassis inspections confirmed in the chassis manufacturer's customer service booklet.



- ▷ Observe the inspections indicated by the manufacturer and have them carried out at the specified intervals. The value of the vehicle is thus preserved.
- ▷ The confirmation of the inspection work carried out serves as valid proof in the event of damage and guarantee claims.



12.3 Maintenance work

As with every machine, this vehicle requires maintenance. The extent and frequency of the maintenance work required depend on conditions of operation and use. More difficult operating conditions make it necessary to service the vehicle more often.

Have the base vehicle and the appliances serviced at the intervals specified in the corresponding instruction manuals.

12.4 Boiler (Whale)



- ▶ Have gas tightness and burner function checked by an approved specialist.



- ▷ The device contains components sensitive to ESD. Have device opened only by an authorized service centre.
- Have boiler checked by an authorized service centre in accordance with the applicable local provisions at least once a year.
- Fully sterilize the boiler at least once a year.
- Use a sterilization liquid that complies with the manufacturer's specifications for cleaning and sterilizing.
- If the water system has not been used for a period longer than 7 days, empty the water system completely and flush it thoroughly before filling it again.
- In order to protect the pressure relief valve from calcifications: actuate the pressure relief valve at least twice a year. In order to do this, turn lever of the drain cock through 90° in an anticlockwise direction.

12.5 Replacing illuminants, external



- ▷ Information can be obtained in the separate instruction manual for the base vehicle.



Replace rear vehicle lamps

To access the rear right-hand vehicle lamps, first remove the panel (Fig. 88,3).

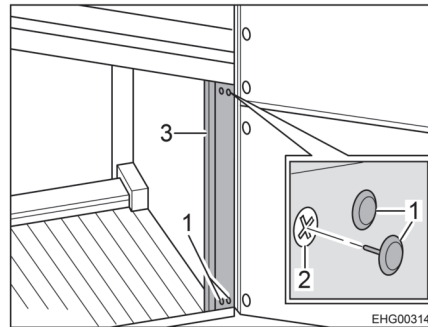


Fig. 88 Panel at the rear of the vehicle

- Remove four screw covers (Fig. 88,1).
- Unscrew four Phillips screws (Fig. 88,2).
- Remove the panel (Fig. 88,3). You can now access the vehicle lamps.

12.6 Replacing illuminants, internal



- ▶ Do not replace the LEDs in lamps with standard light bulbs. Risk of fire due to intense heat build up.



- ▶ If LEDs in lights are defect, contact an authorised dealer or service centre.



12.7 Spare parts

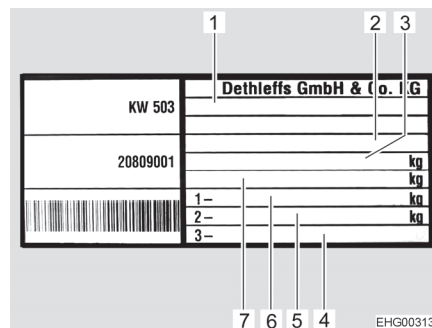


- ▶ Every alteration of the original condition of the vehicle can alter road behaviour and jeopardize road safety.
- ▶ The special equipment and original spare parts recommended by us have been specially developed and supplied for your vehicle. These products are available at your dealer. The dealer is informed about admissible technical details and carries out the required work correctly.
- ▶ The use of accessories, parts and fittings not supplied by us may cause damage to the vehicle and jeopardize road safety. Even if an expert's report, a general type approval or a design certification exists, there is no guarantee for the proper quality of the product.
- ▶ No liability can be assumed for damage caused by products which have not been released by us. This also applies to impermissible alterations to the vehicle.

For safety reasons, spare parts for pieces of equipment must correspond with manufacturer's instructions and be permitted by the manufacturer as a spare part. These spare parts may only be fitted by the manufacturer or an authorised specialist workshop. The authorised dealers and service centres are available for any spare parts requirement.

When ordering spare parts, please indicate the serial number and the vehicle type to the dealer.

12.8 Vehicle identification plate



- 1 Type
- 2 Manufacturer's code and chassis number
- 3 Maximum permissible gross weight of the vehicle
- 4 Free
- 5 Permissible axle load rear
- 6 Permissible axle load front
- 7 Maximum permissible gross weight of the vehicle with trailer

Fig. 89 Vehicle identification plate

The vehicle identification plate (Fig. 89) with the serial number is fitted on the B column on the front passenger side.

Do not remove the vehicle identification plate. The vehicle identification plate:

- Identifies the vehicle
- Helps with the procurement of spare parts
- Together with the vehicle documents identifies the vehicle owner



- ▷ Always include the **serial number** with all inquiries for the customer service office.



12.9 Warning and information stickers

There are warning and information stickers on and inside the vehicle. Warning and information stickers are for the sake of safety and must not be removed.



- ▷ Replacement stickers can be obtained from an authorised dealer or a service centre.

12.10 Dealers

Contact your authorised dealer or service centre whenever spare parts are needed for the vehicle.

You can find the addresses and telephone numbers of the authorised dealers and service centres on the web at the homepage of the manufacturer.





Chapter overview

This chapter contains instructions regarding the tyres of the vehicle.

At the end of the chapter there is a table you can use to find the correct tyre pressure for your vehicle.

13.1 General



- ▶ Check tyre pressure before a journey or every 2 weeks. Wrong tyre pressure causes excessive wear and can lead to damage or even to tyre burst. You can lose control of the vehicle (see section 13.6).



- ▷ Check the tyre pressure on cold tyres. Do not reduce the higher tyre pressure when the tyres are warm.
- ▷ Tubeless tyres have been installed on the vehicle. Never install tubes in these tyres.
- ▷ Read the instruction manual for the base vehicle.



- ▷ Depending on the model, the vehicle may only be equipped with a tyre repair kit as standard.
- ▷ In the case of a puncture, pull the vehicle over to the side of the road. Make vehicle safe with a hazard warning triangle. Switch on the warning lights.
- ▷ Tyres must not be older than 6 years as the material will become brittle over time. The four-digit DOT number on the tyre flank indicates the date of manufacture. The first two digits designate the week, the last two digits the year of manufacture.
Example: (0718) Week 7, year of manufacture 2018.
- ▷ The on-board tool set is stowed in the bedding box on the left.

Observe:

- Check the tyres regularly (every 2 weeks) for equal tread wear, tread depth and external damage.
- Replace tyres at the latest, when the minimum depth of tread stipulated by law is reached.
- Always use tyres of the same model, same brand and same style (summer and winter tyres).
- Only use tyres approved for the wheel rim type fitted. The permitted rim and tyre sizes are quoted in the vehicle documents and the authorised dealer or service centre will always be glad to give you advice.
- Run-in new tyres for approx. 100 km (60 miles) at low speed since only then do they reach full strength.



Fig. 90 Tightening the wheel nuts or wheel bolts cross-wise

- Tighten the wheel nuts or wheel bolts in the order shown in Fig. 90. In order to do this, use a torque wrench and comply with the specified tightening torque (see section 13.5).
- Check regularly that the wheel nuts or wheel bolts are firmly seated. Re-tighten the wheel nuts or wheel bolts of a changed wheel after 50 km (30 miles). While doing so, proceed in the order shown in Fig. 90.
- When using new or newly painted rims, re-tighten the wheel nuts or wheel bolts once again after approx. 1,000 to 5000 km (600 miles to 3,000 miles). While doing so, proceed in the order shown in Fig. 90.
- For lay-ups or long periods of inactivity, keep the tyres and tyre bearings free from pressure points:
Jack up the vehicle so that the wheels do not bear any load, or move the vehicle every 4 weeks in such a way that the position of the wheels is changed.

13.2 Tyre selection



- ▶ A wrong tyre can damage the tyres during the journey and even cause it to burst.



- ▷ If tyres that are not approved for the vehicle are used, then the type approval for the vehicle and subsequently the insurance coverage can lapse. The authorised dealer or service centre will be happy to advise you.

The tyre sizes approved for the vehicle are given in the vehicle documents or can be obtained from the authorised dealers or service centres. Each tyre must fit the vehicle on which it will be driven. This applies to the external dimensions (diameter, width), which are indicated with the standardised size designations. In addition, the tyres must meet the requirements of the vehicle with regard to weight and speed.

Weight refers to the maximum permissible axle load which can be distributed on two tyres. The maximum load-carrying capacity of a tyre is indicated by its load index (= LI, load index code).



The maximum permissible speed for a tyre (with full load-carrying capacity) is indicated by the speed index (= SI). Together, load index and speed index form the operating code of a tyre. This is an official component of the complete, standardised dimensions description which appears on every tyre. The information on the tyres must correspond to the specifications which appear in the vehicle papers.

13.3 Tyre specifications

215/70 R 15C 109/107 Q (example)

Description	Explanation
215	Tyre width in mm
70	Height-to-width proportion in percent
R	Tyre design (R = radial)
15	Rim diameter in inches
C	Commercial (transporter)
109	Load index code for single tyres
107	Load index code for twin tyres
Q	Speed index (Q = 160 km/h)

13.4 Handling of tyres

- Drive over kerbs at an obtuse angle. Otherwise the flanks of the tyres may get pinched. Driving over a kerb at a sharp angle can damage the tyre and result in it getting ruptured.
- Drive over high manhole covers at a slow speed. Otherwise the tyres may get pinched. Driving over a high manhole cover at high speed can damage the tyre and result in it getting ruptured.
- Check the shock absorbers regularly. Driving with poor shock absorbers significantly increases wear.
- In the event of an uneven thread wear, contact customer service.
- Do not clean the tyres with a high-pressure cleaner. The tyres can suffer serious damage within just a few seconds and rupture as a result.
- Drive the tyres with care. Avoid braking sharply, revving up too strongly and journeys on poor roads.

13.5 Tightening torque

Fiat base vehicle

Wheel rim	Tightening torque
Steel wheel rim 15"	160 Nm
Steel wheel rim 16"	180 Nm
Alloy wheel rim 15"	140 Nm
Alloy wheel rim 16"	160 Nm



13.6 Tyre pressure



- ▶ Tyres overheat if the tyre pressure is too low. This can cause serious tyre damage.
- ▶ Check tyre pressure before a journey or every 2 weeks. Wrong tyre pressure causes excessive wear and can lead to damage or even to tyre burst. You can lose control of the vehicle.
- ▶ Use only valves that are approved for the specified tyre pressure.

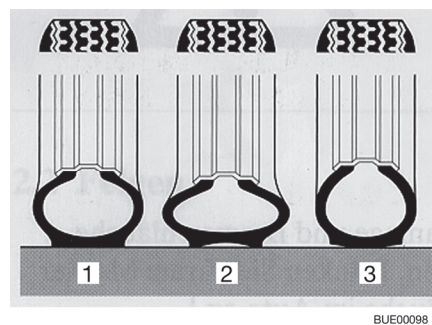


- ▷ Check the tyre pressure on cold tyres. Do not reduce the higher tyre pressure when the tyres are warm.

The payload and the durability of tyres is directly dependent on the tyre pressure. Air is a volatile medium. It is unavoidable that it will escape from tyres.

As a rule of thumb it can be assumed that a filled tyre loses pressure at a rate of 0.1 bar every two months. To prevent the tyres becoming damaged or burst, check the tyre pressure regularly.

The contact surface of the tyre changes, depending on the tyre pressure.



- 1 Correct tyre pressure
- 2 Tyre pressure too low
- 3 Tyre pressure too high

BUE00098

Fig. 91 Contact surface of the tyre



- ▷ The information on pressure levels is valid for cold tyres and loaded vehicles.
- ▷ Pressure in hot tyres is higher than in cold tyres. Therefore, check the pressure when the tyres are cold.
- ▷ Tyre pressures in bar.
- ▷ Over 4.75 bar requires a metal valve.
- ▷ When a replacement is needed, we recommend "Camping" tyres.



The vehicles are constantly brought up to the newest technical standards. It is possible that new tyre sizes are not yet included in this table. If this is the case, any dealer will be happy to provide the newest values.

	Types	Tyre size	Front air pressure in bar	Rear air pressure in bar
Fiat	All types	215/70 R 15 C/CP (109/107) Q	4.25	4.5
	All types with "Camping" tyres	215/70 R 15 C/CP (109/107) Q	4.75	5.5
	All types	225/75 R 16 C/CP (116/114) R	4.5	5.0
	All types with "Camping" tyres	225/75 R 16 C/CP (116/114) R	4.75	5.5





Chapter overview

This chapter contains instructions about possible faults in your vehicle. The faults are listed with their possible causes and corresponding remedies. The specified faults can be remedied with relative ease and without a great deal of specialised knowledge. In the event that the remedies detailed in this instruction manual should not be successful, an authorised specialist workshop must find and eliminate the cause of the fault.

14.1 Braking system



- ▶ Have defects on the braking system immediately remedied by an authorised specialist workshop.

14.2 Electrical system



- ▷ When the living area battery is changed, only use batteries of the same type and the same capacity.




- ▷ See chapter 8 for changing the fuses.

Fault	Cause	Remedy
Road light system does no longer work correctly	Bulb is defective	Replace bulb. Note volts and watts specifications
	Fuse is defective	Replace fuse
Interior lighting does not work	Illuminant, plug connector or cable faulty	Contact customer service
The electrically operated entrance step cannot be moved in or out	Fuse on the transformer/rectifier is defective	Replace fuse on the transformer/rectifier
No 230 V power supply in spite of connection	230 V automatic circuit breaker has triggered	Switch on 230 V automatic circuit breaker
Starter or living area battery is not charged when operated in 230 V mode	Jumbo flat fuse on the starter or living area battery is defective	Replace jumbo flat fuse on the starter or living area battery
	No mains voltage	Switch on automatic circuit breaker in the vehicle
	Transformer/rectifier is overheated	Ambient temperature too high or transformer/rectifier ventilation hindered
	Too many appliances are switched on	Switch off appliances that are not required
	Charger module in the transformer/rectifier is defective	Contact customer service



Fault	Cause	Remedy
Living area battery is not charged during vehicle operation	Fuse on terminal D+ of the alternator is defective	Replace fuse
	Disconnecter relay in the transformer/rectifier is defective	Contact customer service
12 V indicator lamp does not light up	12 V power supply is switched off	Switch 12 V power supply on
	Battery cut-off switch on the transformer/rectifier is switched off	Set battery cut-off switch to on
	Starter or living area battery is not charged	Charge the starter or living area battery
	Disconnecter relay in the transformer/rectifier is defective	Contact customer service
	Flat fuse on the living area battery is defective	Replace flat fuse on the living area battery
12 V power supply does not work	12 V power supply is switched off	Switch 12 V power supply on
	Battery cut-off switch on the transformer/rectifier is switched off	Set battery cut-off switch to on
	Living area battery is discharged	Charge the living area battery
	Jumbo flat fuse on the living area battery is defective	Replace jumbo flat fuse on the living area battery
	Disconnecter relay in the transformer/rectifier is defective	Contact customer service
12 V power supply does not work in 230 V operation	12 V power supply is switched off	Switch 12 V power supply on
	Battery cut-off switch on the transformer/rectifier is switched off	Set battery cut-off switch to on
	230 V automatic circuit breaker has triggered	Contact customer service
	Charger module in the transformer/rectifier is defective	Contact customer service
	Jumbo flat fuse on the living area battery is defective	Replace jumbo flat fuse on the living area battery
Mains check symbol does not light up even though 230 V mains supply is connected	The mains connection is de-energised	Check external mains connection
	230 V automatic circuit breaker upstream of transformer/rectifier has tripped or is switched off	Reset 230 V automatic circuit breaker



Fault	Cause	Remedy
No voltage at a connected appliance	Self-resetting Polyswitch fuse has tripped	Check plug connectors and cables. Switch off 12 V power supply for approx. 2 minutes, then switch it back on
	Self-resetting Polyswitch fuse has tripped several times (3 times), system has deactivated corresponding output permanently	Remedy cause of Polyswitch tripping Cancel permanent switch-off (switch on 12 V power supply for living area, press rotary knob and keep it pressed for minimum 3 seconds)
Starter battery is discharged in 12 V operation	Disconnecter relay in the transformer/rectifier is defective	Contact customer service
	Battery cut-off switch on the transformer/rectifier is switched off	Set battery cut-off switch to on
No voltage is supplied by the living area battery	Living area battery is discharged	Charge living area battery immediately  ▷ Total discharge damages the battery. If the vehicle is to be laid up for a long period, fully charge the living area battery beforehand Discharging is caused by inactive appliances (see chapter 8)
Battery charge through solar module not working	Electrical connection to solar module interrupted	Check plug connectors and cables
	Fuse is defective	Replace fuse on the transformer/rectifier
	Solar charge regulator defective	Contact customer service
Living area battery overloaded ("hot")	Battery selection switch set wrongly	Move position of battery selection switch
	Defective load sensor or relay	Pull out the jumbo flat fuse on the living area battery, then contact customer service



14.3 Gas system



- ▶ In case of a defect of the gas system (gas odour, high gas consumption) there is danger of explosion! Close regulator tap on the gas bottle immediately. Open doors and windows and ventilate well.
- ▶ If the gas system is defective: Do not smoke; do not ignite any open flames, and do not operate electric switches (light switches etc.). Check the tightness of gas-conducting parts and lines with leakage search spray. Do not check with an open flame.
- ▶ Have the defective gas system repaired by an authorised specialist workshop.

Fault	Cause	Remedy
No gas	Gas bottle is empty	Change gas bottle
	Gas isolator tap closed	Open the gas isolator tap
	Regulator tap on the gas bottle is closed	Open regulator tap on the gas bottle
	External temperature is too low (-42 °C for propane gas, 0 °C for butane gas)	Wait for higher external temperatures
	Built-in appliance is defective	Contact customer service

14.4 Cooker

Fault	Cause	Remedy
Ignition fuse does not operate (flame does not burn after the control knobs are released)	Heat-up time is too short	Keep control knob pressed for approx. 15 to 20 seconds after ignition
	Ignition fuse is defective	Contact customer service
Flame extinguishes when being reduced to its minimum setting	Thermocouple sensor is incorrectly set	Correctly reset thermocouple sensor (do not bend). The sensor tip should protrude by 5 mm beyond the burner. The sensor neck should not be more than 3 mm away from the burner ring; if necessary, contact customer service



14.5 Heater/boiler

Fault	Cause	Remedy
Heater does not ignite	Temperature sensor on operating unit or remote sensor defective	Pull out plug on operating unit. The heater then works without thermostat. Contact the customer service as soon as possible
Boiler empties, safety/drainage valve has opened	Internal temperature below 3 °C	Heat inside
Safety/drainage valve cannot be closed	Temperature at safety/drainage valve below 8 °C	Heat inside
Fan wheel runs noisily or not steadily	Fan wheel is soiled	Contact Truma service department
None of the LEDs comes on, device is switched on, operating voltage is connected	Automatic restart is blocked, e.g. following an interruption of the power supply	Reset the device (switch off, wait 5 seconds, switch on again)
After switching on (winter and summer operation) none of the LEDs comes on	No operating voltage	Check 12 V battery voltage, load battery if necessary
		Check all electrical plug connectors
	Appliance fuse or vehicle fuse defective	Check appliance fuse or vehicle fuse and replace if necessary
After switching on, the green LED comes on but the heater does not work	The temperature set on the control unit is below room temperature	Set a higher temperature on the control unit
Green LED comes on, red LED flashes	The safety switch on the window above the waste gas vent has triggered	Close the window
	Risk of undervoltage; battery voltage too low < 10.4 V	Charge the battery
The heater permanently toggles between minimum and maximum power	Air circulation suction system blocked	Remove blocking of air circulation suction system
Red LED comes on, approximately 30 seconds after the heater is switched on	Regulator tap or gas isolator tap is closed	Open regulator tap or gas isolator tap
	Gas bottle is empty	Change gas bottle
	Combustion air inlet or exhaust gas outlet closed	Uncover openings
After extended operation, heater registers a fault	Gas pressure regulator defrosted up	Use regulator heater (defroster)
	Level of butane in the gas bottle too high	Use propane gas (butane gas is unsuitable for heating especially for temperatures under 10 °C)
	Warm air louvres blocked	Remove blocking



Fault	Cause	Remedy
Green LED is flashing after switching the heater off	Overrun is active to reduce temperature of appliance	No error; overrun switches off after approximately 5 minutes
After the appliance is switched on, the green and red LEDs come on	Electronics defective	Contact customer service

If these measures do not lead to the elimination of the fault, contact the nearest customer service workshop of the relevant appliance manufacturer. The list of addresses is enclosed with the accompanying appliance documentation. Only authorised qualified personnel may repair the appliance.

14.5.1 Independent vehicle heater (Webasto)

See the manufacturer's documentation for any information on causes and correction of faults.

14.6 Refrigerator

14.6.1 General

In the event of a defect contact the nearest customer service workshop of the relevant appliance manufacturer. The list of addresses is enclosed with the accompanying appliance documentation. Only authorised qualified personnel may repair the appliance.



- ▷ Further information can be obtained in the manufacturer's instruction manual.

Fault	Cause	Remedy
Refrigerator is cooling very intensely	Quick-cooling function is switched on	Switch off the quick-cooling function
Compressor does not run	No supply voltage	Charge the battery
		Contact customer service if necessary
	Battery voltage too low	Charge the battery
	Battery capacity too low	Change the battery
	Ambient temperature is too high	If possible, ensure a lower ambient temperature (e.g. park the vehicle in the shade)
	Ventilation insufficient	Keep the ventilation slots clear
Contact customer service if necessary		



Fault	Cause	Remedy
Cooling power decreases, internal temperature increases	Ambient temperatures are too high	If possible, ensure a lower ambient temperature (e.g. park the vehicle in the shade)
	Ventilation insufficient	Keep the ventilation slots clear Contact customer service if necessary
	Battery capacity low	Charge the battery
Unusual noises	Fan noise	-


14.7 Water supply

Fault	Cause	Remedy
Leakage water inside the vehicle	A leak has occurred	Identify leak, re-connect water pipes
No water	Water tank is empty	Replenish drinking water
	Drain cock not closed	Close drain cock
	12 V power supply is switched off	Switch 12 V power supply on
	Switch for water pump is off	Switch water pump on
	Fuse of the water pump is defective	Replace fuse on the transformer/rectifier
	Water pump defective	Exchange water pump (have it exchanged)
	Water pipe snapped off	Straighten water pipe or replace
Toilet has no flush water	Transformer/rectifier defective	Contact customer service
	Water tank is empty	Replenish drinking water
Display for water and waste water indicates a wrong value	Measuring probe in the waste water or water tank is soiled	Clean water/waste water tank
	Measuring probe is defective	Replace measuring probe
Waste water tank cannot be emptied	Drain cock is clogged	Open the cleaning cap on the waste water tank and drain the waste water. Rinse the waste water tank well
Drain on the single lever mixer tap is clogged	Perlator calcified	Unclip the perlator, de-calcify in vinegar water (only for products made from metal)
Water jets on the shower nozzle clogged	Water jets calcified	De-calcify shower nozzle in vinegar water (only for products made from metal) or rub off soft nozzle burling



Fault	Cause	Remedy
Water drains from the shower tray slowly or does not drain at all	The vehicle is not in a horizontal position	Position the vehicle horizontally
Milkiessness of the water	Tank filled with dirty water	Clean water tank mechanically and chemically; then disinfect and rinse copiously with drinking water
	Residues in the water tank or water system	Clean water system mechanically and chemically; then disinfect and rinse copiously with drinking water
Any change in the taste or odour of the water	Tank filled with dirty water	Clean water system mechanically and chemically; then disinfect and rinse copiously with drinking water
	Fuel filled into the water tank by mistake	Clean water system mechanically and chemically; then disinfect and rinse copiously with drinking water. If not successful: Contact a specialist workshop
	Microbiological deposits in the water system	Clean water system mechanically and chemically; then disinfect and rinse copiously with drinking water
Deposits in the water tank and/or water-carrying components	Water excessively long in the water tank and in water-carrying components	Clean water system mechanically and chemically; then disinfect and rinse copiously with drinking water

14.8 Body

Fault	Cause	Remedy
Flap hinges/door hinges are difficult to operate	Flap/door hinges are not (sufficiently) lubricated	Lubricate flap hinges/door hinges with acid-free and resin-free grease
Hinges/joints in the bathroom unit/toilet compartment are difficult to operate/make a grating noise	Hinges/joints are not (sufficiently) lubricated	Lubricate hinges/joints with solvent-free and acid-free grease  ▷ Spray cans often contain solvents
Storage compartment hinges are difficult to operate/make a grating noise	Storage compartment hinges are not (sufficiently) lubricated	Lubricate storage compartment hinges with acid-free and resin-free grease



- ▷ The authorised dealers and service centres are available for any spare parts requirement.



Chapter overview

This chapter contains helpful tips for the journey.

At the end of the chapter there is a checklist containing the most important equipment for the journey.

15.1 Traffic rules in foreign countries



- ▷ The vehicle driver is required to inform himself as to the traffic rules of the countries in which he plans to travel before beginning the trip. Contact your automobile club or embassy for further information.
- ▷ In some European countries, warning vests must be worn when exiting the vehicle outside of towns in the case of vehicle failures or accidents.
- ▷ Depending on the country, different rules and regulations apply (e.g. different warning signs for rear carriers, obligation to carry breathalyzer kits, spare bulbs, high-visibility vests, size of reserve canister). The driver of the vehicle must familiarise him or herself with these rules before every journey.
- ▷ Up-to-date information can generally be found on the web pages of the national automobile associations.

Information about traffic regulations is especially important as state law applies in case of damage. For your own safety, always observe the following rules when travelling abroad:

- Carry your insurance certificate with you.
- Always register accidents with the police.
- Never sign documents that you have not read and understood completely.

15.2 Help on Europe's roads



- ▷ Before commencing the trip, gather information on national phone numbers for rescue and police. In many countries the central emergency phone number 112 (without area code) applies.
- ▷ As far as possible, draw up a list with the important phone numbers in the travelled countries and keep the table in the vehicle.

Motoring clubs at home or in the travelled country are happy to help.



15.3 Gas supply in European countries



- ▷ In Europe, there are several different connection systems for gas bottles. It is not always possible to fill or exchange your gas bottles in a foreign country. Get information about the connection system in the country you are travelling to before embarking on your journey, e.g. at a motoring club or in the trade press.

General tips

Always observe the following instructions:

- Only go on vacation with completely filled gas bottles.
- Use all of the gas bottles' capacity.
- Take along adapter sets (available in camping supply stores) for filling gas bottles in foreign countries and for connecting the gas pressure regulator to foreign gas bottles.
- During the cold time of the year observe filling with propane gas component (butane does not gas below 0 °C).
- Use blue bottles from the firm Campingaz (distributed world-wide). Only use gas bottles with safety valves.
- When bottles from other countries are used, check the gas bottle compartments to see if the gas bottles fit into them. Gas bottles from other countries do not always display the same size as your own gas bottles.
- The web site www.mylpg.eu provides an overview of gas suppliers in Europe.

15.4 Toll regulations in European countries

Many European countries have introduced a mandatory toll system. The toll regulations and how they are collected vary greatly from country to country. Nevertheless, ignorance is no excuse. Penalties can be quite severe.

As is the case with traffic regulations, the vehicle driver is required to be familiar with the toll formalities before starting out on a trip. For example, in Austria the vignette does not meet the toll requirements for vehicles that weigh more than 3.5 t. There, a so-called "Go-Box" must be obtained and charged.

Contact your automobile club or the Internet for further information.



- ▷ Windscreens with solar filters can affect the functioning of automatic toll collection systems (e.g. Go-Box). This must be taken into account when acquiring the appropriate device (e.g. Split-Go-Box).



15.5 Tips on staying overnight safely during travel

Prudent behaviour is the most important protective measure for insuring a safe night in the motorhome.

The risk of thievery is reduced to a minimum when the following basic rules are observed:

- During high season do not spend the night at highway rest stops or parking areas located along typical vacation routes.
- Several vehicles on one site at the same time do not necessarily decrease the chances of thievery occurring. Consult your own feelings about the parking site.
- Even if it is just for one night, go to a camping site.
- When parking on open space keep emergency routes clear. The way to the driver's seat should be clear. The ignition key should always be within reach.
- Only take with you those valuables which are absolutely necessary for the journey. If possible, store valuables in a small safe and not in the immediate vicinity of windows or doors.
- Always lock up the vehicle.

15.6 Tips for winter campers

The following tips will help make your winter camping experience as agreeable as possible.

- Reserve your parking place in good time. Good winter camping sites are often booked up early.
- Do not start your trip without winter tyres.
- Bring snow chains.
- Choose your parking place with care. Observe the ground beneath you. Snow and ice may melt.
- When the vehicle has been positioned, release the handbrake to prevent freezing.
- No snow walls should be allowed to cover the built-in forced ventilation.
- Keep the built-in forced ventilation free from snow and ice.
- Make sure the air circulation is good. Good air circulation prevents moisture from collecting and makes it easier to heat the living area.
- Cover the single-paned driver's cabin window with insulation mats to avoid thermal bridges.
- Follow the instructions in the section "Gas supply in European countries".
- Use a two-bottle system with automatic controller for the gas system, so that the supply does not run out during the night.
- Only operate the gas system using propane gas.
- Do not use the space behind the heater as a storage space.
- Never operate catalytic ovens or infra-red gas radiators in the interior of the vehicle, since they consume oxygen for burning.
- Lay the 230 V power cable in such a way that the cable cannot be frozen or be damaged (e.g. during snow removal).
- When it is snowing heavily, clear the roof of the vehicle of snow regularly. A few centimetres of powdery snow serves as insulation, but wet snow quickly becomes a heavy burden.
- Before embarking on the return journey, remove all the snow from the roof to avoid impeding vehicles behind you with a "snow flag".



15.7 Travel checklists

The following checklists will help that nothing important is left at home although not everything on the checklists might be necessary.



- ▷ Do not leave checking of documents (e.g. vehicle papers and information) as well as checking the condition of the vehicle until just before commencing the trip. Planning and checking documents well in advance will save unnecessary trouble.

Kitchen area

✓	Object	✓	Object	✓	Object
	Wiping cloth		Cleansing agent (detergent)		Salad servers
	Silverware		Dishcloths		Chopping board
	Turnspit		Glasses		Brush to wash the dishes
	Can opener		Set of knives and forks for grilling		Cloth to wash the dishes
	Ice cube tray		Corkscrew		Matches
	Lighter		Kitchen paper		Thermos jug
	Bottle opener		Garbage bags		Pots
	Air-tight storage boxes		Frying pans		
	Crockery		Stirring spoons		

Bathroom/sanitary items

	Towels		Sanitary items		Toilet paper
	Hygiene products		Toilet brush		Toothbrush glass

Living area

	Dustbin		Deck of cards		Rucksack
	Road atlas		Broom		Sleeping bags
	Bath towels		Dust pan		Pencils and paper
	Bath shoes		Candles		Shoes
	Batteries		Coat-hangers		Shoe polish
	Bed linen		Clothes brush		Sports equipment
	Laundry bag		Pillow		Vacuum cleaner
	Books		Map		Flash light
	Camping guide/parking space directory		Medicine		Pocket knife
	Binoculars		Mobile phone		Table cloth
	Fire extinguisher		Sewing kit		Drinking bottle
	Gas bottle		Rain clothes		Clothes pins
	Insect lamp		First aid kit		Clothesline
	Insect repellent		Travel guide		



Vehicle/tools

✓	Object	✓	Object	✓	Object
	Waste water container		Gas tube		Snow chains (winter)
	Adapter socket		Fabric tape		Screwdriver
	CEE adapter		Watering can for drinking water		Current-measuring instrument
	Wire		Cable reel		Wheel chocks
	Spare wheel		Glue		First-aid kit
	Spare lamps		Universal pliers		Vehicle jack
	Spare fuses		Compressor		Hazard warning triangle
	Hammer		Loops		Warning sign
	Flat wrench		Tube adapter		Warning vest(s)
	Gas filling adapter		Hose clips		Flashing hazard warning light

Outside

	Stay rope		Camping table		Lock
	Bellows		Luggage racks		String
	Camping chairs		Grill		Tent pegs/tightening ropes

Documents

	List of addresses		Registration book		Passport
	Registration confirmation(s)		Driving licence		Writ of protection
	Allergy certificate		Vaccination certificate		Insurance documents
	Instruction manuals		Credit card		Vignette/toll card
	Instruction leaflets for medicines		Identity card		Visa





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