

# Instruction manual

## Congratulations

We congratulate you on your new caravan and would like to thank you for choosing a quality product from Dethleffs. Whether you want to enjoy your holidays on good or bad roads, whether you want to have your "holiday home" out in the country, at the seaside or in the mountains: Your Dethleffs caravan will always make sure that you can enjoy your holidays, because the Dethleffs team has been manufacturing caravans for 90 years and knows what is important. This experience shows itself in the well thought-out, cosy and yet highly functional equipment as well as in the outstanding driving characteristics.

Each Dethleffs vehicle is manufactured with great care and the quality is closely checked. This ensures that our products have a long service life. In view of these strict requirements, we guarantee top quality of our products and grant you a six year leakage guarantee of the body in accordance with our guarantee conditions (see Section 1.1).

This instruction manual deals primarily with the body of your caravan. It will give you all important information and tips so that you can enjoy all technical advantages of your Dethleffs caravan to the full. We have also included a chapter on maintenance – and thus on the conservation of value.

In addition, you will find the documents on the chassis and all the various built-in appliances.

For maintenance work or whenever you need some help, please always get in touch with your authorised specialist workshop. They know your caravan best of all and will meet all your requests fast and reliably.

We wish you a lot of fun with your caravan, a relaxing holiday and safe driving at all times.

**Your Dethleffs team**



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# 1 Guarantee

## 1.1 Conditions for leakproof guarantee


1. In addition to the legal guarantee and product warranty rights due to the customer, Dethleffs GmbH & Co. KG may also grant a guarantee of six years that the vehicles constructed by the company are sealed in such a manner that moisture cannot penetrate from the outside into the interior of the vehicle. The guarantee obligations do not apply if the leakage is a result of improper handling of the windows, doors and skylights or damage that has not been properly repaired. Damage that is caused by forces of nature (e.g. flooding) is not covered by the guarantee. The guarantee extensions include only the correct repair work. Conversion or diminution as well as travelling expenses or other indirect costs are not covered by the guarantee.
2. When dealing with a case of leakage covered under the conditions of this guarantee, Dethleffs GmbH & Co. KG is obliged to rectify the defective vehicle part concerned by repairing it free of charge or replacing the part, depending on what is necessary to immediately to repair the damage. Defects are to be rectified by Dethleffs GmbH & Co. KG or by an authorised specialist workshop in accordance with the guidelines of Dethleffs GmbH & Co. KG.
3. The prerequisite for this guarantee is that the vehicle must be presented once a year to an authorised specialist workshop for an ingress test. The presentation must take place  $\pm 6$  months at the latest after the initial registration. If the inspection is not carried out according to schedule, this will nullify your warranty. It cannot be renewed by carrying out an inspection at a later time. **As proof that the inspection has been completed, there are designated coupons in the Dethleffs GmbH & Co. KG guarantee booklet where inspection stamps are to be glued and endorsed by a stamp, the date and the signature of a respective Dethleffs dealer.**
4. **The guarantee begins on the day of the initial registration or taking-over of the vehicle by the customer, at the latest 18 months after delivery to the dealer, and is valid while the vehicle is in use, for 6 years at the longest.** If initial registration of the vehicle precedes taking delivery, the warranty commences on the vehicle's initial registration date (warranty qualifying date). **A change of ownership of the purchased object has no effect on the guarantee obligations of the manufacturer.** The guarantee expires if the terms outlined in Paragraph 3 are not complied with. The performance of guarantee work does not increase the guarantee period.
5. Parts installed to rectify faults are also guaranteed under the terms of the guarantee until the guarantee period expires.
6. If leakage occurs, the owner must notify Dethleffs GmbH & Co. KG or a Dethleffs dealer of this in writing within 14 days of its detection. The guarantee certificate and the corresponding guarantee stamps must be included with the notification. If notification of leakage does not occur within the time limit stated, no claims can be made under the terms of the guarantee. Remedying of leakage will take place after approval has been given by Dethleffs GmbH & Co. KG.
7. The costs of the inspection are to be paid by the party covered by the guarantee.
8. As far as legally permissible, the court responsible for Isny will be agreed upon as the venue for jurisdiction.
9. The leakproof guarantee does not apply for caravans that are installed fixed.

# 1

## Guarantee

### 1.2 Water ingress test

#### 1.2.1 Inspection plan

Pos.	Component	Activity
1.1	Wheel housing	Visual check
1.2	Rear wall floor plateau connection	Visual check
1.3	Front wall floor plateau connection	Visual check
1.4	Side wall floor plateau right connection	Visual check
1.5	Side wall floor plateau left connection	Visual check
1.6	Base frame with base frame cut-outs	Visual check
1.7	State check of the outer metal sheets of side panels as well as of the parts made of glass-fibre reinforced plastic (GRP)	Visual check
1.8	Check the status of the window rubbers, expansion joints, sealing joints	Visual check
2.1	Measure the floor plateau at this connection point with a moisture measuring device, write down the corresponding values with the date of the assessment. Prescribed maximum values – up to 20% normal.	Measuring If the values lie above 20%, check if it is due to accumulated condensation.
2.2	Measure inside the vehicle (walls, window sections, roof, etc.), note changes in the colour of the decor. Prescribed maximum values – up to 20% normal.	Measuring If the values lie above 20%, check if it is due to accumulated condensation.
2.3	Measure at the inner decor of the storage flaps using a moisture measuring device.	Measuring
3.1	Rear wall floor plateau connection	Spray with Dethleffs special weatherproof solution
3.2	Front wall floor plateau connection	Spray with Dethleffs special weatherproof solution
3.3	Side wall floor plateau right connection	Spray with Dethleffs special weatherproof solution
3.4	Side wall floor plateau left connection	Spray with Dethleffs special weatherproof solution
3.5	Openings/ducts for cables, gas lines and air circulation	Spray with Dethleffs special weatherproof solution
3.6	Connection of floor to chassis  ▷ In the case of an underbody made of GRP the surface is not treated with the Dethleffs special weatherproof solution, but only still the cable glands, gas lines and at cable connections to the chassis.	Spray with Dethleffs special weatherproof solution

We reserve the right to modify the inspection plan.



# 1

## Guarantee

### 1.2.2 Inspection records

#### Delivery

Signature, date and stamp of the Dethleffs dealer:

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#### 1st year

Signature, date and stamp of the Dethleffs dealer:

---

#### Water ingress test

**Paste inspection stamp here** (garage)

---

- Water ingress test 1st year
  - No defects found
  - Found defects:

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---

Should it be determined during an inspection that additional work is necessary, then the carrying out of this work is dependent on the customer commissioning this to be done. Please also adhere to the service intervals stipulated by the manufacturers of the individual equipment. Information is included in the service documents enclosed.

# 1

## Guarantee

### 2nd year

Signature, date and stamp of the Dethleffs dealer:

### Water ingress test

Paste inspection stamp here (garage)

- Water ingress test 2nd year
  - No defects found
  - Found defects:

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### 3rd year

Signature, date and stamp of the Dethleffs dealer:

### Water ingress test

Paste inspection stamp here (garage)

- Water ingress test 3rd year
  - No defects found
  - Found defects:

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---

Should it be determined during an inspection that additional work is necessary, then the carrying out of this work is dependent on the customer commissioning this to be done. Please also adhere to the service intervals stipulated by the manufacturers of the individual equipment. Information is included in the service documents enclosed.

# 1

## Guarantee

### 4th year

Signature, date and stamp of the Dethleffs dealer:

### Water ingress test

Paste inspection stamp here (garage)

- Water ingress test 4th year
  - No defects found
  - Found defects:

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### 5th year

Signature, date and stamp of the Dethleffs dealer:

### Water ingress test

Paste inspection stamp here (garage)

- Water ingress test 5th year
  - No defects found
  - Found defects:

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Should it be determined during an inspection that additional work is necessary, then the carrying out of this work is dependent on the customer commissioning this to be done. Please also adhere to the service intervals stipulated by the manufacturers of the individual equipment. Information is included in the service documents enclosed.

# 1

## Guarantee

### 6th year

Signature, date and stamp of the Dethleffs dealer:

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### Water ingress test

**Paste inspection stamp here (garage)**

- Water ingress test 6th year
  - No defects found
  - Found defects:

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---

Should it be determined during an inspection that additional work is necessary, then the carrying out of this work is dependent on the customer commissioning this to be done. Please also adhere to the service intervals stipulated by the manufacturers of the individual equipment. Information is included in the service documents enclosed.

# 1

## Guarantee

### 1.3 Further inspections

#### 1.3.1 Inspection plan for annual inspection



The annual inspection is not bound to the 6-year water ingress test, but should nevertheless be carried out annually.

Pos.	Component	Activity	Interval
1	Skylights	Remove the inside frame of the skylights and tighten the screw connections of the securing clips	1st year
2	Refrigerator, heater, kitchenette, storage flap locks, water system, interior electrics	Function check	Annually
3	Waste water system, toilet, autonomy package (optional), screens and blinds	Visual and function check	Annually
4	Windows, skylights	Function check, applying talc to the rubber seals	Annually
5	Hot-water heater (Alde)	Check fluid level	Annually
6	Hot-water heater (Alde)	Replace heating fluid	Every 2 years
7	Gas system	Official gas inspection	Every 2 years
8	Joints, hinges, flaps, doors	Lubricate	Annually

We reserve the right to modify the inspection plan.

# 1

## Guarantee

### 1.3.2 Inspection plan for chassis



The chassis inspection is not bound to the 6-year water ingress test, but should nevertheless be carried out annually. Please also observe the respective instructions of the manufacturer (AL-KO).

Pos.	Component	Activity	Interval
1	Front wheel	Lubricate, check wheel rims for damage, visual check of the tyres, check threaded spindle and crank	Annually
2	Stabiliser, friction linings	Check wear indication	Annually
3	Accumulator	Lubricate or oil the slide and articulation points	Annually
4	Corner steadies	Check	Annually
5	Joints, hinges and levers on the chassis	Lubricate	Annually
6	Wheel attachment	Tighten the wheel nuts, check tyre bearings	Annually
7	Slotted nut on the wheel	Check position and fit lock mechanism##	Annually
8	Tyres and wheel rims	Air pressure check (see Section 15.7), visual check for damage, tread depth at least 2 mm	Annually
9	Brakes, brake lining	First inspection after 1500 km or after 6 months	Annually
10	Brake drums	Visual check for wear and rust, check spring tension	Annually
11	Outside lighting	Function check	Annually
12	Overrun brake	Function check	Annually
13	Brake cable assembly	Visual check	Annually
14	Chassis underbody	Check bolts are firmly secured	Annually

We reserve the right to modify the inspection plan.

### 1.3.3 Gas inspection plan



- ▷ The gas inspection is prescribed by law and must be carried out every two years.
- ▷ The respective local regulations apply in other counties.

Pos.	Component	Activity	Interval
1	Gas system	Official gas inspection	Every 2 years
2	Gas filter	Replace gas filter cartridge, when residues are located on the filter cartridge. At the latest every 2 years	Every 2 years

# 1

## Guarantee

### 1.3.4 Inspection records

#### Delivery

Signature, date and stamp of the Dethleffs dealer:

#### 1st year

Signature, date and stamp of the Dethleffs dealer:

- Chassis inspection
- Annual inspection 1st year
  - No defects found
  - Found defects:

\_\_\_\_\_  
\_\_\_\_\_

Should it be determined during an inspection that additional work is necessary, then the carrying out of this work is dependent on the customer commissioning this to be done. Please also adhere to the service intervals stipulated by the manufacturers of the individual equipment. Information is included in the service documents enclosed.

# 1

## Guarantee

### 2nd year

Signature, date and stamp of the Dethleffs dealer:

- Gas inspection
- Chassis inspection
- Annual inspection 2nd year
  - No defects found
  - Found defects:

---

---

### 3rd year

Signature, date and stamp of the Dethleffs dealer:

- Chassis inspection
- Annual inspection 3rd year
  - No defects found
  - Found defects:

---

---

Should it be determined during an inspection that additional work is necessary, then the carrying out of this work is dependent on the customer commissioning this to be done. Please also adhere to the service intervals stipulated by the manufacturers of the individual equipment. Information is included in the service documents enclosed.



# 1

## Guarantee

### 4th year

Signature, date and stamp of the Dethleffs dealer:

---

- Gas inspection
- Chassis inspection
- Annual inspection 4th year
  - No defects found
  - Found defects:

---

---

### 5th year

Signature, date and stamp of the Dethleffs dealer:

---

- Chassis inspection
- Annual inspection 5th year
  - No defects found
  - Found defects:

---

---

Should it be determined during an inspection that additional work is necessary, then the carrying out of this work is dependent on the customer commissioning this to be done. Please also adhere to the service intervals stipulated by the manufacturers of the individual equipment. Information is included in the service documents enclosed.

# 1

## Guarantee

### 6th year

Signature, date and stamp of the Dethleffs dealer:

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---

- Gas inspection
- Chassis inspection
- Annual inspection 6th year
  - No defects found
  - Found defects:

---

---

Should it be determined during an inspection that additional work is necessary, then the carrying out of this work is dependent on the customer commissioning this to be done. Please also adhere to the service intervals stipulated by the manufacturers of the individual equipment. Information is included in the service documents enclosed.

## 2

## Introduction

### 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 Dethleffs caravan you will receive a file with the following vehicle manuals and documents:

#### Dethleffs documents

- Instruction manual
- List of Dethleffs dealers

#### Additional 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 in part not accordingly 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 guarantee claim is deemed invalid.**

## 2

## Introduction



- ▷ 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.



- ▷ The vehicle comes without a wheel brace and vehicle jack. We recommend you buy a commercial wheel brace before first use of your vehicle, in order to have it ready in the case of mishap or emergency. If there is no AL-KO vehicle jack (special equipment for AL-KO chassis), procure a commercial scissors-type jack or hydraulic vehicle jack before first use of your vehicle in order to have it ready in the case of mishap or emergency. Our authorised dealers and service centres will be happy to advise you.

### 2.1 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.

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 in accordance with the directives of the manufacturer.

Luggage and accessories may only be transported up to the maximum permissible gross weight.



- ▷ Observe the test and inspection periods stipulated by the manufacturer.

## 2

# Introduction

## 2.2 Environmental tips



- ▷ Do not impair the tranquility and spruceness of nature.
- ▷ Remember that: All kinds of waste water and household waste are not to be disposed of in drains or in the open countryside.
- ▷ Collect waste water on board only in the waste water tank or, if need be, in other vessels suitable to this 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.
- ▷ Empty waste bins as often as possible into the cans or containers that are provided for this purpose. This helps to avoid unpleasant smells and an accumulation of rubbish on board.
- ▷ When parked, do not allow the engine of the towing vehicle 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 longer periods, search for parking areas which are especially designated for caravans and towing vehicles. Enquire at the town or community authority about parking spaces.
- ▷ Always leave the parking places in a clean condition.

# 3

## Safety

### Chapter overview

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

The instructions address the following topics:

- fire prevention and what to do in case of fire
- general care of the vehicle
- road safety of the vehicle
- towing
- gas system of the vehicle
- electrical system of the vehicle
- water system of the vehicle

### 3.1 Fire prevention

#### 3.1.1 Avoidance of fire risks



- ▶ Never leave children in the vehicle unattended.
- ▶ Keep flammable materials clear of heating and cooking appliances.
- ▶ Lights can get very hot. When the light is switched on, a safety distance of 30 cm to combustible material has to be maintained. Fire hazard!
- ▶ Never use portable heating or cooking appliances.
- ▶ Only authorised qualified personnel may modify the electrical system, the gas system or the appliances.

#### 3.1.2 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 at hand near the cooker.

#### 3.1.3 Gas odour



- ▶ 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.
- ▶ Close the gas valve. Inspection by specialised personnel.



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

## 3

## Safety

All the windows and doors that fulfil the following criteria rate as emergency exists:

- Opening outwards or moving in the horizontal direction
- Opening angle at least 70°
- Diameter of the clear opening at least 450 mm
- Maximum distance to vehicle floor 950 mm

### 3.2 General



- ▶ The oxygen in the vehicle interior is used up by breathing and the use of gas operated appliances. That is why the oxygen needs to be replaced on a constant basis. For this purpose, forced ventilation options (e.g. skylights with forced ventilation, mushroom-shaped vents or floor vents) 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 CO<sub>2</sub> levels.
- ▶ Observe the headroom of the doors.
- ▶ If a roof rack with ladder is installed, only climb the ladder if the rear corner steadies have been extended or the caravan is connected to the towing vehicle or the caravan has been secured against tilting at the back. Otherwise the caravan can tip over to the back. Danger of falling!



- ▷ As far as the appliances (heater, cooker, refrigerator, 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 parts must be entered in the vehicle papers.
- ▷ 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.
- ▷ Only move the vehicle on the road if the driver has a driver's license valid for the towing vehicle and trailer.
- ▷ When selling the vehicle, hand over all instruction manuals for the vehicle and the fitted appliances.

# 3

## Safety

### 3.3 Road safety



- ▶ Before commencing the journey, carry out a functional check of indicating and lighting equipment 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 starting your journey, remove the television from the support and store it securely.
- ▶ Before commencing the journey, place and secure the flat screen and screen support in the initial position. If the screen holder is installed in a TV cabinet: Close TV cabinet.
- ▶ During the journey, no persons are to travel inside the caravan.
- ▶ Observe the overall height of the vehicle (including roof loads) at underpasses, tunnels, etc.
- ▶ In winter, the roof must be free of snow and ice before commencing the journey.
- ▶ Before commencing the journey, empty the waste water tank.
- ▶ Push in fully the drive-on ramp and lock it into place before commencing the journey.
- ▶ Check the tyre pressure before a journey and at 2-week intervals. Wrong tyre pressure causes excessive wear and can lead to damage or even to tyre burst. You can lose control of the vehicle.



- ▷ Before commencing the journey, distribute the vehicle payload evenly (see Chapter 4).
- ▷ 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).
- ▷ Ensure that the maximum permitted nose weight is not exceeded and that the minimum nose weight does not fall below the minimum. Load the caravan accordingly.
- ▷ While driving with your caravan, the towing vehicle must be equipped with two external mirrors.
- ▷ Before commencing the journey, ensure that all cupboard doors, the toilet door and all drawers and flaps are secure. Engage the refrigerator door securing device.
- ▷ Before commencing the journey, convert the tables to a bed foundation or fasten them in the provided retainer.
- ▷ Before commencing the journey, close windows and skylights.
- ▷ Before commencing the journey, close all external flaps and lock them.
- ▷ Before commencing the journey, remove the external steady legs and retract the steady legs that are fitted to the vehicle.
- ▷ Crank the jockey wheel up as far as possible.
- ▷ Before commencing the journey, put the antenna in park position.
- ▷ During the initial journey and each time after changing a wheel, re-tighten the wheel bolts/wheel nuts after 50 km. Subsequently inspect them at regular intervals in order to ensure that they are firmly seated. See Chapter 15 for the tightening torque.



## 3

## Safety



- ▶ Tyres must not be older than 6 years as the material becomes brittle over time (see Chapter 15).
- ▶ Lower the table of the round seating group at the rear and fix to the bench. In order to do this, use the holding device fitted as standard.

### 3.4 Towing



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

### 3.5 Gas system

#### 3.5.1 General information



- ▶ Before starting the journey, when leaving the vehicle or when gas equipment is not in use, close all gas isolator taps and the main isolator tap on the gas bottle.
- ▶ No appliance (e.g. heating or refrigerator) that is operated with an open flame may be operational while fuel is being filled up, on ferries or in the garage. Danger of explosion!
- ▶ If an appliance is operated with an open flame, do not start the appliance up in closed areas (e.g. garages). Danger of poisoning and suffocation!
- ▶ Have the gas system serviced, repaired or altered by an authorised workshop only.
- ▶ Have the gas system checked by an authorised specialist workshop before starting up and according to the national regulations. 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 and the exhaust gas pipes also have to be checked. The gas pressure regulator has to be replaced at least every 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 the regulator tap on the gas bottle immediately. Open doors and windows and ventilate well.
- ▶ In case of a defect in the gas system: Do not smoke; do not ignite any open flames, and do not operate electric switches (light switches etc.).
- ▶ Before using the cooker make sure that there is sufficient ventilation. Open windows or the skylight.
- ▶ Do not use the gas cooker or gas oven 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 installed gas appliances are designed for use solely with propane or butane gas or a mixture of both. The gas pressure regulator as well as all installed gas devices are set 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.

### 3

## Safety



- ▶ Regularly inspect the gas tube fitted to the gas bottle connection for tightness. The gas tube must not have any tears and must not be porous. Have the gas tube replaced by an authorised specialist workshop no later than 10 years after the manufacturing date. The operator of the gas system must see to it that the parts are replaced.
- ▶ Due to its function and construction, the gas bottle compartment is a space which is open to the exterior. Never cover or block the standard forced ventilation. Otherwise leaking gas cannot be dispersed to the outside.
- ▶ Do not use the gas bottle compartment as storage space. Fire hazard!
- ▶ Secure the gas bottle compartment in order to prevent unauthorised persons opening it. To do so lock the access.
- ▶ 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. Therefore keep the waste gas vents and intake openings clean and free (e.g. of snow and ice). No snow walls or aprons may be allowed to lie against the vehicle.

### 3.5.2 Gas bottles



- ▶ Gas bottles are only to be transported within the designated gas bottle compartment.
- ▶ Place gas bottles vertically in the gas bottle compartment.
- ▶ Tie down gas bottles so that they are unable to turn or tilt.
- ▶ 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.
- ▶ Use your hands only to connect the gas pressure regulator or the gas tube to the gas bottles. Do not use any tools.
- ▶ 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 defroster (Eis-Ex) for the gas pressure regulator at temperatures below 5 °C.
- ▶ Use only 11 kg or 5 kg gas bottles. Camping gas bottles with a built-in reflux valve (blue bottle with max. 2.5 or 3 kg content) are permitted in exceptional cases with a safety valve.
- ▶ Use the shortest possible tube lengths (150 cm max.) for external gas bottles.
- ▶ Never block the ventilation openings in the floor under the gas bottles.

## 3

# Safety

### 3.6 Electrical system



- ▶ Only allow qualified personnel to work on the electrical system.
- ▶ The electrical system of the caravan should be viewed and tested by a competent electrician every 2 years. If the caravan is used often, annually. The electrician should then issue a report on the state of 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.

### 3.7 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 case of lay-ups lasting more than a week, disinfect the water system before using the vehicle.



- ▷ 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. Leave the water taps on in central position. Leave the safety/drainage valve (if available) 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.

## 4

# Before the journey

## Chapter overview

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

The instructions address the following topics:

- initial start-up
- registration of the vehicle
- connecting and detaching to the towing vehicle
- tow coupling
- calculating the payload
- loading the vehicle
- drive-on ramp
- PVC-floor covering
- storing the television

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

### 4.1 Start-up



- ▷ During the initial journey and each time after changing a wheel, re-tighten the wheel bolts/wheel nuts after 50 km. Subsequently inspect them at regular intervals in order to ensure that they are firmly seated. See Chapter 15 for the tightening torque.



- ▷ Check whether the road light system of the towing vehicle corresponds to that of the caravan (see Chapter 9), and whether a rated voltage of 12 V is provided by the towing vehicle.

The caravan is supplied with a set of keys.

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.

### 4.2 Registration

The caravan has an EC-type approval.

Your caravan is a vehicle which must be registered. The following documents are required for the registration:

- the registration document
- a confirmation of insurance
- your identity card
- if appropriate, a letter of authorisation to carry out the registration
- a registration application form

Please remember that certain countries require a separate national code sticker in addition to the EU plate.

## 4

# Before the journey

## 4.3 Connecting



- ▶ 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 towing vehicle. Nose weight and rear axle load must not be exceeded. The values of the nose weight and rear axle load are included in the documents of the vehicle and the tow coupling.
- ▶ Ensure that the interior of the coupling is not soiled and that the movable parts of the coupling (not the ball retainer) are lubricated.
- ▶ The tow ball is not to be lubricated when using a stabiliser. The friction pads are pressed against the coupling ball and thereby generate an anti-rolling moment. This anti-rolling effect is only guaranteed when the towing vehicle coupling head is free of lubricant and other residues. When lubricating the stabiliser ensure that no lubricant is on the friction pads.



- ▷ Caravan with an overrun brake: Do not connect or detach caravan with the overrun brake on.
- ▷ In order to connect the vehicle, crank the supporting jockey wheel down and set it down on the ground.
- ▷ Do not use the stabilising lever of the stabiliser as a maneuvering aid.



- ▷ Check whether the caravan connecting plug fits into the towing vehicle socket. If the connecting plug and socket differ, ask authorised dealers and workshops for adaption possibilities.
- ▷ Further information on the stabiliser can be obtained in the manufacturer's instruction manual.

### Connecting:

- Connect the caravan (see Section 4.4). The coupling jaw and the ball must interlock and are not to be loosely superposed. The coupling jaw must completely surround the ball.
- Attach the breakaway cable of the overrun brake to a lug at the towing vehicle or to a lug at the coupling device. Take the length of the cable into account: The cable may not drag on the ground or initiate the braking function when driving through curves.
- Crank the jockey wheel up as far as possible. Adjust the running role in parallel to the direction of travel and to the draw box.
- Insert the connector plug of the caravan in the socket of the towing vehicle. Ensure that the hooks of the safety cover engage with the plug. The hooks prevent the plug from becoming loose during the journey.
- Put the connection cable in a loose loop across the drawbar. Make sure that it does not touch the ground.
- Check whether the tow coupling is mounted correctly on the coupling ball. Pay attention to the safety indicator.
- Check whether corner steadies and jockey wheel are raised.
- Check the caravan lighting system whilst the towing vehicle is connected.

## 4 Before the journey

### 4.4 Tow couplings



- ▶ Before connecting, ensure that the tow ball of the coupling device is free of dirt and grease.

#### 4.4.1 AKS 3004 stabiliser

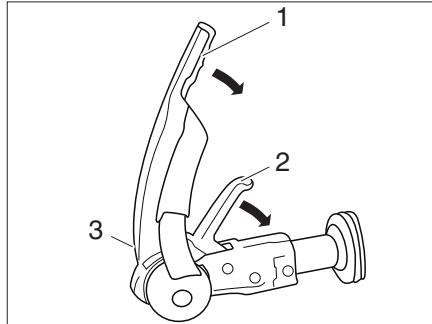


Fig. 1 AKS 3004 stabiliser

Connecting:

- Pull the stabilising lever (Fig. 1,1) upwards as far as it will go.
- Pull the coupling handle (Fig. 1,2) upwards.
- Place the opened stabiliser on the towing ball. The coupling handle must audibly lock back into its initial position.
- In addition, push the coupling handle downwards by hand (not with your foot). Closing and securing is carried out automatically.
- Conduct a visual inspection: The green cylinder of the safety indicator (Fig. 1,3) has to be visible.
- Activate the stabilising mechanism. To do so, push the stabilising lever (Fig. 1,1) downwards as far as it will go.
- Ensure that the breakaway cable is guided correctly through the breakaway cable guide.

#### 4.4.2 Support bracket

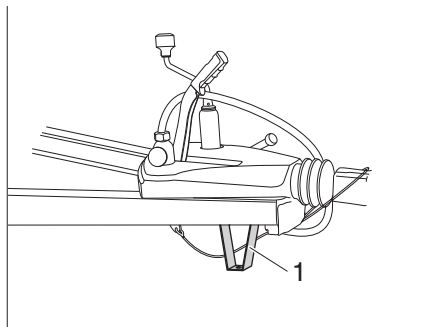


Fig. 2 Support bracket

Depending on the respective model, a support bracket (Fig. 2,1) is located under the drawbar. This protects the coupling against soiling through ground contact.

## 4 Before the journey

### 4.4.3 ATC (AL-KO Trailer Control)

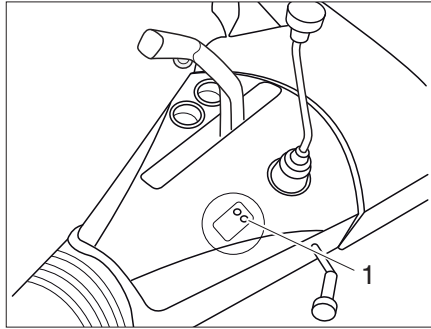


Fig. 3 LED of the ATC (AL-KO Trailer Control)

The optional anti-snaking system reacts automatically when the swinging movements of the towing vehicle and trailer exceeds limits. In the case of lateral accelerations the caravan brakes automatically. Through the braking movement the caravan automatically stays on track, the towing vehicle and caravan continue on safely.

*Connecting the ATC:*

- Plug the plug of the ATC in at the tow coupling. A self-test is carried out, the LED (Fig. 3,1) lights up red.
- After the self-test the LED (Fig. 3,1) lights up green, the ATC is active. If the LED does not light up green, the ATC does not function correctly. See the following table.

LED colour	ATC state	Remedy	Result	Status
Green	ATC is active			ATC is ready
Green flashing	ATC is active Self-test is being carried out	Drive forward a little bit to end the self-test Check the LED again	Green LED lights up	ATC is ready
Red	ATC is not active Journey can be continued	Remove the plug of the ATC, wait 5 seconds and plug it in again	Green LED lights up Red LED lights up	ATC is ready ATC error memory full You can continue to tow the caravan, but the ATC cannot access the brakes

## 4

## Before the journey

LED colour	ATC state	Remedy	Result	Status
Red flashing	ATC error Journey cannot be continued with connected ATC	Remove the plug of the ATC, wait 5 seconds and plug it in again	Green LED lights up Red LED lights up	ATC is ready  ATC defective, journey cannot be continued Remove the push rod and contact the manufacturer
LED off	No power supply LED defective	Remove the plug of the ATC, wait 5 seconds and plug it in again Check the power supply Before continuing your journey check the position of the push rod	Green LED lights up LED does not function	ATC is ready  Check the position of the push rod: Red line visible - journey cannot be continued Red line not visible: Journey can be continued, contact the manufacturer

### 4.5 Detaching



- ▶ Care is to be taken when connecting and detaching a trailer. Risk of accident and injury!
- ▶ Additionally observe the safety instructions with respect to connecting included in this instruction manual.

*Detaching:*

- Apply the caravan handbrake.
- Place the wheel chocks behind both of the wheels.
- Remove the connector plug of the caravan from the towing vehicle socket and insert it in the retainer which is to be found on the drawbar.
- Remove the breakaway cable from the towing vehicle.
- Crank the jockey wheel down until it is firmly positioned on the ground. Now loosen the tow coupling.
- Using the jockey wheel, lift the drawbar until the towing vehicle can be driven away without risk.



## 4 Before the journey

### 4.6 Payload



- ▶ Excessive payload and the wrong tyre pressure can cause the tyre to burst. You can lose control of the vehicle.
- ▶ Only the maximum permissible gross weight and the mass in a ready-to-drive condition, not the actual weight of the vehicle, is stated in the vehicle documents. For your own safety, we recommend that you have your loaded vehicle weighed on a public weighbridge before you set out on your journey.
- ▶ Adapt your speed to the payload. The stopping distance is longer when the payload is higher.



- ▷ The maximum permissible gross weight stated in the vehicle documents is not to be exceeded by the payload.
- ▷ **Built-in accessories and special equipment reduce the payload.**
- ▷ Adhere to the axle load stated in the vehicle documents.

Load the caravan so that the drawbar coupling head is not pushed downwards due to the permissible nose weight. Heavy objects should be close to the axles and a weight centre should be in the centre of the vehicle.

When loading the caravan observe:

- The permissible maximum caravan load
- The maximum permissible nose weight (e.g. 50 kg)
- The minimum nose weight of 25 kg to German Traffic Licencing Regulations ("Straßenverkehrszulassungsordnung" (StVZO))

This information is in the towing vehicle instruction manual.

#### Maximum permitted payloads

Description	Load (kg)
Bunk beds	80
Folding beds	50
Single beds	100
Roof load (distributed load)	100
Drawers	10

#### 4.6.1 Terms



- ▷ In technical and scientific texts the term "mass" has replaced the term "weight". However the term "weight" is still the more common term in general usage. To contribute toward understanding the term "mass" is therefore only used in established phrases in the following passages.
- ▷ All specifications according to EU norm DIN EN 1645-2.

#### Maximum permissible gross weight in a laden condition

The maximum permissible gross weight is a value set by the manufacturer which the vehicle must never exceed, even when loaded, for safety reasons (e.g. 3,500 kg). Information on the technically permissible gross weight can be found in the registration documents (field F.1) and on the body manufacturer's nameplate attached to the vehicle.

The maximum permissible overall weight in laden condition consists of the **mass in ready-to-drive condition** and of the **payload**.

In order to determine the remaining payload capacity, it is important that the real weighed mass of the vehicle is known.

## 4

# Before the journey

Upon completion of your vehicle, Dethleffs will determine the real weight of the vehicle by weighing it at the end of the production belt. This includes the mass in ready-to-drive condition plus the weight of all ordered and factory-fitted special equipment.

Based on this actually weighed mass, the remaining payload capacity for luggage or other accessories can be calculated.

Example:

Technically permissible gross weight	Real weighed mass	Passenger weight	Remaining payload option
3500 kg	3000 kg	225 kg (3 × 75 kg)	275 kg



- ▷ The factory calculation of the remaining payload capacity for the mass of the driver (included in the real weighed mass) and the passenger weight is a flat rate of 75 kg per seat. Due to differing body weights, the real remaining load capacity of your vehicle may be affected.
- ▷ All specifications according to EU norm DIN EN 1645-2.

### Mass in ready-to-drive condition

The mass in ready-to-drive condition is the weight of the ready-to-drive standard vehicle.

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

- Unladen weight (mass of the empty vehicle) with factory-installed standard equipment
- Basic equipment weight

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

- 15 l Fresh water
- Aluminium gas bottles filled up to 100%
- A full heating system
- A full toilet flushing system

The waste water and sewage tanks are empty.

### Example for calculating the basic equipment with one gas bottle

Fresh water	15 kg
Filled aluminium bottle gas	+ 16 kg
<b>Total</b>	<b>= 31 kg</b>

The actual mass in ready-to-drive conditions including basic equipment in specified in the CoC (Certificate of Conformity).

### Payload

The payload is made up as follows:

- Additional equipment
- Personal equipment

Explanations of the individual components of the payload are contained in the following text.



- ▷ The payload of the vehicle can be increased by reducing the vehicle mass complete in a ready-to-drive condition. To this purpose it is permissible, for example, to empty the liquid tanks or to remove the gas bottles.

## 4

# Before the journey

### Additional equipment

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

- Roof rail
- Spare wheel
- Awning
- Bike rack
- Satellite unit
- Microwave oven
- Hot water supply

Chapter 17 lists the weights of the various items of special equipment; they may also be obtained from the manufacturer.

### Personal equipment

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

- Foodstuffs
- Crockery
- Television
- Radio
- Clothes
- Bedding
- Toys
- Books
- Toiletries

No matter where kept, personal equipment also includes:

- Bikes
- Boats
- Surfboards
- 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 payload  $M$  (kg) =  $10 \times N + 10 \times L$

**Explanation**  $N$  = maximum number of beds, as stated by the manufacturer  
 $L$  = total length of the caravan in metres, not including the drawbar

**Example** Caravan with 4 beds and a length of 5 m:  
Minimum payload  $M$  (kg) =  $10 \times 4_{\text{beds}} + 10 \times 5_{\text{metres}} = 90 \text{ kg}$

# 4

## Before the journey

### 4.6.2 Calculating the payload



- ▶ Payload calculation at the manufacturer is partly based on all-inclusive weights. For safety reasons, the maximum permissible gross weight in a laden condition must not be exceeded.
- ▶ Only the maximum permissible gross weight and the mass in a ready-to-drive condition, not the actual weight of the vehicle, is stated in the vehicle documents. For your own safety, we recommend that you have your loaded vehicle weighed on a public weighbridge before you set out on your journey.

The payload (see Section 4.6.1) is the difference in weight between

- Maximum permissible gross weight in a laden condition and
- Vehicle mass complete in a ready-to-drive condition.

#### Example for calculating the payload

	Mass in kg to be calculated	Calculation
Maximum permissible gross weight according to vehicle documents, Field F.1	1500	
Actual mass in a ready-to-drive condition, including basic equipment according to CoC	- 1200	
<b>This results in a permissible payload of</b>	<b>300</b>	
Additional equipment	- 40	
<b>For the personal equipment this results in</b>	<b>= 260</b>	

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

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

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

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

## 4

# Before the journey

### 4.6.3 Loading the caravan correctly



- ▶ Never exceed the max. permissible gross weight.
- ▶ Distribute the load evenly between the left-hand and right-hand sides of the vehicle.
- ▶ Securely store all the objects so that they cannot slide or slip.
- ▶ Store heavy objects (awning, canned food, etc.) close to the axles. Low-lying storage compartments whose doors do not open in the direction of travel are particularly suited for storing heavy objects.
- ▶ Store lighter objects (laundry) in the roof storage compartments.
- ▶ Never concentrate the caravan load at the rear.

The payload arrangement recommended cannot be adhered to consequently as the storage facilities are to be found throughout the complete caravan. Ensure that heavy items are close to the axles and the lower area, i.e. directly above the vehicle floor. Store heavy objects (awning, tin cans, etc.), if possible, in the towing vehicle.

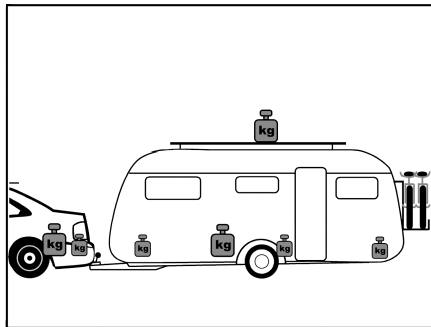


Fig. 4 Incorrect weight distribution

#### Incorrectly loaded

Loads stored apart from each other (Fig. 4) lead to inclination to skid. Roof loads impair the driving characteristics and move the centre of gravity upwards. This increases the inclination to skid.

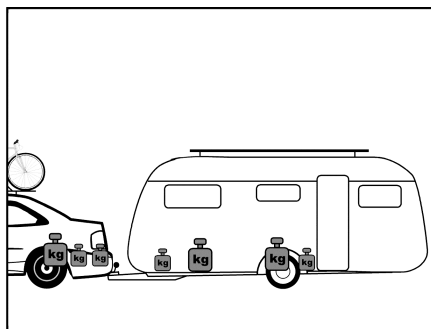


Fig. 5 Correct weight distribution

#### Correctly loaded

Do not store heavy objects such as awnings, tin cans, etc. in the caravan but rather in the towing vehicle. Secure bicycles on the roof of the towing vehicle. Store all loads close to the axle (Fig. 5).

## 4 Before the journey

### 4.6.4 Caravan load, nose weight and axle load



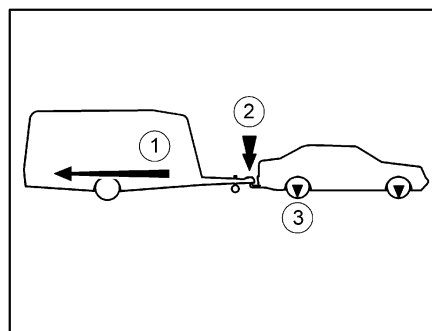
- ▶ If the caravan is licenced for a maximum speed of 100 km/h, always set the maximum possible nose weight.



- ▶ The maximum nose weight is limited by the maximum nose weight of the towing vehicle or the maximum nose weight of the individual chassis components on the drawbar.



- ▶ The information on the towing vehicle documents is important for the selection of the car and caravan.
- ▶ For information about the 100 km rule also refer to Section 5.1.



- 1 Tow load
- 2 Nose weight
- 3 Axle load

Fig. 6 Caravan load, nose weight and axle load

**Tow load** The tow load (Fig. 6,1) stipulated in the towing vehicle documents provides information as to the **maximum weight** which the towing vehicle is permitted to tow. The tow load refers to the **actual** weight of the caravan and **not** to the maximum permissible gross weight of the caravan.

**Example** The towing vehicle may tow 1200 kg. If the caravan has a maximum permissible gross weight of 1200 kg and in fact weighs 900 kg, it can be loaded with another 300 kg. If however the caravan has a maximum permissible gross weight of 1400 kg, it may only be loaded to a maximum of 1200 kg.

**Nose weight** The nose weight (Fig. 6,2) specifies how much weight the caravan drawbar can apply to the tow coupling of the towing vehicle. Information is to be found in description of the tow coupling and the vehicle documents. Therefore, a tow coupling with a permissible nose weight of 50 kg may not support a loaded caravan which has a nose weight of 75 kg. Additionally, for the permissible gross weight the nose weight must be taken into consideration. If necessary the payload in the towing vehicle must be reduced by the amount of the nose weight.

The maximum permissible gross weight for the towing vehicle and for the caravan is not to be exceeded.



- ▶ Only when the nose weight is adapted optimal to the towing vehicle and caravan combination, the towing vehicle and caravan achieves its maximum stability and safety in highway traffic. The optimal nose weight is simultaneously the maximum possible nose weight.

## 4

# Before the journey

- Please refer to the vehicle documents and the description of the tow coupling for the maximum permissible nose weight.
- If different values are specified in the vehicle documents and in the description of the tow coupling: Select the **lowest** value. This value is the **maximum possible nose weight** for the towing vehicle and caravan.
- Check the nose weight before each journey, e.g. with a nose weighing scales. To obtain a correct value, position the nose weighing scales vertical under the coupling jaw and place the caravan drawbar horizontal.
- The caravan is equipped with a buoyancy weight in the form of sandbag/sandbags, if applicable. If the necessary nose weight is reached without these weights (e.g. by gas bottle etc.), they may be removed.
- The payload in the caravan must be distributed in such a way that the measured nose weight comes as close as possible to the maximum permissible nose weight. The maximum permissible nose weight is not to be exceeded.

### Axle load

The axle load (Fig. 6,3) is also specified in the vehicle documents of the towing vehicle and provides information concerning the permissible maximum load for the front and rear axles. The axle load may not be exceeded by a trailer. The above illustration shows where which forces act on the car and caravan.

### 4.6.5 Roof loads



- ▶ Only step on the ladder if the rear corner steadies have been extended **or** if the caravan is connected to the towing vehicle **or** if the caravan is supported at the rear to prevent it from tilting. Otherwise the caravan can tip over to the back. Danger of falling!
- ▶ Take care when stepping onto the ladder. There is danger of slipping if the ladder is wet or icy.
- ▶ Take care when stepping onto the roof. There is danger of slipping when the roof is wet or icy.
- ▶ Do not place too much load on the roof. The road behavior and the stopping behavior deteriorate as the roof load increases.
- ▶ Observe maximum roof load of 100 kg!



- ▷ **The vehicle roof is not suitable for localised load. Before stepping on to the roof, extensively cover the area you will be treading on. Materials with a smooth or soft surface are suitable, for example, a thick polystyrene panel.**
- ▷ The maximum permissible roof load amounts to 100 kg.
- ▷ If the vehicle is equipped with a roof rail, load racks can be mounted on the roof rail for roof loads (e.g. for surfboards, rubber boats or light canoes). Special girder systems are available as accessories of third-party manufacturers.
- ▷ Secure roof loads with tension belts. Do not use rubber expanders.
- ▷ Observe the overall height of the vehicle when the roof rack is loaded.



- ▷ A clearly visible notice stating the overall height should be attached to the towing vehicle.

## 4 Before the journey

### 4.7 PVC floor covering



- ▷ 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.

### 4.8 Television



- ▶ Before starting your journey, remove the television from the support and store it securely.
- ▶ Before commencing the journey, place and secure the flat screen and screen support in the initial position. If the screen holder is installed in a TV cabinet: Close TV cabinet.
- ▶ Before commencing the journey, ensure that the antenna is in park position. Danger of accidents! Park position means: The antenna points towards the back, is fully lowered and is locked in this position.



- ▷ For further information about positioning the flat screen see Chapter 7.

#### Holder with jointed arm

The flat screen is fastened to a jointed arm.

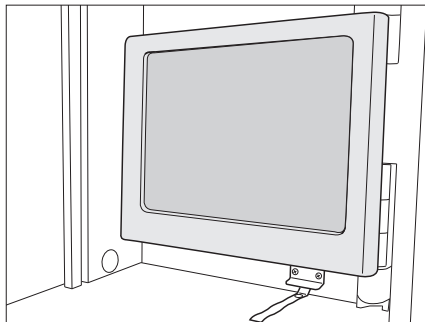


Fig. 7 Holder with jointed arm

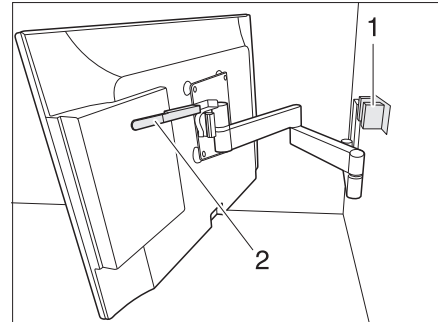


Fig. 8 Holder with jointed arm

#### Storing the flat screen:

- Swivel the flat screen back to its initial position and let it latch into the latch (Fig. 8, 1).



## 4 Before the journey

### 4.9 Sink cover

A sink cover can be placed loose onto the sink.



- ▶ Stow the sink cover securely again before setting off.

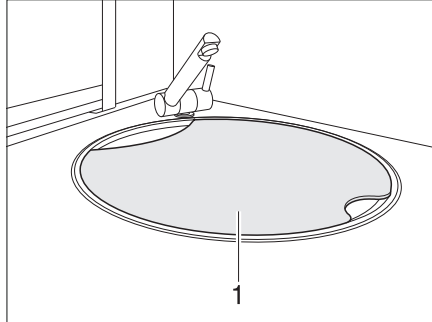


Fig. 9 Sink cover

*Stowing the sink cover:*

- Take the sink cover out of the sink and stow it in a storage compartment.

### 4.10 Road safety



- ▶ Check the tyre pressure before a journey and at 2-week intervals. Wrong tyre pressure causes excessive wear and can lead to damage or even to tyre burst. You can lose control of the vehicle.
- ▶ Superstructures such as air conditioning unit, satellite antenna, etc. can influence the vehicle height.

Before commencing the journey, work through the checklist:

**Towing vehicle with caravan**

No.	Checks	Checked
1	All vehicle documents are on board	
2	Two external mirrors fitted to towing vehicle	
3	Nose weight has not been exceeded or fallen below the minimum	
4	Tyres in proper condition	
5	Road lighting system working	
6	Overrun brake functions correctly	
7	Brakes react evenly	
8	When braking, the towing vehicle and caravan remain in the lane	
9	Overall height measured and noted. Keep the height information close at hand in the towing vehicle	

**Water system housing body**

10	Mobile waste water tank stored away and secured in the gas bottle compartment	
11	Water system emptied in case of risk of frost. Watertaps and drain cocks open	

# 4

## Before the journey

### Housing body, outside

No.	Checks	Checked
12	Awning completely retracted	
13	Roof free of snow and ice (in winter)	
14	External connections and lines disconnected and stored away	
15	External supports removed	
16	Corner steadies and jockey wheel cranked as high as possible	
17	Wheel chocks removed and stored away	
18	Entrance step securely stored	
19	External flaps closed and locked	
20	Drive-on ramp is fully pushed in and locked in place	
21	Conversion door locked	
22	Switch the awning light off	


### Housing body, inside

23	Windows and skylights closed and locked	
24	Television secured in the TV cabinet or removed from the support and stored securely	
25	Television antenna retracted (if one is built in)	
26	Loose parts stored away or fixed in position	
27	Open storage spaces empty	
28	No gas cartridges or other easily flammable materials stored in the roof cupboard of the awning light	
29	Refrigerator door secured	
30	Refrigerator set to 12 V operation	
31	All drawers and flaps closed	
32	Inner doors and table secured	
33	Dinette table hooked in the lower mounting rail	
34	Lift-off table lowered and secured to the benches	
35	Folding beds or adjustable beds are locked in place	
36	Sink cover is stored securely	

### Gas system

37	Gas bottles firmly fixed in the gas bottle compartment so that they are unable to turn	
38	Protective cap set on top of the gas bottle	
39	Regulator tap on the gas bottle and gas isolator taps are closed	

### Electrical system

40	<p>Check the battery voltage of the living area battery (see Chapter 9). If the panel indicates that the battery voltage is too low, the living area battery has to be recharged. Observe the instructions in Chapter 9</p> <p> ▷ Commence the journey with fully charged living area battery.</p>	
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# 5

## During the journey

### Chapter overview

This chapter contains instructions on how to drive the caravan.

The instructions address the following topics:

- driving speed
- brakes
- driving in reverse

### 5.1 Driving with the caravan



- ▶ During the journey no persons are to travel inside the caravan.
- ▶ The caravans have been designed for a technically permissible maximum speed of 120 km/h. Observe the country-specific regulations.
- ▶ Please always observe the speed limits in the individual countries (see Chapter 18).



- ▷ During the journey ensure that the angle between the vehicles does not become too narrow. The corners can bump against each other, thus causing major damage to the vehicles. As soon as both vehicles are at an approximate angle of 120° to each other, come to a stop (see Chapter 5.3).
- ▷ In the case of trailer drawbars with support wheels mounted on the side the free steering angle to the corresponding side is reduced slightly.
- ▷ Check whether the awning light is switched off.

The main differences between driving with a caravan and driving without a caravan are the increased vehicle width and length, a decreased acceleration and an increased vehicle stopping distance. Therefore, adapt your driving technique to the altered road behaviour resulting from driving with a caravan.

The maximum speed for towing vehicles and trailers currently amounts to 80 km/h in Germany.

If the following prerequisites are fulfilled, the limit is increased to 100 km/h on motorways and roads solely for motor-powered vehicles:

- The caravan is designed technically for a maximum speed of 100 km/h.
- The maximum permissible gross weight of the towing vehicle may not exceed 3.5 t.
- The towing vehicle is equipped with ABS or an anti-lock device.
- The tyres of the caravan are less than 6 years old (see Chapter 15).
- The tyres of the caravan bear at least the speed index "L" (see Chapter 15).
- The caravan is equipped with hydraulic axle shock absorbers.
- The nose weight corresponds to the maximum possible nose weight (see Section 4.6.4).
- The 100-km sticker, which is available from the vehicle registration office, is to be applied to the rear of the caravan.
- The maximum permissible gross weight of the caravan does not exceed the mass of the towing vehicle.
- The caravan is equipped with a stabiliser conforming to ISO 11555-1 or with a different technical device whose type approval confirms safe operation up to 120 km/h.

Optionally the towing vehicle can be equipped with a special electronic, dynamic-driving stability system for towing. A confirmation by the manufacturer for the stability system has to be available and it has to be entered in the vehicle documents.

## 5 During the journey



- ▷ The driver is responsible for ensuring that the prerequisites for driving at 100 km/h are fulfilled.
- ▷ if the caravan has already been designed by the manufacturer for a speed of 100-km, this is noted in the registration documents of the caravan.
- ▷ Always have the certification of the approval for 100-km operation with you during the journey.

### 5.2 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:

- Does the overrun brake function?
- Do the brakes react evenly?
- Do the towing vehicle and the caravan remain on track when braking?

### 5.3 Driving in reverse



- ▷ When driving in reverse, the caravan reacts in exactly the opposite direction to the steering movements of the towing vehicle. If you steer the towing vehicle to the left, the caravan moves to the right!
- ▷ Never back up without a second person to direct you.

As far as all models with an automatic reverse driving mechanism are concerned, the caravan can be reversed without difficulty. In addition to the rolling resistance, residual braking power must be taken into account.

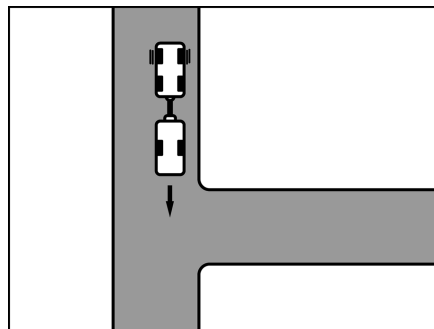


Fig. 10 Approach

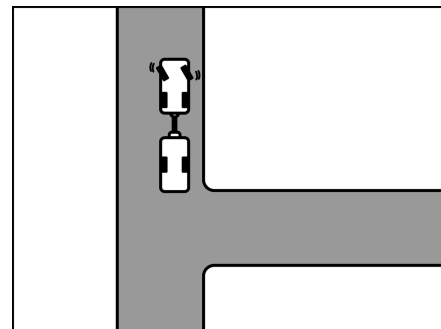


Fig. 11 Steer to the left

#### Driving in reverse:

- Drive up to the entrance until the rear of the caravan is roughly level with the entrance (Fig. 10).
- With a stationary towing vehicle and trailer turn the steering wheel to the left (Fig. 11).
- Reverse with caution. The caravan moves to the right.

## 5 During the journey

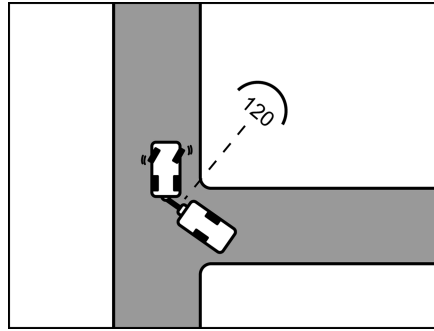


Fig. 12 Approach

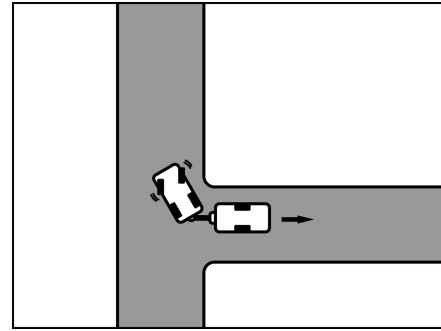


Fig. 13 Steer to the right



- ▷ The angle between the vehicles must not be too narrow, otherwise the corners will bump against each other. This can cause major damage to the vehicles. Get someone to direct you!
- ▷ The specified angle also applies for driving forwards!
- As soon as both vehicles are at an approximate angle of  $120^\circ$  to each other, come to a stop (Fig. 12).
- Turn the steering wheel to the right and reverse with caution (Fig. 13).
- Continue to reverse, correcting the steering if necessary.
- For the last 2 to 3 m, turn the steering wheel to the left once more so that the towing vehicle and trailer are in line.

## 6 Pitching the caravan

### Chapter overview

This chapter contains instructions on how to pitch the vehicle.

The instructions address the following topics:

- handbrake
- wheel chocks
- operation of the supports
- entrance step
- mobile waste water tank
- 240 V connection
- refrigerator



- ▷ Pitch the vehicle so that it is as horizontal as possible. 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.

### 6.1 Handbrake

Firmly apply the handbrake when parking the vehicle.

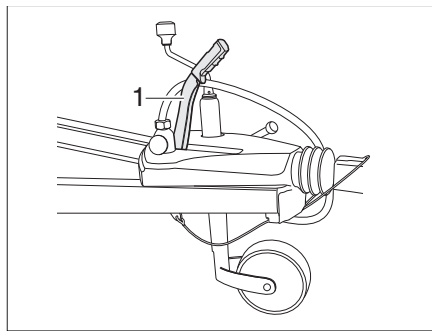


Fig. 14 Handbrake

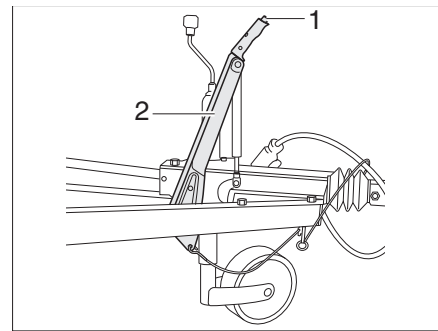


Fig. 15 Alternative: Handbrake

*Release the handbrake*

- To release, pull the brake lever (Fig. 14,1) up and then lower it.

*Alternative: Release the handbrake*

- In order to release it, press the securing button (Fig. 15,1) and lower the handbrake (Fig. 15,2).



- ▶ Brake lever may not contact in an emergency. Ensure that the brake lever can still move freely after activation via the breakaway cable (handbrake in closed position). It is imperative that the clearance be observed!  
If the handbrake contacted the road surface, the emergency brake function would not function.



- ▷ Prior to releasing the handbrake, lift the handbrake slightly. This enables the safety knob which is subjected to spring pressure to be pushed in more lightly.
- ▷ If there is any risk of frost, release the handbrake every now and then and apply it again. This will prevent it from freezing or rusting. Prior to releasing the handbrake, secure the vehicle so that it cannot roll away.

## 6 Pitching the caravan

### 6.2 Wheel chocks

Use the two wheel chocks even when the upward or downward gradients are of a minimum. The wheel chocks are located respectively in the gas bottle compartment of the caravan.

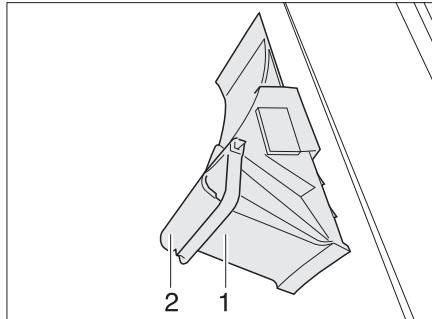


Fig. 16 Wheel chock

- Removal:*
- Swivel the retaining clip (Fig. 16,2) down.
  - Remove the wheel chock (Fig. 16,1) from the holder.

### 6.3 Corner steadies



- ▷ **Do not use the fitted corner steadies as a vehicle jack. The corner steadies are only for stabilising the pitched vehicle. The vehicle wheels are not to be raised above the ground.**
- ▷ When pitching the vehicle ensure that load is placed evenly on the corner steadies.
- ▷ Before driving away, turn in the corner steadies upwards completely until they stop.
- ▷ The corner steadies may not be used to level the caravan's position on uneven terrain.



- ▷ When the ground is soft, place a large-surface pad or wood under corner steadies in order to prevent the vehicle from sinking into the ground.

In order to stabilise the pitched caravan use the corner steadies fitted as standard. With the assistance of the jockey wheel position the pitched caravan in a horizontal position. For control purposes use a small spirit level.

Crank down the corner steadies after the caravan is in an absolutely horizontal position.



- ▷ Do not lubricate the spindle of the corner steadies. Spray corner steady with conventional Teflon spray.

## 6

# Pitching the caravan

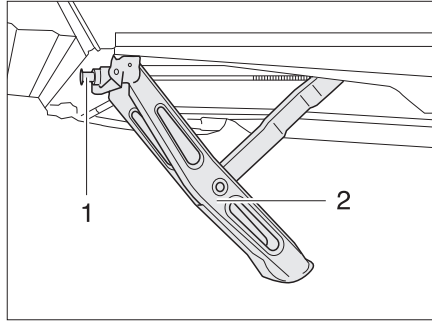


Fig. 17 Corner steady cranked down

- Cranking down:*
- Place the hand crank provided as standard on the hexagonal nut (Fig. 17,1) of the corner steady (Fig. 17,2).
  - Rotate the hand crank in a clockwise direction. The corner steady is swung downwards.

- Cranking upwards:*
- Turn the crank handle anticlockwise. The corner steady is swung upwards.

### 6.4 Entrance step (free-standing)



- ▶ Ensure that the entrance step is positioned on an even and stable surface. This will prevent the entrance step from toppling over.
- ▶ Do not step on the edges of the entrance step. Danger of slipping!
- ▶ Secure the entrance step to the ground, for example, with tent pegs. This way the entrance step cannot slip away.

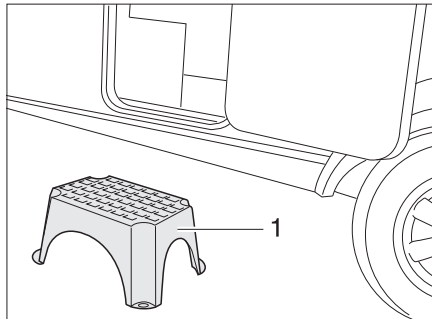


Fig. 18 Entrance step (free-standing)

- Place the entrance step (Fig. 18,1) in front of the entrance to the caravan.



## 6 Pitching the caravan

### 6.5 Waste water tank, mobile

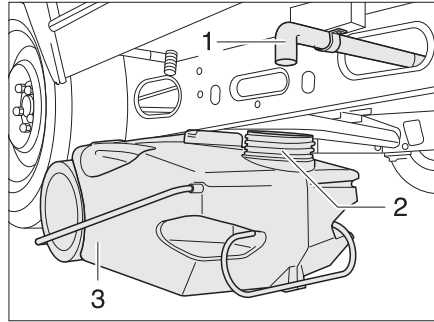


Fig. 19 Waste water tank, mobile

During the journey the waste water tank (Fig. 19,1) is stored in the gas bottle compartment of the caravan. The drain pipe (Fig. 19,3) of the caravan is located on the floor of the vehicle on the left in the direction of travel.

Before using the water system: Place the waste water tank under the caravan so that the opening (Fig. 19,2) of the waste water tank is positioned under the drain pipe.

### 6.6 240 V connection

The vehicle can be connected to a 240 V power supply (see Chapter 9).

### 6.7 Refrigerator



- ▷ The 12 V operation of the refrigerator already functions as soon as a towing vehicle is connected. If the vehicle engine is switched off, set the refrigerator to 230 V operation or gas operation so that the battery is not discharged. The 12 V operation is only possible if the ignition is switched on.

#### Battery pack for Thetford N4000 operating panel (option)



A battery pack that is located under the operating panel is available optionally for Thetford N4000 models. The battery pack supplies current to the operating panel when the refrigerator is operated with gas.

- ▷ There are no batteries in the works state of delivery. 6×1.5 V Size AA batteries are required for the battery pack.

# 7

## Living

### Chapter overview

This chapter contains instructions about living in the vehicle.  
The instructions address the following topics:

- opening and closing the doors and external flaps
- heating the vehicle
- ventilation of the vehicle
- opening and closing the windows and blinds
- opening and closing the skylights
- converting tables
- positioning the television
- lamps
- extending the seating groups
- using the beds

### 7.1 Doors



▶ Only drive with the doors locked.



- ▷ 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 a set of traffic lights.
- ▷ When leaving the vehicle, always lock the doors.
- ▷ At conversion doors with a left opening locking and opening is carried out mirror-inverted to the shown conversion door.

#### 7.1.1 Conversion door, outside (hinged handle)

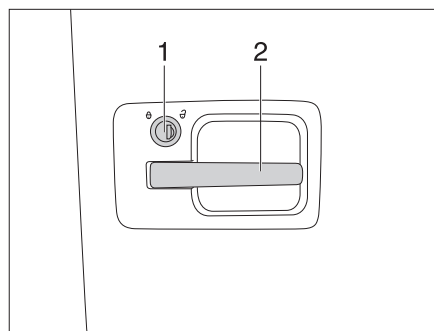


Fig. 20 Door lock, outside

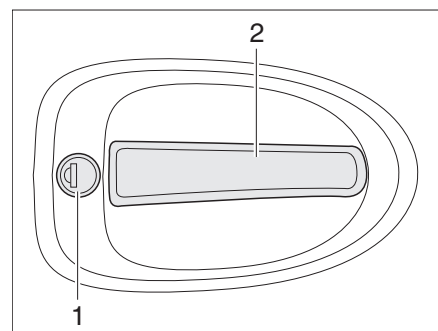


Fig. 21 Door lock, outside

- Opening:**
- Insert the key in the locking cylinder (Fig. 20,1 and Fig. 21,1) and turn clockwise until the door lock is unlatched.
  - Return the key to the central position and remove it.
  - Pull on the handle (Fig. 20,2 and Fig. 21,2). The door is open.
- Locking:**
- Insert the key in the locking cylinder (Fig. 20,1 and Fig. 21,1) and turn it anti-clockwise until the door lock is engaged.
  - Return the key to the central position and remove it.

# 7

## Living

### 7.1.2 Conversion door, inside

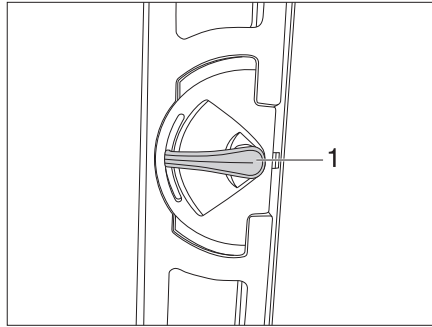


Fig. 22 Variant 1: Door lock of conversion door, inside, open

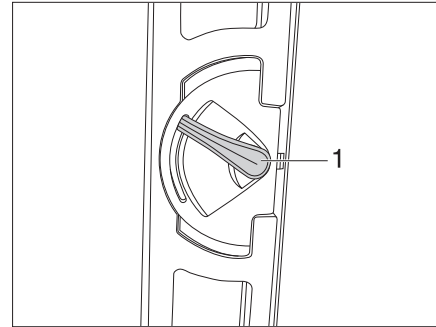


Fig. 23 Variant 1: Door lock of conversion door, inside, locked

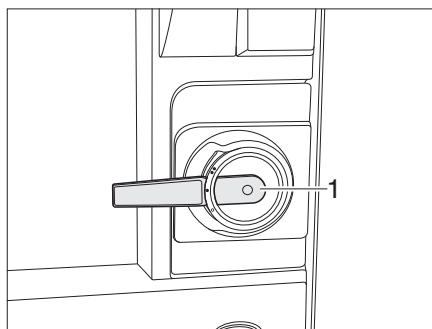


Fig. 24 Variant 2: Door lock of conversion door, inside, open

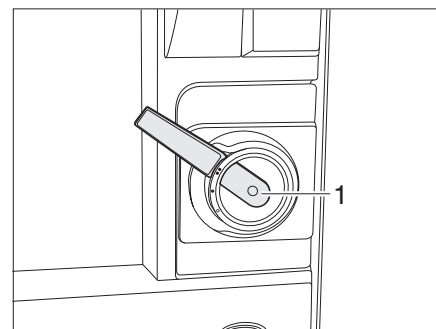


Fig. 25 Variant 2: Door lock of conversion door, inside, locked

**Opening:** ■ Push the handle (Fig. 22,1 or Fig. 24,1) down.

**Locking:** ■ Turn the handle (Fig. 23,1 or Fig. 25,1) approx. 45° upward and leave it in this position.

#### Conversion door, inside (with locking lever)



▷ Do not use the handle as a hook for clothes, bags and similar objects.

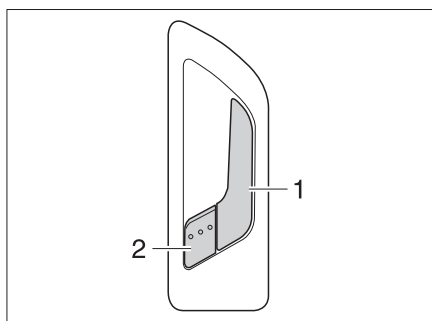


Fig. 26 Door lock of conversion door, inside

## 7

## Living

**Opening:** ■ Pull on the handle (Fig. 26,)1. The door lock is unlatched. The locking lever (Fig. 26,2) jumps out automatically.

**Locking:** ■ Press the locking lever (Fig. 26,2).

### 7.1.3 Insect screen on the conversion door



- ▷ Material damage possible when the conversion door is closed while the insect screen is pulled out. Do not bang the conversion door shut.
- ▷ Slide the insect screen in completely before the conversion door is closed.

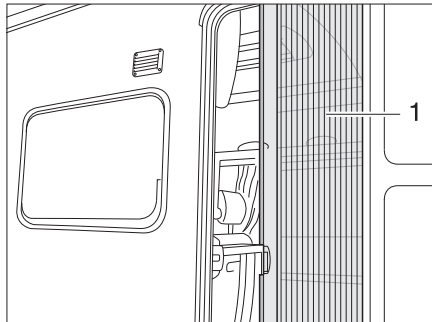


Fig. 27 Insect screen

**Opening:** ■ Pull out the insect screen completely by the handle (Fig. 27, 1).

**Closing:** ■ Slide back the insect screen by the handle (Fig. 27, 1).

### 7.1.4 Conversion door blind (variant 1)

The blind of the conversion door is located in the upper blind box.

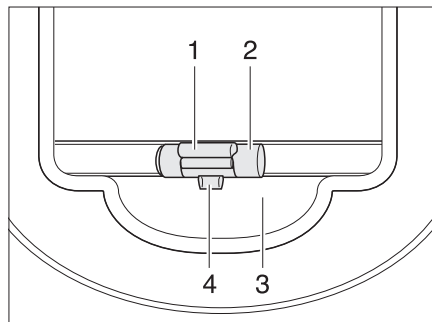


Fig. 28 Blind

**Closing:** ■ Pull blind downwards by the handle (Fig. 28,2) and lock it into place.

**Opening:** ■ Pull blind downwards gently by the handle (Fig. 28,2) and push the unlocking bar (Fig. 28,1) outwards. The lock (Fig. 28,4) is released from the holder (Fig. 28,3).

■ Use handle to return the blind slowly to its initial position.

## 7

## Living

### 7.1.5 Conversion door blind (variant 2)

The conversion door window is fitted with a Roman shade.

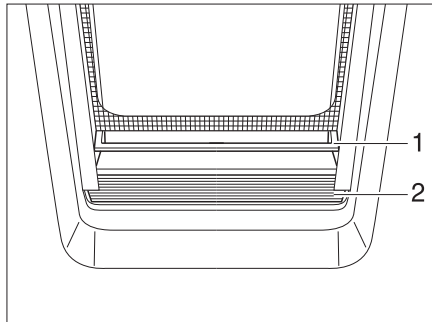


Fig. 29 Roman shade

*Closing:* ■ Grip the Roman shade (Fig. 29,2) in the middle of the holding bar (Fig. 29,1), pull it upwards and then release it at the desired height. The Roman shade will stay at this height.

*Opening:* ■ Grip the Roman shade in the middle of the holding bar and push it down.

### 7.2 External flaps



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



- ▷ 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.

## 7

# Living

### 7.2.1 Flap lock with recessed handle



- ▷ To open the external flap, simultaneously pull all the lock handles fitted to the external flap.

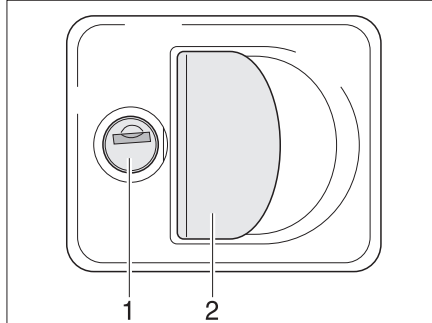


Fig. 30 Flap lock with recessed handle

- Opening:**
- Insert the key into the locking cylinder (Fig. 30,1) and turn a quarter turn. The flap lock is unlatched.
  - Remove the key.
  - Pull on the lock handle (Fig. 30,2). The external flap is open.

- Closing:**
- Firmly close the external flap.
  - Insert key into locking cylinder and turn a quarter turn. The flap lock is locked.
  - Remove the key.

### 7.2.2 Flap lock, elliptical



- ▷ During rain, water can penetrate the opened flap lock. Therefore close the lock handle.

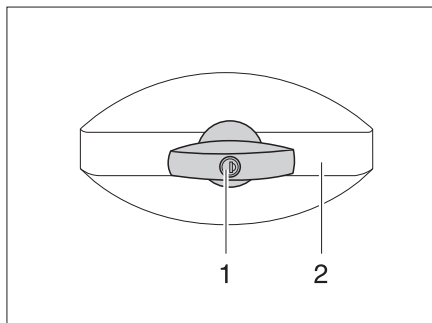


Fig. 31 Flap lock, elliptical, locked

- Opening:**
- Insert the key into the locking cylinder (Fig. 31,1) and turn a quarter turn anti-clockwise. Lock handle (Fig. 31,2) is released.
  - Remove the key.
  - Turn lock handle one quarter turn in an anticlockwise direction. The flap lock is open.

## 7

## Living

- Closing:*
- Firmly close the external flap.
  - Turn the lock handle clockwise until it is positioned horizontally. The flap lock is latched in but not yet engaged.
  - Insert the key into the locking cylinder.
  - Press down lock handle with key inserted and turn key a quarter turn in a clockwise direction. The lock handle will stay bolted.
  - Remove the key.

### 7.2.3 Flap lock, rectangular

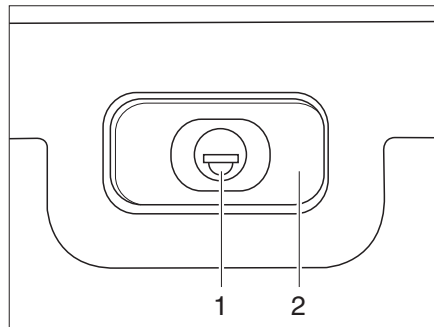


Fig. 32 Flap lock, rectangular, locked

- Opening:*
- Insert the key into the locking cylinder (Fig. 32,1) and turn a quarter turn. Lock handle (Fig. 32,2) is released.
  - Remove the key.
  - Turn the lock handle one quarter turn. The flap lock is open.
- Closing:*
- Firmly close the external flap.
  - Turn the lock handle until it is positioned horizontally. The flap lock is latched in but not yet closed.
  - Insert the key into the locking cylinder.
  - Press down lock handle with key inserted and turn key a quarter turn. The lock handle will stay bolted.
  - Remove the key.

# 7

## Living

### 7.2.4 Turnbuckle lock

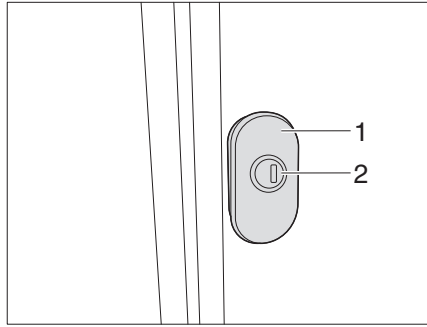


Fig. 33 Turnbuckle lock (variant 1)

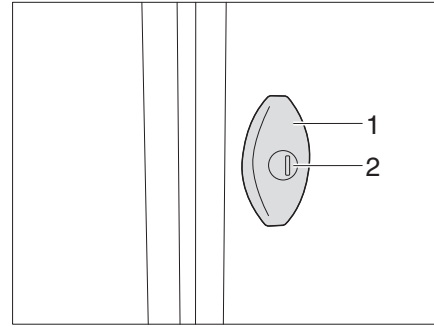


Fig. 34 Turnbuckle lock (variant 2)

With the turnbuckle lock, the bolt pulls the flap onto the seal by rotating the handle through 180°.

- Opening:*
- Insert the key into the locking cylinder (Fig. 33/ Fig. 34,1) and turn a quarter turn. The flap lock is unlatched.
  - Remove the key.
  - Pull on the turnbuckle lock (Fig. 33/ Fig. 34,2) and rotate anticlockwise through 180°. The external flap is open.
- Closing:*
- Firmly close the external flap.
  - Rotate the turnbuckle lock clockwise through 180°. The flap is pulled onto the seal.
  - Insert key into locking cylinder and turn a quarter turn. The flap lock is locked.
  - Remove the key.



## 7

# Living

### 7.2.5 Flap lock with push buttons

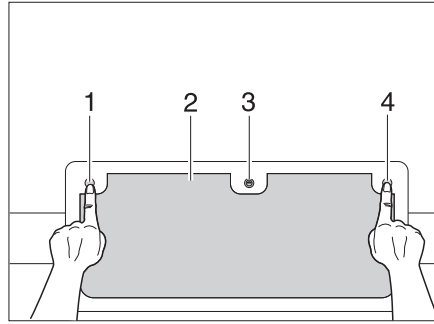


Fig. 35 Flap lock with buttons, locked

- Opening:**
- Insert the key into the locking cylinder (Fig. 35,3) and turn a quarter turn.
  - Remove the key.
  - Press in the three push buttons (Fig. 35,1, 3 and 4).
- Closing:**
- Close the external flap (Fig. 35,2) completely until it engages audibly.
  - Insert the key into the locking cylinder (Fig. 35,3) and turn a quarter turn. The lock is locked.
  - Remove the key.

### 7.2.6 Flap for toilet cassette

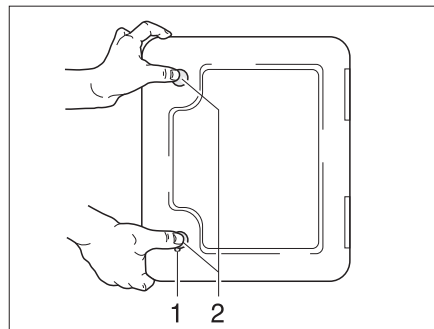


Fig. 36 Flap for toilet cassette

- Opening:**
- Insert the key into the locking cylinder of the push-button lock (Fig. 36,1) and turn a quarter turn.
  - Remove the key.
  - Press both push-button locks (Fig. 36,2) simultaneously with your thumb and open the flap for the toilet cassette.
- Closing:**
- Close the flap for the toilet cassette and press it shut.
  - Insert the key into the locking cylinder (Fig. 36,1) and turn a quarter turn.
  - Remove the key.

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### 7.2.7 External flap 240 V connection

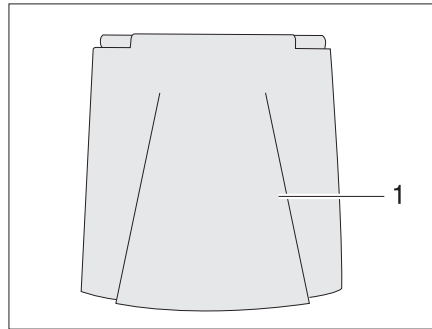


Fig. 37 External flap 240 V connection

*Opening:* ■ Swivel the external flap (Fig. 37,1) upward.

*Closing:* ■ Swivel the external flap (Fig. 37,1) downward and press it shut.

### 7.3 Heating



- ▶ During heater operation, the exhaust gas pipe in the wardrobe will get hot. Therefore do not store any heat-sensitive garments immediately next to the exhaust gas pipe (see also Chapter 10).



- ▷ The operation of the heater is described in Chapter 10.

### 7.4 Ventilation



- ▶ The oxygen in the vehicle interior is used up by breathing and the use of gas operated appliances. That is why the oxygen needs to be replaced on a constant basis. For this purpose, forced ventilation options (e.g. skylights with forced ventilation, mushroom-shaped vents or floor vents) 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 CO<sub>2</sub> 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. mushroom-shaped vents, skylight edges, sockets, windows, 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. If the vehicle is laid up for a longer period, occasionally ventilate it well, especially in summer as heat accumulation can occur.

## 7 Living

### 7.5 Windows



- ▷ The windows are fitted with a blind and a roller insect screen. After the latch has been released, the blind and roller insect screen automatically spring back to the initial position by tensile force. In order not to damage the tension mechanics, hold onto the blind or roller insect screen and allow it to slowly return to the initial position.
- ▷ **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 case of strong temperature differences or in extreme weather conditions, light condensation 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.

#### 7.5.1 Hinged window with rotary hinges



- ▷ When opening the hinged windows, ensure that there are no torsional forces. Open and close the hinged windows evenly.

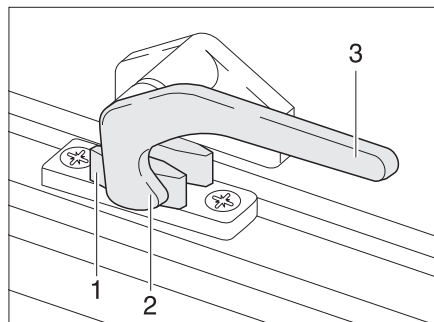


Fig. 38 Catch lever in "closed" position

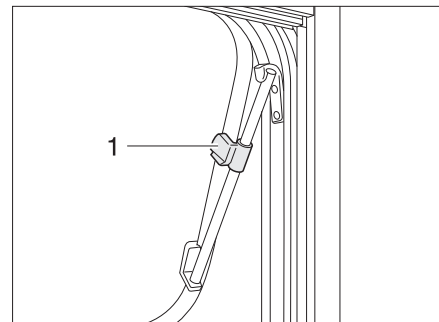


Fig. 39 Hinged window with rotary hinges, open

#### Opening:

- Turn the catch lever (Fig. 38,3) a quarter turn towards the centre of the window.
- Open the hinged window until the required position has been reached and secure in position using the knurled knob (Fig. 39,1).

The hinged window remains locked in the required position.

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## Living

*Closing:*

- Turn the knurled knob (Fig. 39,1) until the latch is released.
- Close the hinged window.
- Turn the catch lever (Fig. 38,3) a quarter turn towards the window frame. The locking catch (Fig. 38,2) is located on the inside of the window catch (Fig. 38,1).

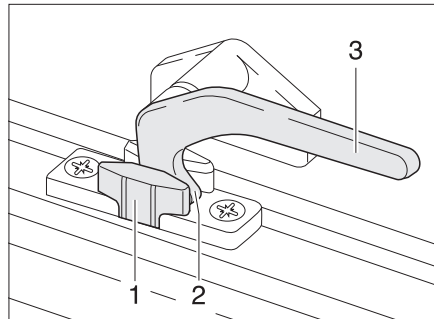


Fig. 40 Catch lever in the "continuous ventilation" position

### Continuous ventilation

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

- "Continuous ventilation" (Fig. 40)
- "Firmly closed" (Fig. 38)

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

- Turn the catch lever (Fig. 40,3) a quarter turn towards the centre of the window.
- Lightly open the hinged window outwards.
- Return the catch lever to its initial position. The locking catch (Fig. 40,2) has to be moved into the recess of window catch (Fig. 40,1).

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

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## Living

### 7.5.2 Hinged window with automatic hinges



- ▷ Open the window completely in order to unblock the locking device. If the locking device is not unblocked and the window is closed nevertheless, there is the danger of the window being torn 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.

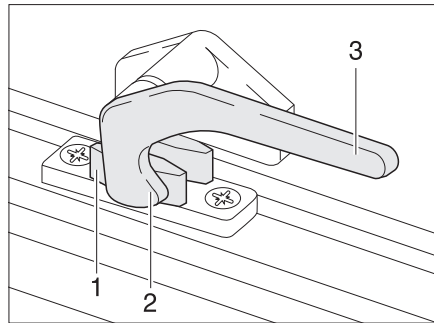


Fig. 41 Catch lever in "closed" position

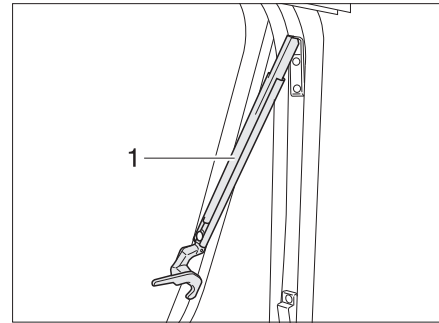


Fig. 42 Hinged window with automatic hinges, open

#### Opening:

- Turn the catch lever (Fig. 41,3) a quarter turn towards the centre of the window.
- Open the hinged window to the desired latched position. The automatic hinge (Fig. 42,1) locks in place automatically.

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. 41,3) a quarter turn towards the window frame. The locking catch (Fig. 41,2) is located on the inside of the window catch (Fig. 41,1).

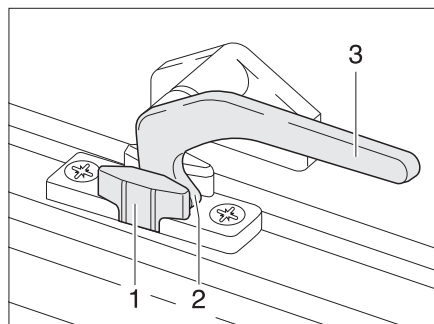


Fig. 43 Catch lever in the "continuous ventilation" position

#### Continuous ventilation

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

- "Continuous ventilation" (Fig. 43)
- "Firmly closed" (Fig. 41).

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

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- Turn the catch lever (Fig. 43,3) a quarter turn towards the centre of the window.
- Lightly open the hinged window outwards.
- Turn the catch lever a quarter turn towards the window frame. The locking catch (Fig. 43,2) has to be moved into the recess of window catch (Fig. 43,1).

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

### 7.5.3 Blind and roller insect screen



- ▷ **Open the blinds and roller screens before starting the journey. If the blinds and roller screens are closed, the spring loads may be damaged through the vibrations and shocks.**



- ▷ Depending on the window size the blinds and roller screens are equipped with one or two handles.

The windows are fitted with a blind and a roller insect screen. The blind and roller insect screen can be adjusted separately.

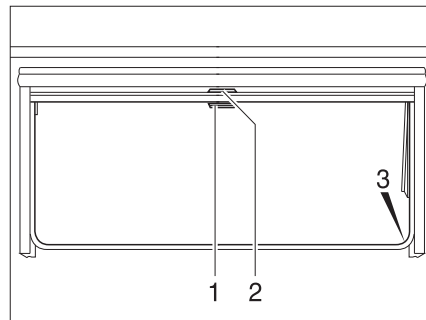


Fig. 44 Hinged window

**Blind** The blind is located in the upper blind box.

- Closing:*
- Pull blind at the handle (Fig. 44,2) downwards. If the blind is to be completely closed, it is suspended into the locking devices (Fig. 44,3) situated on both sides of the window frame.
- Opening:*
- If the blind is completely closed: Press the handle (Fig. 44,2) downwards and, at the same time, tilt it slightly inward. The blind can be taken out of the locking devices situated on both sides of the window frame.
  - If the blind is in an intermediate position: Pull the handle (Fig. 44,2) slightly downwards until the locking device releases.
  - Use handle to return blind slowly to its initial position.

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# Living

### Roller insect screen

The roller insect screen is located in the upper blind box.

- Closing:*
- Pull the roller insect screen at the handle (Fig. 44,1) downwards and hang it into the locking devices (Fig. 44,3) situated on both sides of the window frame.
- Opening:*
- Press the handle (Fig. 44,1) downwards and, at the same time, tilt it slightly inward. The roller insect screen can be taken out of the locking devices situated on both sides of the window frame.
  - Use handle to return the roller insect screen slowly to its initial position.

## 7.6 Skylights

Depending on the model, skylights with or without forced ventilation are fitted to the vehicle. If a skylight is fitted without forced ventilation, the forced ventilation is performed using mushroom-shaped vents.



- ▶ 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.



- ▷ The skylights are fitted with a blind or Roman shade and with a roller insect screen or folding insect screen. After the latch has been released, the blind and roller insect screen automatically spring back to the initial position by tensile force. In order not to damage the tension mechanics, hold onto the blind or roller insect screen and allow it to slowly return to the initial position.
- ▷ **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.
- ▷ Never step on the skylights.
- ▷ Before commencing the journey, close the skylights.
- ▷ Before commencing the journey, check that the skylights are closed and locked.
- ▷ Before commencing the journey, open the blinds or Roman shades.
- ▷ **Apply talc to the rubber seals of the skylights at least twice a year.**
- ▷ **When leaving the vehicle, always close the skylights.**



# 7

## Living

### 7.6.1 Skylight with snap latch

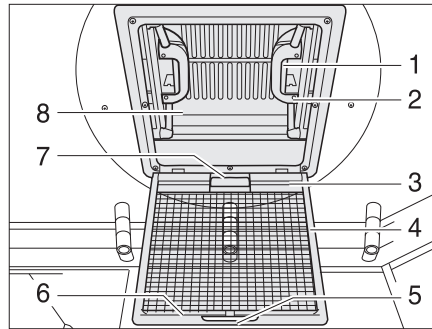


Fig. 45 Skylight with snap latch

The skylight can be pushed upwards either from one side or from both sides. Depending on the version, the skylight is fitted with a blind.

- Opening:*
- Pull on the handle (Fig. 45,5).
  - Fold the insect screen (Fig. 45,4) downwards.
  - Push the spring-loaded latch (Fig. 45,1) towards the inside of the skylight (Fig. 45,8). At the same time use the handle (Fig. 45,2) to press the skylight upwards.
  - Swing the insect screen upwards (Fig. 45,4) until it latches in place.

- Closing:*
- Pull on the handle (Fig. 45,5).
  - Fold the insect screen (Fig. 45,4) downwards.
  - Using both handles (Fig. 45,2), pull down the skylight (Fig. 45,8) with force until the two snap latches (Fig. 45,1) lock into place.
  - Swing the insect screen upwards (Fig. 45,4) until it latches in place.

**Blind** To close and open the blind:

- Closing:*
- Pull the handle (Fig. 45,7) of the blind and hook the hook rail (Fig. 45,3) into the retainer (Fig. 45,6) on the insect screen.
- Opening:*
- Release the hook rail (Fig. 45,3) from the retainer (Fig. 45,6) and feed the blind back slowly.



# 7

## Living

### 7.6.2 Heki skylight (mini and midi)

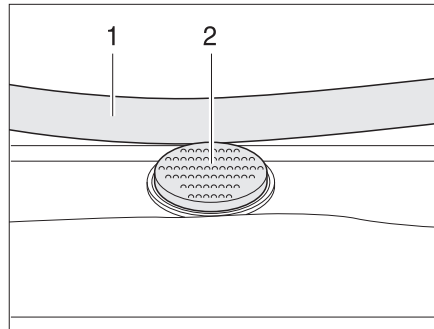


Fig. 46 Safety knob on the Heki skylight

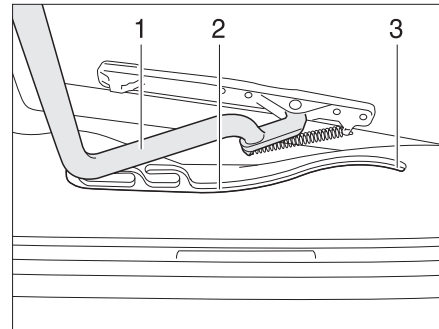


Fig. 47 Heki skylight, guide

The Heki skylight is opened on one side only.

- Opening:**
- Press the safety knob (Fig. 46,2) and pull the bar (Fig. 46,1) down with both hands.
  - Pull the bar (Fig. 47,1) in the guides (Fig. 47,2) to the rearmost position (Fig. 47,3).

- Closing:**
- Use both hands to push the bar (Fig. 47,1) slightly upwards.
  - Push the bar back in the guides.
  - Push the bar upwards with both hands until it is above the safety knob (Fig. 46,2).

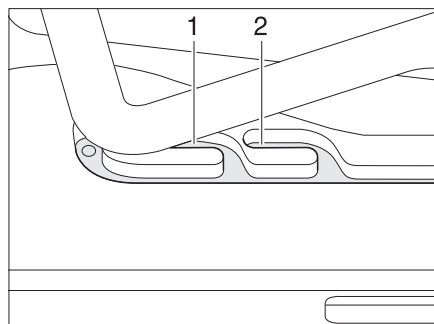


Fig. 48 Heki skylight in ventilation position

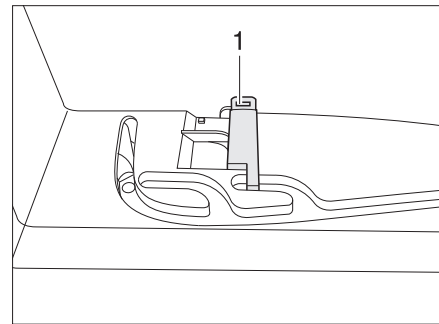


Fig. 49 Ventilation position locking mechanism

#### Ventilation position

The Heki skylight can be put in two ventilation positions: Bad weather position (Fig. 48,1) and central position (Fig. 48,2). Depending on the model, the skylight can be locked in the central position with the latch (Fig. 49,1).

- Press the safety knob (Fig. 46,2) and pull the bar (Fig. 46,1) down with both hands.
- Pull the bar in the guides (Fig. 47,2) to the desired position.
- Push the bar slightly upwards and into the selected guide (Fig. 48,1 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.

### 7.6.3 Heki skylight

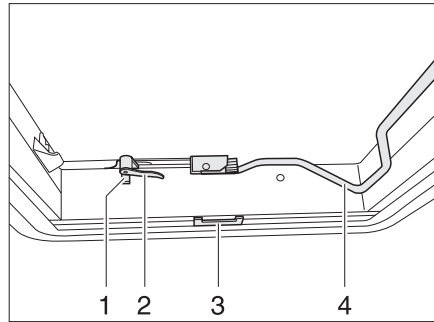


Fig. 50 Heki skylight, closed

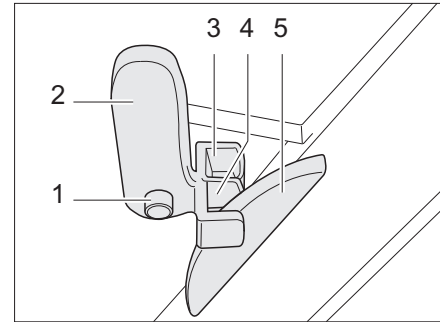


Fig. 51 Heki skylight in ventilation position 1

The Heki skylight may be opened on one side only.

- Opening:*
- Press the safety knob (Fig. 50,1) and turn the catch lever (Fig. 50,2) one quarter turn inward.
  - Pull the bar (Fig. 50,4) downwards out of the latch.
  - Press the Heki skylight upwards using the bar.
  - Press the bar back into the latch.
- Closing:*
- Pull the bar (Fig. 50,4) downwards out of the latch.
  - Pull the Heki skylight downward using the bar.
  - Turn the catch levers (Fig. 50,2 and Fig. 51,2) one quarter turn. The hook of the roof lock (Fig. 51,5) must engage in the upper locking fork (Fig. 51,3).
  - Press the bar back into the latch.

# 7

## Living

Ventilation position  
(Variant 1):

- Open Heki skylight and push lightly outwards.
- Press the safety knob (Fig. 51,1) and turn the catch lever (Fig. 51,2) back. The hook of the roof lock (Fig. 51,5) must engage in the lower locking fork (Fig. 51,4).
- Press the bar back into the latch.

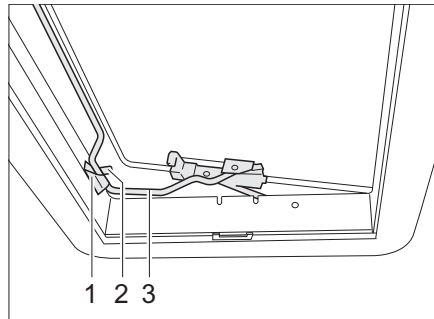


Fig. 52 Heki skylight in ventilation position 2

Ventilation position  
(Variant 2):

- Open Heki skylight.
- Insert the bar (Fig. 52,3) into the holder (Fig. 52,1).
- Place the lever (Fig. 52,2) over the bar.

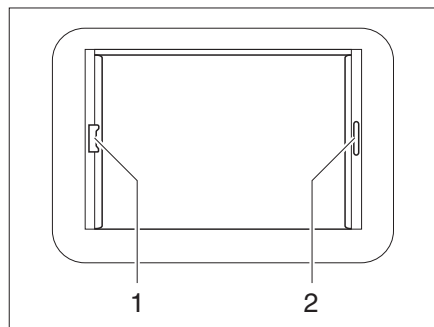


Fig. 53 Heki skylight, blind lock

### Roman shade

To close and open the Roman shade:

*Closing:* ■ Pull out Roman shade at the handle (Fig. 53,2) 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.

### Roller insect screen

To close and open the roller insect screen:

*Closing:* ■ Pull the roller insect screen at the handle (Fig. 53,1) to the opposite handle of the Roman shade (Fig. 53,2) and allow to engage.

*Opening:* ■ At the back, press the roller insect screen handle upward and unhook the roller insect screen at the Roman shade (Fig. 53,2).

■ Use handle to return the roller insect screen slowly to its initial position.

# 7

## Living

### 7.6.4 Wind-up skylight

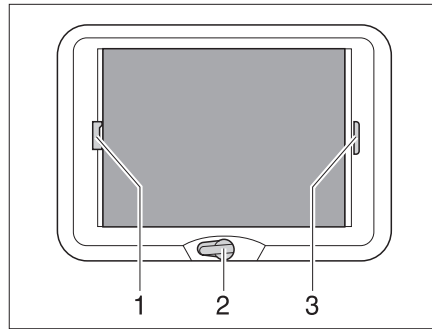


Fig. 54 Wind-up skylight

The wind-up skylight can be opened using the manual crank.

- Opening:*
- Rotate the hand crank (Fig. 54,2) until a resistance can be felt (max. opening angle 70°).
- 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. 54,3) and release 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:*
- Pull insect screen at the handle (Fig. 54,1) to the opposite handle of the Roman shade (Fig. 54,3) and allow to engage.

- Opening:*
- Press the handle of the insect screen (Fig. 54,1) at the back upwards and detach the insect screen from the Roman shade (Fig. 54,3).
  - Slowly push insect screen at the handle to its initial position.

## 7 Living

### 7.7 Tables

#### 7.7.1 Suspension table with fold-out leg

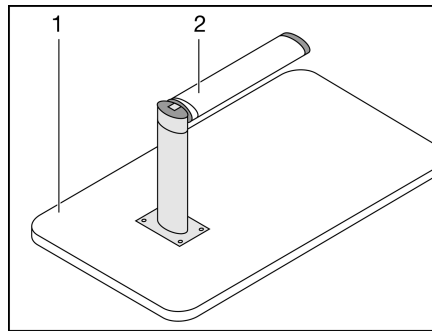


Fig. 55 Bed foundation

The table's fold-out leg enables it to be used as a bed foundation.

*Conversion to bed foundation:*

- Lift the front of the table-top (Fig. 55,1) by approx. 45°.
- Pull the lower part of the fold-out leg (Fig. 55,2) down and fold through 90°.
- Remove the table from its retainer.
- Insert the table into the lower retainer.

#### 7.7.2 Lift-off table

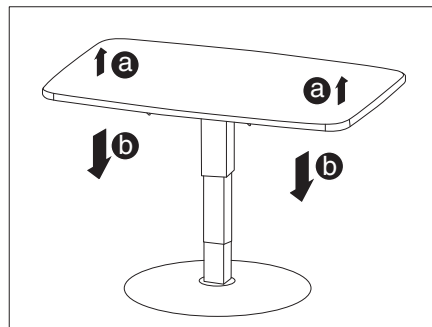


Fig. 56 Lift-off table

The lift-off table can be used as a bed base with the help of its lifting mechanism.

*For bed foundation:*

- Lift up the tabletop briefly (Fig. 56,a) and then press down (Fig. 56,b), until the desired height is reached.

*Use as a table:*

- Press down the table top briefly.

The table top automatically moves up to the table height.

# 7

## Living

### 7.8 Television



- ▶ Before starting your journey, remove the television from the support and store it securely.
- ▶ Before commencing the journey, place and secure the flat screen and screen support in the initial position. If the screen holder is installed in a TV cabinet: Close TV cabinet.
- ▶ Before commencing the journey, ensure that the antenna is in park position. Danger of accidents!

#### Flat screen with jointed arm

The flat screen is fastened to a jointed arm.

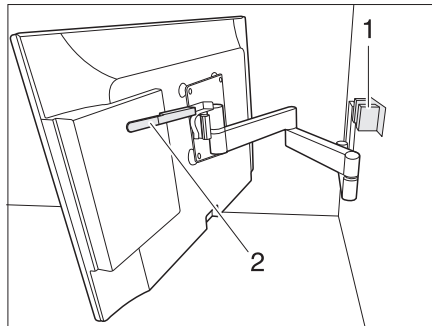


Fig. 57 Holder with jointed arm

#### *Positioning the flat screen with jointed arm:*

- Press the lever (Fig. 57,2) downwards to release the flat screen from the latch (Fig. 57,1). Release the lever.
- Swivel the flat screen into the required position.
- Take hold of the flat screen at the top and bottom edge with both hands and set the desired angle of inclination.

# 7

## Living

### 7.9 Lamps



- ▶ Bulbs and light fittings can be extremely hot.
- ▶ Let the bulbs and lamp holders cool down before touching them.
- ▶ When the light is switched on or is still hot, a safety distance of at least 30 cm to combustible material such as net curtains or curtains has to be maintained. Fire hazard!

Depending on the model the lights are equipped with halogen, fluorescents or LED lamps. For information about replacing the lamps and, if appropriate, the batteries see chapter 13.

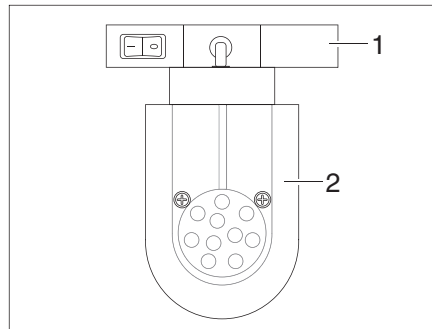


Fig. 58 LED spot light (example)

*Moving the LED spotlight:*

- Grasp the holder (Fig. 58,1) and turn it 90°.
- Remove the LED spotlight (Fig. 58,2) from the rail system.
- Insert the LED spotlight (Fig. 58,2) into the rail system at the desired position and turn 90°.

## 7

## Living

### 7.10 Beds

#### 7.10.1 Bunk bed



- ▶ Only use the bunk bed with the safety net or safety guard (depending on the model) in position.
- ▶ The maximum permitted bunk bed load is 80 kg.
- ▶ Never allow small children to remain in the bunk bed without supervision.
- ▶ But in particular with regard to small children less than 6 years of age, users should ensure that they cannot fall out of the bunk bed.
- ▶ Use separate children's beds or travel cots suitable for children.

Depending on the model, the vehicle is fitted with a bunk bed. The bunk bed can be used immediately, without additional conversion.

Always use the provided access aid to climb up to the upper bed.

#### 7.10.2 Fixed bed (gas pressure spring)

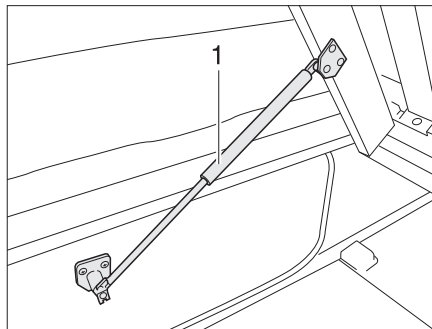


Fig. 59 Fixed bed

A storage compartment is underneath the bed. Lift up the slatted frame from the vehicle inside to place items in the storage compartment or to empty it.

- Opening:**
- Lift the mattress forwards and set it down on the panel.
  - Lift slatted frame. The gas-pressure springs (Fig. 59,1) hold the slatted frame open.
- Closing:**
- Press the slatted frame downwards against the resistance of the gas-pressure springs.
  - If necessary, push the mattress behind the panel.



# 7

## Living

### 7.11 Converting seating groups for sleeping



- ▶ In the event of an accident, emergency braking or on uneven road surfaces, additional cushions with reinforced undersides can be thrown through the vehicle and damage parts of the equipment. Before setting off, stow the additional cushions safely away or secure them with the straps provided for that purpose.

#### 7.11.1 Bench seating group and side seating group



- ▶ Depending on the model, the seating group can be slightly different in shape and position to the one shown here.

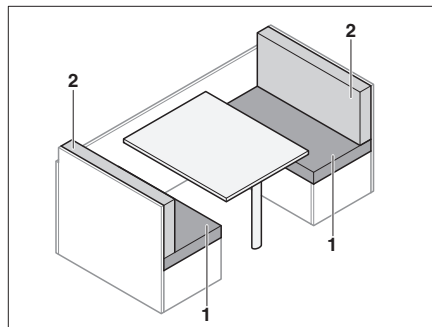


Fig. 60 Prior to conversion

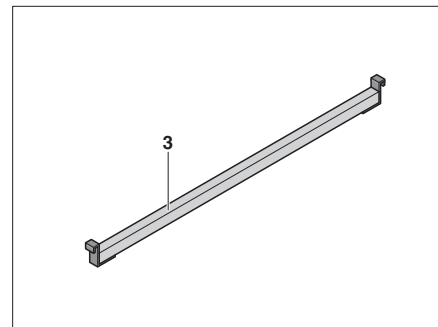


Fig. 61 Additional rail

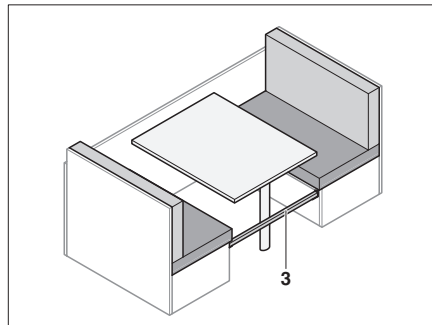


Fig. 62 Inserting the reinforcement panel

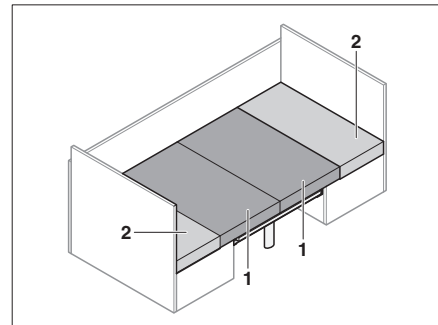


Fig. 63 After conversion

- Insert the additional rail (Fig. 62,3) between the benches.
- Convert the table into a bed foundation (see Section 7.7).
- Pull the seat cushions (Fig. 63,1) into the centre.
- Insert the back cushions (Fig. 63,2) between the seat cushions and the wall.

# 7

## Living

### 7.11.2 Round seating group

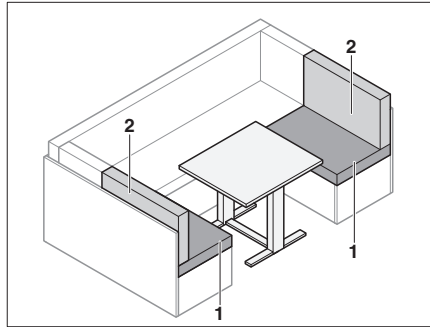


Fig. 64 Prior to conversion

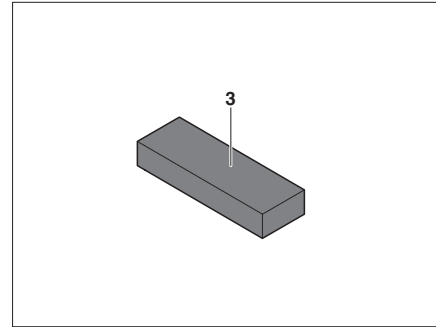


Fig. 65 Additional cushion

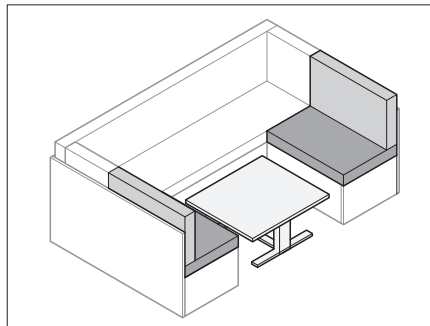


Fig. 66 Converting the table

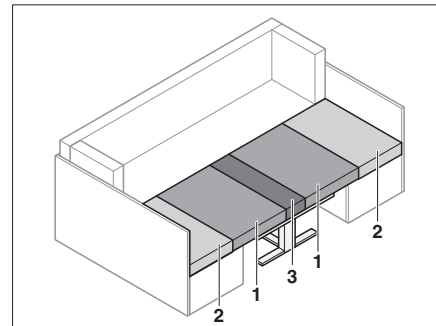


Fig. 67 After conversion

- Convert the table (Fig. 66) into a bed foundation (see Section 7.7).
- Remove the back cushions (Fig. 67,2).
- Pull the seat cushions (Fig. 67,1) into the centre.
- Insert the back cushions (Fig. 67,2) between the seat cushions (Fig. 67,1) and the exterior wall.
- Insert the additional cushion (Fig. 67,3) onto the table between the seat cushions (Fig. 67,1).

# 7

## Living

### 7.11.3 Rear seating group

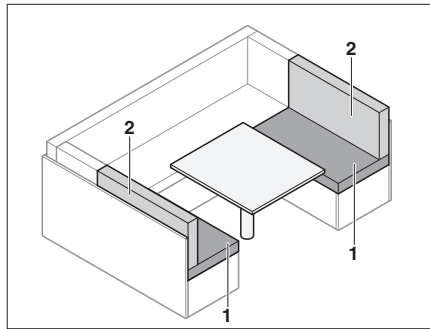


Fig. 68 Prior to conversion

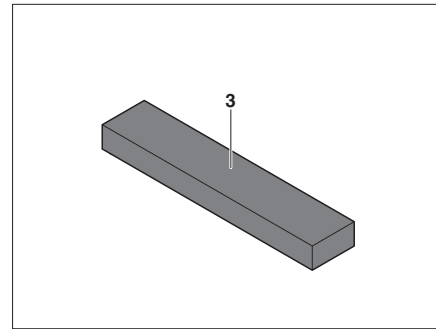


Fig. 69 Additional cushion

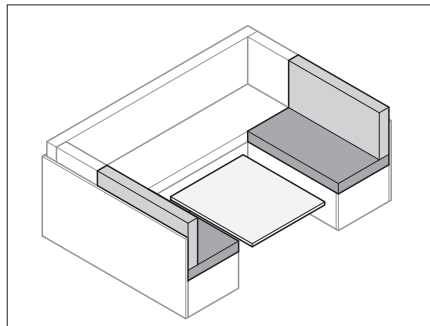


Fig. 70 Converting the table

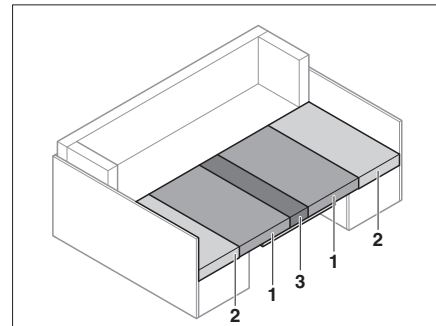


Fig. 71 After conversion

- Convert the table (Fig. 70) into a bed foundation (see Section 7.7).
- Remove the back cushions (Fig. 68,2).
- Pull the seat cushions (Fig. 71,1) into the centre.
- Insert the back cushions (Fig. 71,2) between the seat cushions (Fig. 71,1) and the exterior wall.
- Insert the additional cushion (Fig. 71,3) onto the table between the seat cushions (Fig. 71,1).

### 7.11.4 Facing seating unit

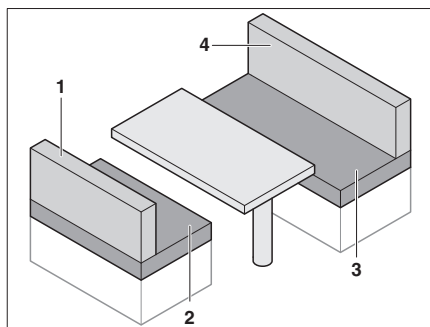


Fig. 72 Prior to conversion

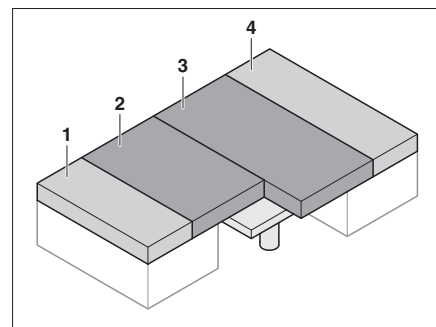


Fig. 73 After conversion

- Remove the back cushions (Fig. 72,1 and 4).
- Convert the table into a bed foundation (see Section 7.7).
- Pull the seat cushions (Fig. 73,2 and 3) into the centre.
- Insert the back cushions (Fig. 73,1 and 4) between the seat cushions (Fig. 73,2 and 3) and the exterior wall.

# 7

## Living

### 7.11.5 Bed widening

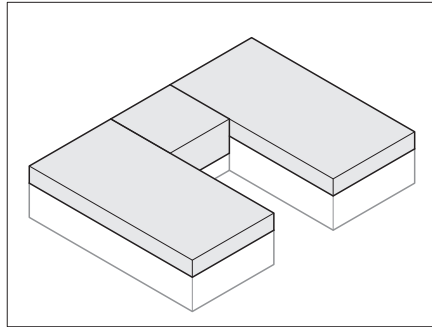


Fig. 74 Prior to conversion

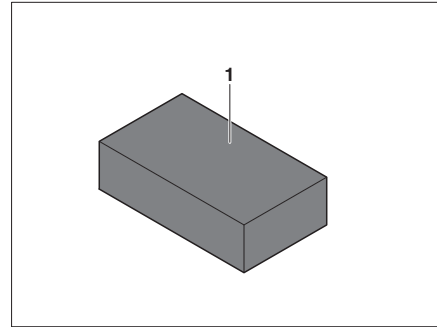


Fig. 75 Additional cushion

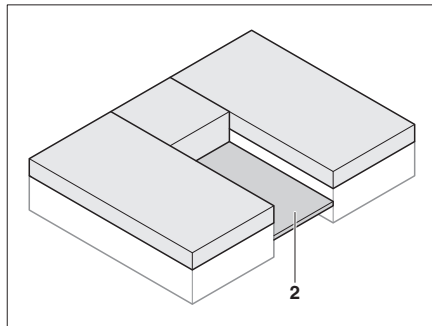


Fig. 76 Pull out slatted frame

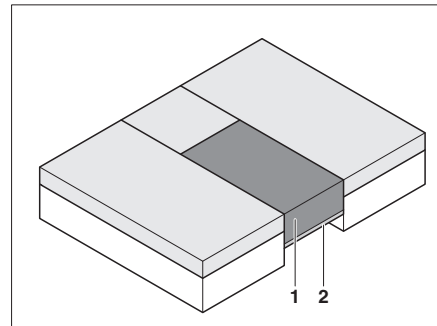


Fig. 77 After conversion

- Pull out the slatted frame (Fig. 76,2) between the single beds.
- Place the additional cushion (Fig. 77,1) on the extended slatted frame (Fig. 77,2).



Firmly press down to position the extra cushion (Fig. 77,1) at the same height as the other cushions.

- ▷ Insert and sit on the extra cushion (Fig. 77,1).  
The weight pushes the cushion into the gap.

# 7

## Living

### 7.12 Sleeping area partition

Depending on the model the sleeping area in the rear can be partitioned by a folding door or by a sliding door.



- ▷ Sliding doors or folding doors can bang shut uncontrolled while travelling. Material damage can occur. Before commencing the journey open the sleeping area partition and secure it with the securing strap.

#### 7.12.1 Sliding door

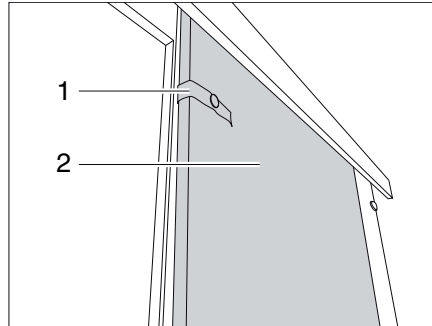


Fig. 78 Sliding door

*Closing the sliding door:*

- Release the securing strap (Fig. 78,1).
- Pull the sliding door (Fig. 78,2) into the closing position.

*Opening the sliding door:*

- Push the sliding door (Fig. 78,2) into the open position.
- Secure the sliding door with the securing strap (Fig. 78,1).

#### 7.12.2 Folding door

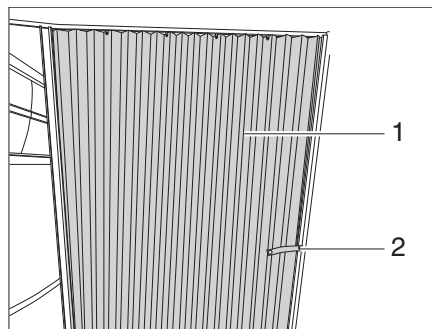


Fig. 79 Folding door

*Closing the folding door:*

- Release the securing strap (Fig. 79,2).
- Pull the folding door (Fig. 79,1) into the closing position.

*Opening the folding door:*

- Push the folding door (Fig. 79,1) into the open position.
- Secure the folding door with the securing strap (Fig. 79,2).

## Chapter overview

This chapter contains instructions regarding the gas system of the vehicle. The instructions address the following topics:

- safety
- gas consumption
- changing the gas bottles
- gas isolator taps
- external gas connection
- automatic switching facility

The operation of the gas operation appliances of the vehicle is described in Chapter 10.

### 8.1 General



- ▶ Before starting the journey, when leaving the vehicle or when gas equipment is not in use, close all gas isolator taps and the main isolator tap on the gas bottle.
- ▶ No appliance (e.g. heating or refrigerator) that is operated with an open flame may be operational while fuel is being filled up, on ferries or in the garage. Danger of explosion!
- ▶ If an appliance is operated with an open flame, do not start the appliance up in closed areas (e.g. garages). Danger of poisoning and suffocation!
- ▶ Have the gas system serviced, repaired or altered by an authorised workshop only.
- ▶ Have the gas system checked by an authorised specialist workshop before starting up and according to the national regulations. 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 and the exhaust gas pipes also have to be checked. The gas pressure regulator has to be replaced at least every 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 the regulator tap on the gas bottle immediately. Open doors and windows and ventilate well.
- ▶ In case of a defect in the gas system: Do not smoke; do not ignite any open flames, and do not operate electric switches (light switches etc.).
- ▶ Before using the cooker make sure that there is sufficient ventilation. Open windows or the skylight.
- ▶ Do not use the gas cooker or gas oven 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 installed gas appliances are designed for use solely with propane or butane gas or a mixture of both. The gas pressure regulator as well as all installed gas devices are set 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.

## 8

## Gas system



- ▶ Regularly inspect the gas tube fitted to the gas bottle connection for tightness. The gas tube must not have any tears and must not be porous. Have the gas tube replaced by an authorised specialist workshop no later than 10 years after the manufacturing date. The operator of the gas system must see to it that the parts are replaced.
- ▶ Due to its function and construction, the gas bottle compartment is a space which is open to the exterior. Never cover or block the standard forced ventilation. Otherwise leaking gas cannot be dispersed to the outside.
- ▶ Do not use the gas bottle compartment as storage space. Fire hazard!
- ▶ Secure the gas bottle compartment in order to prevent unauthorised persons opening it. To do so lock the access.
- ▶ 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. Therefore keep the waste gas vents and intake openings clean and free (e.g. of snow and ice). No snow walls or aprons may be allowed to lie against the vehicle.

### 8.2 Gas bottles



- ▶ Gas bottles are only to be transported within the designated gas bottle compartment.
- ▶ Place gas bottles vertically in the gas bottle compartment.
- ▶ Tie down gas bottles so that they are unable to turn or tilt.
- ▶ 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.
- ▶ Use your hands only to connect the gas pressure regulator or the gas tube to the gas bottles. Do not use any tools.
- ▶ 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 defroster (Eis-Ex) for the gas pressure regulator at temperatures below 5 °C.
- ▶ Use only 11 kg or 5 kg gas bottles. Camping gas bottles with a built-in reflux valve (blue bottle with max. 2.5 or 3 kg content) are permitted in exceptional cases with a safety valve.
- ▶ Use the shortest possible tube lengths (150 cm max.) for external gas bottles.
- ▶ Never block the ventilation openings in the floor under the gas bottles.

## 8

# Gas system



- ▷ Screwed connections on the gas pressure regulator have left-handed threads.
- ▷ 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.

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

- ▷ For filling and connecting the gas bottles in Europe the accessories shops have corresponding Euro filling sets and Euro bottle sets.
- ▷ Information is available at the dealers and service centres.
- ▷ For information on the gas supply in Europe see Chapter 18.

### 8.3 Gas consumption



- ▷ The data about gas consumption of the individual gas devices is only standard average values.

Appliances	Gas consumption in grams/hour
Heater	Approx. 170 - 490 g/h
Cooker, per cooker	Approx. 140 - 165 g/h
Refrigerator	Approx. 18 g/h

**Example** A full 11 kg gas bottle is sufficient to:

- Cook for 3 days using one flame,
- Heat for 22 hours on full output or
- Cool for 25 days.



## 8

# Gas system

## 8.4 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.

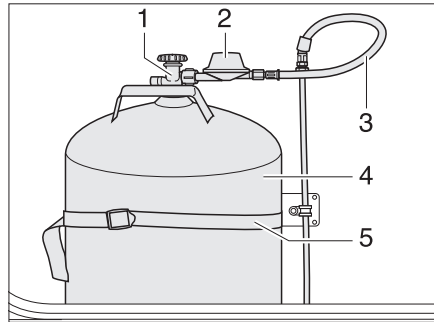
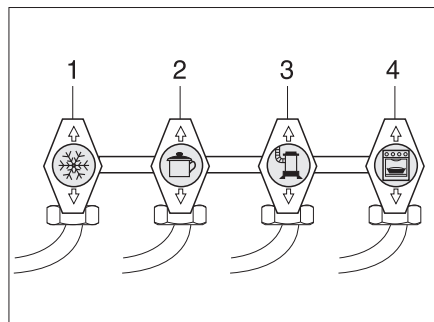


Fig. 80 Gas bottle compartment

- Open external gas bottle compartment (see Chapter 7).
- Close the regulator tap (Fig. 80,1) on the gas bottle (Fig. 80,4). Pay attention to the direction of the arrow.
- Unscrew the gas pressure regulator (Fig. 80,3) with the gas tube (Fig. 80,5) from the gas bottle by hand (left-handed thread).
- Release the fixing belts (Fig. 80,2) and take out the gas bottle.
- Place a filled gas bottle in the gas bottle compartment.
- Fix gas bottle in place with the fixing belts.
- Screw gas pressure regulator and gas tube manually onto gas bottle (left-handed thread).

## 8.5 Gas isolator taps



- 1 Refrigerator
- 2 Cooker
- 3 Heater/boiler
- 4 Oven

Fig. 81 Symbols for the gas isolator taps

A gas isolator tap (Fig. 81) for every gas device is built into the vehicle. The gas isolator taps are located under the cooker or in the vicinity of the gas devices (e.g. in the bench seat).

## 8

# Gas system

## 8.6 External gas connection



- ▶ Always close the gas isolator tap when the external gas connection is not being used.
- ▶ Only gas appliances with a suitable adapter should be connected to the external gas connection.
- ▶ Connect only external gas appliances which are designed for an operation pressure of 30 mbar.
- ▶ Ensure that gas does not escape at the connection point after connecting and after the gas isolator tap has been opened. If there is a leak in the external gas connection, gas will escape into the open air. Immediately close the gas isolator tap and the main regulator tap on the gas bottle. Have the external gas connection checked by an authorised specialist workshop.
- ▶ When connecting an external gas appliance, make sure that there is nothing near the external gas connection that could cause a spark.
- ▶ Do not use the external gas connection to fill gas bottles. Observe the information stickers on the external gas connection.

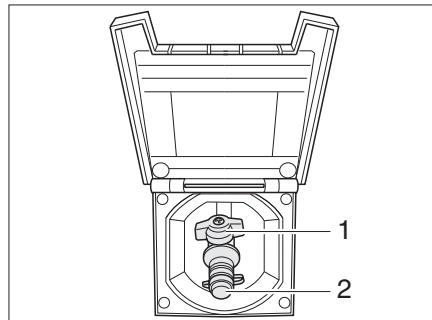


Fig. 82 External gas connection, gas isolator tap closed

The external gas connection (Fig. 82) is located at the rear or to the left or right of the vehicle depending on the model.

- Connect the external gas device to the connection point (Fig. 82,2).
- Open the gas isolator tap (Fig. 82,1).

## 8

# Gas system

## 8.7 DuoControl CS switching facility



- ▶ Do not use the switching facility in closed spaces.
- ▶ During the journey operate the gas system only with a crash sensor and suitable high-pressure hoses with hose break guard. Danger of explosion.

The DuoControl is an automatic switching facility with a remote display for a two-bottle gas system. The DuoControl switching facility automatically switches 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 switching facility is suitable for all commercial gas bottles from 3 kg to 33 kg.

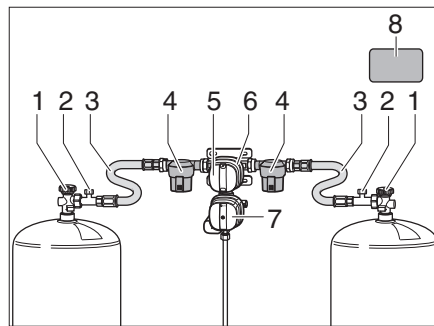


Fig. 83 DuoControl switching facility

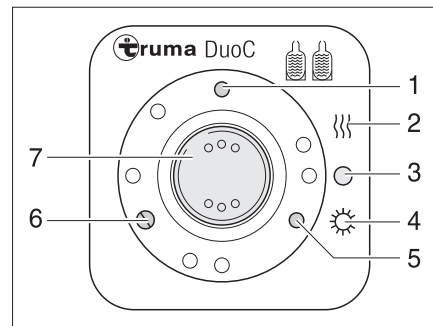


Fig. 84 Operating unit

### Construction of the unit

The DuoControl switching facility consists of a switching valve (Fig. 83,6) and the operating unit (Fig. 84). The switching valve is mounted between the high-pressure hoses (Fig. 83, 3). The knob (Fig. 83,5) on the switching valve is used to select which of the gas bottles is to be used as a primary bottle and which is to be used as a reserve bottle.

The switching valve (Fig. 83,6) is equipped with the regulator defroster "EisEx". This prevents damage to the gas system during the winter months.

A gas filter (Fig. 83,4) that protects the gas system against oil and other contamination is located on each side before the switching valve.

Only the electrical functions can be switched at the operating unit (Fig. 84). The regulator taps (Fig. 83,1) on the gas bottles must be opened manually.

The switching valve provides a constant gas pressure, regardless of which gas bottle is being drawn upon. The two indicator lamps on the operating unit show the filling level of the primary bottle. The primary bottle is full when the green indicator lamp (Fig. 84,6) lights up. The primary bottle is empty when the red indicator lamp (Fig. 84,5) lights up. The gas is then supplied via the reserve bottle.

### Operating modes

The DuoControl switching facility has two operating modes:

- Winter operation "On and heating"
- Summer operation "On"

## 8

## Gas system



- ▷ When routing the high-pressure hoses ensure that the hoses rise continuously (Fig. 85).

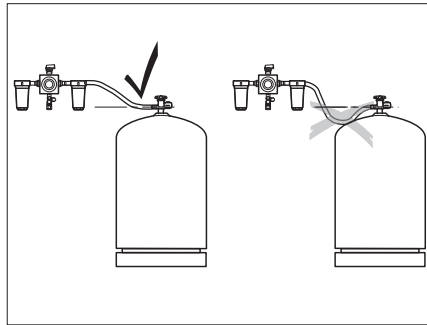


Fig. 85 Routing of the high-pressure hoses

### Putting into operation:

- Open the regulator taps (Fig. 83, 1) on the gas bottles.
- Use the knob (Fig. 83,5) on the switching valve (Fig. 83,6) 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.

### Switching off:

- Set the rocker switch (Fig. 84,7) to "O" (Fig. 84,3). The yellow indicator lamp (Fig. 84,1) goes out.
- Close the regulator tap (Fig. 83,1) on the gas bottles.

### Remote display

The indicator lamps on the operating unit (Fig. 84,5 and 6) indicate in the vehicle interior whether the primary bottle is ready for operation.

### Changing gas bottles

If the green indicator lamp (Fig. 84,6) goes out during operation and the red indicator lamp (Fig. 84,5) lights up, the gas bottle selected as the primary bottle is empty and has to be replaced. The reserve bottle continues supplying the gas appliances with gas.



- ▶ When changing gas bottles, do not smoke or create any open fire.



- ▷ Use a country-specific connection for gas bottles.

### Changing gas bottles:



- ▷ Use the enclosed screw aid (Fig. 86,1) to connect and disconnect the high-pressure hoses. It ensures the required tightening torque and prevents damage to the screw connection through using unsuitable tools.

## 8

## Gas system

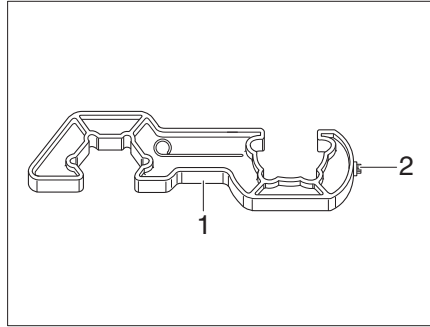


Fig. 86 Screw aid

- Close the regulator tap (Fig. 83, 1) on the empty gas bottle.
- Unscrew the high-pressure hose (Fig. 83,3) from the gas bottle using the screw aid (Fig. 86).
- Connect the full gas bottle to the high-pressure hose (Fig. 83,3).
- Open the regulator tap (Fig. 83, 1) on the gas bottle.
- Set the knob (Fig. 83, 5) on the switching valve (Fig. 83, 6) with half a turn, so that the newly replaced gas bottle will serve as a reserve bottle.
- Press the button (Fig. 83, 2) for the hose break guard at the high-pressure hose to activate it.
- If necessary, press the reset button (Fig. 87, 1) at the crash sensor.



- ▶ Ensure that gas withdrawal takes place towards the front in the case of Duo-Control switching facilities. Otherwise the high-pressure hose can be pinched or damaged in the front flap mechanism.
- ▶ Observe the safety label (Fig. 83, 8) in the gas bottle compartment.

### Crash sensor

The crash sensor protects against unwanted gas discharge. In the event of an accident or a too high angle of the vehicle the gas supply will automatically be interrupted.



- ▶ Only operate the living area heater during the journey if the vehicle is equipped with a crash sensor and suitable high-pressure hoses with hose break guard.

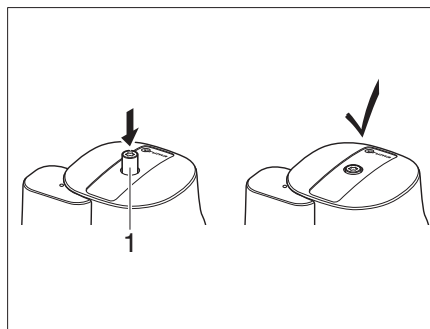


Fig. 87 Crash sensor

If the crash sensor was triggered, it has to be released manually.

## 8

# Gas system

*Releasing:*

- Use the Torx T20 (Fig. 86,2) at the screw aid to press in the safety release knob (Fig. 87,1), turn it slightly clockwise and hold it for 5 seconds. The crash sensor is ready to operate when the safety release knob (Fig. 87,1) remains in the lowered position.

**Gas filter**

The gas filters (Fig. 88) filter exhaust residues such as olefins, paraffins and other hydrocarbon compounds out of the gas system. The filter cartridges have to be checked at regular intervals and be replaced at the latest every 2 years.



- ▷ Observe the instructions for using and installing the gas filter.

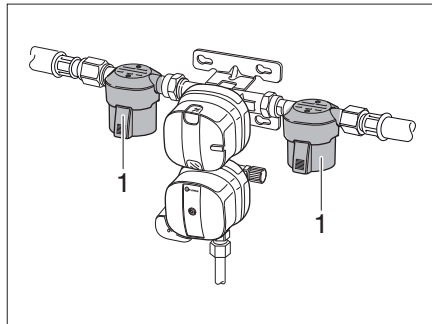


Fig. 88 Gas filter

**Hose break guard**

The hose break guard protects against gas escaping in case of a defect or the high-pressure hose tearing off.



- ▷ Use a suitable high-pressure hose with hose break guard and country-specific connection for gas bottles.

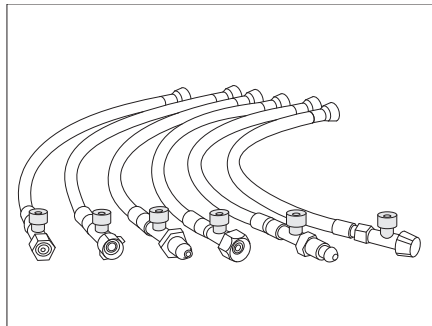


Fig. 89 High-pressure hoses with hose break guard (country-specific variants)

*Activating:*

- After replacing the gas bottle press the green button (Fig. 83,2) at the high-pressure hose (Fig. 83,3) vigorously.

The hose break guard has been activated.

# 9

## Electrical system

### Chapter overview

This chapter contains instructions regarding the electrical system of the caravan. The instructions address the following topics:

- safety
- explanations of terms relating to the battery
- 12 V power supply
- living area battery
- charging the living area battery
- power pack
- transformer/rectifier
- panel
- 240 V power supply
- connection to the 240 V power supply
- fuse rating
- towing vehicle connection

The operation of the electrical appliances of the housing body is described in Chapter 10.

### 9.1 General safety instructions



- ▶ Only allow qualified personnel to work on the electrical system.



- ▶ During a storm disconnect the 230 V connection and retract the antennae as a precaution to protect the electrical devices.

### 9.2 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.

#### 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 12 V power supply 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.



- ▶ **Total discharge damages the battery, recharge the battery immediately.**

#### 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). If a battery possesses a capacity of 80 Ah, then the battery can dispense a current of 1 A for 80 hours or a current of 2 A for 40 hours.

External influences such as temperature may alter the storage capacity of the battery.

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# Electrical system

The specified rated capacity is not the same as the battery capacity actually available. The capacity that can actually be used is lower than the rated capacity.

### 9.3 12 V power supply



- ▷ If you use the battery of the towing vehicle to provide power for the caravan, bear in mind that the battery capacity is restricted. If you place too great a burden on the battery, this may lead to starting difficulties.
- ▷ Always disconnect the electrical connection between the towing vehicle and the caravan before the caravan is connected to the local power supply. In order to carry this out, disconnect the plug from towing vehicle socket.
- ▷ Always disconnect the electrical connection between the towing vehicle and the caravan before the living area battery is charged via an external charger.

When the caravan is not connected to the 240 V power supply, 12 V power supply is performed either by the starter battery of the connected towing vehicle or by the living area battery (Autark Package).

When the caravan is electrically connected to the towing vehicle and the vehicle engine is running, the living area battery is charged by the vehicle generator.

The 12 V power supply can be cut off with the 12 V main switch on the panel (special equipment).



- ▷ To make the living area's electrical installation completely deenergised, pull out the plug from the "Battery Input" at the transformer/rectifier, disconnect the living area battery and disconnect the 230 V connection at the caravan.

#### 9.3.1 Living area battery, general (Autark Package)



- ▶ When changing the living area battery, use only batteries which meet the minimum capacity of the charger. Observe the separate instruction manual for the charger. Lower-capacity batteries will generate a great deal of heat when they are charged. Danger of explosion!
- ▶ Devices with a maximum of 10 A can be connected to the sockets of the 12 V power supply. Fire hazard!



- ▷ 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 (a lead acid or dryfill battery) and the capacity of the living area battery.
- ▷ Prior to commencing a journey ensure the living area battery is fully charged. For this reason charge the battery for at least 24 hours before commencing the journey.
- ▷ During the trip, use every opportunity to charge the living area battery.
- ▷ Charge the living area battery for at least 24 hours after the journey.
- ▷ Before a temporary lay-up charge the battery for at least 24 hours, for longer standstills 48 hours.
- ▷ For long periods of inactivity (4 weeks or more), either disconnect the living area battery or recharge it regularly (charge for 24 hours at least every 12 weeks).
- ▷ In winter store the charged battery in a place which is cool and protected from frost and recharge every 12 weeks.
- ▷ When the living area battery is changed, only use batteries of the same type.



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# Electrical system



- ▷ Before disconnecting or connecting the terminals of the living area battery, switch off the engine of the towing vehicle as well as the 240 V and 12 V power supplies and all appliances. Danger of short circuit!
- ▷ When the living area battery is disconnected and the caravan and the towing vehicle are connected electrically, do not use the ignition of the towing vehicle. 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 has to be charged occasionally using a special charger.**

When the vehicle is not connected to the 240 V power supply or the 240 V power supply is switched off, the living area battery supplies the living area with 12 VDC. The living area battery has a limited power supply only. For this reason, electrical appliances such as the radio and the lights should not be operated for a long time without using the 240 V power supply.

If the vehicle is connected to the 240 V power supply, the living area battery is automatically recharged by the charger installed in the transformer/rectifier (Autark Package).

### Discharging

The living area battery is discharged by the closed circuit current which some electrical appliances continuously require. Appliances such as the charger, solar charge regulator, panel etc. consume approx. 20 mA to 65 mA of electricity from the battery capacity, even when the 12 V main switch is turned off.



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

At lower outdoor temperatures the battery loses its capacity.

The self-discharge rate of the battery is also dependant on temperature.

At 20 to 25 °C the self-discharge rate amounts to approx. 3% of the capacity per month. The self-discharge rate will increase with rising temperatures: At 35 °C the self-discharge rate amounts to 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.

In order to prevent fast discharge of the living area battery, the refrigerator is operated on 12 V power supply only when the engine is running and when there is an electrical connection between the towing vehicle and caravan.



- ▷ Further information can be obtained in the separate documents of the living area battery.

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## Electrical system

### 9.3.2 Check the living area battery (Autark Package)

The capacity of a battery is limited as to time. The higher the number of electrical appliances, the faster the energy of the living area battery is consumed. A battery which has been installed for years has no longer the complete capacity available.

#### Charging condition

To protect the living area battery, no more than 50% of the battery's capacity should be drawn. Therefore check the charging condition of the living area battery regularly. The charging condition of the living area battery can be read off on the panel.



- ▷ A meaningful measurement of the charging condition can only be made after 4 hours of battery charging. Immediately after charging, the battery voltage is higher, after approx. 4 hours, it sinks to the so-called off-load voltage. The off-load voltage displays the charging condition.
- ▷ In order to ensure a long battery life the battery has to be recharged at an off-load voltage of < 12.3 V.

Off-load voltage (measured at the poles)		Charging condition
Higher than	12,80 V	100%
Approx.	12.55 V	75%
Approx.	12.32 V	50%
Approx.	12.18 V	25%
Lower than	12.00 V	0%

#### Energy reserves

The living area battery has a limited power supply only. That is why electrical appliances should not be operated over a long period of time if the vehicle is not connected to the 240 V power supply or the engine of the towing vehicle is switched off.

### 9.3.3 Charging the living area battery (Autark Package)



- ▶ The acid in the battery is poisonous and corrosive. Any contact with the skin or the eyes is to be avoided.
- ▶ In the case of charging with an external charger there is danger of explosion. Only charge the battery in a well ventilated area and away from naked flames or possible sources of sparks.
- ▶ Always remove the living area battery from the vehicle when charging it using an external charger.



- ▷ Do not connect the battery cables to the wrong poles.
- ▷ When the living area battery is disconnected and the caravan and the towing vehicle are connected electrically, do not use the ignition of the towing vehicle. Danger of short circuit!
- ▷ Before disconnecting or connecting the terminals of the living area battery, switch off the engine of the towing vehicle as well as the 240 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 manual for the charger.
- ▷ Irreparable damage to the living area battery will result if it is overcharged.

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# Electrical system

### Charging using a 240 V power supply

If the vehicle is connected to the 240 V power supply, the living area battery is recharged by the installed charger. 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.

### Charging using the vehicle engine of the towing vehicle

When the engine of the towing vehicle is running, the vehicle generator charges the living area battery. An electrical connection between the towing vehicle and the caravan is prerequisite for this. If the engine of the towing vehicle is switched off, the electrical connection is automatically disconnected by a relay. This prevents the battery of the towing vehicle from being run down by electrical appliances in the living area. The starting capability of the towing vehicle is thus preserved.



- ▷ To ensure reliable operation of 12 V appliances in caravans during the journey make sure that the towing vehicle makes sufficient voltage available. At some towing vehicles the battery management of the towing vehicle switches off appliances to protect the battery.
- ▷ Further information can be obtained from the vehicle manufacturer.

### Charging with an external charger

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

- Disconnect the caravan electrically from the towing vehicle.
- Switch off the 12 V main switch on the panel. The indicator lamp goes out.
- 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 pole on the living area battery and then the positive.
- Remove the living area battery from the vehicle.
- If the vehicle is equipped with a dryfill battery, Check whether the external charger is approved for the dryfill battery.
- Check that the external charger is turned off.
- Connect the external charger to the living area 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.

## 9 Electrical system

### 9.4 Power pack



- ▷ When the ignition is switched off and there is no connection to the 240 V power supply, the battery of the towing vehicle is discharged by consumers such as the refrigerator or the living area lamps (exception: Power Pack SE). The starting capability of the towing vehicle can be impaired.



- ▷ The towing vehicle battery is not charged by the power pack.

If the vehicle is **not** connected to the 240 V power supply, the requisite power supply is provided by the battery of the towing vehicle, as long as contact 9 "Constant positive" is connected to the towing vehicle socket (see connection diagram at the end of this chapter). The 12 V living area lamps, the cassette toilet and the water pump can be used.

If the vehicle is connected to the 240 V power supply, the power pack switches the power supply in the living area automatically from the towing vehicle battery to mains operation.

**Fuse box** The 230 V fuse box (Fig. 90,3) is mounted next to the power pack (Fig. 90,2).

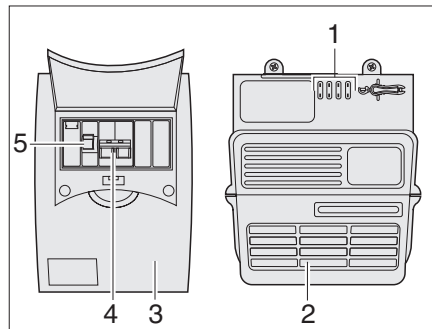


Fig. 90 Power pack and automatic circuit breaker

The main fuse (Fig. 90,4) and a residual-current circuit-breaker (Fig. 90,5) are located in the fuse box (Fig. 90).

The residual current circuit-breaker (Fig. 90,5) measures the current flow of the current feed and return lines. If the two lines are equivalent, the residual-current circuit-breaker does not become active. If there is a difference between the lines the breaker interrupts the current flow immediately. This prevents dangerous electrical accidents.

*Switching on:*

- Switch the main switch (Fig. 90,4) upwards to the "ON" position.
- Switch the residual-current circuit-breaker (Fig. 90,5) upwards to the "ON" position.

## 9 Electrical system

### 9.5 Transformer/rectifier EBL 109 (Autark Package)



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

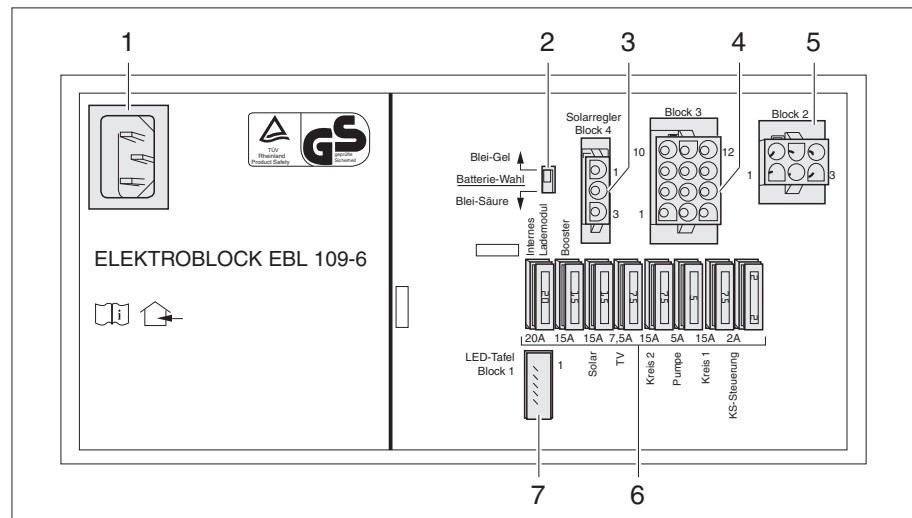


Fig. 91 Transformer/rectifier EBL 109

- 1 Main supply socket 240 V~
- 2 Battery selector switch, lead acid/dryfill option
- 3 Input: Solar charge regulator
- 4 Output: Consumer circuit 1 and 2, water pump, TV, input solar cells
- 5 Input: Living area battery, vehicle battery, alternator D+, battery detector living area battery, minus (earth)
- 6 Fuses (see "Fuse rating" table)
- 7 Connection panel

**Functions** The transformer/rectifier has the following functions:

- The transformer/rectifier charges the living area battery.
- The transformer/rectifier distributes the current to the 12 V circuits and secures them.
- The transformer/rectifier contains connections for a solar charge regulator as well as other control and monitoring functions.
- The transformer/rectifier separates the starter battery of the towing vehicle electrically from the living area battery of the caravan if there is an electric connection between the towing vehicle and the caravan and if the vehicle engine is turned off. In this way the 12 V appliances of the caravan cannot discharge the starter battery of the towing vehicle.
- The transformer/rectifier distributes the current to the 12 V sockets. Devices with a maximum of 10 A can be connected to the sockets.

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 charging device against overheating. The transformer/rectifier is subject to a heavy load when e.g. an empty living area battery is charged, additional electrical appliances are turned on and the ambient temperatures are high.

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# Electrical system

### Location

Depending on the model, the transformer/rectifier is situated either in the bench or in the bedding box.



- ▷ Further information can be obtained from the separate instruction manual "Transformer/rectifier".

### 9.5.1 Battery selector switch



- ▶ If the battery selector switch is set incorrectly, oxyhydrogen gas (exploding gas) can form. Danger of explosion!



- ▷ Incorrect setting of the battery selector switch damages the living area battery.
- ▷ Do not change the factory setting of the battery selector switch.

The battery selector switch is used to set the charger module in the transformer/rectifier to the type of living area battery installed in the vehicle ("lead acid" or "dryfill" battery).

### 9.5.2 Charging the battery

During driving the towing vehicle generator charges the living area battery. If the engine of the towing vehicle is switched off, the transformer/rectifier separates the starter battery of the towing vehicle from the living area battery so that discharging of the starter battery of the towing vehicle through usage of 12 V living area appliances is not possible.

When the vehicle is connected to the 240 V supply, the transformer/rectifier charges the living area battery.



- ▷ The power supply unit is not used to charge the starter battery of the towing vehicle.

## 9 Electrical system

### 9.6 Panel LT 101 / LT 102



- ▷ The Panel LT 101 / LT 102 is equipped with touch-sensitive sensor button fields. These fields react to bare finger contact. If gloves are worn (e.g. when camping in winter), the LT 101 / LT 102 operating and control panel cannot detect the touch contact. Gloves must therefore be removed before operation.
- ▷ Further information can be obtained from the separate instruction manual of the Panel LT 101 / LT 102.

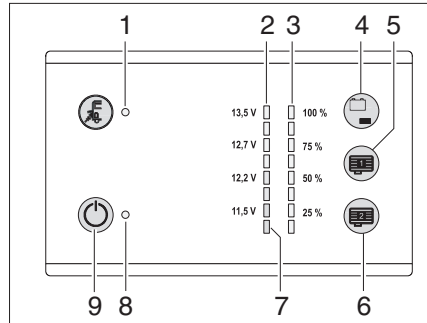


Fig. 92 Panel LT 101 / LT 102

- 1 230 V indicator lamp lights up at connected network (yellow)
- 2 LEDs (green-yellow-red) Display of the battery voltage in eight steps with voltage specification and warning against total discharge
- 3 LEDs (blue) Display of the tank fill levels of water and waste water tanks in four steps
- 4 Calling up battery voltage of the living area battery/Calling up level indicator water tank
- 5 Level indicator interior waste water tank 2 (special equipment)
- 6 Level indicator interior waste water tank 1 (special equipment)
- 7 Warning LED total discharge
- 8 12 V indicator lamp (green) at switched-on system
- 9 Main switch 12 V ON/OFF

#### 9.6.1 Level indicator of the water tank

The tank fill level of the water tank can be called up by using the sensor touchpad (Fig. 92,4).

*Calling up fill level:*

- Touch the sensor touchpad (Fig. 92,4): The fill level of the water tank is indicated in four steps with the LEDs (Fig. 92,3) (25% to 100%).

#### 9.6.2 Battery alarm for the living area battery

The red warning LED (Fig. 92,7) flashes as soon as the voltage of the living area battery only still amounts to 11 V (measured under operation) and there is a risk of a total discharge.











- ▷ 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.
- ▷ Total discharge damages the battery.

## 9 Electrical system

### 9.6.3 Living area battery charging condition

The charging condition of the living area battery can be called up by using the sensor touchpad (Fig. 92,4).

*Displays:* ■ Touch the sensor touchpad (Fig. 92,4): The charging condition of the living area battery is displayed.

LED indicator	Battery voltage	Vehicle is in		
		Battery operation	Mobile operation	Power operation
13,5V  13,5V  13,0V 12,7V  12,7V	< 11 V (lower red LED flashes)	<b>Totally discharged</b>	Totally discharged and no charging by alternator	Totally discharged and no charging by the power supply
 12,5V 12,2V  12,2V  12,0V 11,5V  11,5V  11,0V	< 12.2 V (red and yellow LEDs light up) Danger of total discharge	If appliances are switched off: Battery empty If many appliances are switched on: Battery possibly overloaded	No charging by alternator 12 V power supply overload	No charging by the power supply 12 V power supply overload
12.2 V to 12.7 V (red, yellow and both lower green LEDs light up)	12.2 V to 12.7 V (red, yellow and both lower green LEDs light up)	Normal range	If the voltage does not exceed this range for several hours: No or little charging by the alternator	If the voltage does not exceed this range for several hours: No or little charging by the power supply
			12 V power supply overloaded because too many appliances are switched on	
13.5 V and higher (all LEDs light up)	13.5 V and higher (all LEDs light up)	Occurs only during charging (only if solar regulator exists) or possible briefly after charging	Battery being charged	Battery being charged

### 9.6.4 12 V main switch

The 12 V main switch (Fig. 92,9) switches the panel and the 12 V power supply of the living area on and off.

*Switching on:* ■ Touch the sensor touchpad (Fig. 92,9): The 12 V living area power supply is switched on. The indicator lamp (Fig. 92,8) lights up green.

*Switching off:* ■ Touch the sensor touchpad (Fig. 92,9) again: The 12 V living area power supply is switched off. The 12 V indicator lamp (Fig. 92,8) goes off.



- ▷ When leaving the vehicle switch off the 12 V main switch. This prevents unnecessary discharging of the living area battery.
- ▷ If the warning LED total discharge (Fig. 92,9) flashes, the power supply cannot be switched on because the battery voltage is too low.



## 9 Electrical system

### 9.7 240 V power supply



- ▶ Only allow qualified personnel to work on the electrical system.

The 240 V power supply provides electricity for:

- sockets with earth contact for appliances with maximum 16 A
- refrigerator
- 12 V living area power supply
- heater
- air conditioning unit
- electrical boiler

The electrical appliances which have been connected to the 12 V power supply system of the living area are supplied with power from the living area battery (Autark Package) or the power pack.

Connect the vehicle to an external 240 V power supply system as often as possible. The charger module in the transformer/rectifier automatically charges the living area battery (Autark Package).

#### 9.7.1 240 V connection



- ▶ The external 240 V power supply must be protected by fuse with a fault current protection switch (FI-switches, 30 mA).



- ▷ Always disconnect the electrical connection between the towing vehicle and the caravan before the caravan is connected to the local power supply. In order to carry this out, disconnect the plug from towing vehicle socket.
- ▷ Check whether the power supply of the local utility company is suitable for the electrical system and appliances of the caravan with regard to the dimensioning of voltage, frequency and current. In addition, the cables or lines and the connections have to be suitable.



- ▷ For the connection points on camp sites (camping distributors) highly sensitive fault current protection switches (FI-switches, 30 mA) are obligatory.

The vehicle can be connected to an external 240 V power supply. The cable may have a length of maximum 25 m.

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## Electrical system

### 9.7.2 Power cable for external 240 V connection



- ▶ Completely unwind the cable on cable drums to prevent overheating.
- ▶ Check cables/lines, plugs and connections for damage.

#### Power cable

- Three-core (3 x 2.5 mm<sup>2</sup>) flexible rubber sheathed cable
- Maximum 25 m in length
- 1 plug with earth contact
- 1 socket with earth contact (connectors to EN 60309)

#### Connection possibilities

We recommend a CEE connection cable with CEE plug and CEE socket as the supply line. If these connection possibilities are not available, we recommend the following combination with an isolated earth plug:

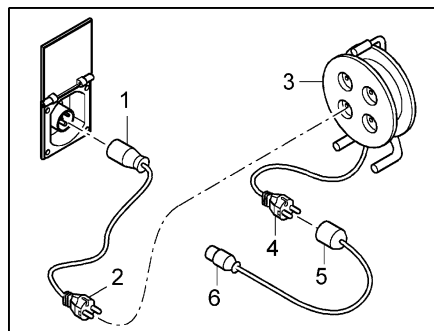


Fig. 93 Connection options for 240 V power connection

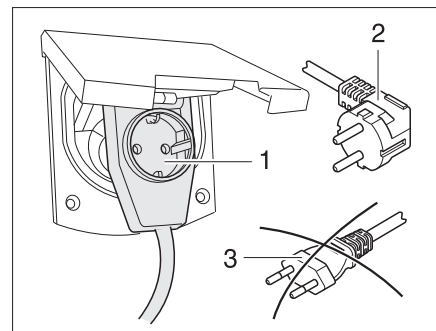


Fig. 94 Connecting an angled connector with socket

- Adapter cable:  
CEE 17 socket with earth contact (Fig. 93,1) – Plug with earth contact (Fig. 93,2)
- Cable reel:  
Socket with earth contact (Fig. 93,3) – Plug with earth contact (Fig. 93,4)
- Adapter cable:  
Socket with earth contact (Fig. 93,5) – CEE 17 plug with earth contact (Fig. 93,6)



- ▶ If a CEE 17 angled connector with socket mounted on rear (Fig. 94,1) is used, use only a rubberised and sealed IP 44 plug with earth contact (Fig. 94,2). Do not use a plug without earth contact (Fig. 94,3). Danger of electrocution!

Depending on the model, the flap for the 240 V connection is identified with the symbol "⚡".

#### Connecting the power cable:

- Open external flap at the caravan.
- Depending on the model, fold up the cover.
- Plug in the plug.
- Plug the plug into the electrical socket of the power supply unit at the caravan site.
- Switch on the main cut-off switch at the caravan.
- Check whether the fault-current protection switch in the caravan functions by pressing the test button and switch it back on.

## 9

# Electrical system



- ▶ In cases of faults or if the supply is not available or is faulty after you have carried out the procedure above, inform the caravan site operator.

*Disconnecting the supply line:*

- Switch off the main cut-off switch at the caravan.
  - Unplug the plug at the electrical socket of the power supply unit at the caravan site.
  - Remove the plug at the caravan.
- ▷ Depending on the model, unlock the plug before pulling it out.



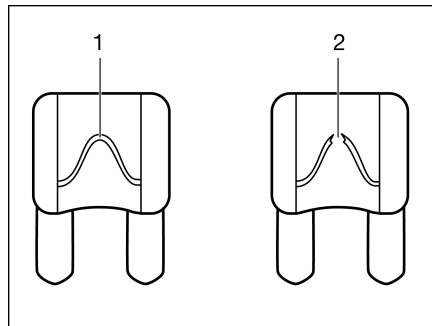
## 9.8 Fuses



- ▶ Only replace defective fuses when the cause of the defect is known and has been remedied.
- ▶ Only replace defective fuses when the power supply is switched off.
- ▶ Never bridge or repair fuses.

### 9.8.1 12 V fuses

The appliances connected to the 12 V power supply in the living area are fused individually. The fuses are accessible on the power pack and on the transformer/rectifier.



- 1 Unbroken fuse element
- 2 Broken fuse element

Fig. 95 12 V fuse

An intact 12 V fuse can be detected by the unbroken fuse element (Fig. 95,1). If the fuse element is broken (Fig. 95,2), change the fuse.

# 9

## Electrical system

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 at the living area battery (Power Pack SE)

Function	Value/colour
Cable from the living area battery to the power supply unit	40 A red
Cable from the living area battery to the power supply unit	2 A grey

### Fuses on the power pack

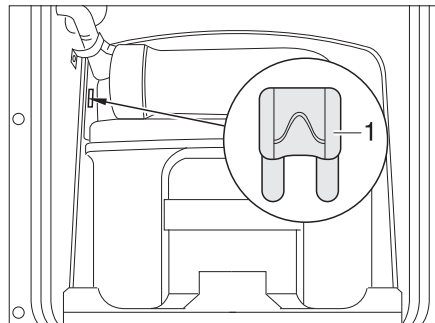
Circuit 1	15 A blue
Circuit 2	15 A blue
Circuit 3	10 A red
Circuit 4	7,5 A brown

### Fuses on the transformer/rectifier EBL 109 (Power Pack SE)

Internal charger	20 A yellow
Booster	15 A blue
Solar	15 A blue
TV	7,5 A brown
Circuit 2	15 A blue
Water pump	7,5 A light brown
Circuit 1	15 A blue
Refrigerator control	2 A grey

### Fuse for the Thetford toilet (swivel toilet)

The fuse is located in the locker wall of the Thetford cassette.



1 Flat fuse 3 A/purple

Fig. 96 Fuse for the Thetford toilet

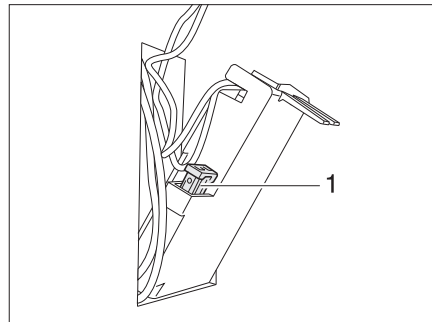
- Changing:*
- Open the flap for the Thetford cassette on the outside of the vehicle.
  - Pull out the Thetford cassette completely.
  - Replace fuse (Fig. 96,1).

## 9

# Electrical system

### Fuse for the Thetford toilet (fixed seat)

The fuse is located in the locker wall of the Thetford cassette.



1 Flat fuse 3 A/purple

Fig. 97 Fuse for the Thetford toilet

*Changing:*

- Open the flap for the Thetford cassette on the outside of the vehicle.
- Remove the Thetford cassette and swing out the flap in the housing panel.
- Replace the fuse (Fig. 97,1).

### 9.8.2 240 V fuse

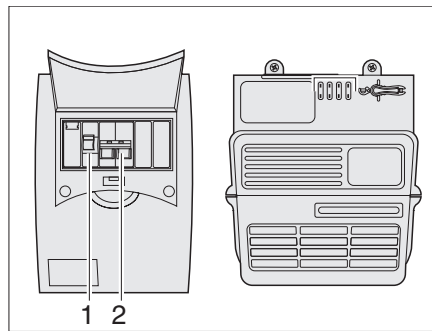


Fig. 98 230-V fuse box

The main fuse (Fig. 98,2) protects the 240 V input current with a max. of 10 A. In addition, a residual-current circuit-breaker (Fig. 98,1) is located in the fuse box.

## 9.9 Connection to the towing vehicle

### 9.9.1 Thirteen-pin plug connection diagram



- ▷ Note the colours of the connecting cables which are fitted to the socket of the towing vehicle. This makes any new connection which may be necessary easier.
- ▷ To connect the thirteen-pin plug with a seven-pin socket, use an adaptor (commercially available).

# 9

## Electrical system

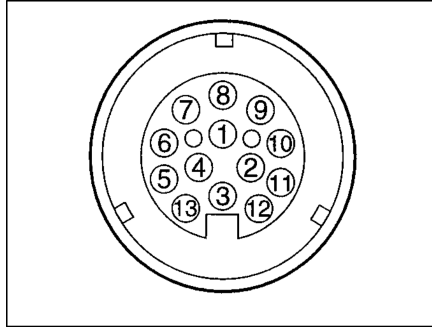


Fig. 99 Top view on socket towing vehicle (thirteen-pin system Jaeger to DIN EN 1648-1)

### Connection diagram

Contact number	DIN-specification	Function	Cable colour	Cross section of the wire
1	L	Left direction indicator	Yellow	1.5 mm <sup>2</sup>
2	54 G	Fog tail light	Blue	1.5 mm <sup>2</sup>
3 <sup>1)</sup>	31	Earth (contacts 1, 2, 4 - 8)	White	2.5 mm <sup>2</sup>
4	R	Right direction indicator	Green	1.5 mm <sup>2</sup>
5	58 R	Right tail light, side marker light, clearance light, marker light, licence plate light	Brown	1.5 mm <sup>2</sup>
6	54	Brake lights	Red	1.5 mm <sup>2</sup>
7	58 L	Left tail light, side marker light, clearance light, marker light, licence plate light	Black	1.5 mm <sup>2</sup>
8		Reverse lamp and/or reverse equipment for overrun brake	Pink	1.5 mm <sup>2</sup>
9		Power supply (constant positive): Light, water pump, charging line of transformer/rectifier (only for Power Pack SE). Refrigerator, control line via power pack (without Power Pack SE), ATC with relay.	Orange	2.5 mm <sup>2</sup>
10		Power supply (controlled by the ignition switch): Control booster in the transformer/rectifier (only for Power Pack SE) D+, refrigerator	Grey	2.5 mm <sup>2</sup>
11 <sup>1)</sup>		Earth (contact 10)	White black	2.5 mm <sup>2</sup>
12		Not assigned	White blue	1.5 mm <sup>2</sup>
13 <sup>1)</sup>		Earth (contact 9)	White red	2.5 mm <sup>2</sup>

<sup>1)</sup> These earth cables may not be connected to electrical conductors on the trailer side.



▷ Contact number 12 is not assigned at the factory.

## 9 Electrical system

### 9.9.2 Towing vehicle installation (recommendation)



- ▷ The towing vehicle must be retrofitted with the corresponding cable cross sections and a relay for the power supply (controlled using the ignition) (see Fig. 100).
- ▷ If the cable cross sections stipulated below are not adhered to, then it is possible that a correct charging of the living area battery and the 12 V function of the refrigerator during the journey is not possible.
- ▷ To ensure reliable operation of 12 V appliances in caravans during the journey make sure that the towing vehicle makes sufficient voltage available. At some vehicles the battery management of the vehicle switches off appliances to protect the battery. Contact your vehicle manufacturer for further relevant information.

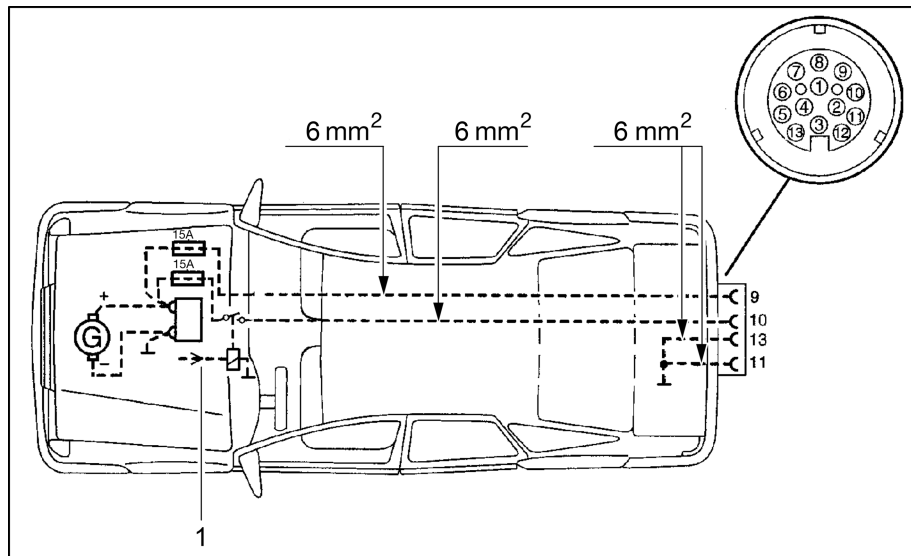


Fig. 100 Towing vehicle installation diagram

1 Relay



- ▷ At 12 V battery in the caravan:
  - If the LED display of the ATC lights up or flashes although the caravan is connected to 240 V and not to the towing vehicle, proceed as follows:
    - Switch the 240 V safety cut-out (see Fig. 98) and the main switch battery (see Fig. 92,9) on and off briefly in order to interrupt the current flow.
    - If no panel with main switch battery exists, interrupt the current supply directly at the 12 V battery.

## 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.

The instructions address the following topics:

- heater
- air conditioning unit
- boiler
- gas cooker
- gas oven
- microwave oven
- extractor hood
- refrigerator

### 10.1 General



- ▷ The heat exchanger of the Truma hot-air heater has to be replaced after 30 years. The heat exchanger of the Alde hot-water heater has to be replaced after 10 years. Only the manufacturer of the heater or an authorised specialist workshop is allowed to replace the heat exchanger. The operator of the heater must see to it that the parts are replaced.
- ▷ The heat exchanger of the Alde hot-water heater has to be replaced after 10 years. Only the manufacturer of the heater or an authorised specialist workshop is allowed to replace the heat exchanger. The operator of the heater must see to it that the parts are replaced.
- ▷ 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.

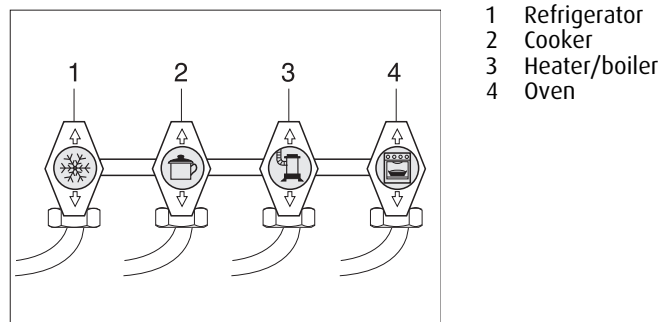


Fig. 101 Symbols for the gas isolator taps



# 10

## Appliances

### 10.2 Heater



- ▶ In winter, check that the waste gas vent on the roof is free of snow and ice before using the heater.
- ▶ Never let gas escape unburned due to danger of explosion.
- ▶ When filling the fuel tank of the towing vehicle, on ferries or in the garage, never run the heater in gas operation. Danger of explosion!
- ▶ Never operate the heater in gas operation in closed rooms (e.g. garages). Danger of poisoning and suffocation!
- ▶ If the circulation fan does not switch on automatically, switch the circulation fan from heat setting 3 to 4. There is danger of overheating for the heater!
- ▶ Do not damage the exhaust gas pipe.
- ▶ The waste gas vent may neither be closed nor blocked.
- ▶ When camping in winter, the Truma waste gas vent extension should be used to prevent snow from choking the waste gas vent.
- ▶ Do not use the space behind the heater as a storage compartment.

**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.

#### 10.2.1 To heat properly

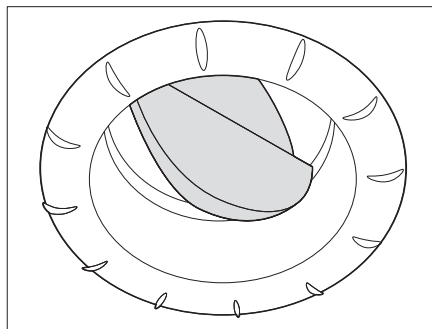


Fig. 102 Air outlet nozzle

**Hot air distribution** Several air outlet nozzles (Fig. 102) 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.

#### 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.

# 10

## Appliances

### 10.2.2 Hot-air heater Truma S 3004 (P)/S 5004



▶ In case of problems wait for 3 minutes before trying again.

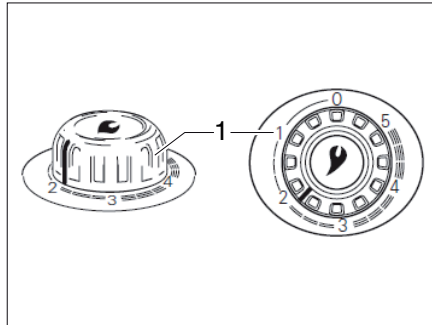


Fig. 103 Hot-air heater control knob

*Switching on without automatic ignition:*

- Open the regulator tap on the gas bottle and the gas isolator tap "Heater".
- Turn the control knob on the heater (Fig. 103,1) to the required position and press down to its stop limit.
- Strike gas lighting button (at the control knob) several times in succession.
- Keep the control knob pressed until the flame burns. You can check in the inspection window in the heater cover whether the flame is burning.
- Hold down for a further 10 seconds, until the ignition fuse starts up.

*Switching on with automatic ignition:*

- Open the regulator tap on the gas bottle and the gas isolator tap "Heater".
- Turn the control knob on the heater (Fig. 103,1) to the required position and press down to its stop limit.  
The automatic ignition produces ignition sparks. A clicking noise can be heard.
- Keep the control knob pressed until the flame burns. You can check in the inspection window in the heater cover whether the flame is burning.
- Hold down for a further 10 seconds, until the ignition fuse starts up.



- ▷ The automatic ignition sparks until the gas burns. If there is no gas, it will continue to spark until the battery in the automatic ignition is empty. When the heater is not required, set the control knob to "0" to avoid the battery in the automatic ignition running flat.
- ▷ If the clicking noise cannot be heard at all or only in intervals of several seconds during ignition: Changing the battery on the automatic ignition.
- ▷ Insert new batteries before the beginning of every heating season.

# 10

## Appliances

Switching off:

- Turn the control knob at the heater (Fig. 103,1) to "0". The automatic ignition is switched off simultaneously.
  - Close the "Heater" gas isolator tap and the main regulator tap on the gas bottle.
- ▷ Further information can be obtained from the separate instruction manual "Truma S 3004 (P) / S 5004".

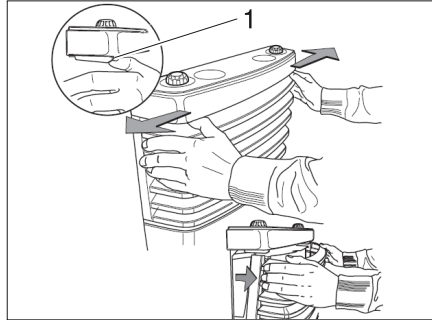


Fig. 104 Removing the heater cover

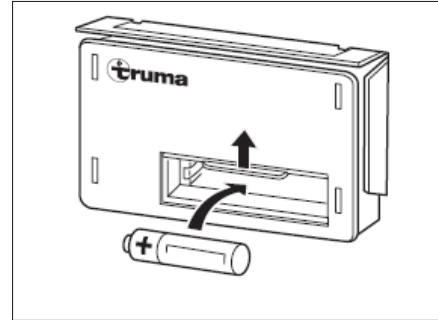


Fig. 105 Changing the batteries

Changing the battery on the automatic ignition:

- Ensure that the heater is switched off and, if applicable, cooled down.
- Remove the heater cover. To do so, push the locking springs (Fig. 104,1) sideways and outwards, swivel the cover forwards and lift it out of the lower brackets.
- Slide the cover of the battery compartment at the automatic ignition (Fig. 105) upwards.
- Remove the old battery from the battery compartment of the automatic ignition.
- Insert a new battery of the same type into the battery compartment of the automatic ignition, observing the correct polarity (+/-) (Fig. 105). Use only temperature-resistant (+70 °C) and leak-proof Mignon batteries.
- Slide the cover of the battery compartment at the automatic ignition downwards.

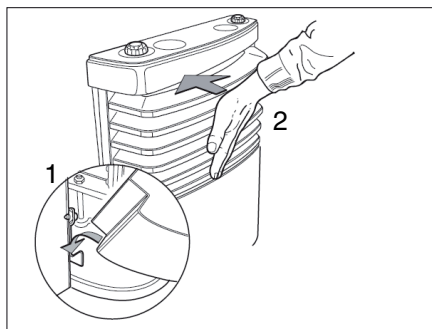


Fig. 106 Mounting the heater cover

- Mount the heater cover. To do so, insert the cover into the lower bracket (Fig. 106,1).
- Swivel the cover in until the catch levers engage audibly (Fig. 106,2).
- Check for correct sitting by pulling the cover.

# 10

## Appliances

### 10.2.3 Circulation fan

The circulation fan together with the hot-air heater ensures a better distribution of hot air throughout the caravan.

Depending on the model either one or two circulation fans are installed in the vehicle.

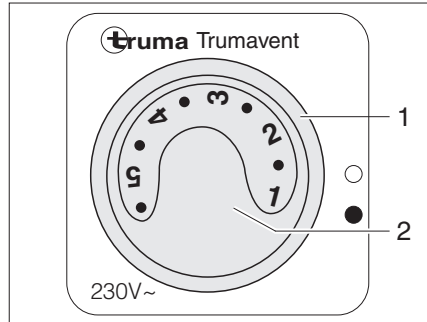


Fig. 107 Operating switch for circulation fan (240 V)

Switching circulation fan (240 V) on:

- Turn the rotary switch (Fig. 107,1) to "●".
- Turn the knob (Fig. 107,2) to the required position of the circulation fan.

Switching circulation fan (240 V) off:

- Turn the rotary switch (Fig. 107,1) to "○".

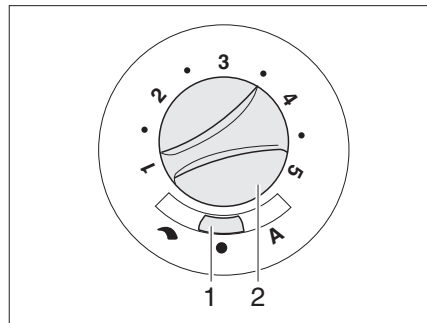


Fig. 108 Operating switch for circulation fan (12 V)

A circulation fan for 12 V line voltage is available as special equipment.

Switching circulation fan (12 V) on:

- Set sliding switch (Fig. 108,1) to "●" (manual control) or "A" (automatic operation).
- If "●" (manual control) is set on the sliding switch (Fig. 108,1): Turn the knob (Fig. 108,2) to the required position of the circulation fan.

## 10

## Appliances

*Switching circulation fan (12 V) off:*

- Set the sliding switch (Fig. 108,1) to "●" (off). This switch setting has no function in heating operation.

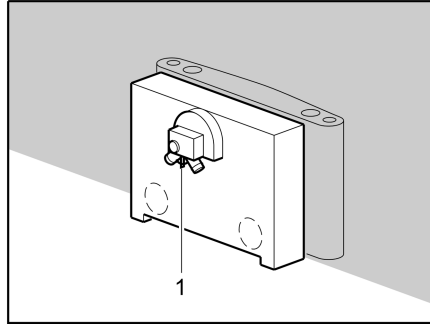


Fig. 109 Circulation fan

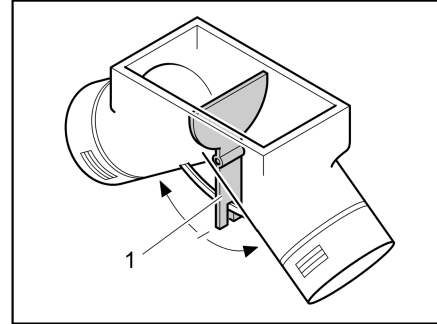


Fig. 110 Circulation fan, adjustment flap in central position

The hot air flow can be adjusted as required with the operating lever (Fig. 109,1) on the back of the circulation fan. Factory setting is the central position.

In the central position the warm air is distributed evenly to each warm air outlet. The operating lever (Fig. 110,1) for the adjustment flap is located under the base flap in the wardrobe.

*Setting the hot air distribution:*

- Undo bottom locker wood screws.
  - Remove bottom locker cover.
  - Push the operating lever (Fig. 110,1) in the direction of the arrow until the required position has been reached.
- ▷ Further information can be obtained from the separate "Trumavent" instruction manual.



# 10

## Appliances

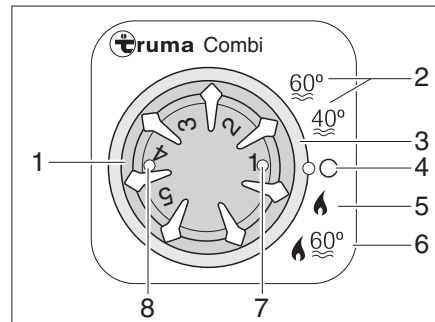
### 10.2.4 Hot-air heater Truma Combi



▷ If the heater is not in operation when there is risk of frost, empty the entire heating system.



▶ **Do not use the space above and behind the heater as a storage compartment. Fire hazard!**



- 1 Temperature control knob
- 2 Summer operation water temperature 40 °C or 60 °C
- 3 Rotary switch
- 4 Off
- 5 Winter operation "Heater without boiler"
- 6 Winter operation "Heater and boiler"
- 7 Indicator lamp green:  
Lit = "Heater in operation"  
Flashing = "After-running for temperature-reduction of the device is active"
- 8 Indicator lamp yellow/red:  
Lit yellow = "Boiler heating-up phase"  
Flashing/lit red = "Fault"

Fig. 111 Operating unit for heater/boiler

#### Operating modes

The heater has two operating modes:

- Winter operation
- Summer operation

It is only possible to heat the vehicle in the "Winter" operating mode. With the "Summer" operating mode only water in the boiler is heated. It is not possible to heat the vehicle in this operating mode.

#### Selecting operating mode:

- Set the operating mode using the rotary switch (Fig. 111,3).

The power supply of the heater cannot be interrupted by means of the 12 V main switch.

#### Winter operation

The heater selects the necessary burner setting according to the set heating level. In the "Heater and boiler" (Fig. 111,6) operating mode, the water in the boiler is also heated. The heater can be operated with an empty boiler in the "Heater without boiler" (Fig. 111,5) operating mode.

#### Switching on:

- Open the regulator tap on the gas bottle and the gas isolator tap "Heater/boiler".
- Turn the temperature control knob (Fig. 111,1) on the operating unit to the desired heating level.
- Set the rotary switch (Fig. 111,3) to winter operation "Heater without boiler" (Fig. 111,5) or to winter mode "Heater and boiler" (Fig. 111,6).

The green indicator lamp (Fig. 111,7) lights up.

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

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## Appliances

Switching off:

- Set the rotary switch (Fig. 111,3) to "O" (Fig. 111,4).
- Close the gas isolator tap "Heater/Boiler" and the main 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 the "Summer" operating mode. In this operating mode, only water in the boiler is heated.



- ▷ Further information can be obtained from the separate instruction manual "Gas heater".
- ▷ For further information about the use of the boiler see section "Boiler".

### Variant: Heater with gas and 240 V electrical operation



- ▷ 240 V electrical operation is only possible when the vehicle is connected to the 240 V power supply.
- ▷ Select the output level for 240 V electrical operation so that it corresponds to the fuse protection of the 240 V connection (900 W for 3.9 A fuse, 1800 W for 7.8 A fuse).
- ▷ When the heater on the operating unit is set to summer operation and the energy selector switch is set to mixed operation, the heater still runs only in 240 V operation. The gas burner is not switched on.

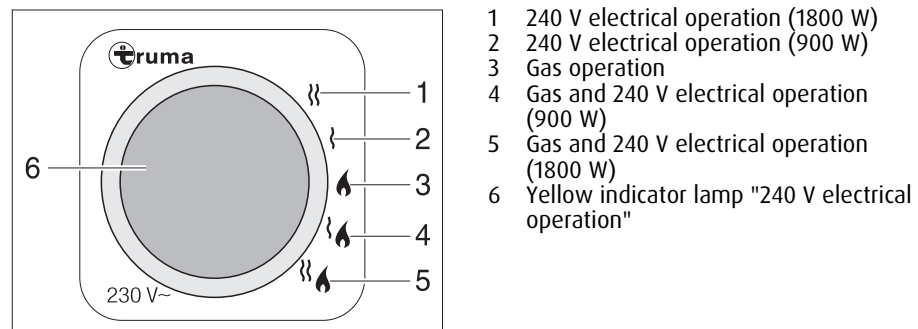


Fig. 112 Energy selector switch for heater/boiler

The heater can be operated with different types of energy:

- Gas operation (Fig. 112,3)
- 240 V electrical operation with the output levels 900 W (Fig. 112,2) or 1800 W (Fig. 112,1)
- Gas and 240 V electrical operation (mixed operation) with the output levels 900 W (Fig. 112,4) or 1800 W (Fig. 112,5)

The combination gas operation and 240 V electrical operation reduces the heating-up time (only possible when the heater on the operating unit (Fig. 111) is set to winter operation).

When 240 V electrical operation is selected, the yellow indicator lamp illuminates (Fig. 112,6).



- ▷ Further information can be obtained from the separate "Gas heater" instruction manual.
- ▷ For further information about the use of the boiler see section "Boiler".

# 10

## Appliances

### 10.2.5 Alde hot-water heater



- ▷ Never run the hot-water heater without heating fluid. Observe the specifications in Chapter 13.
- ▷ Never drill holes in the floor. This might damage the hot-water pipes.
- ▷ Do not use the space above and behind the heater as a storage compartment.



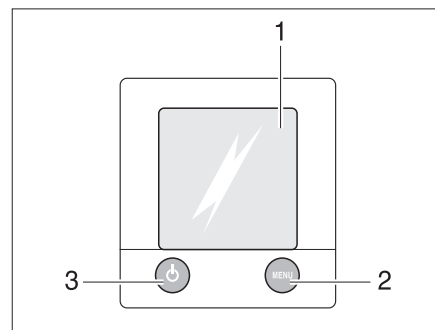
- ▷ The circulating pump must always be turned on when the hot-water heater is in operation.
- ▷ We recommend bleeding the heating system after the initial heater operation to checking the glycol content. Observe the specifications in Chapter 13.
- ▷ When the heater is turned on, it starts with the last settings used.
- ▷ For further information, see the separate manufacturer's instruction manual and observe the maintenance instructions found in Chapter 13.
- ▷ For further information about the use of the boiler see Section "Boiler".

**The hot-water heater is usually fitted below in the wardrobe.**

#### Operating unit

The operating unit is divided into two sections:

- Display (touch screen)
- Control buttons



- 1 Display (touch screen)
- 2 "Menu" button
- 3 On/Off button


Fig. 113 Operating unit for hot-water heater



- ▷ If no button is pressed, the operating unit automatically switches to the home position after two minutes.
- ▷ Changes to the settings are saved automatically after 10 seconds.

#### Control buttons

The control buttons have the following functions:

No. in Fig. 113	Button	Function
2	MENU	Open adjustment menu
3		Activate heating

#### Display

The display (Fig. 113,1) is designed as a touch screen. Touching the symbols calls up the relevant function.








# 10

## Appliances

### Start screen






The Start screen appears on the display after the heater is switched on. The Start screen contains the following information:

Symbol	Meaning
	This symbol appears when the circulating pump is activated
	This symbol appears when a switching facility for gas cylinders is activated
	This symbol appears when a voltage of 240 V is present at the heater
	The internal temperature is displayed next to this symbol
	The external temperature is displayed next to this symbol if an external sensor is fitted

### Adjustment menu

The "MENU" button calls up the adjustment menu. The meanings of the individual symbols are described in the following table.

The values can be increased or reduced via the "+" or "-" symbols.

Symbol	Meaning
	Set the desired temperature from +5 to +30 °C
	Set the water temperature in the boiler
	Set the heat output in electrical operation
	Activate the function "Heating in gas operation"
	Call up the enabling menu for the tool menus




*Resetting the heating to the factory setting:*

- Keep the "MENU" button pressed for 15 seconds.

### Tool menus

The various heater functions can be called up and adjusted via the tool menus. The arrow symbols are used to change between the menus. The meanings of the individual symbols are described in the manufacturer's instruction manual.

*Setting the pump speed:*

- Press the "MENU" button.
- Press the "" symbol.
- Press the "" symbol.
- Page downward using the arrow.
- Press the "" symbol.
- Press the "+" button until the desired level has been reached.
- Use the "OK" button to confirm the entry.

**Selecting the operating mode**

The hot-water heater can be operated with the following energy sources:

- Gas operation
- 240 V electrical operation
- Gas and 240 V electrical operation

The operating mode is selected on the operating unit.

*Selecting gas operation:*

- Press the "On" button next to the "△" symbol. The gas operation is activated.

*Selecting 240 V electrical operation:*

- Press the "+" button next to the "⚡" symbol until the desired heat output is reached.



- ▷ Select the output level during 240 V electrical operation in such a way that it corresponds to the 240 V connection protection:

Level 1 (1050 W) at 6 A

Level 2 (2100 W) at 10 A

Level 3 (3150 W) at 16 A

*Selecting gas and 240 V electrical operation:*



- Select gas operation and 240 V electrical operation on the operating unit.

- ▷ If gas and 240 V electrical operation is selected and if the vehicle is connected to the 240 V power supply, then the hot-water heater at first only operates in 240 V electrical operation. Only if the heat output is insufficient, does the gas operation also automatically switch on.

- ▷ The gas operation is only possible when the regulator tap on the gas bottle and the gas isolator tap are opened.

- ▷ 240 V electrical operation is only possible when the vehicle is connected to the 240 V power supply.

When the heater is turned on, it starts with the last set operating mode.

*Switching on the heater:*

- Press the "⏻" button. The Start screen appears in the display. The heater starts automatically.

*Switching the heater off:*

- Press the "⏻" button. The heater is turned off.

**240 V circulating pump**

Depending on the equipment, the hot-water heater has an additional 240 V circulating pump.

The switch for switching between the 12 V circulating pump and the 240 V circulating pump is located on the hot-water heater operating unit.

**Setting the rotational speed of the circulating pump**

- ▷ Level 2 = Normal level
- ▷ Level 5 = Ventilation

*Setting the output:*

- Set the adjusting screw at the pump to Level 2.
- To ventilate the pump set the adjusting screw to Level 5.

## 10

# Appliances

### 10.2.6 Ultraheat additional electric heater

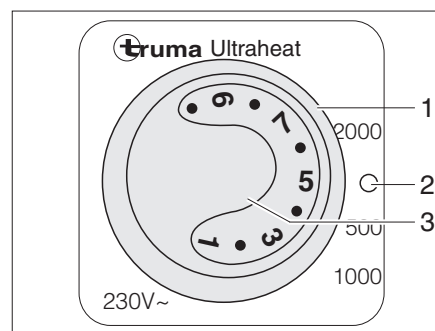
The Ultraheat additional electric heater is built-in to the hot-air heater. Therefore there are three heating options:

- Only the hot-air heater
- Hot-air heater and electric heater
- Only the electric heater

The vehicle can be heated more quickly with the additional electric heater.



- ▷ The additional electric heater only operates if the vehicle is connected to the 240 V power supply.
- ▷ If the heater is operated simultaneously with current and gas, the additional electric heater switches off before possible overheating by the stronger gas burner occurs.



- 1 Rotary switch
- 2 Off
- 3 Temperature control knob

Fig. 114 Operating unit for Ultraheat additional electric heater

- Switching on:*
- Connect the vehicle to the 240 V power supply (see Section 9.7).
  - Turn the rotary switch (Fig. 114,1) to the desired output level (500, 1000 or 2000 W).
  - Turn the temperature control knob (Fig. 114,3) to the desired output level.

- Switching off:*
- Set the rotary switch (Fig. 114,1) to "0" (Fig. 114,2).

## 10

# Appliances

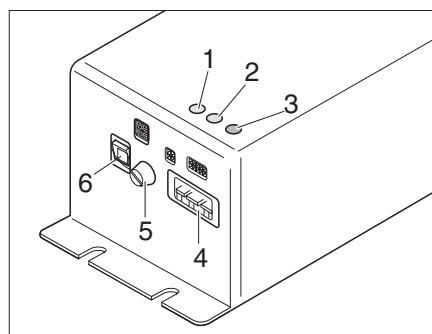
### 10.2.7 Warming unit for waste water pipes (special equipment)



- ▷ The warming unit only functions when the vehicle is connected to a 240 V power supply.
- ▷ Observe the instruction manual which is separately enclosed.

In order to prevent waste water pipes freezing up, the waste water pipes can be electrically warmed.

When the warming unit is turned on, the temperature of the waste water pipes is monitored by temperature sensors. If the temperature falls below 5 °C, the heating elements are switched on and the waste water pipes are warmed. If the temperature rises above a certain level, the heating elements are switched off again.



- 1 Indicator LED HC1 (Heating circuit 1)
- 2 Indicator LED HC2 (Heating circuit 2)
- 3 Fault LED
- 4 Power connection socket
- 5 Fuse
- 6 On-off switch

Fig. 115 Control unit for waste water heating

The control unit for the waste water heating (Fig. 115) is installed in the wardrobe or in the storage area beneath the seating group, depending on the model.

Three indicator LEDs are located at the control unit:

- The indicator LED (Fig. 115,1) lights up in green: Heating circuit 1 is operating
- The indicator LED (Fig. 115,2) lights up in green: Heating circuit 2 is operating
- Fault LED (Fig. 115,3)

**Switching on:**

- Connect the vehicle to a 240 V power supply (see Section 9.7.1).
- Turn the switch (Fig. 115,1) on the transformer (Fig. 115,2) to "ON".

**Switching off:**

- Turn the switch (Fig. 115,1) on the transformer (Fig. 115,2) to "OFF".

## 10

# Appliances

### 10.2.8 Electrical floor warming unit (special equipment)



- ▶ On models with electrical floor warming unit, never drill holes in the floor or screw in any screws. Caution with sharp-edged or pointed objects. There is danger of a power cut or a short circuit due to damage to a heater wire.



- ▶ Do not cover the regulator. Danger of overheating!



- ▶ The electrical floor warming unit only operates if the vehicle is connected to the 240 V power supply.
- ▶ The output of the electrical floor warming unit alone is not sufficient to heat the living area. It solely heats the floor in the walking area.

The regulator for the electrical floor warming unit is installed in the bench seat or in the wardrobe, depending on the model.

#### Operating levels

The electrical floor warming unit has four operating levels:

- 0 "Off"
- 20 V "low heating level"
- 22 V "medium heating level"
- 24 V "high heating level"

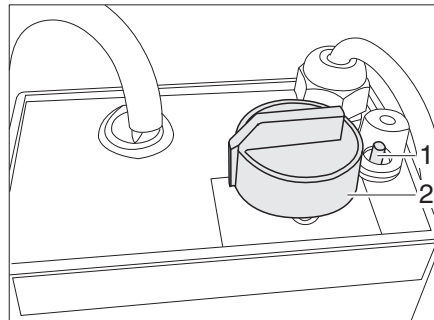


Fig. 116 Regulator for electrical floor warming unit

- Switching on:*
- Connect the vehicle to the 240 V power supply (see Section 9.7.1).
  - Turn the control knob (Fig. 116,2) to the desired heating level.

- Switching off:*
- Turn the control knob (Fig. 116,2) to the setting "0".

After switching off, the floor remains warm for a while, due to residual heat.

If the regulator is overloaded, the overload protection is actuated. The pin (Fig. 116,1) will trip.

- Switching on overload protection:*
- Press in the pin (Fig. 116,1) at the overload protection when the regulator has cooled down.

## 10

# Appliances

### 10.2.9 Floor warming unit with hot-water heater Alde (special equipment)



- ▷ In the case models with floor warming through the Alde hot water heater, never drill holes in the floor or screw in any screws. Danger of damage to a heating line and water leaking into the floor.



- ▷ The floor warming unit only functions when the hot-water heater is operating.

#### Blender package

With the blender package the floor heating is operated with its own thermostat and circulating pump. It ensures an even flooring temperature.



- ▷ Further information can be obtained from the separate instruction manual "Blender package".

## 10.3 Air conditioning unit

### 10.3.1 Roof air conditioning unit (Telair)

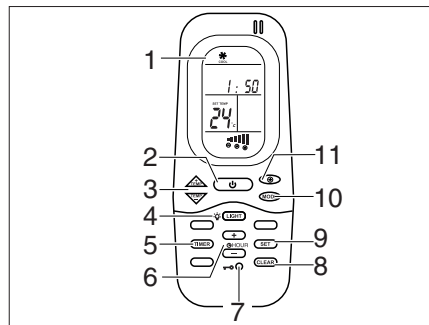


Fig. 117 Remote control

- 1 Display
- 2 On/off switch
- 3 TEMP (+/-) buttons for setting the temperature
- 4 LIGHT button for illumination on the diffuser
- 5 TIMER button for the timer function
- 6 HOUR (+/-) buttons for setting the time, remote control and operating and off times for the timer function
- 7 Reset button
- 8 CLEAR button for deleting the programming
- 9 SET button for setting mode
- 10 MODE button for selecting the operating modes
- 11 Selecting the fan speed levels

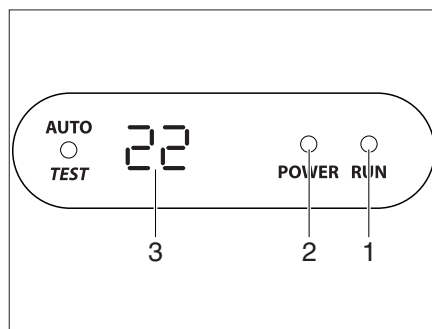


Fig. 118 Display on the diffuser

The air conditioning unit is located on the roof of the vehicle. The remote control (Fig. 117) for the air conditioning unit is located in the kitchen area.

## 10

# Appliances

*Switching on:*

- Connect the vehicle to the 230 V power supply.  
The air conditioning unit is ready to operate. The LED (Fig. 118,2) on the diffuser's display lights up red.
- To switch on, press the on/off switch (Fig. 117,2) on the remote control. The LED (Fig. 118,1) lights up green when the air conditioning unit is in cooling mode. The LED (Fig. 118,1) lights up red when the air conditioning unit is in heating mode.
- Set the desired operating mode using the MODE button (Fig. 117,10).
  - "COOLING"
  - "HEATING"
  - "AUTOMATIC"
- If necessary, set the desired fan level by using the button (Fig. 117,11) and the room temperature by using the buttons (Fig. 117,3).

*Switching off:*

- To switch off, press the On/Off switch (Fig. 117,2) on the remote control again.

### Timer

The integrated timer can be used to set the switching-on and -off times for the climate system up to 24 hours in advance from the current time on.

- To carry out programming, switch on the air conditioning unit with the On/off switch (Fig. 117,2) on the remote control.
- Press the TIMER button (Fig. 117,5). The ON indicator for the Start time is activated.
- Set the time with the TEMP (+/-) buttons (Fig. 117,3).
- Press the TIMER button (Fig. 117,5) again. The OFF indicator for the Start time is activated.
- Set the time with the TEMP (+/-) buttons (Fig. 117,3).
- Press the TIMER button (Fig. 117,5) again.
- Upon completing the setting, press the SET button (Fig. 117,9).
- Press the CLEAR button (Fig. 117,8) to delete the timer programming.



- ▷ Further information can be obtained from the separate manufacturer's instruction manual "DualClima 8400 H".

## 10.4 Boiler



- ▶ Never let gas escape unburned due to danger of explosion.
- ▶ When filling the fuel tank of the towing vehicle, on ferries or in the garage, never run the boiler in gas operation. Danger of explosion!
- ▶ Never operate the boiler in gas operation in closed rooms (e.g. garages). Danger of poisoning and suffocation!
- ▶ The water in the boiler can be heated up to 65 °C. Risk of scalding!



- ▷ When the vehicle is not being used, switch off and drain the boiler.
- ▷ Never use boiler when empty.
- ▷ If the boiler is not being used, empty it if there is any risk of frost.
- ▷ Only operate the boiler with the maximum temperature setting if you require a large quantity of warm water. This protects the boiler against the build-up of limescale.

## 10

# Appliances



- ▷ Dethleffs recommends that you do not use the water from the boiler as drinking water.

### 10.4.1 Models with waste gas vent on the right-hand side of the vehicle



- ▶ If the awning is put up and the boiler is running in gas operation, exhaust gases from the boiler can escape into the awning area. Danger of suffocation! Make sure the area is sufficiently ventilated.

### 10.4.2 Boiler Alde (special equipment)

#### Switching the boiler on/off

The boiler is integrated in the hot-water heater. Separate operation is not possible. For information about operating the hot-water heater see Section 10.2.5.

#### Filling/emptying the boiler

The boiler can be supplied with water from the water tank.



- ▷ Depending on the model, the vehicle is fitted with one or two drain cocks.
- ▷ The drain cocks are always located near the boiler.

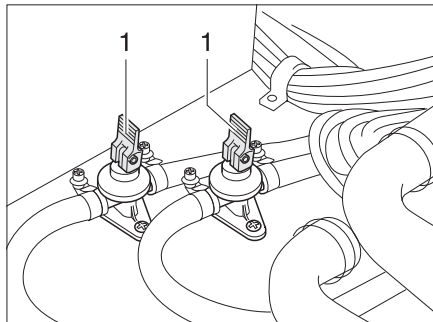


Fig. 119 Drain cocks

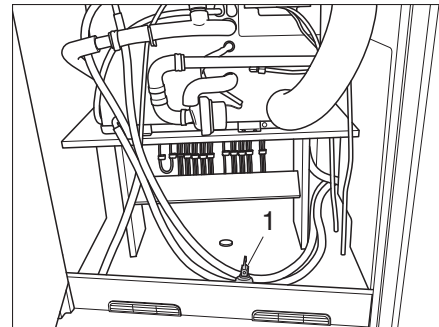


Fig. 120 Position of the drain cocks

#### Filling the boiler with water:

- Close the drain cocks. Position the rocking levers (Fig. 119,1) horizontally.
- Switch on 12 V power supply on the panel.
- Set all the water taps to "Hot" and open them. The water pump is turned on. The hot water pipes are filled with water.
- Keep the taps open until the water flowing out of the taps has no bubbles in it. This is the only way to ensure that the boiler is full of water.
- Close all water taps.

#### Emptying the boiler:

- Switch off boiler.
- Open all water taps and set to the central position.
- Open the drain cocks (Fig. 119). Position the rocking levers (Fig. 119,1) vertically. The boiler is drained to the outside using the drain cocks.
- Check whether the water has been drained completely from the boiler (approx. 12.5 litres).



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



## 10

# Appliances

### 10.4.3 Water heater Truma



- ▷ If you want to empty the water heater: Empty the water tank completely before opening the drain cocks of the water heater.
- ▷ Do not install a non-return valve in the cold water pipe between the water heater and the water pump.
- ▷ Use a pressure reducer in case of a central water supply or more powerful pumps. The water heater is only designed for a maximum pressure of 1.2 bars. Insert a safety/drainage valve additionally in the cold water pipes.



- ▷ Do not use the water from the water heater as drinking water.

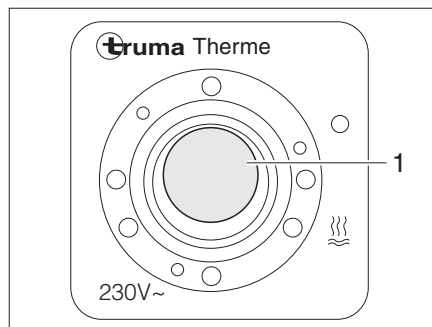


Fig. 121 Operating switch for water heater

The water heater can either be operated using the 240 V power supply (electrical mode of operation), with the hot air of the heater system or both types of energy. The water heater heats approx. 5 l water to a temperature of approx. 65 °C.

The electrical mode of operation is activated using the operating switch (Fig. 121). The indicator lamp (Fig. 121,1) on the switch must light up.

During hot air operation, the water in the water heater is heated up by the heater and the circulating air.

- Switching on:*
- Connect the vehicle to the external 240 V power supply and switch on the 240 V automatic circuit breaker.
  - Switch on the operating switch (Fig. 121). Indicator lamp (Fig. 121,1) on the switch lights up.

The water in the water heater is heated up to 65 °C.

## 10

# Appliances

*Switching off:*

- Switch off the operating switch (Fig. 121). The indicator lamp (Fig. 121,1) on the switch goes off.



- ▷ Depending on the model, the vehicle is fitted with one or two drain cocks.
- ▷ The drain cocks are always located near the boiler.

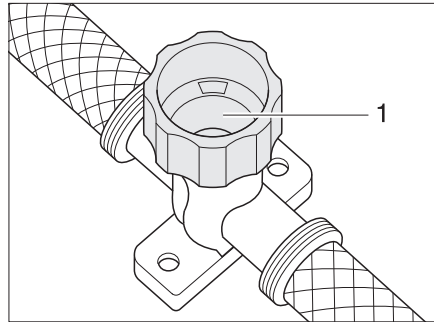


Fig. 122 Drain cock for water heater

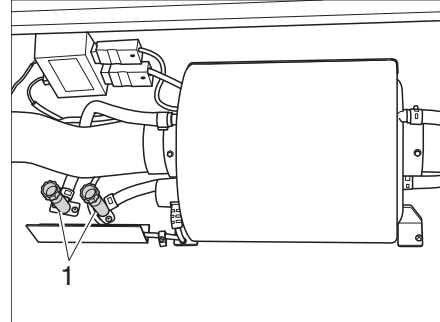


Fig. 123 Position of the drain cocks

*Filling the water heater with water:*

- Connect the vehicle to the external 240 V power supply and switch on the 240 V automatic circuit breaker.
- Switch off the operating switch (Fig. 121). The indicator lamp (Fig. 121,1) in the switch is not on.
- Close the drain cock. To do so, turn the cap (Fig. 122,1) clockwise.
- Set all the water taps to "Hot" and open them. The water pump is turned on. The hot water pipes are filled with water.
- Keep the taps open until the water flowing out of the taps has no bubbles in it. This is the only way to ensure that the water heater is full of water.
- Close all water taps.

*Emptying the water heater:*

- Set the 12 V main switch on the panel to "AUS" ("OFF") (Autark Package).
- Switch off the 240 V power supply at the 240 V automatic circuit breaker.
- Remove the cap of the water tank.
- Take out the stopper of the water tank.
- 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.
- Open the drain cock of the water heater. To do so turn the cap (Fig. 122,1) anti-clockwise.
- Check whether the water is completely drained from the water heater.



- ▷ Further information can be obtained from the separate instruction manual "Water heater".

# 10

## Appliances

### 10.5 Cooker



- ▶ Never let gas escape unburned due to danger of explosion.
- ▶ Before using the cooker make sure that there is sufficient ventilation. Open windows or the skylight.
- ▶ Do not use gas cooker or gas oven for heating.
- ▶ Always protect your hands with cooking gloves or potholders when handling hot pots, pans and similar items. There is a risk of injury.

#### 10.5.1 Gas cooker



- ▶ During activation and operation of the gas cooker, no flammable or easily combustible objects such as dishcloths, napkins etc. may 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.
- ▶ Depending on the model, the gas cooker lid is held closed by a spring. When closing there is danger of getting injured!



- ▷ Do not use the glass gas cooker lid as a hob.
- ▷ Do not close the gas cooker lid while the gas cooker is in operation.
- ▷ Do not apply pressure on the gas cooker lid when it is closed.
- ▷ Do not place hot cooking pans on the gas cooker lid.
- ▷ Keep the gas cooker lid open after cooking as long as the burner emits heat. The glass plate could otherwise burst.



- ▷ Use only pots and pans whose diameter is suitable for the burner grates of the gas cooker.
- ▷ When the flame fades, the thermocouple automatically cuts the gas supply.
- ▷ Further information can be obtained from the separate instruction manual "Gas cooker".

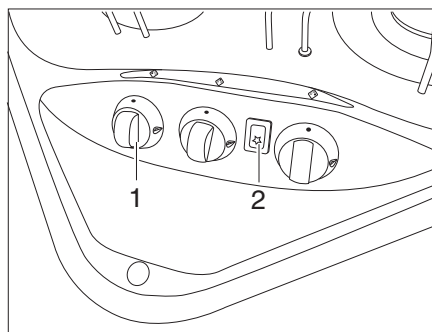


Fig. 124 Operating controls for gas cooker

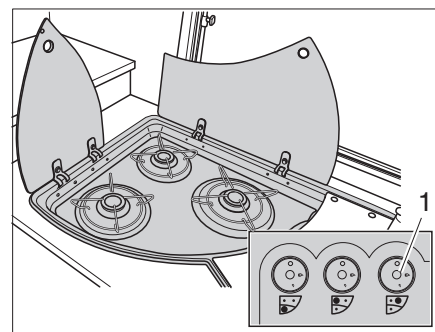


Fig. 125 Alternative: Operating controls for gas cooker

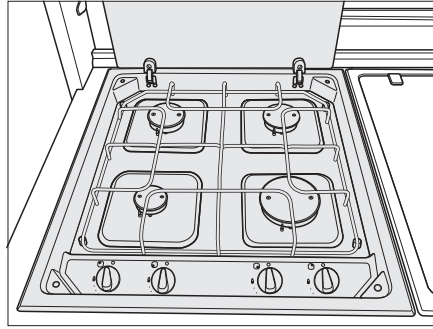


Fig. 126 4-burner gas cooker

- Switching on:*
- Open the regulator tap on the gas bottle and the gas isolator tap "Cooker".
  - Open the gas cooker lid.
  - Turn the control knob (Fig. 124,1 or Fig. 125,1) on the burner you wish to use to the ignition position (large flame).
  - Press down the control knob and hold it down.
  - If an ignition button (Fig. 124,2) is present:  
Create a spark by pushing the ignition button.
  - If an ignition button is not present:  
Ignite the burner with a gas lighter, a match or with other suitable means of lighting.
  - When the flame burns, hold the control knob down for 10 to 15 seconds, until the thermocouple keeps the gas supply automatically open.
  - Release the control knob and turn to the desired setting.
  - If ignition was not successful, 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.

## 10

# Appliances

### 10.5.2 Gas oven (special equipment)



- ▶ Always keep ventilation apertures at the gas oven open.
- ▶ There must be no flammable objects near the gas oven when it is being lit.
- ▶ The oven flap must remain open when it is being lit.
- ▶ If ignition has not taken place, repeat the entire procedure. If necessary, check if there is gas and/or current in the gas oven.
- ▶ If the gas oven still does not work, close the gas isolator tap and notify your service centre.
- ▶ If the burner flame is accidentally extinguished, switch off the oven and leave the burner off for at least 1 minute. Only then ignite it again.



- ▷ Before using the gas oven for the first time run it for 30 minutes at maximum temperature without any contents.
- ▷ When the flame fades, the thermocouple automatically cuts the gas supply.
- ▷ Further information can be obtained from the separate instruction manual "Gas oven".

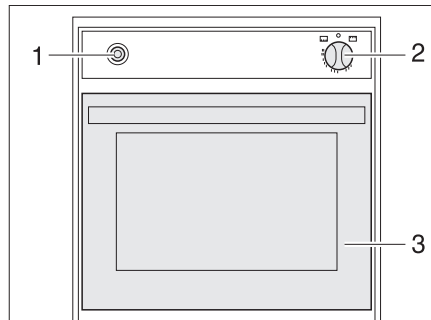


Fig. 127 Gas oven

#### Switching on:

- Open the regulator tap on the gas bottle and the gas isolator tap "Oven".
- Fully open the oven flap (Fig. 127,3).
- Lightly press control knob (Fig. 127,2) and set to "🔥" (oven).
- Press the control knob (Fig. 127,2) and hold it down for 5 to 10 seconds. Gas will stream into the burner.
- Press the ignition switch (Fig. 127,1) repeatedly until there is a flame.
- When the flame burns, hold the control knob down for 10 to 15 seconds, until the thermocouple keeps the gas supply automatically open.
- Release the control knob and turn to the desired setting.

#### Switching off:

- Turn the control knob (Fig. 127,2) to "○". The flame fades.
- Close the gas isolator tap "Oven" and the regulator tap on the gas bottle.

## 10

# Appliances

### 10.5.3 Extractor hood (special equipment)

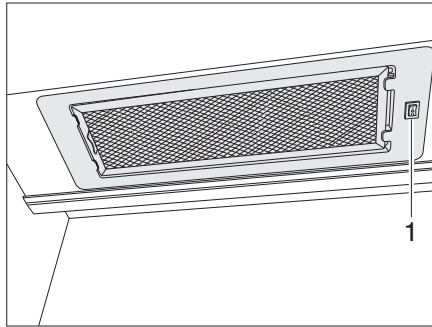


Fig. 128 Extractor hood

The cooker is equipped with an exhaust-air extractor hood. This disposes of a two-level fan.

*Switching extractor hood on/off*

- Use the switch (Fig. 128,1) to turn the extractor hood on and off.

### 10.6 Refrigerator

During the journey, only operate the refrigerator via the 12 V power supply. At high ambient temperatures full cooling power is not possible. When external temperatures are high, full cooling power of the cooling unit is only ensured if the refrigerator is ventilated sufficiently. The refrigerator ventilation grill can be removed in order to achieve a better ventilation.



- ▷ When leaving the vehicle, always fit the refrigerator ventilation grills. Otherwise water could penetrate during rain.
- ▷ **If the caravan is equipped with the AL-KO Trailer Control System (ATC), the cooling power of the refrigerator during driving is somewhat less than with vehicles without ATC.**

The battery management system (BMS) at the towing vehicle can cause voltage fluctuations at the 12-V supply of the caravan, causing the 12 V supply of the refrigerator to be interrupted as well.

- ▷ Check the 12 V supply of the refrigerator during breaks in the journey.

#### 10.6.1 Refrigerator ventilation grill

**Thetford**

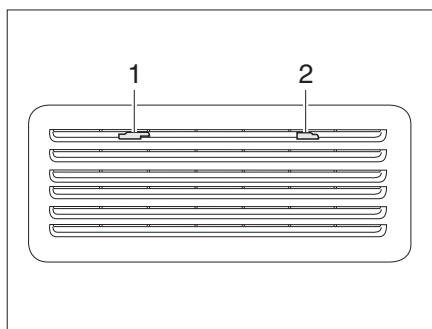


Fig. 129 Refrigerator ventilation grill (Thetford small)

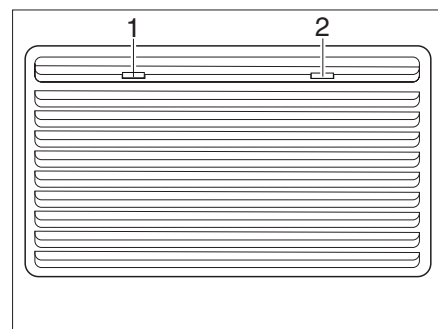


Fig. 130 Refrigerator ventilation grill (Thetford large)

- Removal:*
- Slide the locking devices (Fig. 129,1 and 2 or Fig. 130,1 and 2) to the middle.
  - Remove the refrigerator ventilation grill.

# 10

## Appliances

### 10.6.2 Operation (Thetford without SES)

#### Operating modes

The refrigerator has 2 operating modes:

- Gas operation
- Electrical operation (240 VAC or 12 VDC)

The operating mode is set with the operating controls on the refrigerator panel. Infinitely variable regulation of the cooling power is only possible with gas operation and when the refrigerator is operated with 240 V. It is not possible with 12 V operation.

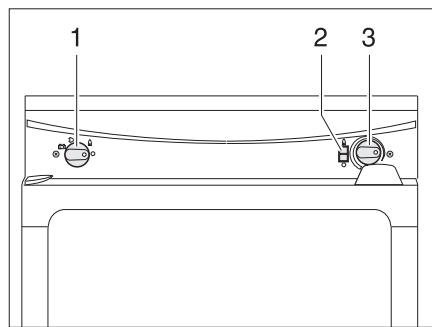


- ▷ Select only one energy source.
- ▷ Even when the 12 V supply is switched off, a small electrical current flows which puts an extra load on the living area or vehicle battery. Always switch the refrigerator off during a temporary lay-up.

#### Gas operation



- ▶ Never let gas escape unburned due to danger of explosion.



- 1 Energy selector switch
- 2 Flame indicator
- 3 Control knob for setting the temperature

Fig. 131 Operating controls for the refrigerator (Thetford without SES)

#### Switching on:

- Open the regulator tap on the gas bottle and the gas isolator tap "Refrigerator".
- Set the energy selector switch (Fig. 131,1) to gas "🔥".
- Press the control knob (Fig. 131,3) down and hold it. The gas supply is open. Ignition will take place automatically. A ticking sound can be heard until ignition has been completed successfully.
- Keep the control knob (Fig. 131,3) pressed down until the flame indicator (Fig. 131,2) becomes green and then release it. If the flame fades, then the ignition device will repeat the ignition process.
- Adjust the refrigerating temperature with the control knob.

#### Switching off:

- Set the energy selector switch (Fig. 131,1) to "0". Refrigerator is switched off.
- Close the gas isolator tap "Refrigerator" and the regulator tap on the gas bottle.

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## Appliances

### Electrical operation



- ▷ Close the gas isolator tap "Refrigerator" when the refrigerator is operated electrically.

The refrigerator can be operated with the following voltages:

- 240 VAC
- 12 VDC

*Switching the 240 V operation on:*

- Set the energy selector switch (Fig. 131,1) to 240 V operation "⚡".
- Use the control knob (Fig. 131,3) to adjust the refrigerating temperature.

*Switching the 240 V operation off:*

- Set the energy selector switch to "○". Refrigerator is switched off.

*Switching the 12 V operation on:*

- Set the energy selector switch (Fig. 131,1) to 12 V operation "⊕".

*Switching the 12 V operation off:*

- Set the energy selector switch to "○". Refrigerator is switched off.

When operated with 12 V, the refrigerator draws power only from the starter battery of the vehicle. During prolonged driving breaks without 240 V power supply therefore change over to gas operation so that the vehicle battery does not discharge and the starting capability of the towing vehicle is preserved.

The thermostat is not activated during 12 V operation. The refrigerator operates continuously.



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

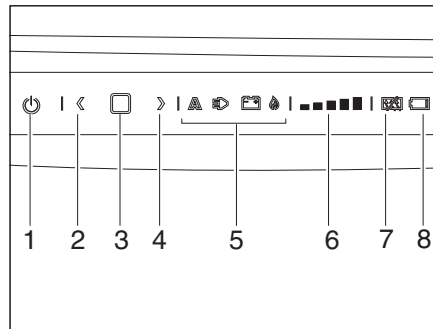


# 10

## Appliances

### 10.6.3 Operation (Thetford N4000)

#### Operating modes



- 1 On-off switch
- 2 Arrow button left
- 3 Confirmation button
- 4 Arrow button right
- 5 Operating indicator
- 6 LED indicator "Temperature level"
- 7 Display anti-condensation function
- 8 Flat battery indicator (optional)

Fig. 132 Operating controls for the refrigerator (Thetford)

The refrigerator has 3 operating modes:

- Gas operation
- Electrical operation with 240 V alternating voltage
- Electrical operation with 12 V direct voltage

The operating mode is set with the operating controls on the refrigerator panel. Infinitely variable regulation of the cooling power is only possible with gas operation and when the refrigerator is operated with 240 V. It is not possible with 12 V operation.



- ▶ Never let gas escape unburned due to danger of explosion.



- ▷ Select only one energy source.
- ▷ Even when the 12 V supply is switched off, a small electrical current flows which puts an extra load on the living area or vehicle battery. Always switch the refrigerator off during a temporary lay-up.

#### Switching on and off

*Switching on:*

- If the refrigerator is to be operated with gas, open the regulator tap on the gas bottle and the gas isolator tap "Refrigerator".
- Press the on-off switch and hold it down for 1 second.
- A lamp lights up green in the on-off switch.

*Switching off:*

- Press the on-off switch again and hold it down for 2 seconds.
- The lamp in the operating panel extinguishes.



- ▷ Close the gas isolator tap "Refrigerator" when the refrigerator is operated electrically.
- ▷ If there is no Autark Package, the refrigerator draws power only from the starter battery of the vehicle when operated with 12 V. During prolonged driving breaks without 240 V power supply change over to gas operation so that the vehicle battery does not discharge and the starting capability of the towing vehicle is preserved.

*Selecting the energy source:*

- Press the confirmation button (Fig. 132,1) and hold it down for 2 seconds.
- The symbols for gas, mains and battery operation begin to flash in the display (Fig. 132,5) for the energy source.
- Use the arrow buttons (Fig. 132,2 and Fig. 132,4) to select the desired source.
- Press the confirmation button (Fig. 132,3) to confirm the selection.

*Selecting the cooling level:*

- The display (Fig. 132,6) for the cooling level begins to flash.
- Use the arrow buttons (Fig. 132,2 and Fig. 132,4) to select the desired cooling level.
- Press the confirmation button (Fig. 132,3) to confirm the selection.



- ▷ The appliance has an anti-condensation function to prevent the operating field from being clouded. The function can be switched off to save energy, for example if the battery capacity is dwindling.

*Switching off the anti-condensation function:*

- Press both arrow buttons (Fig. 132,2 and Fig. 132,4) simultaneously and hold down for 2 seconds.
- The display symbol (Fig. 132,7) for the anti-condensation function lights up and the function is deactivated.

*Switching on the anti-condensation function:*

- Press both arrow buttons (Fig. 132,2 and Fig. 132,4) simultaneously and hold down for 2 seconds.
- The display symbol (Fig. 132,7) for the anti-condensation function extinguishes and the function is activated.



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

# 10

## Appliances

### 10.6.4 Refrigerator door locking mechanism

With some models, the refrigerator has a separate freezer compartment. The specifications in this section correspondingly also apply to the door of the freezer compartment.



- ▷ During the journey the refrigerator door must always be closed and be locked in the closed position.



- ▷ When the refrigerator is switched off, bring the refrigerator door into the ventilation position and lock it in place if possible. This prevents mould from 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

#### Thetford

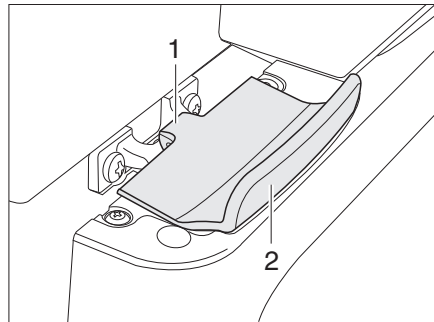


Fig. 133 Lock of refrigerator door, closed (Thetford)

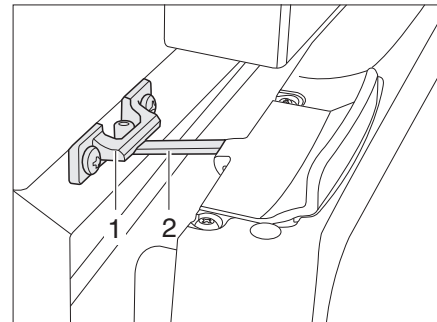


Fig. 134 Refrigerator door in ventilation position (Thetford)

- Opening:*
- Open the refrigerator door at the handle (Fig. 133,2). The lock (Fig. 133,1) is released automatically.

- Closing:*
- Fully close the refrigerator door. Ensure that the lock is engaged.

- Locking in the ventilation position:*
- Slightly open refrigerator door.
  - Open the lock (Fig. 134,2) and snap it into the locking catch (Fig. 134,1). The refrigerator door will then stay slightly open.

## Chapter overview

This chapter contains instructions regarding the sanitary fittings of the vehicle. The instructions address the following topics:

- water tank
- waste water tank
- complete water system
- toilet compartment
- toilet

### 11.1 Water supply, general



- ▶ Only fill the water tank from supply systems that have been verified to provide drinking water quality.
- ▶ Use only hoses or vessels for filling that are approved for drinking water.
- ▶ Rinse the filling hose or vessel thoroughly with drinking water before use (2 to 3 times the capacity).
- ▶ Drain the filling hose or vessel completely after use and close the openings of the filling hose or vessel.
- ▶ 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 case of lay-ups lasting more than a week, disinfect the water system before using the vehicle.



- ▶ **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. Leave the water taps on in central position. Leave the safety/drainage valve (if available) 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.**
- ▶ The water pump will overheat without water and can get damaged. 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.

A canister or the waste water tank collects the waste water.



- ▶ Before using the water fittings, the 240 V power supply must be connected and the 240 V automatic circuit breaker must be switched on, or the caravan must be electrically connected to the towing vehicle. Otherwise the water pump will not work.

This is not required when the caravan is fitted with the Autark Package.

- ▶ When the water tank is re-filled, an air bubble may form at the bottom of the pump. This air bubble will prevent water from being drawn in. Shake the water pump up and down energetically in the water.

## 11 Sanitary fittings

### 11.2 Water tank

#### 11.2.1 Drinking water filler neck with cap



- ▶ The cap for the drinking water filler neck and for the fuel filler neck are very similar. Before filling the tank, always check the label.

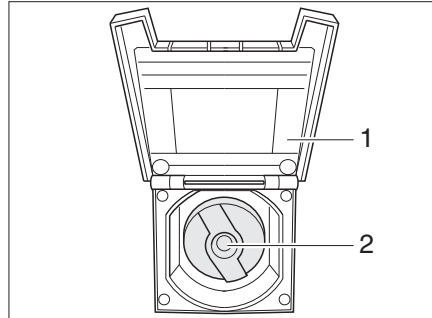


Fig. 135 Cap for the drinking water filler neck

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

- Opening:*
- Open the cover flap (Fig. 135,1) of the drinking water filler neck.
  - Insert the key into the locking cylinder (Fig. 135,2) and turn a quarter turn anti-clockwise.
  - Remove the cap.
  - Fill the water tank with drinking water.
- Closing:*
- Place the cap on the drinking water filler neck.
  - Turn the key one quarter turn clockwise.
  - Remove the key.
  - Check that the cap sits firmly on the drinking water filler neck.
  - Close the cover flap (Fig. 135,1).

#### 11.2.2 Filling with 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 the drinking water filler neck (Fig. 135).
- 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.

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## Sanitary fittings

### Forced overflow in water tank

If the complete volume of the water tank is not available, the water tank may have a forced overflow. This forced overflow can be removed and replaced with the enclosed plug.

- Unscrew the cap (Fig. 136,2).
- Pull the forced overflow from the drain pipe of the water tank.
- Put the plug onto the drain pipe.

### 11.2.3 Draining water

To empty the water tank, proceed as follows:

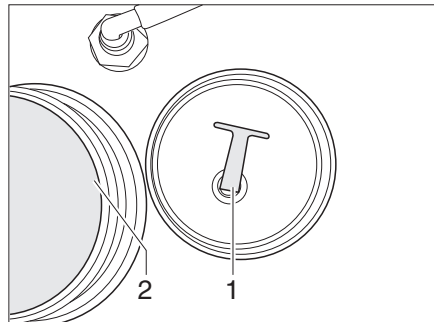


Fig. 136 Water tank

- Unscrew the cap (Fig. 136,2) on the water tank.
- Screw out the stopper (Fig. 136,1) from the drainage opening. The water drains off.
- Screw in the stopper.
- Screw the cap onto the water tank.

## 11.3 Waste water tank

### 11.3.1 Waste water tank, mobile



- ▶ Before commencing the journey, empty the waste water tank.



- ▷ If there is any risk of frost, empty the waste water tank. For models with a heater for the waste water tank, the waste water tank is only sufficiently protected from frost when the hot-water heating and the heater for the waste water tank are in operation.
- ▷ 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, at camping sites or caravan sites, that are especially provided for this purpose.

## 11 Sanitary fittings

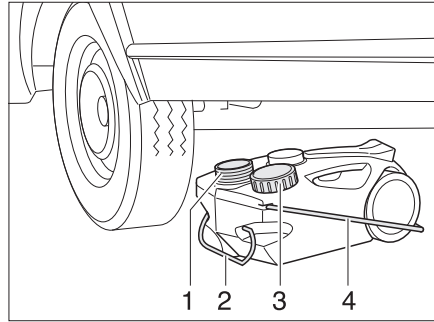


Fig. 137 Waste water tank, mobile

- Emptying:*
- Close the opening of the waste water tank (Fig. 137,1) with the lid (Fig. 137,3).
  - Pull out the waste water tank at the handle (Fig. 137,2).
  - Swing up the carrying handle (Fig. 137,4) and set the waste water tank up.
  - Only empty the waste water tank (completely!) at disposal stations that are especially provided for this purpose.

### 11.3.2 Waste water tank, underfloor (special equipment)

The heated underfloor waste water tank with the waste water pipes for the kitchen and bath washbasin is located under the vehicle. The shower drain does not end in this tank, but in the mobile waste water tank (see Section 11.3.1).

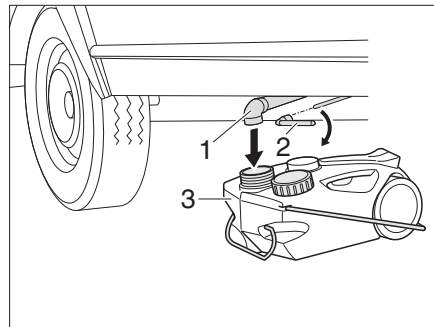


Fig. 138 Waste water tank, underfloor

- Emptying:*
- Place the mobile waste water tank (Fig. 138,3) under the waste water piping (Fig. 138,1).
  - Place the socket spanner (Fig. 138,2) on the square bolt.
  - In order to open the waste water tap, turn the square bolt a quarter turn in a clockwise direction.
  - Completely empty waste water tank.
  - To close the waste water tap, turn the square bolt back as far as it will go.

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## Sanitary fittings

### 11.4 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. Never operate water pump when the water tank is empty.



- ▶ The water level can be checked on the panel while the water tank is being filled (Autark Package).

- Position the vehicle horizontally.
- Connect the 240 V power supply and switch on the 240 V automatic circuit breaker. As far as the Autark Package with battery is concerned, a 240 V power supply is not necessary.
- Switch on the 12 V main switch on the panel (Autark Package).
- Clean or disinfect water system.
- Close drain cocks for the boiler and hot water source.
- Close all water taps.
- Open the cap on the water tank.
- Close the drainage opening in the water tank with the stopper provided.
- Firmly close the water tank again with the cap.
- 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 hot water pipes are filled with water.
- Keep the taps open until the water flowing out of the 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 taps open until the water flowing out of the taps has no bubbles in it.
- Close all water taps.
- Check that the cap on the water tank is not leaking.



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## Sanitary fittings

### 11.5 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. Leave the water taps on in central position. Leave the safety/drainage valve (if available) 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.



- ▷ Take note of the environmental tips in this chapter.

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

- Position the vehicle horizontally.
- Switch off the 12 V power supply on the panel (Autark Package).
- Switch off the 240 V power supply on the 240 V automatic circuit breaker.
- Open all drain cocks.
- Take the cap off the cleaning opening of the water tank.
- Take out the stopper of the water tank.
- Open all water taps and set to the central position.
- Hang the shower handset up in the shower position.
- Take the cap off the opening for the water pump of the water tank.
- After fully emptying the system, drive a few kilometres so the remaining water can run out of the tank.
- Allow the pressure pump to run for approx. 1 minute to dry it.
- Empty the waste water tank. Take note of the environmental tips in this chapter.
- Empty Thetford cassette. Take note of the environmental tips in this chapter.
- 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.
- Leave all drain cocks open.

## 11 Sanitary fittings

### 11.6 Toilet compartment



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



- ▷ For ventilation purposes during or after a shower, and for drying wet clothing, close the toilet compartment door and open the toilet compartment window or skylight. This improves the air circulation.
- ▷ Close the shower curtain completely while showering, so that water cannot penetrate between the washroom wall and the shower tray.
- ▷ 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 Section 12.2.

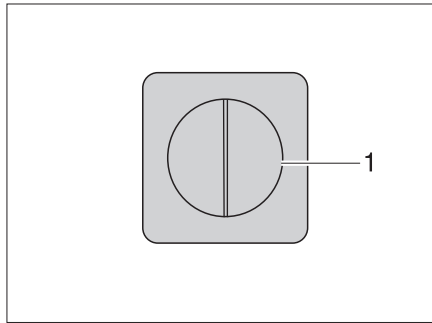


Fig. 139 Light switch

The switches for the toilet compartment lighting are installed in different places in the toilet compartment depending on the model.

For example, the light switch (Fig. 139,1) of the toilet compartment is located under the bathroom cabinet.

### 11.7 Toilet



- ▷ If there is any risk of frost and the vehicle is not heated, empty the sewage tank (cassette).
- ▷ 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 (cassette) at disposal stations, at camping sites or caravan sites, that are especially provided for this purpose.

# 11 Sanitary fittings

## 11.7.1 Toilet with separate water tank

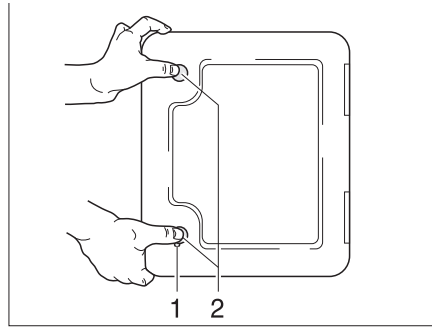


Fig. 140 Flap for Thetford cassette

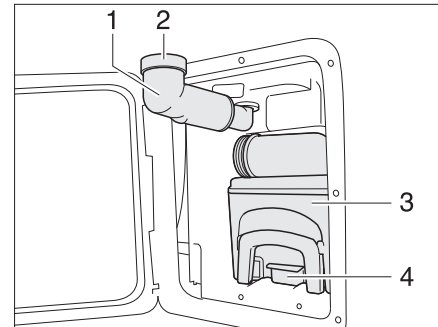


Fig. 141 Thetford cassette

The Thetford toilet is flushed via its own water tank, which is integrated in the toilet compartment.

The flap for the Thetford cassette (Fig. 140) is located on the outside of the vehicle.

### Filling the water tank:

- Insert key into locking cylinder of the push-button lock (Fig. 140,1) and turn a quarter turn clockwise.
- Remove the key.
- Press both push-button locks (Fig. 140,2) simultaneously with your thumb and open the flap for the Thetford cassette.
- Swing the fresh water filler neck (Fig. 141,1) towards the outside.
- Remove the screw cap (Fig. 141,2).
- Fill with fresh water until the fluid level reaches the top edge. This corresponds to approx. 15 l.
- Close the screw cap.
- Swivel the fresh water filler neck inwards.
- Close the flap for the Thetford cassette.

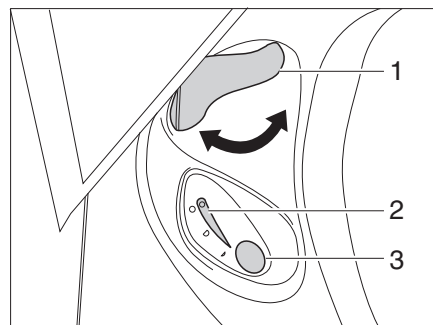


Fig. 142 Operating unit Thetford toilet

### Flushing:

- Before flushing open the sliding trap of the Thetford toilet. To do this, turn the slide lever (Fig. 142,1) anticlockwise.
- For flushing, press the blue flush button (Fig. 142,3).
- After flushing close the sliding trap. To do this turn the slide lever (Fig. 142,1) clockwise.

The indicator lamp (Fig. 142,2) goes on whenever the Thetford cassette has to be emptied.

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## Sanitary fittings

*Emptying:*

- Turn the slide lever (Fig. 142,1) clockwise. The sliding trap is closed. To empty, the sliding trap in the Thetford toilet **must** be closed.
- Remove the Thetford cassette and empty it as described in Sections 11.7.2 and 11.7.3.

*Emptying the water tank:*

- Open the sliding trap. To do this, turn the slide lever in an anticlockwise direction.
- Press the flush button until water ceases to flow into the bowl.
- Close the sliding trap. To do this turn the slide lever in a clockwise direction.
- Open the flap for the Thetford cassette.
- Swing the fresh water filler neck towards the outside.
- Remove the screw cap from the fresh water filler neck.
- Turn the fresh water filler neck in an anticlockwise direction until the residual water flows out.
- Turn the fresh water filler neck back in a clockwise direction.
- Screw the screw cap onto the fresh water filler neck.
- Swivel the fresh water filler neck inwards.

### 11.7.2 Removing the cassette



- ▷ The sewage tank (cassette) can only be removed when the sliding trap is closed.

#### Service flap

The sewage tank (cassette) can be accessed via the special service flap.

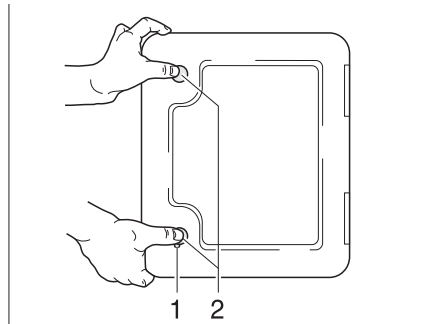


Fig. 143 Flap for the toilet cassette

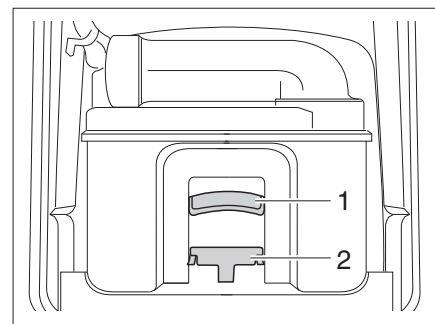


Fig. 144 Thetford cassette

- Open the flap for the cassette on the outside of the vehicle. Insert the key into the locking cylinder of the push-button lock (Fig. 143,1) and turn a quarter turn.
- Remove the key.
- Press both push-button locks (Fig. 143,2) simultaneously with your thumb and open the flap for the cassette.
- Pull the retaining clip (Fig. 144,2) forward to unlock the toilet cassette and pull out the cassette at the handle (Fig. 144,1).

## 11 Sanitary fittings

### 11.7.3 Emptying the cassette

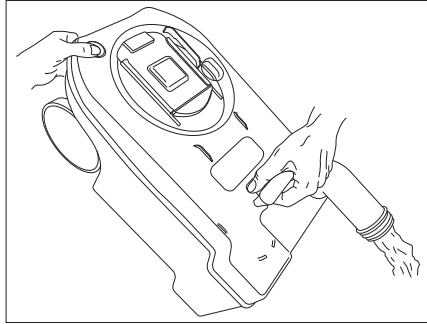


Fig. 145 Emptying the Thetford cassette

- Take the cassette to a disposal point especially provided for this purpose. As you do this, point the drainage neck upwards.
- If necessary, turn the drainage neck upwards.
- Remove the drainage neck cap.
- Point the cassette with the drainage neck downwards.
- For Thetford cassettes: Activate the aeration knob with your thumb. The cassette empties.
- Close the drainage neck with the cap.
- If necessary, return the drainage neck to its original position.
- Push the cassette back to its original position.
- Ensure that the cassette is secured by the retaining clip.
- Lock the flap for the cassette.

## Chapter overview

This chapter contains instructions regarding the care of the vehicle.

The instructions address the following topics:

- exterior of the vehicle
- interior
- water system
- extractor hood
- air conditioning unit
- winter operation

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.

The checklist address the following topics:

- temporary lay-up
- winter lay-up
- start-up after a lay-up

### 12.1 External care

#### 12.1.1 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 instructions 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, ventilation grills or skylights. The vehicle may be damaged or water may enter the interior.

#### 12.1.2 Washing the vehicle



- ▷ Never have the vehicle cleaned in a car wash. Water can penetrate in the refrigerator grills, the waste gas vents, the ventilations of the extractor hoods or in 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.
- Clean surfaces made of glass-fibre reinforced plastic (GRP) only with mild cleansers. Cleaning agents and polishes for GRP surfaces are available in specialised stores.

## 12

## Care

- 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 of doors and storage flaps with talc.
- Treat locking cylinder of doors and storage flaps with graphite dust.

### 12.1.3 Windows of acrylic glass

Acrylic glass windows are delicate and require very careful handling.



- ▷ Never rub acrylic glass windows when dry as dust particles might damage the surface.
- ▷ Only clean acrylic glass windows with plenty of warm water, 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 drive into car wash units.
- ▷ Do not apply stickers to the acrylic glass windows.
- ▷ After cleaning the vehicle rinse the acrylic glass windows again with sufficient clear water.
- ▷ Treat rubber seals with glycerin.



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

### 12.1.4 Hot-dip galvanised chassis

Adhering salt damages the hot-dip galvanised chassis and can cause white rust. However, so-called white rust is not a flaw. It is only an optical impairment. The most common causes of white rust are:

- Gritting material and road salt (e.g. from journeys during winter)
- Condensation (e.g. by covering the vehicle with plastic films or tarpaulins)
- Humidity (e.g. by parking the vehicle in high grass, in puddles or mud)
- Cleansers (e.g. by cleaning with aggressive cleansers)
- Snow (e.g. by standing longer in snow)
- Insufficient ventilation (e.g. by covering with aprons in the underfloor area)

To avoid formation of white rust or to remove any existing white rust, we recommend the following method:

- After traveling in winter rinse the hot-dip galvanised surfaces with clear water.
- If hot-dip galvanised surfaces have white rust, clean the locations with a zinc cleaner (e.g. Poligrat).

## 12

## Care

### 12.1.5 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.

### 12.1.6 Waste water tank

Clean the waste water tank after every use of the vehicle.

*Cleaning:*

- Open the cleaning opening on the waste water tank and the drain cock.
- Thoroughly rinse out the waste water tank with fresh water.

### 12.2 Internal care



- ▷ If possible, treat stains immediately.
- ▷ Acrylic glass windows are delicate and require very careful handling (see Section 12.1.3).
- ▷ 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 containing sand. This procedure will help you to avoid brittleness and formation of cracks.
- ▷ 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 decalcification of the water system. Vinegar-based products may cause damage to seals or parts of the installation. Use standard decalcifying products for decalcification.
- ▷ 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.
- ▷ Check at an inconspicuous point whether the cleanser used is suitable for the surface to be cleaned.
- ▷ Staining from textiles is excluded from any and every manufacturer guarantee claims. This is by no means a fault in the cover fabric, but rather a fault in the clothing for which the clothing store has to be contacted.
- 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 necessary, treat finished surfaces with furniture polish.
- Clean upholstery with dry foam specially manufactured for the use on upholstery or with the foam of a mild detergent. Do not wash upholstery, only have them cleaned. Protect upholstery from direct sunlight so that it does not lose its colour.



- Clean covers made of synthetic leather at least once a week with an absorbent cloth or sponge and with a mixture of water and mild lather. Wipe off with clear water, but do not use too much water.  
Clean stubborn stains with a mixture of alcohol and water (30% alcohol and 70% water) or with 10% diluted ethanol (10% ethanol and 90% water) and then with clear water. However marks may remain.  
Do not use solvent-based or scouring products, nor undiluted alcohol and/or acetone.
- Wipe off Teflon coverings with an absorbent cloth or sponge and use a mild water-based household detergent. Alternatively use a mixture of 2 table-spoons of ammonia with 1 litre of water.  
Never rub wet or oily stains. Instead, dab them with an absorbent cloth. Work from the outside to the inside to prevent spreading the stain. When treating solid or dried stains, always try to scrape them off with a dull knife or scraper or remove them off with a soft brush. Afterwards, dab off any residue with a moist cloth.
- 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 cleanser 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.
- Brush insect screens on doors, windows and skylights with a soft brush or vacuum with the brush attachment of the 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).

## 12

## Care

### 12.3 Water system

#### 12.3.1 Cleaning the water tank

- Clean the water tank with a plastic-compatible cleanser from specialised stores. Observe the manufacturer's instructions.

#### 12.3.2 Cleaning the water pipes



- ▷ Use only suitable cleansers from specialised stores.



- ▷ Collect the exiting mixture of water and cleansers and dispose of it correctly.

- Empty the water system.
- Close all the drainage openings and drain cocks.
- Fill a mixture of water and cleanser into the water tank. Observe the manufacturer specifications for the mixing ration.
- Open the drain cocks individually.
- Leave the drain cocks open until the mixture of water and cleanser has reached the respective drain.
- Close the drain cocks again.
- Set all the water taps to "Hot" and open them.
- Leave the water taps open until the mixture of water and cleanser has reached the drain.
- Set all the water taps to "Cold" and open them.
- Leave the water taps open until the mixture of water and cleanser has reached the drain.
- Close all water taps.
- Flush the toilet several times.
- Let the cleanser act in accordance with the manufacturer specifications.
- Empty the water system. Collect the exiting mixture of water and cleansers and dispose of it correctly.
- To rinse fill the entire water system with drinking water and empty it again several times.

## 12

## Care

### 12.3.3 Disinfecting the water system



▷ Use only suitable disinfectants from specialised stores.



▷ Collect the exiting mixture of water and disinfectant and dispose of it correctly.

- Empty the water system.
- Close all the drainage openings and drain cocks.
- Fill a mixture of water and disinfectant into the water tank. Observe the manufacturer specifications for the mixing ration.
- Open the drain cocks individually.
- Leave the drain cocks open until the mixture of water and disinfectant has reached the respective drain.
- Close the drain cocks again.
- Set all the water taps to "Hot" and open them.
- Leave the water taps open until the mixture of water and disinfectant has reached the drain.
- Set all the water taps to "Cold" and open them.
- Leave the water taps open until the mixture of water and disinfectant has reached the drain.
- Close all water taps.
- Flush the toilet several times.
- Let the disinfectant act in accordance with the manufacturer specifications.
- Empty the water system. Collect the exiting mixture of water and disinfectants and dispose of it correctly.
- To rinse fill the entire water system with drinking water and empty it again several times.

## 12

## Care

### 12.4 Extractor hood



► Prior to carrying out work on the device, turn off the power supply.

Clean the grease filter of the range hood occasionally. How often cleaning is necessary depends on how often the range hood is used. Do not wait to clean the filter until the performance of the range hood has noticeably decreased.

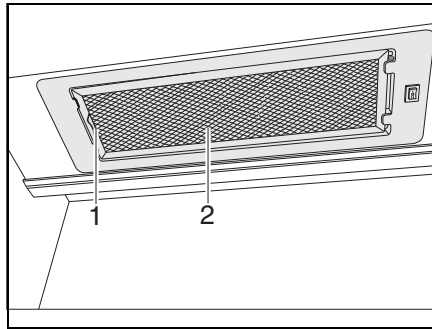


Fig. 146 Extractor hood

*Cleaning grease filter:*

- Push the lever (Fig. 146,1) to the inside.
- Remove the filter (Fig. 146,2) downwards.
- Wash the filter with warm water and some washing-up liquid.
- Let the filter dry completely and re-install it.
- Insert the filter upwards and latch it in.

## 12

## Care

### 12.5 Wash basin/sink

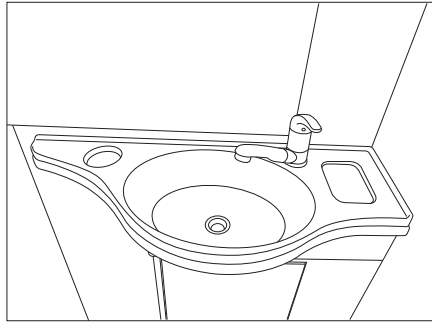


Fig. 147 Sink

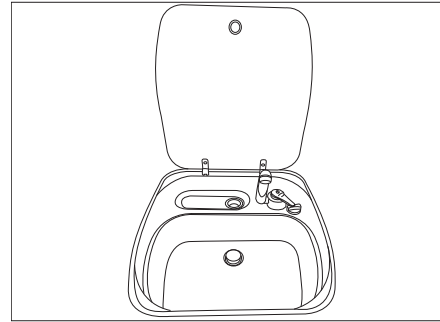


Fig. 148 Sink

#### 12.5.1 Stainless-steel wash basin/sink



- ▷ Do not use bleaches, products containing chloride or hydrochloric acid, baking soda or silver polish for cleaning.
- ▷ Do not use scouring milk or rough sponges.



- ▷ Before cleaning test at an inconspicuous point whether the cleanser used is suitable for the surface.
- ▷ After cleaning the surfaces, wipe thoroughly dry to avoid traces of lime.
- ▷ With brushed stainless-steel surfaces, wipe in the same direction as the polish.

- Clean and treat the wash basin/sink at least twice a year with a household stainless-steel cleaner.
- Rinse out the wash basin/sink after use and dry it with household cloths.

#### *Removing stubborn soiling:*

- Clean the wash basin/sink with a common household sponge and cleansing milk.
- Rinse out the wash basin/sink and dry it with household cloths.

#### *Removing greasy and oily residue:*

- Saturate a kitchen cloth in some white spirits and rub the wash basin/sink with it.
- Rinse out the wash basin/sink and dry it with household cloths.

#### *Removing fingerprints:*

- Clean the wash basin/sink with a cleaning solution and a leather cleaning cloth.
- Rinse out the wash basin/sink and dry it with household cloths.

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## Care

### 12.5.2 Plastic wash basin/sink



- ▷ Do not use scouring milk/scouring powder or rough sponges.



- ▷ Before cleaning test at an inconspicuous point whether the cleanser used is suitable for the surface.
- ▷ After cleaning the surfaces, wipe thoroughly dry to avoid traces of lime.

*Removing normal soiling:*

- Clean the sink with a conventional cleaning solution or non-scouring household cleaner.

*Removing stubborn soiling:*

- Apply spot salt or dishwasher salt with a moist sponge and allow it to work in for several hours.
- Remove salt and clean sink with a food-safe plastic cleaner.
- Rinse out sink.

*Removing lime deposits:*

- Clean the sink with vinegar or lime remover.
- Rinse out sink.

### 12.6 Waste bin (special equipment)



- ▷ Empty waste bins as often as possible into the cans and containers that are provided for this purpose. This helps to avoid unpleasant smells and an accumulation of rubbish on board.



- ▷ Damage to the waste bin through improper filling, for example with hot ash!

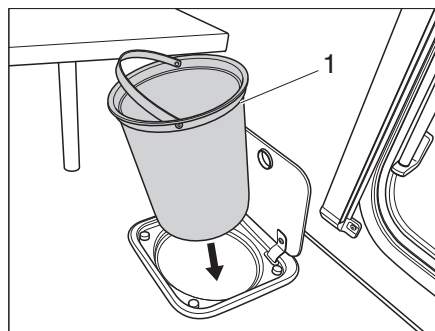


Fig. 149 Waste bin in kitchen

*Cleaning the waste bin in the kitchen:*

- Remove the waste bin (Fig. 149,1) using the handle and empty in accordance with the applicable regulations.
- Clean the waste bin with a conventional washing-up liquid or non-scouring household cleaner.
- Put the waste bin back in until it latches into place.

## 12

## Care

### 12.7 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. Set the circulation fan (if existing) to automatic mode. 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.
- ▷ Keep the waste gas vent, skylights with forced ventilation and mushroom-shaped vents free of snow. In the case of a roof waste gas vent use a vent extension that is at least 10 cm long.

#### 12.7.1 Preparations

- Check the vehicle for paint and rust damage. Repair damage as necessary.
- Make certain that water cannot penetrate the automatic floor ventilation system and the heater.
- Use a wax-based rust inhibitor to protect the metal parts of the underbody.
- Use appropriate protection for external painted surfaces.

#### 12.7.2 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.

- Attach vent extension with a length of at least 10 cm.
- 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.
- If the vehicle is equipped with a circulation fan, always switch the fan on when the heater is on. There is danger of overheating for the heater!
- 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.

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## Care

### 12.7.3 At the end of the winter season

- Thoroughly clean the underbody. 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.
- Remove vent extension.

### 12.8 Lay-up

#### 12.8.1 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 your 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:

	Activities	Done
Chassis	Lubricate the moving parts of the caravan coupling  ▶ Do not lubricate the friction pads on the stabiliser!	
	Jack up caravan with suitable support so that the wheels do not bear any load, or move caravan every four weeks. This prevents any pressure points from occurring on tyres and wheel bearings  ▶ Never use the fitted corner steadies as a car jack but only external support.	
	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.	
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	
	In order to avoid the formation of condensation and thus mould, ventilate the interior, all the storage areas accessible from the outside and the parking space (e.g. garage) every 3 weeks	



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## Care

	Activities	Done
<b>Interior</b>	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	
<b>Gas system</b>	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	
<b>Electrical system</b>	Fully charge living area battery	
	 ▷ Charge the battery for at least 24 hours before laying up.	
	Spray the contacts on the thirteen-pin connector with contact spray	
<b>Water system</b>	Empty the entire water system. Leave the water taps on in central position. Leave the safety/drainage valve (if available) and all drain cocks open. Observe the notes in Chapter 11	

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## Care

### 12.8.2 Winter lay-up

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


	Activities	Done
<b>Chassis</b>	Clean body and underbody thoroughly and spray with hot wax or protect with varnish	
	Repaint paint damage	
	Inflate tyres up to the recommended maximum pressure	
<b>Body</b>	Keep the forced ventilation open	
	Clean installed corner steadies and spray with conventional Teflon spray.	
	Clean and grease all door and flap hinges	
	Brush oil or glycerine on all locking mechanisms	
	Rub all rubber seals with talc	
	Use graphite dust to treat locking cylinders	
<b>Interior</b>	Position de-humidifiers	
	Remove upholstery from the vehicle and store in a dry place	
	Air the interior at regular intervals	
	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	
<b>Electrical system</b>	Remove living area battery and store in a place protected from frost (see Chapter 9)	
<b>Water system</b>	Clean the water system using a cleaning agent from a specialised store	
<b>Complete vehicle</b>	Clean the awning area and store in a dry place	
	Arrange the tarpaulins in such a way that the ventilation openings are not covered, or use porous tarpaulins	

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## Care

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

Go through the following checklist before start-up:

	Activities	Done
<b>Chassis</b>	Check the tyre pressure on all tyres	
	Check the tyre pressure and condition of the spare wheel. The spare wheel has to be replaced every 5-6 years.	
<b>Body</b>	Check the functioning of the fitted corner steadies	
	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)	
	Remove the winter cover from the refrigerator grills (if there is one)	
<b>Gas system</b>	Put the gas bottles in the gas bottle compartment, tie down and connect to the gas pressure regulator	
<b>Electrical system</b>	Connect to 240 V external power supply	
	Fully charge living area battery	
	 ▷ Charge at least for 24 hours after laying up	
	Check that the electrical system are working, e.g. interior light, socket and all installed electrical appliances	
<b>Water system</b>	Disinfect water pipes and water tank	
	Close all drain cocks and water taps	
	Check the water taps, drain cocks and water distributors for leaks	
<b>Appliances</b>	Check the function of the refrigerator	
	Change heating fluid of the hot-water heater every 2 years	
	Check the function of the heater/boiler	
	Check the function of the gas cooker	
	Check the function of the air conditioning unit	
	Check the function of the oven	

## Chapter overview

This chapter contains instructions about official inspections as well as inspection and maintenance work concerning the vehicle.

The maintenance instructions address the following topics:

- stabiliser
- braking system
- alde hot-water heater
- replacing bulbs and fluorescent tubes

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

### 13.1 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.



- ▷ Observe the inspections specified 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 also serves as valid proof in the case of damage and claims under the guarantee.

### 13.2 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 appliances serviced at the intervals specified in the corresponding instruction manuals.

## 13 Maintenance

### 13.3 Stabilisers

Clean the stabiliser and the coupling head regularly. Use either thinners or white spirit. When lubricating the stabiliser ensure that no lubricant is on the friction pads.

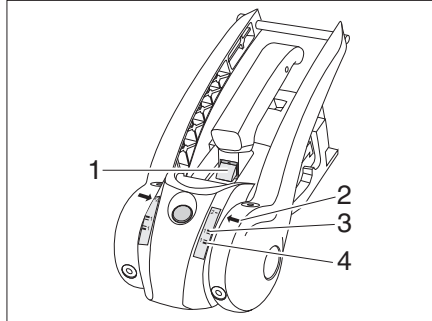


Fig. 150 Friction control of friction lining

#### Friction control of friction lining

Prerequisite: The stabiliser is connected and the stabiliser handle bar is pressed down until you meet resistance.

- If the green marking (Fig. 150,1) is visible, the friction linings at the front and back are OK. If the green marking is no longer visible, the friction linings have to be replaced.
- If the arrow (Fig. 150,2) is below the softdock marking 1-green (Fig. 150,4), the friction linings on the right and left are OK. If the arrow (Fig. 150,2) is above the softdock marking 1-red (Fig. 150,3), the friction linings have to be replaced.



- ▷ Resetting the friction pads is not required.

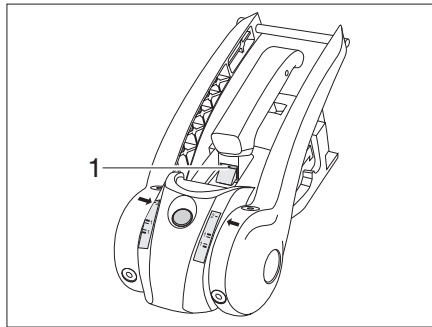


Fig. 151 Wear indication

#### Friction control of coupling ball and coupling mechanism

Prerequisite: The stabiliser is connected.

- Drive approx. 500 m with the towing vehicle (stabilising device deactivated).
- Check the condition at the wear indication:
  - If the green marking (Fig. 150,1) is visible, the coupling ball is OK. If the green marking is no longer visible, the diameter of the coupling ball < 49 mm and the coupling ball has to be replaced.

## 13 Maintenance

### 13.4 Braking system AL-KO chassis



- ▷ Have maintenance work on the braking system carried out by a specialist workshop. Siehe "Inspection plan for chassis" auf Seite 14.

Look up the following table for the inspection deadlines.

Model	First inspection	Braking system	Brake lining
AL-KO chassis	After 1500 km or after 6 months	Every 10000 to 15000 km or every 12 months	Every 5000 km or every 12 months

### 13.5 Alde hot-water heater



- ▷ Check the level of the heating fluid at the compensator reservoir every 6 months.
- ▷ During or after the first operating hours of the hot-water heater, the filling level may fall below the minimum mark. If this is the case, top up the heating fluid.
- ▷ We recommend bleeding the heating system after the initial heater operation to checking the glycol content.
- ▷ Have heating fluid changed by an authorised dealer or a service centre at intervals of approximately two years as corrosion-protection wears off after some time.
- ▷ Top up heating system with a water-glycol mixture (60 : 40) only. This mixture offers frost protection up to approx. -25 °C.



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

#### 13.5.1 Checking the fluid level

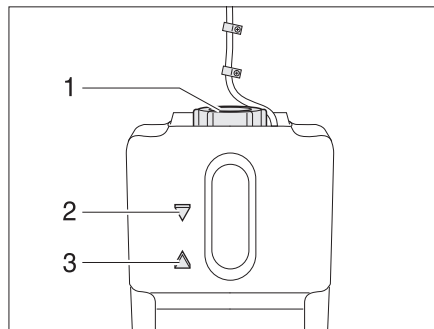


Fig. 152 Compensator reservoir hot-water heater

- Switch off the hot-water heater and allow it to cool down.
- Check if the fluid level is between the marks "MIN" (Fig. 152,3) and "MAX" (Fig. 152,2) on the compensator reservoir (Fig. 152).
- Replace the fluid every 2 years.

## 13

## Maintenance

### 13.5.2 Topping up the heating fluid



▷ The heating fluid has to be renewed every 2 years.

- Position the vehicle horizontally. This prevents formation of bubbles.
- Switch off the hot-water heater and allow it to cool down.
- Unscrew or remove the panel.
- Unscrew the screw cap (Fig. 152,1) at the compensator reservoir.
- Slowly remove the cover with circulating pump upwards.
- Check anti-freeze with an anti-freeze hydrometer. The frost protection content must be 40% or provide frost protection of up to -25 °C.
- Fill the water frost protection mixture slowly into the compensator reservoir.



▷ The optimum fluid level is reached when the fluid in the compensator reservoir is 1 cm above the "MIN" mark.

### 13.5.3 Bleeding the heating system

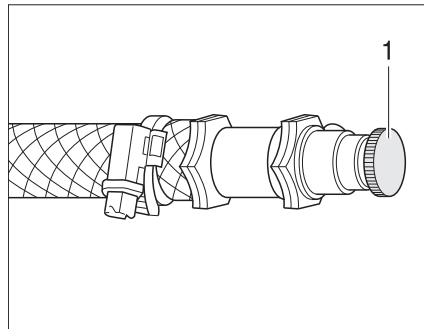


Fig. 153 Bleeding valve of hot-water heater

The bleeding valves are built in nearby the radiators.

- Switch off the hot-water heater and allow it to cool down.
- Open the bleeding valve (Fig. 153,1) and leave it open until no more air escapes.
- Close bleeding valve.
- Repeat this procedure at all bleeding valves.
- Check to see if the hot-water heater warms up.

## 13 Maintenance

### 13.6 Air conditioning unit Truma



- ▶ Prior to carrying out work on the device, turn off the power supply.



- ▷ Never operate the air conditioning unit without a lint filter. Without a lint filter the evaporator becomes soiled, resulting in the performance of the air conditioning unit being impaired.
- ▷ If the condensation drain is clogged, condensate can enter the vehicle. Keep the condensation drain free of dirt, leaves and similar obstacles.

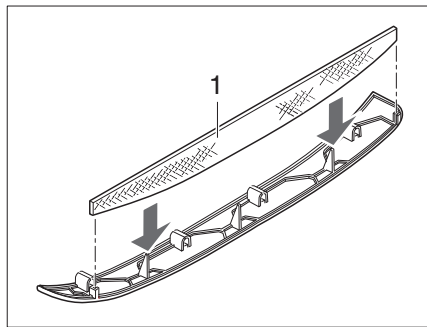


Fig. 154 Lint filter air conditioning unit

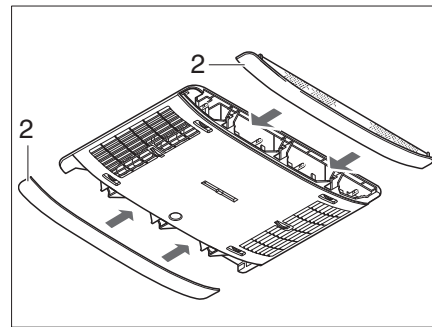


Fig. 155 Air conditioning unit panels

Two lint filters are located in the side panels (Fig. 155,2). The lint filters must be cleaned at regular intervals, at least every 6 months however, and replaced if necessary.

- Remove the panels (Fig. 155,2) from the air distribution unit and clean the lint filter (Fig. 154,1) or replace it if necessary.
- Place the panels with cleaned or new lint filter.

### 13.7 Change LED bulb

#### In the living area



- ▷ LED lamps can also generate heat during continuous operation. Therefore, carefully check whether the lamp has developed heat.
- ▷ In some cases, light sources and LED boards are permanently installed, which is why the entire lamp may have to be replaced. To do this, visit an authorised trade partner or service centre.

#### Outdoors

The vehicle lights are fitted with LED bulbs throughout. It is not possible to replace defective or partially defective lamps, as the light boards are permanently installed. Therefore, the only option is to completely replace the affected lamp.



- ▷ For a complete exchange, visit an authorised trade partner or a service centre.



## 13 Maintenance

### 13.7.1 LED spotlight

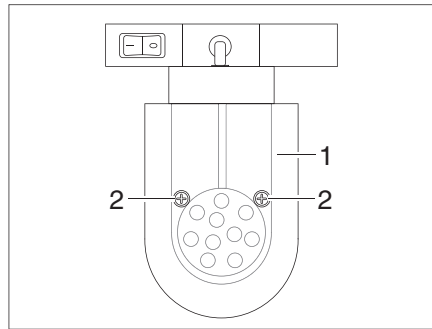


Fig. 156 LED spotlight (movable)

- Changing bulbs:*
- Loosen the fixing screws (Fig. 156,2).
  - Remove the lamp glass cover (Fig. 156,1) carefully.
  - Remove the LED lamps.
  - Insert a new LED lamp.
  - Reassemble the lamp in the reverse order.

### 13.8 Replacing bulbs and fluorescent tubes



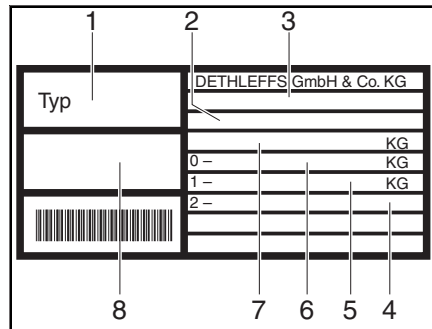
- ▶ Bulbs and light fittings can be extremely hot. Therefore, allow lights to cool down before changing bulbs.
- ▶ Before changing bulbs, switch off the power supply at the safety cut-out in the 240 V fuse box.
- ▶ Store bulbs in a safe place inaccessible to children.
- ▶ Do not use any bulb that has been dropped or which shows scratches in its glass. The bulb might burst.
- ▶ Lights can get very hot. When the light is switched on, a safety distance of 30 cm to combustible material has to be maintained. Fire hazard!



- ▷ New bulbs should not be touched with the fingers. Use a cloth when inserting the new bulb.
- ▷ Only use bulbs of the same type and with the correct wattage.
- ▷ If LEDs in the lights are defective, contact an authorised dealer or a service centre.

## 13 Maintenance

### 13.9 Vehicle identification plate



- 1 Type
- 2 Vehicle identification number
- 3 EC type approval number
- 4 Permissible axle load axle 2
- 5 Permissible axle load axle 1
- 6 Permissible nose weight
- 7 Maximum permissible gross weight of the vehicle
- 8 Serial number

Fig. 157 Vehicle identification plate

Depending on the model, the vehicle identification plate (Fig. 157) with the vehicle identification number is attached in the gas bottle compartment or in the front storage area.

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 **vehicle identification number** with all inquiries for the customer service office.

### 13.10 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 the service centre.

### Chapter overview

This chapter contains important instructions on how to obtain 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 Dethleffs have been specially developed and supplied for your vehicle. These products are available at the authorised dealers or service centres. The authorised dealers or service centres are informed about admissible technical details and carries out the required work correctly.
- ▶ The use of accessories, parts and fittings not supplied by Dethleffs 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 approved by Dethleffs. 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.

Here are some suggestions of important spare parts:

- Fuses
- Bulbs
- Water pump (submerged pump)

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

The vehicle described in this instruction manual is built and equipped to factory standards. Special equipment is offered depending on its purpose or use. When fitting special equipment check if such equipment has to be entered in the vehicle documents. Observe the max. permissible gross weight. The authorised dealer or service centre will be happy to advise you.

## Chapter overview

This chapter contains instructions regarding the tyres of the vehicle.

The instructions address the following topics:

- tyre selection
- handling of tyres
- changing wheels
- spare wheel support
- tyre pressure

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

### 15.1 General



- ▶ Check the tyre pressure before a journey and at 2-week intervals. Wrong tyre pressure causes excessive wear and can lead to damage or even to tyre burst. You can lose control of the vehicle.
- ▶ Check the tyre pressure and condition of the spare wheel at regular intervals. Danger of accidents if a spare wheel that is no longer suitable for use is used!



- ▷ Only check the tyre pressure on cold tyres.
- ▷ Tubeless tyres are mounted on the vehicles. Never mount tubes in these tyres.
- ▷ Snow chains may only be used if this is permitted by a further stipulation in the expert's report.



- ▷ In the case of a puncture, pull over to the side of the road. Make vehicle and caravan safe with a hazard warning triangle. Switch on the warning lights.
- ▷ Tyres on vehicles with tandem axles may wear faster due to the characteristics of the axle.
- ▷ 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: (1509) Week 15, year of manufacture 2009.

- Note:**
- 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 type (summer and winter tyres).
  - Only use tyres approved for the wheel rim type fitted. The permitted rim and tyre sizes are specified in the vehicle documents and the authorised dealer or service centre will always be glad to give you advice.
  - Special wheels may only be balanced with adhesive weights on the inside below the drop-centre and the inner flange.
  - Run-in new tyres for approx. 100 km (60 miles) at low speed since only then do they reach full strength.

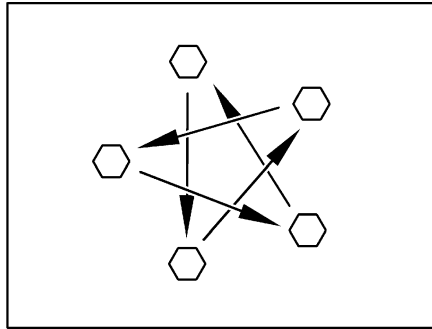


Fig. 158 Tighten the wheel nuts or wheel bolts cross-wise

- Check regularly that the wheel nuts or wheel bolts are firmly seated. Re-tighten the wheel bolts of a changed wheel cross-wise after 50 km (30 miles) (Fig. 158).  
See Section 15.5.2 for tightening torque.
- When using new or newly painted rims, re-tighten the wheel nuts or wheel bolts once again after approx. 1000 to 5000 km (600 miles to 3000 miles).
- 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.
- Replace the spare wheel every 5-6 years.

## 15.2 Tyre selection



- ▶ The wrong tyre choice can lead to damage to the tyres or even to tyres bursting.



- ▶ 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 (do not load unevenly or one-sided). 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.

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## Wheels and tyres

### 15.3 Tyre designations

215/70 R 15C 109/107 Q

Designation	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)

### 15.4 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.
- Avoid block brakings. A block braking gives the tyres "brake plates" of varying strength, thus reducing travelling comfort and possibly rendering the tyres unusable.
- 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.

## 15 Wheels and tyres

### 15.5 Changing wheels

#### 15.5.1 General instructions

The spare wheel is in the drawbar box. Use a commercial scissors-type jack to change the wheel.



- ▶ The vehicle must be on level, firm ground, secure from slipping.
- ▶ Before jacking up the vehicle firmly apply the handbrake.
- ▶ Prevent the vehicle from rolling away by blocking the opposite wheel with the wheel chocks.
- ▶ Under no circumstances jack the vehicle with the fitted steady legs.
- ▶ Position the vehicle jack underneath the axle, not under any circumstances on the bodywork.
- ▶ Never overload the vehicle jack. The maximum permissible load is specified on the vehicle jack's identification plate.
- ▶ Use the jack only to lift the vehicle briefly while changing the tyre.
- ▶ Persons may not lie under a vehicle that is jacked up.
- ▶ If alloy wheels rims are in use and a steel spare wheel is mounted after a puncture: Do not drive any further than necessary (car dealer, car workshop, tyre dealer). Only drive at a suitable speed. The different wheels affect driving handling.



- ▷ Do not damage the thread of the thread bolts when changing the wheel.
- ▷ Tighten the wheel nuts or wheel bolts cross-wise (Fig. 158).
- ▷ When changing wheels (e.g. light metal wheel rims or wheels with winter tyres), use the correct wheel bolts of the correct length and shape. The firm seating of the wheels and the function of the braking system depend on this.
- ▷ Wheel rims and tyres not permitted for use with the vehicle can jeopardise road safety.



- ▷ Protect the vehicle according to national regulations, e.g. with a hazard warning triangle.
- ▷ Before changing the wheel, check the wheel rim and tyre size, the max. tyre load and the speed index on the tyres. Only use the wheel rim and tyre sizes stated in the vehicle documents.

#### 15.5.2 Tightening torque

Wheel rim	Tightening torque
Steel wheel rim 14"	90 Nm
Aluminium wheel rim 14" / 15"	110 Nm

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## Wheels and tyres

### 15.5.3 Changing a wheel



- ▶ The base of the vehicle jack must stand evenly on the ground.
- ▶ Do not tilt the vehicle jack.
- ▶ Always push in the insert profile of the AL-KO vehicle jack (special equipment) into the receiving pocket until it stops.



- ▷ A special vehicle jack from AL-KO with receiving pockets is available as special equipment. These receiving pockets are mounted on the frame.
- ▷ If a mover (special equipment) is installed behind the axle, the receiving pockets are no longer accessible.
- ▷ You should always have a spare wheel that is ready to use on hand. Therefore always have a replaced wheel repaired immediately.
- ▷ Take note of the general tips in this chapter.

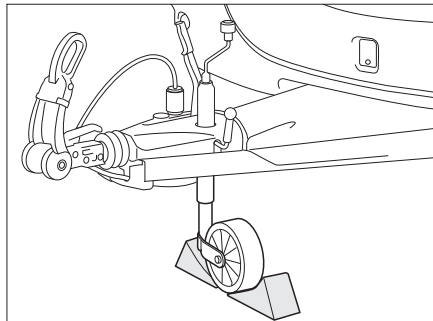


Fig. 159 Securing support wheel

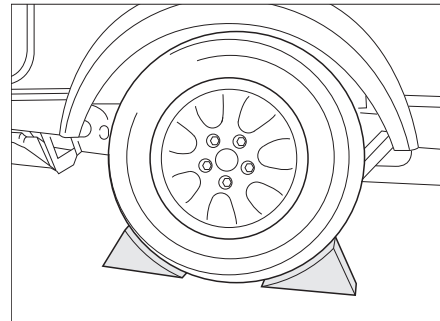


Fig. 160 Securing vehicle

*Preparing the connected caravan:*

- Loosen the stabilising device in caravan couplings with stabilising devices. Otherwise the friction pads will be highly loaded.
- Pull the handbrake of the towing vehicle and go to first gear or reverse gear.

*Preparing the disconnected caravan:*

- Park the vehicle on as even and stable a surface as possible.
- Apply the handbrake.
- Place the support wheel diagonal to the direction of travel and secure with suitable tools (Fig. 159).

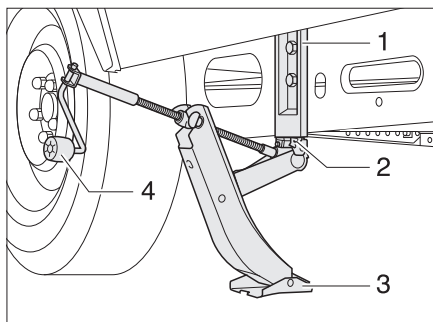


Fig. 161 AL-KO vehicle jack



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# Wheels and tyres

*Changing the wheel:*

- Place chocks or other appropriate objects beneath the opposite wheel of the vehicle to secure it (Fig. 160).
- Remove the spare wheel from the spare wheel support.
- If the ground is soft, place a stable support such as a wooden board beneath the vehicle jack.
- Commercial vehicle jack:  
Position the commercial scissors-type jack or hydraulic vehicle jack on the axle.
- AL-KO vehicle jack:  
Always push in the insert profile (Fig. 161,2) of the AL-KO vehicle jack into the receiving pocket (Fig. 161,1) until it stops.
- AL-KO vehicle jack:  
Hold the AL-KO vehicle jack with one hand and with the other hand turn the hand crank (Fig. 161,4) clockwise until the base (Fig. 161,3) has ground contact and is level.
- Turn the wheel bolts several times to loosen them, but do not remove them!
- Lift the vehicle until the wheel has been lifted 2 to 3 cm above the ground.
- Remove the wheel bolts and take off the wheel.
- Place the spare wheel on the wheel hub and adjust.
- Screw in the wheel bolts and slightly tighten them cross-wise.
- Crank down the vehicle jack and remove it.
- Using the wheel brace, tighten the wheel bolts evenly. The target value of the tightening torque of the wheel bolts is 90 Nm for steel wheel rims or 120 Nm for alloy wheel rims.

### 15.5.4 Changing the wheel at alloy wheel rims



- ▶ The resting surfaces of the wheels on the break drums must be clean and free of burrs.
- ▶ First tighten the wheel lightly with the enclosed fastening parts and ensure that they are positioned optimally and can move smoothly. Then tighten the wheel bolts cross-wise using a torque spanner.
- ▶ At various axle versions there are no centring aid, no collar and no bolts. Take care that the wheel bolts are centred evenly across the bolt circle (no tilting).

## 15 Wheels and tyres

### 15.6 Spare wheel support

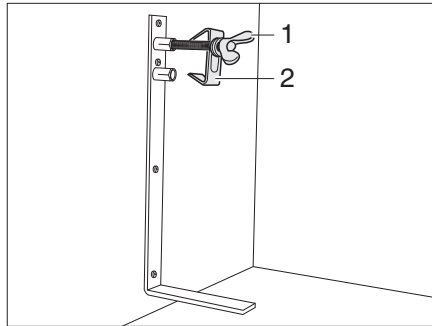


Fig. 162 Spare wheel support

The spare wheel support is fitted as standard in the gas bottle compartment. The spare wheel is available for a surcharge.

*Removing the spare wheel:*

- Loosen the screw (Fig. 162,1) and remove the centring device (Fig. 162,2).
- Remove the spare wheel.

### 15.7 Tyre pressure



- ▶ Tyre pressure that is too low results in overheating of the tyre. Serious damage to the tyre can be the result.
- ▶ Check the tyre pressure before a journey and at 2-week intervals. 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.



- ▷ Only check the tyre pressure on cold tyres.

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 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.

Max. permissible speed = 120 km/h (75 mph).

Please always observe the speed limits in the individual countries (see Chapter 18).

## 15 Wheels and 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 Dethleffs dealer will be happy to provide the newest values.

Reifendrucktabelle				Tyre pressure table				
Reifen	techn. zul. Gesamtmasse Mono-Achse kg	techn. zul. Gesamtmasse Tandem-Achse kg	Reifendruck bar	Reifen	techn. zul. Gesamtmasse Mono-Achse kg	techn. zul. Gesamtmasse Tandem-Achse kg	Reifendruck bar	
Tyre	Maximum permissible gross weight Mono axle kg	Maximum permissible gross weight Tandem axle kg	Tyre pressure bar	Tyre	Maximum permissible gross weight Mono axle kg	Maximum permissible gross weight Tandem axle kg	Tyre pressure bar	
185/70 R13 LI86	bis 700		2,50	195/65 R15 LI91	bis 1.000	2.000	2,50	
	800		2,70		1.100	2.200	2,70	
	900	1.800	2,70		195/65 R15XL LI95	bis 1.100	2.000	2,50
	1.000	2.000	3,00			1.200	2.200	2,80
195/70 R13XL LI90	bis 1.000	2.000	2,90		1.300	2.500	3,10	
	1.100	2.200	3,10					
185/70 R14 LI88	bis 900	1.800	2,60	195/70 R15C LI104	bis 1.100	2.000	3,00	
	1.000	2.000	2,80		1.200	2.200	3,25	
	1.100	2.200	2,80		1.300	2.500	3,50	
					1.400			3,75
185 R14C LI102	bis 1.100		3,30		1.500	2.800	4,00	
	1.200		3,30		1.600		4,25	
	1.300		3,50		1.700		4,50	
	1.400		3,80	205/70 R15C LI106	bis 1.100	2.000	3,00	
	1.500		4,25		1.200	2.200	3,00	
	1.600	2.800	4,50		1.300	2.500	3,20	
	*1.700		4,50		1.400		3,50	
			1.500			3,80		
			1.600		4,00			
			1.700		4,20			
195/65 R14 LI89	bis 1.000	2.000	2,50		1.800	3.500	4,50	
	1.100	2.200	3,00					
195/70 R14 LI91	bis 1.000	2.000	2,50	215/70 R 15 C LI109	bis 1.100	2.000	3,00	
	1.100	2.200	2,70		1.200	2.200	3,00	
195/70 R14XL LI95	bis 1.100	2.000	2,50		1.300	2.500	3,00	
	1.200	2.200	2,80		1.400		3,20	
	1.300	2.500	3,10		1.500		3,40	
					1.600	2.800	3,60	
195/70 R14XL LI96	bis 900	1.800	2,50			1.700		3,80
	1.000	2.000	2,50		1.800	3.500	4,10	
	1.100	2.200	2,50		1.900		4,40	
	1.200		2,70		2.000		4,50	
	1.300	2.500	3,00	225/70 R15C LI112	bis 1.100	2.000	3,00	
195/70 R14C LI101/104	bis 1.100	2.000	3,30		1.200	2.200	3,00	
	1.200	2.200	3,50		1.300	2.500	3,00	
	1.300	2.500	3,80		1.400		3,00	
	1.400		4,10		1.500		3,00	
	1.500	2.800	4,50		1.600	2.800	3,50	
195 R14C LI106	bis 1.100		3,00			1.700		3,50
	1.200		3,00		1.800	3.500	3,70	
	1.300		3,20		1.900		4,00	
	1.400		3,40		2.000		4,30	
	1.500		3,75	205/55 R16XL LI94	bis 2.000		3,30	
	1.600	2.800	4,00			2.200	3,40	
	1.700		4,50			2.500	3,40	
205 R14C LI109	1.800	3.500	4,50	215/55 R16XL LI97	bis 1.100		2,70	
	1.900		4,50		1.200		2,70	
	2.000		4,50		1.300		3,00	
				1.400		3,00		
	215 R14C LI112	bis 1.600		3,30	215/50 R17XL LI95	bis 2.500		3,20
		1.700		3,50				
1.800		3.500	3,80	215/55 R17XL LI98	bis 1.400		3,20	
1.900			4,00		*1.500		3,20	
	2.000		4,30	215/60 R17C LI109 (Ventil bis max. 7 bar)	bis 1.700		4,00	
					1.800		4,50	
					1.900		4,50	
					2.000		4,75	

**\*ohne weitere Traglastreserve**

Es dürfen nur die Reifengrößen montiert werden, die in der Betriebslaubnis / EG-Typgenehmigung aufgeführt sind.  
Lastindex beachten!

**\*without further load Reserve**

Only the tyre sizes listed in the Approval / EC type-approval can be mounted.  
Refer to the load index!

Stand: Juli 2020

# 16 Troubleshooting

## Chapter overview

This chapter contains instructions about possible faults in your vehicle. The faults are listed with their possible causes and corresponding remedies. The instructions address the following topics:

- chassis
- braking system
- electrical system
- gas system
- gas cooker
- gas oven
- microwave oven
- heater
- boiler
- water heater
- refrigerator
- air conditioning unit
- water supply
- body

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.

### 16.1 Chassis

Fault	Cause	Remedy
Coupling does not lock in place after being placed on top	Ball larger than Ø 50 mm	Remove dirt Contact customer service
	The coupling interiors are soiled and no longer work automatically	Clean well and lubricate (not stabiliser)
Caravan cannot be detached	Ball worn	Position the caravan and towing vehicle in the same direction and detach. Immediately replace the worn ball

### 16.2 Braking system



- ▶ Have defects on the braking system immediately remedied by an authorised specialist workshop.
- ▶ Follow maintenance or manufacturer specifications.

# 16 Troubleshooting

## 16.3 Electrical system



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




▷ See Chapter 9 for changing the fuses.

Fault	Cause	Remedy
Road light system does no longer work correctly	Bulb is defective	Unscrew cover of the relevant light, replace bulb. Note volts and watts specifications
	Contacts on the plug and/or in the socket have oxidised and/or are contaminated	Clean contacts and spray with contact spray
	Short circuit caused by water in the plug and/or socket	Open plug and/or socket, dry out, and spray with contact spray
	Cable interruption on the plug and/or socket	Open plug and/or socket, re-connect cable (see connection diagram in Chapter 9)
Road light system does not match the towing vehicle light system	Contact connections within the plug have been reversed	Check contact allocation and wiring on the plug/connector of the caravan
Interior lighting no longer works correctly	Bulb is defective	Remove cover, replace bulb. Note volts and watts specifications
	Power pack switched off	Switch on power pack
	Fuse on the 240 V automatic circuit breaker is defective	Replace fuse
	Fuse on power pack or at transformer/rectifier defective (Autark Package)	Replace fuse
12 V interior lighting does not work	240 V automatic circuit breaker switched off	Switch on 240 V automatic circuit breaker
	Power pack switched off	Switch on power pack
	12 V power supply switched off (Autark Package)	Switch on 12 V power supply on the control panel
	Fuse on the power pack is defective	Replace fuse
	Power pack/transformer/rectifier defective	Contact customer service
240 V interior lighting does not work	240 V automatic circuit breaker switched off	Switch on 240 V automatic circuit breaker
No 240 V power supply despite connection	240 V automatic circuit breaker has triggered	Switch on 240 V automatic circuit breaker

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## Troubleshooting

Fault	Cause	Remedy
No voltage from the living area battery (Autark Package)	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 9)
Extractor hood does not work	Extractor hood defective	Contact customer service
	Power pack is defective	Contact customer service
	Fuse on power pack or at transformer/rectifier defective (Autark Package)	Replace fuse
	240 V automatic circuit breaker has triggered	Switch on 240 V automatic circuit breaker
Air conditioning unit cannot be switched on or off	240 V automatic circuit breaker has triggered	Switch on 240 V automatic circuit breaker
	Remote control battery is empty	Change remote control battery

### 16.4 Gas system



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

Fault	Cause	Remedy
No gas	Gas bottle empty	Changing gas bottles
	Gas isolator tap closed	Open the gas isolator tap
	Regulator tap on the gas bottle is closed	Open regulator tap on the gas bottle
	Outdoor temperature 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

## 16 Troubleshooting

### 16.5 Gas cooker/gas oven

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	Set thermocouple sensor correctly (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

### 16.6 Heater, boiler and water heater

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.

#### 16.6.1 Trumatic S 3004 (P) / S 5004 hot-air heater

Fault	Cause	Remedy
For heater with automatic ignition: Heater does not ignite	Battery on the automatic ignition empty	Changing the battery on the automatic ignition

#### 16.6.2 Alde heater/boiler



▷ If a fault occurs in the system, the cause is shown on the display.

Fault	Cause	Remedy
Heater does not ignite with gas operation	Lack of gas	Open regulator tap and gas isolator tap
		Connect a full gas bottle
Heater does not ignite	Battery voltage too low	Charge battery. If the battery voltage rises above 11 V, the heater is switched on automatically
Heater does not ignite at 240 V electrical operation	No 240 V power supply	Switch on 240 V automatic circuit breaker
		Connect 240 V power supply
Heater switches off	Overheating	Allow the heater to cool. To reset the display, interrupt the 12 V power supply to the heater and switch it back on again

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Fault	Cause	Remedy
Heater running, but no heat at the convectors	Circulating pump does not work	Switch on room thermostat Contact customer service
Heater and circulating pump running, but no heat at the convectors	Air in the heating system	Bleed hot-water heater

### 16.6.3 Truma water heater

Fault	Cause	Remedy
The water heater is connected to power supply but does not heat	Operating switch is switched off	Switch on operating switch; the red indicator lamp must be lit
	Operating switch defective	Contact customer service
	240 V automatic circuit breaker switched off	Switch on 240 V automatic circuit breaker
	240 V power supply disconnected	Connect 240 V power supply
	Fuse is defective	Replace fuse
	Heating coil in the water heater is defective	Contact customer service

### 16.7 Refrigerator

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.

#### 16.7.1 Thetford refrigerator without SES (error diagnostics)

Error code	Cause	Remedy
1	The 240 V power supply is 75% under the required operating voltage	Contact customer service
2	The 12 V power supply is 75% under the required operating voltage	Contact customer service
3	The refrigerator is operated at 240 V, even though no 240 V mode has been selected	Contact customer service
4	The refrigerator is operated at 12 V, even though no 12 V mode has been selected	Contact customer service
5	The refrigerator is operated in gas operation mode even though gas operation mode has not been selected	Contact customer service
6	The gas valve has been identified as open even though it should be closed	Contact customer service



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## Troubleshooting

Error code	Cause	Remedy
7	The gas valve has been identified as closed even though it should be open	Contact customer service
8	The 240 V power supply is 20% under the required operating voltage	Check 240 V power supply
9	The gas supply has been cut off. The flame has not been ignited within 30 seconds in gas operation mode	<ul style="list-style-type: none"> <li>● Check the gas supply</li> <li>● Repeat ignition 3 to 4 times</li> <li>● Contact customer service</li> </ul>
10	The refrigerator is set to 12 V mode and the vehicle engine is not running	Start the vehicle engine or select a different energy source
11	The refrigerator is set to "AUTO" mode and no energy source is available	Provide an energy source and reset the refrigerator. Switch the refrigerator off and on again for this purpose
12	-	Contact customer service
13	The temperature sensor is defective	Check whether the plug is inserted properly above the fin inside the refrigerator. If so: Contact customer service
14	The connection between operating controls and control device is interrupted	Contact customer service

### 16.7.2 Refrigerator Thetford N4000

Fault	Cause	Remedy
Refrigerator does not work	Refrigerator is not plugged in	Check the connections and connect the refrigerator
	Refrigerator is switched off	Switch the refrigerator off and on again
Refrigerator does not switch on when operating in 240 V mode	No 240 V power supply	Connect 240 V power supply
		Switch to a different energy source
Refrigerator does not switch on when operating in 12 V mode	12 V fuse on the starter battery is defective	Check the fuse and replace if necessary
	The engine is not running	Switch on the engine and change to a different energy source if necessary
Refrigerator does not switch on when operating in gas mode	Lack of gas	Open regulator tap and gas isolator tap
		Connect a full gas bottle
		Switch the refrigerator off and on again
		Switch to a different energy source

## 16 Troubleshooting

### 16.8 Air conditioning unit

#### 16.8.1 Telair DualClima 8400 H

Fault	Cause	Remedy
Air conditioning unit does not start up	Remote control battery empty	Check and, if necessary, replace the batteries of the remote control
	No voltage	Connect to the 230 V power supply
Insufficient ventilation	Air vents in the diffuser insufficiently opened	Adjust air vents
	Diffuser's filter dirty	Replace the filter
Does not work in cooling mode	Set temperature not below the ambient temperature	Set cooling temperature to below the ambient temperature
Does not work in heating mode	Set temperature not above the ambient temperature	Set heating temperature to above the ambient temperature
Low air conditioning unit power	Air filter, condenser and/or evaporator dirty	Clean with the specific cleaning agents

### 16.9 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
	Water drain cock open	Close water drain cock
	Fuse of the water pump is defective	Replace fuse
	Water pump defective	Exchange water pump (have it exchanged)
	Water pipe snapped off	Straighten water pipe or replace
	Power pack is defective	Contact customer service
Toilet has no flush water	Water tank is empty	Replenish drinking water
	Fuse for toilet is defective	Replace fuse
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
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

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## Troubleshooting

Fault	Cause	Remedy
Milky 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	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

### 16.10 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.

# 17

## Special equipment

### 17.1 Weight details for special equipment



- ▶ The use of accessories, parts and fittings not supplied by Dethleffs may cause damage to the vehicle and jeopardise 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.
- ▶ Every alteration of the original condition of the vehicle can alter road behaviour and jeopardize road safety.
- ▶ No liability can be assumed for damage caused by products which have not been approved by Dethleffs. This also applies to impermissible alterations to the vehicle.

Weight details for Dethleffs special equipment are listed in the table below. If these objects are either carried in or on the vehicle and are not part of the standard equipment, they must be taken into consideration when calculating the payload.

All weight details are "approximate".

Observe the max. permissible gross weight.

Item designation	Surplus weight (kg)
Waste water pipes, heated	2
Waste water tank, mobile	3
Load	22-35
External connection, audio	1
External shower	2
External flap	2
Autark Package (depending on equipment)	35-85
Car radio and CD	2
Oven	12
Bed widening	5
Direct water supply	2
Roof rail	11
Drawbar covering	3.5
Extractor hood	3
DuoControl switching facility, gas	2.5
Conversion door, single-section	6
Spare wheel	16-30
Bunk bed	10
Window, front	5
Fire extinguisher 2 kg	3.5
Flat screen	6
Floor warming unit, electrical	9
External gas socket	1
Smooth plate	1 kg/m <sup>2</sup>
Holder for flat screen	6

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**Special equipment**

<b>Item designation</b>	<b>Surplus weight (kg)</b>
Trumatic heater	7
Heater cover (fireplace)	2
Heki skylight (Heki 2)	13
Insect screen door	3
Air conditioning unit	40
Refrigerator with freezer compartment	30
Slatted frame, head section erectable	1
Mover (electrical package)	70-100
Repair kit	1
Radio preparation	4-10
Satellite unit	15-24
Satellite antenna mast	2
Showmen vehicle (depending on equipment)	40-50
Evopore Watergel	7-15
Chain-stitch rug	5-10
Hot water supply with boiler	20-25
Water tank	3
Winter comfort package (depending on equipment)	40-70
Ultraheat additional heater	2

### Chapter overview

This chapter contains helpful tips for your journey.

The instructions address the following topics:

- Road assistance in European countries
- Traffic rules in European countries
- Gas supply in European countries
- Toll regulations in European countries
- Safe ways to spend the night during travel
- Camping in winter

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

### 18.1 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. Information is available, for example, from the automobile clubs or the country representatives.
- ▷ In some European countries warning vests must be worn when exiting the vehicle outside of towns in the case of vehicle failures or accidents.

Information about the traffic rules is particularly important, since the respective country's laws apply in case of accidents or damage. For your own safety always observe the following points when travelling abroad:

- Have your green insurance card on you.
- Take an "Accident report" form from your insurance with you.
- Always have the police record the accident.
- Do not sign documents that you have not read and understood completely.

### 18.2 Help on Europe's roads

Information on this can be found on the Dethleffs website.  
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## Helpful notes

### 18.3 Speed limits



- ▶ Please always observe the speed limits in the individual countries.
- ▶ The caravans have been designed for a technically permissible maximum speed of 120 km/h. Observe the country-specific regulations. In Germany max. 100 km/h.

For information, the speed limits of the countries visited most (all specifications in km/h):

Country	Inner city	Outside built-up areas	Motorway
Belgium	50	90/120 <sup>1) 2)</sup>	120 <sup>2)</sup>
Bosnia and Herzegovina	50	80	80
Bulgaria	50	70	100
Denmark	50	70	80
Germany	50	80/100 <sup>3)</sup>	80/100 <sup>3) 4)</sup>
Estonia	50	70	-
Finland	50	80	80
France	50	90 <sup>5) 6)/110<sup>1) 2) 5) 6)</sup></sup>	130 <sup>2) 5) 6)</sup>
Greece	50	80	80
Great Britain	48	80/96 <sup>1)</sup>	96 <sup>1)</sup>
Ireland	50	80	80
Iceland	50	80	-
Italy	50	70	80
Croatia	50	80	90
Latvia	50 <sup>7)</sup>	90	-
Lithuania	50	90 <sup>8) 9)</sup>	90
Luxembourg	50	75	90
Macedonia	50	80 <sup>10)</sup>	80
Montenegro	50	80	-
Netherlands	50	80 <sup>11)/90<sup>1)</sup></sup>	80 <sup>11)/90<sup>1)</sup></sup>
Norway	50	60 <sup>8)/80</sup>	60 <sup>8)/80</sup>
Austria	50	70/100 <sup>12)</sup>	80/100 <sup>12)</sup>
Poland	50/60 <sup>13)</sup>	90/100 <sup>1)</sup>	140
Portugal	50	70/80 <sup>14)</sup>	100 <sup>15)</sup>
Romania <sup>16)</sup>	50	70/80 <sup>1)</sup>	90 <sup>1)</sup>
Russia	60 <sup>7)</sup>	70	90 <sup>17)</sup>
Sweden	50	80	80
Switzerland/Liechtenstein	50	80	80
Serbia	50	80	80
Slovakian Republic	50	90	90

Country	Inner city	Outside built-up areas	Motorway
<b>Slovenia</b>	50	90/100 <sup>1) 18)</sup>	100 <sup>18)</sup>
<b>Spain</b>	50	70/80 <sup>1)</sup>	90
<b>Czech Republic</b>	50	80	80
<b>Turkey</b>	40	80	110
<b>Hungary</b>	50	70	80
<b>Cyprus</b>	50	80	80

- 1) On expressways, on roads with more than one lane in each direction and on roads resembling highways
- 2) In the event of accidents involving speeds in excess of 100 km/h insurance payments may be reduced as caravans are only type approved for speeds up to 100 km/h
- 3) For towing vehicles up to 3.5 t with special permit and identification
- 4) On three-lane motorways, towing vehicles are not allowed to drive on the far left (right in the UK); in Germany and France, this applies to towing vehicles longer than 7 m and to towing vehicle with a gross weight of more than 3.5 t.
- 5) In wet conditions, reduce speed by 10 km/h in built-up areas and by 20 km/h on motorways
- 6) Anyone who has held their driving licence for less than 3 years may drive on national roads up to 80 km/h, on motorways up to 100 km/h and on superhighways up to 110 km/h
- 7) In residential areas, 20 km/h
- 8) Towing vehicles with a trailer with no brakes having a total weight of more than 300 kg
- 9) For trailers under 0.75 t
- 10) For those having held their driving license for less than 2 years, 60 km/h applies
- 11) Applies to towing vehicles with trailers up to 3.5 t permissible total weight
- 12) With trailers weighing more than 750 kg (permissible gross weight max. 3.5 t) the following applies: on national roads 80 km/h, on motorways 100 km/h. For trailers over 3.5 t gross vehicle weight, the speed limit is 70 km/h on national roads and 80 km/h on motorways
- 13) From 23.00 p.m. to 5.00 a.m., max 60 km/h
- 14) According to traffic signs
- 15) Drivers who have had their driver's licence for less than 1 year is allowed to drive at a maximum of 90 km/h. Corresponding stickers (available from ACP offices) must be affixed in a clearly visible position on the rear of the vehicle
- 16) For drivers with less than 1 year of driving experience, the speed limit is reduced by 20 km/h
- 17) Drivers who have had their driver's licence for less than 2 years must not drive faster than 70 km/h
- 18) Towing vehicles over 3.5 t GVW: 80 km/h

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#### 18.4 Driving with low beam in European countries



- ▷ In many countries driving with low beam is also required during the day. The regulations differ depending on the country. Information is available, for example, from the automobile clubs or the country representatives.



## 18 Helpful notes

### 18.5 Sleeping in the vehicle away from camping areas

Country	Staying overnight on streets and squares*		Sleeping on privately owned lands		Comments * one night away from campsites ** On private property only only with permission of the property owner
	Yes	No	Yes* *	No	
<b>Albania</b>	X 1)		X 2)		1) Restricted in national parks and nature reserves; and near government buildings 2) Permission from the property owners for one to two nights
<b>Bosnia and Herzegovina</b>		X	X		outside of metropolitan and tourist areas, wild camping is tolerated by most authorities and residents
<b>Belgium</b>	X		X		a maximum of 24 hours if no road traffic is impeded
<b>Bulgaria</b>		X	X	X	
<b>Denmark</b>		X	X		
<b>Germany</b>	X 1)		X 1)		Regional and local prohibitions (e.g. nature conservation, forest and dyke laws) 1) One overnight stay to restore driving ability
<b>Estonia</b>	X 1)		X		1) Only outside built-up areas; next to farms only with the permission of the farmer
<b>Finland</b>		X	X		
<b>France</b>	X		X		Only with permission of the local authorities; partly regional bans
<b>Greece</b>		X		X	
<b>Great Britain</b>		X 1)	X 2)		1) only with the permission of the local authorities; partly regional bans; in Scotland, sleeping in public places is largely permitted 2) not along a street
<b>Ireland</b>	X		X		only with the permission of the local authorities; regional restrictions; not along roads and bridges
<b>Italy</b>	X 1)		X 2)		1) only with the permission of the local authorities; not in national parks and state forests 2) partial local bans
<b>Croatia</b>		X		X	
<b>Latvia</b>	X 1)		X		1) Only outside built-up areas; next to farms only with the permission of the farmer

Country	Staying overnight on streets and squares*		Sleeping on privately owned lands		Comments * one night away from campsites ** On private property only only with permission of the property owner
	Yes	No	Yes* *	No	
Lithuania	X 1)		X		1) Only outside built-up areas; next to farms only with the permission of the farmer
Luxembourg		X	X 1)		1) not around the Esch-sur-Sûre lake; maximum two tents; Observe regional restrictions
Macedonia		X		X	
Montenegro		X		X	Only under special circumstances and with the approval of the local authorities
Netherlands		X 1)		X	1) only in municipalities with designated places
Norway	X		X		not on land used for farming or cultivated land; minimum distance to houses: 150 m
Austria	X 1)		X		One overnight stay to restore driving ability; not in nature reserves; regional bans (e.g. Tyrol) 1) only with the permission of the local authorities
Poland	X 1)		X		not on the coast and in nature reserves 1) only with the permission of the local authorities
Portugal		X		X	
Romania	X		X		
Russia		X		X	
Sweden	X		X 1)		not on agricultural land or near houses; observe local restrictions 1) on private property restrictions according to the number of tents and persons
Switzerland		X 1)	X		Overnight stays are tolerated at motorway service stations and in some cantons 1) only with the permission of the local authorities
Serbia		X		X	overnight stays on public or private property are only possible under special circumstances and with the permission of the local authorities
Slovakian Republic		X		X	

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## Helpful notes

Country	Staying overnight on streets and squares*		Sleeping on privately owned lands		Comments * one night away from campsites ** On private property only only with permission of the property owner
	Yes	No	Yes** *	No	
<b>Slovenia</b>		X		X	
<b>Spain</b>	X 1)		X 1)		only with the permission of the local authorities 1) some regional bans, especially on beaches
<b>Czech Republic</b>		X		X	
<b>Turkey</b>	X		X		only with the permission of the local authorities; regional bans
<b>Hungary</b>		X		X	
<b>Ukraine</b>	X 1)		X		1) not in nature reserves; not near border crossings
<b>Belarus</b>	X 1)		X		1) not on agricultural land; not within 50 metres of residential houses or government buildings

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## Helpful notes

### 18.6 Gas supply in European countries

#### General tips

Always observe the following information:

- 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 a German gas 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 Campinggaz (distributed world-wide). Only use gas bottles with safety valves.
- Buy a so-called self-filler bottle. Like a permanently installed gas tank this 11 kg bottle can be refilled at any auto gas filling station (directory available from the ADAC). Inspection at a technical inspectorate is required every 10 years.
- 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 the German Eurogas bottles.
- Follow the EU heating appliance directive. For information, visit [www.truma.de](http://www.truma.de)

For your information a list of the gas supply is given below for some of the most visited European countries:

Country	Gas supply	Provider	Info telephone
<b>Albania</b>	Exchanging and filling gas bottles possible	App Park4Night (the "Additional services" icon hides tips on gas retailers and shops that exchange or refill gas cylinders)	
<b>Belgium</b>	Identical gas bottles	Belgian Shell and Totalfina, Brussels; Primagaz, Tessenderlo; Gasbottling, Gent; Semnickgas, Geraardsbergen	
	Exchanging and filling gas bottles possible		
<b>Denmark</b>	German 5 and 11 kg gas bottles are available for exchange at almost every campsite.	BP Gas offers German gas bottles Kosan Gas A/S, Hasselager Centervej 19-21, 8260 Viby J.	00 45/ 89 48 77 00
	Filling station for grey gas bottles available		
<b>Estonia</b>	Commercially available bottles can be filled with Euro adapters		
<b>Finland</b>	Finnish gas bottles available at NESTE petrol stations and country shops.	Fa. Tehokaasu   Neste ( <a href="http://www.neste.fi">www.neste.fi</a> ). Overview of suppliers at: AGA ( <a href="http://www.aga.no">www.aga.no</a> )	0035 80 10 24 21
	Adapters for Norwegian gas bottles can be purchased from the AGA company		

Country	Gas supply	Provider	Info tele-phone
<b>France</b>	Foreign gas bottles cannot be filled or exchanged		
	French gas cylinders can be used with the help of the Euro connection set (buy already in Germany)		
<b>Greece</b>	German gas cylinders can be filled using the Euro connection set; exchange and filling stations mostly only in larger cities (Athens, Thessalonik, Patras and Monemvassia)		
<b>Great Britain</b>	German gas bottles cannot be filled	Calorgas company (www.calor.co.uk)	
	British gas bottles can be connected to German systems using an adapter (also available from Calorgas)		
<b>Ireland</b>	Gas bottles can be refilled	Noel Leaders Shop company, Tuam Road, Galway Calor Kosangas company, Dublin and Cork	00353 1 50 5000 00353 18 50 81 24 50 00353 28 90 45 55 88
<b>Iceland</b>	Gas bottles can be refilled	N1 (previously Esso), Reykjavík	
	yellow Icelandic gas cylinders fit German systems with a rubber ring placed in the regulator connection		
<b>Italy</b>	Gas supply through Euro filling and connecting set		
	Discharging of liquid gas at gas stations for camping vehicles with a permanently installed gas tank is not permissible on tax grounds		
	you get gas at special exchange or filling stations		
<b>Croatia</b>	Gas bottles whose inspection lies less than 5 years back are filled in INA branches	INA	
	Adapter can be purchased at INA		
<b>Morocco</b>	Gas bottles can be refilled	Tiznit, Agadir (direction Tafrar route), Nador, Mohammedia, Sidi Ifni, Safi, Taza	
	The blue bottles from Camping-gaz are also available.		

## Helpful notes

Country	Gas supply	Provider	Info tele- phone
<b>Netherlands</b>	only use identical gas cylinders		
	Gas bottles can be exchanged and filled (not all campsites exchange German bottles for other German bottles)		
<b>Norway</b>	German gas bottles can be filled at LPG Norga	AGA	0047 81 53 28 80
	Adapters for Norwegian gas bottles can be purchased from the AGA company	LPG Norge	0047 40 60 42 77
	Deposit gas bottles available		
	Norwegian 11 kg gas bottles can be used with adapter		
<b>Austria</b>	Identical gas bottles		
	Exchanging and filling gas bottles possible		
<b>Poland</b>	Identical gas bottles		
	Exchanging and filling gas bottles possible		
<b>Portugal</b>	German gas cylinders are refilled at the gas filling stations marked with a blue elephant (the containers must, however, remain in the bottle crate)	Repsol; Cepsa	
	Deposit gas bottles available		
<b>Sweden</b>	German gas bottles cannot be filled	AGA (www.aga.no)	0046 0 87 06 95 00
	Adapters for Norwegian gas bottles can be purchased from the AGA company		
<b>Switzerland</b>	Hiring of a Swiss gas bottle with pressure regulator possible	Shell Gas, Switzerland	00 41/ 3 27 58 75 55
	German gas bottles can be filled in exceptional cases		
<b>Slovenia</b>	German gas bottles can be filled	Plinarna, Ljubljana; Plinarna, Maribor; Internia DD Ljubljana, Kozina; OMV Istrabenz DOO, Koper	
	We recommend bringing along the Euro filling and connecting set		
<b>Spain</b>	German gas bottles cannot be filled	Repsol	00 34/ 901 10 01 00
	Hiring and filling of Spanish gas bottles possible when the gas connection has been adapted	Cepsa	00 34/ 913 37 75 29
	6 kg deposit gas bottles can be used with adapter		

Country	Gas supply	Provider	Info tele-phone
<b>Czech Republic</b>	German gas bottles can be re-filled	Agip, Bohemia Gas, BP, Krainpol, Pri-maplyn Flaga-Plyn	0090 21 22 32 04 00
<b>Turkey</b>	Sale of 2 and 12 kg gas bottles; connection possible with adapter	Ipragaz company (www.ipragaz.com.tr/tupgaz-size-en-yakin-bayi)	
<b>Hungary</b>	Identical gas bottles Exchanging and filling gas bottles possible	Primagaz, Totalgaz, Shellgas, Mol	

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### 18.7 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.

Contact your automobile club or the Internet for further information.

### 18.8 Tips on staying overnight safely during travel

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

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

- Before commencing the journey, close and lock all windows, doors and skylights.
- If present: Switch on or activate anti-theft alarm and special door securing devices. Warning devices against gas assaults using anaesthetic gas are offered at camping supply stores.
- During high season do not spend the night at highway rest stops or parking areas located along typical vacation routes.
- If possible, stay overnight in large, occupied car parks, e.g. near a restaurant.
- Even if it is just for one night, go to a camping site.
- 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.

### 18.9 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.
- Choose your parking place with care. Observe the ground beneath you. Snow and ice may melt.

## Helpful notes

- Place boards of a sufficient size under the jockey wheel and the corner steadies to prevent them from sinking when the snow thaws.
- When the vehicle has been positioned, release the handbrake to prevent freezing.
- Protect the handbrake lever and the accumulator against frost with protective covers.
- No snow walls should be allowed to cover the built-in forced ventilation.
- Protect the gas bottle compartment against freezing with a protective cover.
- Do not leave waste water in the tank but drain it into a bucket.
- 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.
- 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 compartment.
- Never operate catalytic ovens or infra-red gas radiators in the interior of the vehicle, since they consume oxygen for burning.
- Lay the 240 V power cable in such a way that the cable cannot be frozen or be damaged (e.g. during snow removal).
- Use a winter awning.
- 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".

### 18.10 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
	Mug		Dishcloths		Chopping board
	Turnspit		Set of knives and forks for grilling		Bowls
	Can opener		Coffeepot		Brush to wash the dishes
	Egg-cup		Corkscrew		Cloth to wash the dishes
	Ice cube tray		Kitchen paper		Matches
	Lighter		Spoons		Cups
	Bottle opener		Knives		Plates
	Air-tight storage boxes		Garbage bags		Thermos jug
	Breakfast plate		Frying pans		Pots



## Helpful notes

✓	Object	✓	Object	✓	Object
	Forks		Stirring spoons		Glasses

### Bathroom/sanitary items

	Towels		Toilet brush		Toothbrush glass
	Sanitary items		Toilet paper		

### Living area

	Dustbin		Insect lamp		Rain clothes
	Road atlas		Insect repellent		First aid kit
	Bath towels		Deck of cards		Travel guides/parking guide
	Bath shoes		Broom		Rucksack
	Batteries		Candles		Sleeping bags
	Bed sheets		Dust pan		Pencils and paper
	Bed linen		Coat-hangers		Shoes
	Laundry bag		Clothes brush		Shoe polish
	Books		Pillow		Vacuum cleaner
	Camping guide		Map		Flash light
	Spare bulbs		Medicine		Pocket knife
	Water bottle		Music cassettes		Table cloth
	Binoculars		Neck-supporting pillow		Clothes pins
	Fire extinguisher		Sewing kit		Clothesline
	Gas bottle		Radio		

### Vehicle/tools

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

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## Helpful notes

### Outside

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

### Documents

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

## Chapter overview

In this chapter you will find legal information on weight-related data.

The weight specifications and tests for motorhomes are regulated uniformly throughout the EU in EU Implementing Regulation No. 2021/535 (until June 2022: EU Implementing Regulation No. 1230/2012). The main terms and legal requirements from this regulation are summarised and explained below. Our dealers and the Dethleffs configurator on our website offer additional assistance for configuring the vehicle.

### Maximum permissible gross weight

The technically permissible total mass (also: technically permissible maximum laden mass) of the vehicle (e.g. 3,500 kg) is a mass specification specified by the manufacturer that the vehicle must not exceed. Information on the maximum permissible gross weight of the selected model can be found in the technical data. If the vehicle exceeds the maximum permissible gross weight in practical operation, this is an administrative offense that can be punished with a fine.

### Mass in ready-to-drive condition

In simple terms, the mass in ready-to-drive condition is the basic vehicle with standard equipment plus a legally fixed flat weight of 75 kg for the driver. This mainly includes the following items:

- the unladen weight of the vehicle including the superstructure, including operating fluids such as greases, oils and coolants;
- the standard equipment, i.e. all equipment items that are included as standard in the factory-fitted scope of delivery;
- the fresh water tank filled to 100 % in driving mode (driving fill according to manufacturer's specifications; 20 litres) and an aluminium gas bottle filled to 100 % with a weight of 16 kg;
- the fuel tank is 90 % full, including fuel;
- the driver, whose weight - regardless of actual weight - is set at a flat rate of 75 kg under EU law.

Information on the mass in ready-to-drive condition can be found for each model in our sales documents. It is important that the value given in the sales documents for the mass in ready-to-drive condition is a standard value determined in the type approval process and checked by the authorities. It is legally permissible and possible that the mass in ready-to-drive condition of the vehicle delivered to you differs from the nominal value given in the sales documents. The legal tolerance is  $\pm 5\%$ . In this way, the EU legislator takes account of the fact that there are certain fluctuations in the mass in ready-to-drive condition due to fluctuations in the weight of supplied parts as well as due to process and weather conditions.

These weight deviations can be illustrated by means of an example calculation:

- Mass in ready-to-drive condition according to sales documents: 2,850 kg
- Legally permissible tolerance of  $\pm 5\%$ : 142.50 kg
- Legally permissible range of mass in ready-to-drive condition: 2,707.50 kg to 2,992.50 kg

The specific range of permissible weight deviations can be found for each model in the technical data. Dethleffs makes great efforts to reduce weight fluctuations to the minimum that is unavoidable for production reasons. Deviations at the upper and lower end of the range are therefore very rare; however, they cannot be completely ruled out technically, even with all optimisations. Dethleffs therefore checks the real weight of the vehicle and compliance with the permissible tolerance by weighing each vehicle at the end of the assembly line.

**Passenger weight**

The weight of the passengers is a flat rate of 75 kg for each seat provided by the manufacturer, regardless of how much the passengers actually weigh. The weight of the driver is already included in the mass in ready-to-drive condition (see No. 2 above) and is therefore not included again. For a motorhome with four approved seats, the mass of the passengers is therefore  $3 \cdot 75 \text{ kg} = 225 \text{ kg}$ .

**Special equipment and actual weight**

According to the legal definition, special equipment (also: optional equipment or additional equipment) includes all optional equipment parts not included in the standard equipment which are fitted to the vehicle under the responsibility of the manufacturer - i.e. ex works - and can be ordered by the customer (for example awning, bicycle or motorbike carrier, satellite unit, solar system, oven, etc.). Information on the individual or package weights of the special equipment that can be ordered can be found in our sales documents. Special equipment in this sense does not include other accessories that are retrofitted by the dealer or by you personally after the vehicle has been delivered from the factory.

The mass in ready-to-drive condition (see "Mass in ready-to-drive condition" on page 195) and the mass of the special equipment fitted to a specific vehicle at the factory are together referred to as the actual mass. You will find the corresponding information for your vehicle after handover in section 13.2 of the Certificate of Conformity (CoC). Please note that this is also a standardised value. Since a legally permissible tolerance of  $\pm 5 \%$  applies to the mass in running order - as an element of the actual mass (see "Mass in ready-to-drive condition" on page 195), the actual mass may also deviate accordingly from the stated nominal value.

**Payload and minimum payload**

The installation of optional equipment is also subject to technical and legal limits: Only so much optional equipment can be ordered and fitted at the factory that sufficient free weight remains for luggage and other accessories (so-called payload) without exceeding the maximum permissible gross weight. The payload is obtained by subtracting the mass in ready-to-drive condition (nominal value according to sales documents, see "Mass in ready-to-drive condition" on page 195), the gross weight of the optional equipment (see "Special equipment and actual weight" on page 196) and the gross weight of the passengers (see "Passenger weight" on page 196) from the maximum permissible gross weight (see "Maximum permissible gross weight" on page 195). The EU regulations stipulate a fixed minimum payload for motorhomes, which must at least remain for luggage or other accessories not fitted at the factory. This minimum payload is calculated as follows:

- Minimum payload in kg  $\geq 10 \times (n + L)$

The following applies: "n" = maximum number of passengers plus the driver and "L" = total length of the vehicle in metres.

So for a motorhome with a length of 6 m and 4 approved seats, the minimum payload is e.g.  $10 \text{ kg} \times (4 + 6) = 100 \text{ kg}$ .

## 19

# Weight-related information

To ensure that the minimum payload is maintained, there is a maximum combination of special equipment that can be ordered for each vehicle model. In the above example with a minimum payload of 100 kg, the gross weight of the optional equipment for a vehicle with four authorised seats and a mass in ready-to-drive condition of 2,850 kg, for example, should not exceed 325 kg:

### Example calculation

		Example
Maximum permissible gross weight		3,500 kg
Mass in ready-to-drive condition		- 2,850 kg
Weight of the passengers (3 × 75 kg)		- 225 kg
Minimum payload		- 100 kg
<b>Maximum permissible weight of optional equipment</b>	<b>=</b>	<b>325 kg</b>

It is important to note that this calculation is based on the standard mass in ready-to-drive condition value specified in the type-approval procedure, without taking into account the permissible weight deviations in the mass in ready-to-drive condition (see “Mass in ready-to-drive condition” on page 195).

If the maximum permissible value for the special equipment of (in the example) 325 kg is almost or completely exhausted, an upward deviation in weight may therefore result in the minimum payload of 100 kg being met mathematically using the standard value of the mass in ready-to-drive condition, but in fact there is no corresponding payload possibility.

Here, too, an example calculation for a vehicle with four seats, whose real weighed mass in ready-to-drive condition is 2 % above the nominal value:

### Example calculation

		Example
Maximum permissible gross weight		3,500 kg
Real weighed mass in ready-to-drive condition (+2 % compared to the stated value of 2,850 kg)		- 2,907 kg
Weight of the passengers (3 × 75 kg)		- 225 kg
Special equipment (maximum permissible value)		- 325 kg
<b>Actual payload possibility (&lt; minimum payload of 100 kg)</b>	<b>=</b>	<b>43 kg</b>

In order to avoid such a situation, Dethleffs is further reducing the permissible maximum weight of all optional extras that can be ordered, depending on the model. The limitation of the special equipment is intended to ensure that the minimum payload, i.e. the legally prescribed free mass for luggage and subsequently installed accessories, is actually available for the additional load on the vehicles delivered by Dethleffs.

Since the weight of a specific vehicle can only be determined when it is weighed at the end of the production line, in very rare cases a situation may arise in which the minimum payload at the end of the production line is not guaranteed, despite this limitation on special equipment. In order to ensure the minimum payload in these cases as well, Dethleffs will check with you and your trading partner before delivery of the vehicle, for example whether the vehicle will be loaded, seats reduced or special equipment removed.

# 19

## Weight-related information

### Effects of tolerances of the mass in ready-to-drive condition on the payload

Regardless of the minimum payload, you should also note that unavoidable production-related fluctuations in the mass in ready-to-drive condition – both upwards and downwards – have a mirror-inverted effect on the remaining payload option: If, for example, you order our example vehicle (see “Passenger weight” on page 196.) e.g. with special equipment with a gross weight of 150 kg, this results in a calculated payload of 275 kg based on the standard value for the mass in ready-to-drive condition. The actual available load capacity may deviate from this value and be higher or lower due to tolerances. If the mass of the vehicle in ready-to-drive condition is, for example, permissibly 2 % higher than stated in the sales documents, the payload possibility is reduced from 275 kg to 218 kg:

### Example calculation

		Example
Maximum permissible gross weight		3,500 kg
Real weighed mass in ready-to-drive condition (+2 % compared to the stated value of 2,850 kg)		- 2,907 kg
Weight of the passengers (3 × 75 kg)		- 225 kg
Special equipment ordered for the specific vehicle		- 150 kg
<b>Actual payload capacity</b>	=	<b>218 kg</b>

To ensure that the calculated payload is actually given, you should therefore take the possible and permissible tolerances for the mass in ready-to-drive condition into account when configuring your vehicle as a precaution.

We also recommend that the loaded motorhome be weighed on a non-automatic scale before each journey and, taking into account the individual weight of the passengers, determine whether the maximum permissible gross weight and the gross weight on the axle are complied with.

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