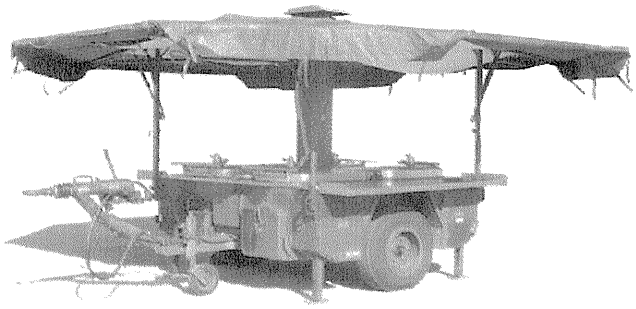
KÄRCHER

INSTRUCTION MANUAL

TFK 250

1.622-140.0



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ETL 5.960-778.0
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Second part

2.2 Maintenance, Scheduled Maintenance, Schedule and Locations for Maintenance up to Maintenance Level 2

2.2.1 Description of the Maintenance and Scheduled Maintenance (Maintenance Level 1)

NOTE
For cleaning and/or disinfection measures, the means listed in Section 2.2.3.3 are available.
Assembly work, if not other mentioned, is carried out in reverse order of disassembly.

CAUTION
Work on the cooking facilities and the burner may be carried out only when these are cooled off.

2.2.1.1 Cleaning the Cooking Facilities

Cooking facilities, cooking equipment and work areas are to be cleaned thoroughly after using.

Use hot water and a grease dissolving cleaning agent for the cleaning.

Remove stubborn debris with a plastic brush and a suitable cleaning agent; do not use scouring agents.

After the cleaning, disinfect the cleaning facilities, cleaning equipment and working areas with a disinfectant allowed for food purposes. Carry out the disinfection according to Section 2.2.3.4.

After the cleaning and disinfection, rinse thoroughly with clear water.

Pay special attention to the cleaning of the lid seals.

Faulty (e. g. torn and/or increasingly greasy) rubber seals are to be replaced in maintenance level 4.

The lid valves and the drain valves are to be dismantled and cleaned (see Section 2.2.1.3 und 2.2.1.5).

Dry the cleaned containers, surface and kitchen equipment with clean cloths or in the open air.

2.2.1.2 Cleaning the Grease Fleece

The grease fleece is to be replaced as required.

- Remove the grease fleece from the trailer according to Section 2.1.8.1.

- Clean the grease fleece with hot water and a grease solving cleaning agent.

CAUTION
Do not treat the grease fleece with rough objects (e. g. a brush). Do not dry clean. Cleaning in a washing machine is permitted up to a maximum temperature of 50 °C. The grease fleece may not be ironed.

- After washing, carefully wind out the grease fleece and dry completely in open air.

2.2.1.3 Cleaning the Lid Valve

Tools: Open-end wrench, size 8 mm, screwdriver

The lid valve is to be cleaned thoroughly after using. Dismantle the lid valve for this purpose.

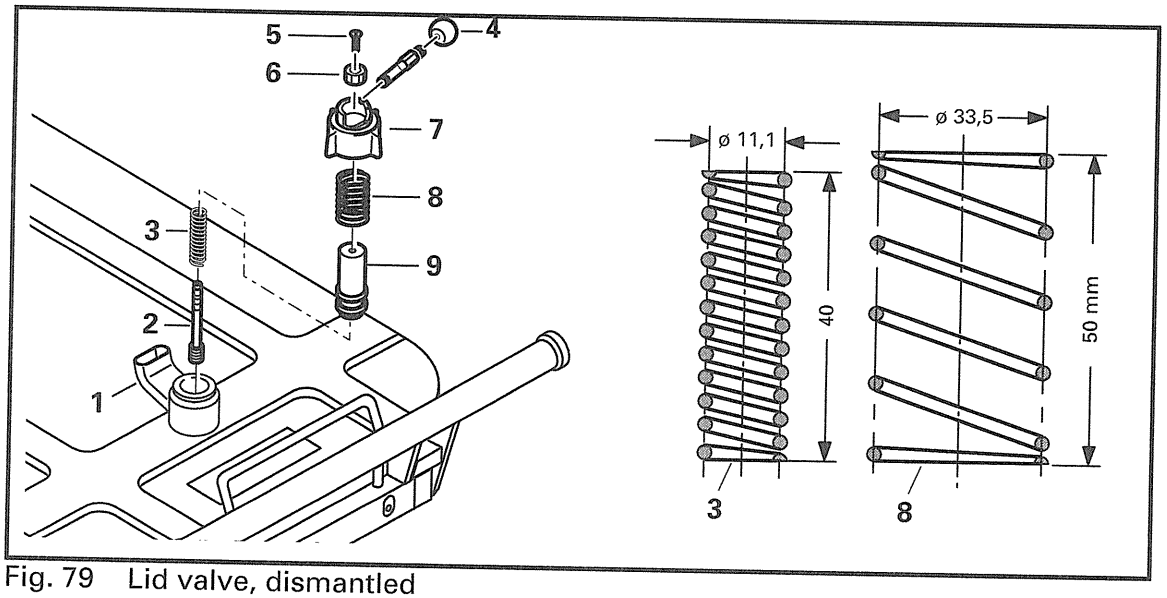


Fig. 79 Lid valve, dismantled

1 Valve housing Indicating pin
2 Spring for indicating pint
3 Blow-off lever
4 Countersink screw (fine-pitch thread)
5 Knurled nut
6 Valve nut
7 Center-piece spring
8 Center piece

- Open the pressure lid after relieving any pressure.
- Unscrew the valve nut (79/6) and remove the valve.
- Unscrew the countersink screw (79/4).

- Unscrew the knurled nut (79/5), removing the indicating pin (79/1) and the spring for the indicating pin (79/2) to the bottom.
- Screw out the blow-out lever (79/3).
- Remove the center piece (79/8) and the center-piece spring (79/7).
- Clean the valve housing (79/1) and the individual parts.

CAUTION
Do not change the length of the springs! Length changes of the springs changes the characteristic of the lid valve.

2.2.1.4 Cleaning the Steam Exhaust Hose

- Push up the grease fleece (80/1) a little at the flue.
- Press the locking latch (80/4) aside and pull the quick-connector (80/3) of the steam exhaust hose downward out of the holding device (80/2).
- Loosen clamping screw (81/1) and pull the funnel of the steam exhaust hose (81/2) of the lid valve (81/3).

  NOTE
  Do not clean the steam exhaust hose in a kitchen utility.
- Soak the hose in hot water for approx. 5 minutes and rinse afterwards.
- Clean the funnel.
- After cleaning, empty the steam exhaust hose and wipe dry on the outside.

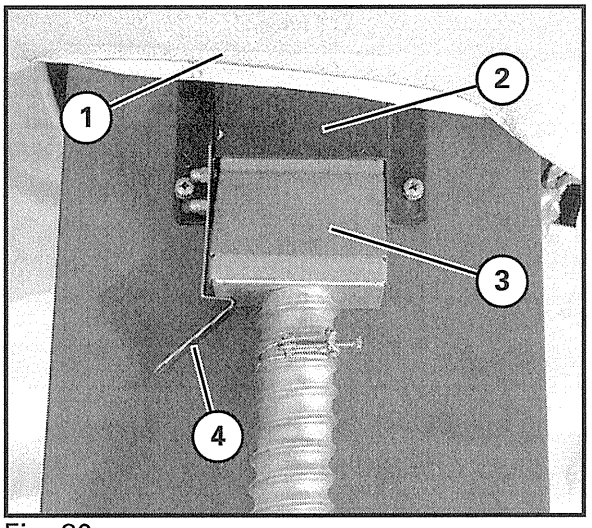


Fig. 80

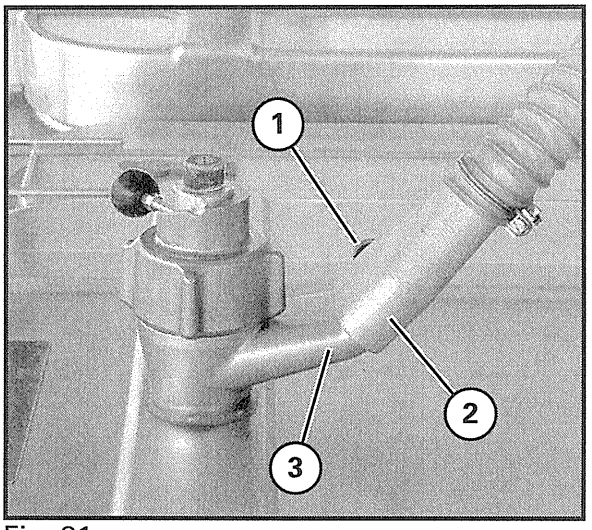


Fig. 81

2.2.1.5 Cleaning the Drain Valve of the Pressure Cooker

The drain valve must be thoroughly cleaned after using. For this purpose, dismantle the drain valve as shown in Fig. 82.

CAUTION
Do not dismantle the drain valve any further.

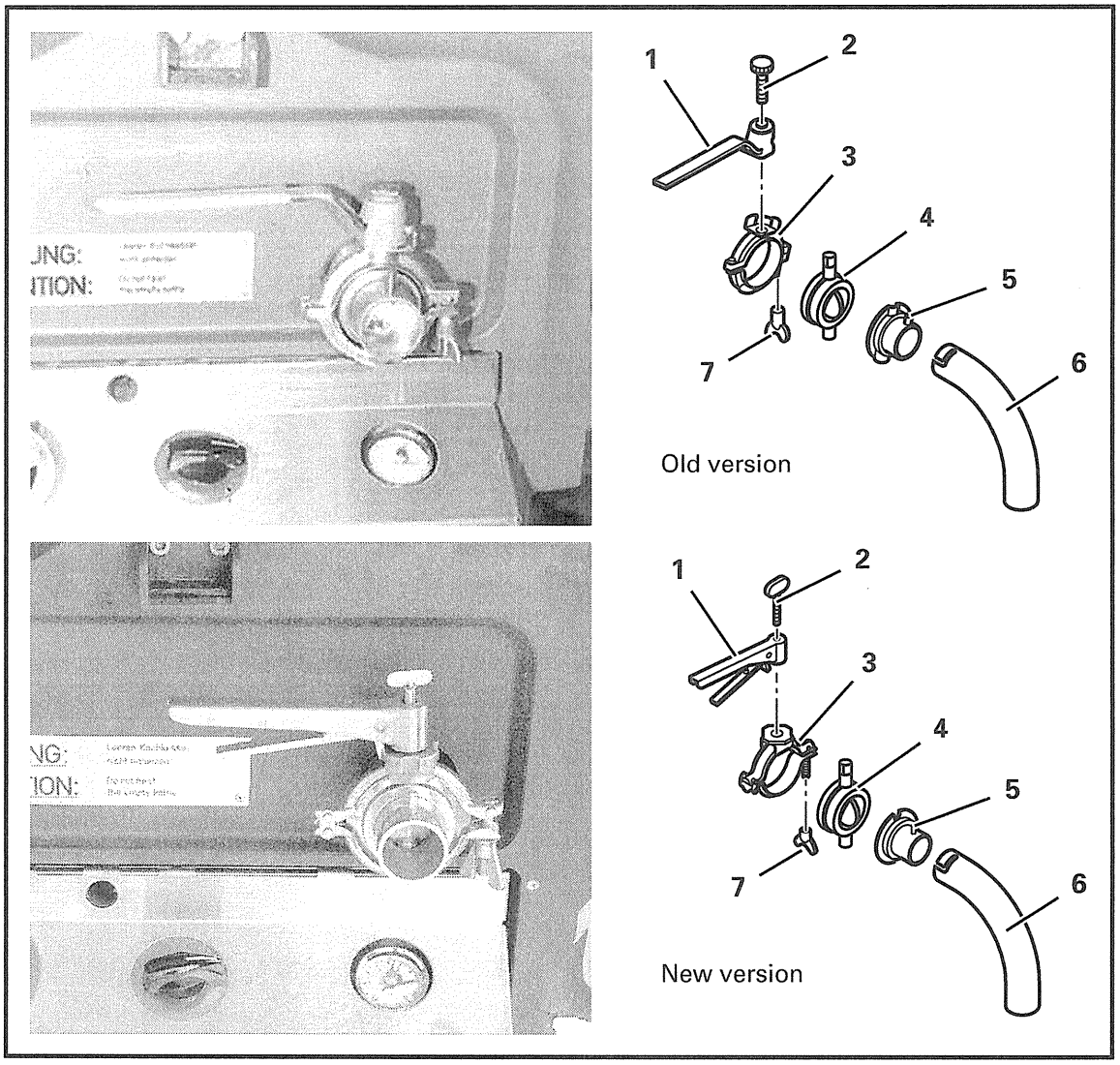


Fig. 82 Drain valve of the pressure cooker, dismantled

1 Lever
2 Knurled screw
3 Band clip
4 Valve flap with sealing ring
5 Bayonet flange
6 Drain elbow
7 Wing nut

- Empty the pressure cooker, as required.
- Remove the drain elbow (82/6).
- Unscrew the knurled screw (82/2) and remove with the lever (82/1).
- Unscrew the wing nut (82/7).
- Fold the band clip (82/3) apart; remove the bayonet flange (82/5), valve flap with sealing ring (82/4) and the band clip.
- Clean the parts of the drain valve.
- Reassemble the drain valve in reverse order, shut and secure.
- Check the function in accordance with Section 2.1.4.1.

2.2.1.6 Cleaning the Burner

Tools: Cleaning brush, round

Aids: Cleaning rag

CAUTION
In case fuel escapes after opening fuel-carrying parts, collect these in a suitable container and dispose of properly. Do not drain fuels into the environment!

NOTE
After a certain operation period a protective oxide coating (rust-like) develops in the upper area of the burner compartment and on the burner cover; this coating is not to be removed.

- Allow the burner to cool down.
- Take out the burner shield (83/1).
- Clean the inner side of the preheater with the cleaning brush; remove soot.
- Clean the burner shield with the cleaning brush and insert it.

CAUTION
The main nozzle with the ceramic insert may not be disassembled and cleaned.

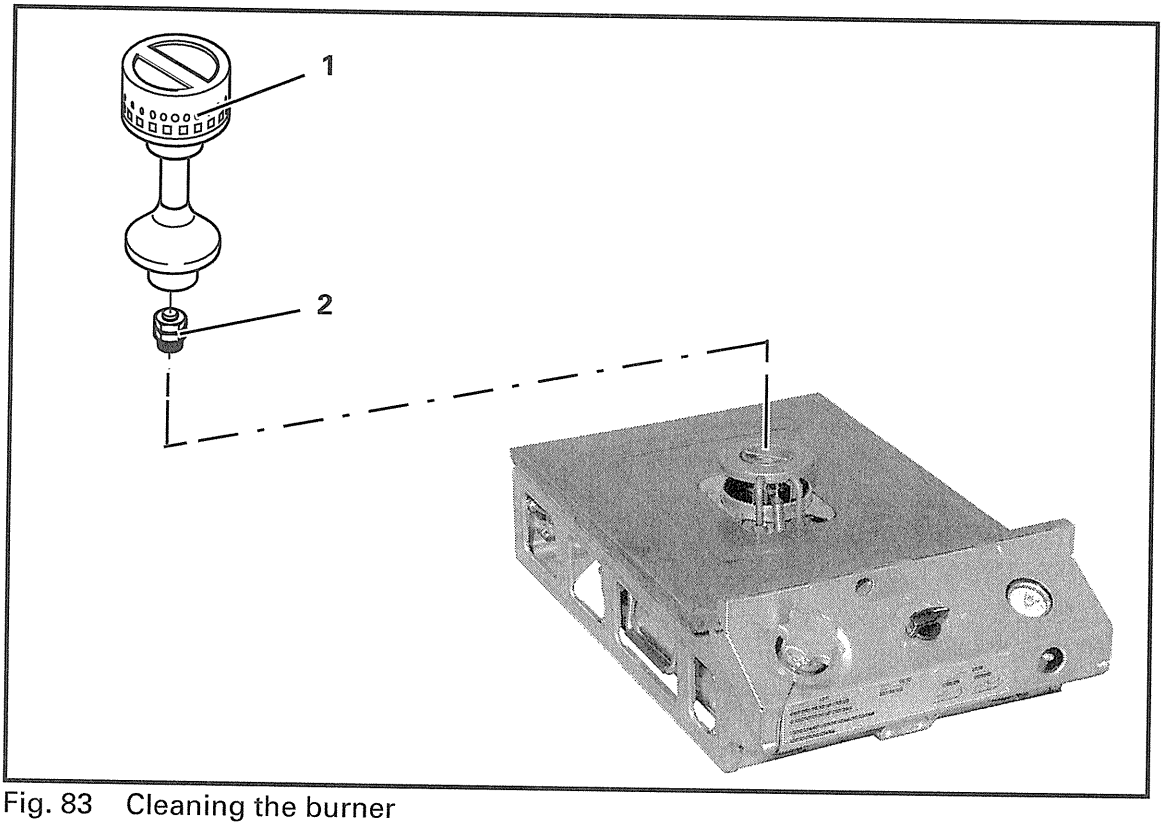


Fig. 83 Cleaning the burner

1 Burner shield
2 Main nozzle with filter

2.2.1.7 Replacing the Burner Main Nozzle

Tools: Socket wrench, triple

Aids: Cleaning rag, cotton

CAUTION
Replace the main nozzle only when the burner is cooled down.

- Relieve the pressure via the tank lid.
- Take out the burner shield (83/1).
- Clean the burner according to Section 2.2.1.6.
- Unscrew main nozzle (83/2) with filter and dispose of.

NOTE
Due to the circlip in the main nozzle, the nozzle is held in the socket wrench.

- Screw in the new main nozzle hand-tight.

2.2.1.8 Replacing the Burner Preheating Nozzle

Tools: Socket wrench, triple; Phillips screwdriver

- Set the rotary switch to the "STOP" position.
- Relieve the pressure via the tank lid and screw off the tank lid.
- Screw on the tank lid.
- Remove the burner cover.
- Unscrew two Phillips screws (84/5) and remove the preheating plate (84/3).
- Insert the two cams of the preheating plate into the holes (84/6) as a counter support, screw out the preheating nozzle (84/1) and dispose of.
- Remove the copper ring (84/2).
- Screw in new preheating nozzle with copper ring hand-tight.
- When assembling, ensure proper condition and seating of the O-rings (84/4).

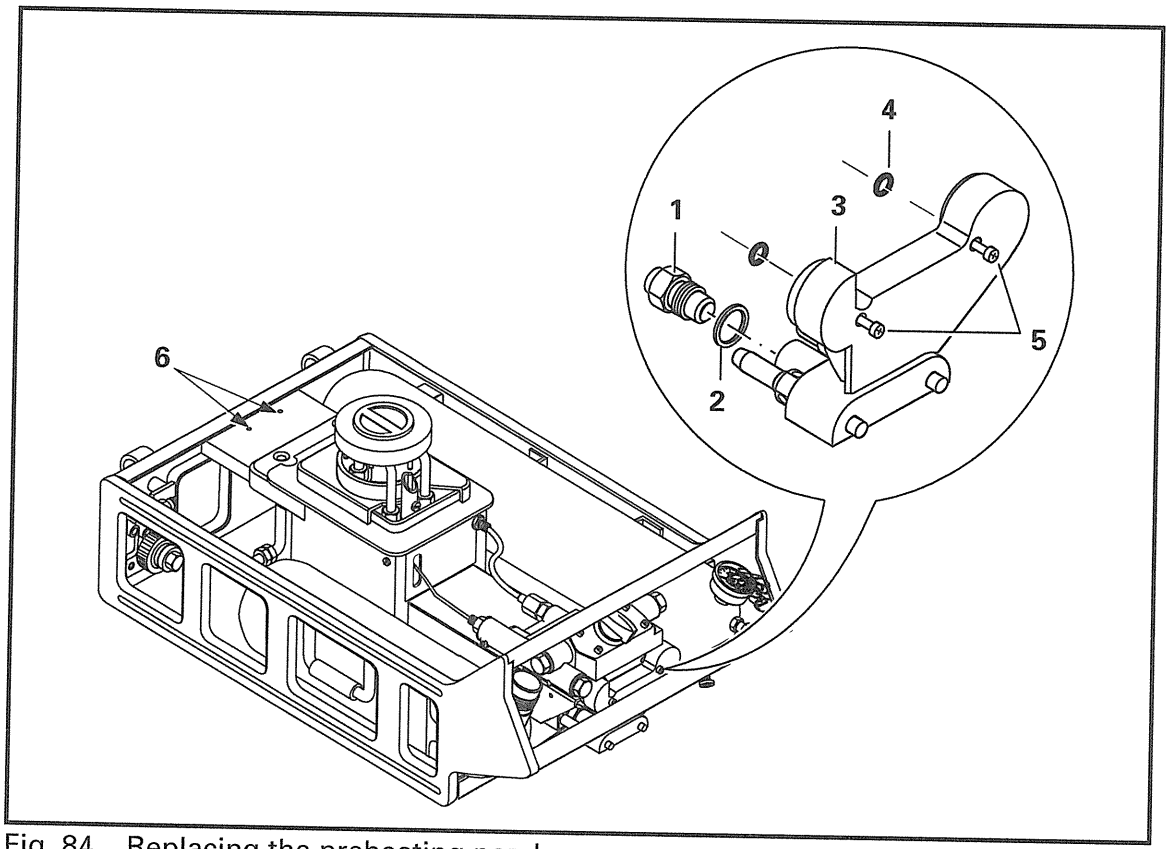


Fig. 84 Replacing the preheating nozzle

1 Preheating nozzle
2 Copper ring
3 Preheating plate
4 O-ring
5 Phillips screws
6 Holes

2.2.1.9 Replacing the Burner Fine Filter

Tools: Socket wrench, triple

- Set the rotary switch to the "STOP" position.
- Relieve the pressure via the tank lid and screw off the tank lid.
- Screw on the tank lid.
- Remove the burner cover.
- Unscrew the screw plug (85/4); remove the fine filter (85/2), sectional seal (85/1), O-ring (85/3) and O-ring (85/5).
- Dispose of the fine filter.
- Check the seals and renew, as required.
- Insert new fine filter with seals.

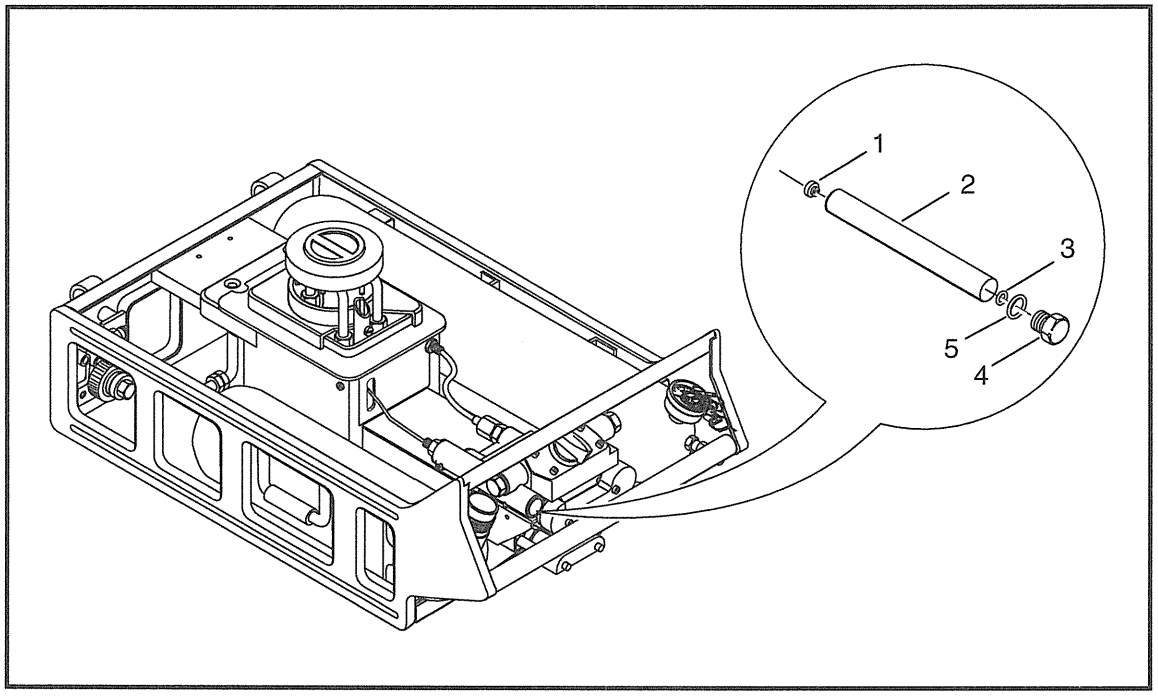


Fig. 85 Replacing the fine filter

1 Sectional seal
2 Fine filter
3 O-ring
4 Screw plug
5 O-ring

2.2.2 Personnel Hygiene

- The ZDv 46/28 regulations apply for the operation of the field kitchen equipment.
- The personnel must not produce and handle foods or brings food into traffic until proof of kitchen fitness in accordance with ZDv 46/28 is put forward.
- Diseases and injuries must be reported immediately to the superior.
- Hygienic clothing must be clean and worn in completeness (including head gear).
- Hands and uncovered parts of the arms are to be cleaned and disinfected:
  - before beginning work,
  - after every longer break,
  - after using the restroom,
  - before and after eating,
  - after processing foods that can bear a risk (e. g. eggs, poultry, fish, meat).

2.2.3 Cleaning and Disinfection

2.2.3.1 General Principles

- The purpose of the cleaning is to remove substances on which micro-organisms can multiply from surfaces and equipment.
- The aim of disinfection is to destroy micro-organisms, which can cause health disorders for humans as well as lead to the spoilage of foods.
- Cleaning and disinfection agents must be permitted for the food sector.
- For cleaning and disinfection of the field kitchen, only water with drinking water quality is to be used.
- Towels for cleaning and drying are to be replaced against clean ones as soon as they are soiled.
- The washing of cloths and towels for cleaning and drying in the cooking facilities of the field kitchen is prohibited.
- Waste bins are to be kept closed. They are to be cleaned daily and subject to disinfection, as required.
- Cleaning and disinfection is to be documented in writing (see form in appendix).

2.2.3.2 Cleaning Process

(1) Pre-cleaning
Removal of superficial dirt/debris by sweeping, wiping or pre-rinsing.

(2) Main cleaning
Dissolving the superficial layer of grease and debris with a washing or dissolving agent.

(3) Rinsing
Removal of debris and cleaning agent remainders.

(4) Intermediate drying
Air drying. If required, drying with the use of one-way towels.

(5) Disinfection
- Use disinfection agents according to instructions
- Observe reacting period depending on concentration and ambient temperature.

(6) Rinsing clear
Only with drinking water
Removal of disinfection agent remainders.

(7) Drying
Air drying. If required, drying with the use of one-way towels.

2.2.3.3 Cleaning and Disinfection Agents

The following agents are intended for cleaning and disinfection:

Ser. No.	Designation	Supply Number NATO Code	Remark
1	Dish washing liquid	7930–12–137–0329	
2	Porcelain cleaner	7930–12–336–1731	Etolit
3	Disinfection agent	6840–12–316–0962	TEGO 2000
4	Cleaning agent, universal	–	Bionades
5	Manipur	–	Washing lotion
6	Spitacid	–	Skin disinfectant
7	Bucket, multipurpose	7240–12–120–9945	Belongs to the built-in and general equipment, and is to be marked as a cleaning bucket.

2.2.3.4 Periodical Cleaning and Disinfection

(1) Before Operation

Ser. No	Equipment/Device	Cleaning	Cleaning Agent	Aid	Disinfection
1	Side surfaces of trailer body and tarpaulin **NOTE** Do not fold up side parts! Do not allow dirt/debris to dry on when heavily soiled.	yes	Water with cleaning agent	Truck cleaning brush	On special order
2	Working area and cooking containers	yes	Hot water with washing soap/cleaning agent	Cleaning cloths, sponge	yes
3	Utility equipment **NOTE** Including the outside.	yes	Hot water with washing soap	Cleaning cloths, sponge	yes

(2) During Operation

NOTE

During operation the working surfaces are to be kept clean continuously by wiping off.

Ser. No.	Ser. No.	Cleaning	Cleaning Agent	Aid	Disinfection
1	Work area and cooking containers	Hot water with washing soap/cleaning agent	Cleaning cloths, brush, sponge	• Daily, latest when finishing operation • After several days without operation • After processing risk foods*)	• Once every week • After several days without operation • After processing risk foods*)
2	Grease fleece (see 2.2.1.2)	Hot water with cleaning agent	Washing machine (e.g. field laundry)	• After several days of operation • As required	• On special order
3	Steam exhaust hose (see 2.2.1.4)	Hot water with cleaning agent	Cleaning cloths, brush	• Every 3 days	• Once every week
4	Cleaning equipment	Hot water with cleaning agent		• Daily • After cleaning risk foods*), contaminated equipment and working surfaces	• Daily • After cleaning risk food*),contaminated equipment and working surfaces

Ser. No.	Ser. No.	Cleaning	Cleaning Agent	Aid	Disinfection
5	Roof and side tarpaulins (when mounted)	Hot water with cleaning agent	Cleaning cloths, brush, sponge	• When heavily soiled	• On special order

*) Risk foods are, e.g., egg, poultry, fish, meat.

(3) When Putting Out of Operation

Ser. No.	Equipment/Device	Cleaning	Cleaning Agent	Aid	Disinfection
1	Cooking containers incl. lids and locking devices as well as kitchen equipment (see 2.2.1.1)	yes	Hot water with washing soap/cleaning agent	Cleaning cloths, brush, sponge	yes
2	Lid valve (see 2.2.1.3)	yes	Hot water with cleaning agent	Cleaning cloths, brush, sponge	yes
3	Drain valve (see 2.2.1.5)	yes	Hot water with cleaning agent	Cleaning cloths, brush, sponge	yes
4	Oven (see 2.2.1.1)	yes	Oven cleaner; afterwards hot water and cleaning agent	Moist cleaning cloth, hard sponge	yes
5	Steam exhaust hose (see 2.2.1.4)	yes	Hot water with cleaning agent	Cleaning cloths, brush	yes

Ser. No.	Equipment/Device	Cleaning	Cleaning Agent	Aid	Disinfection
6	Working surfaces	yes	Hot water with cleaning agent	Cleaning cloths	yes
7	Grease fleece (see 2.2.1.2)	yes, replace if required	Hot water with cleaning agent	Washing machine (e.g. field laundry)	On special order
8	Burner (see 2.2.1.6)	yes	Hot water with cleaning agent	Cleaning cloths, brush	On special order
9	Side surfaces of trailer body side and roof tarpaulins (when used)	yes	Hot water with washing soap/cleaning agent	Cleaning cloths, brush, sponge	On special order

2.2.4 Technical Inspections and Scheduled Maintenance

(1) Explanations of the terms in the "Check/Activity" column

Condition

General appearance, sealing tightness, corrosion, cracks and break-outs, deformations, signs of wear, paint coating, etc.

Function

Proper functioning.

Fastening

Completeness of the fastening means and their secure and tight connection, incl. screws, vibration dampers, supports, etc..

Tight seating

Firm connection between two components, e. g. screwed, welded or riveted connections.

2.2.5 Ease of movement

Free and unrestricted movement of mechanical connections (joints, linkage, hinges, etc.).

(1) Symbols used


= Lubricate (Maintenance Level 1)


= Maintenance location/functional check (Maintenance Level 1)


= Maintenance location (Maintenance Level 2)

a = after operation

b = before operation

d = during operation

F1 = monthly

F2 = half-yearly

F4 = 2 yearly

F6 = 10 yearly

2.2.5.1 Technical Inspections After, Before and During Operation

(1) Cooking Operation

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 86	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
1	Cooking Facilities		Condition						a, b
2	Pressure cooker, Pressure roaster,	8	Observe period of next safety-technical inspection	1 1		1 1			
	Oven	1		1		1			
	Hot water boiler	12			2				
3	Lid valve	11	Condition, well running, tight seating Clean	2		2			a, b a
4	Pressure lid • Pressure lid sealing • Locking lever	8	Condition, well running Condition; clean Condition, well running, function	2 2 2		2 2 2			a a, b a, b
	• Control pins		Condition	4		4			a, b
5	Double jacket valve	9	Condition, fastening	1		1			a, b

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 86	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
6	Lids of the hot water boilers	12	Condition, well running		2				a
	• Bearing		Setting		2				a, b
	• Seal		Condition		2				a, b
	• Lock		Condition, well running, function		2				a, b
7	Drain valve, pressure cooker	14	Condition, well running, function, firm fit	1		1			a, b b
8	Drain valve, hot water boiler	5	Condition, well running, function		2				a, b
9	Oven door	1	Condition, well running	1		1			a, b
	• Sealing	1	Condition	1		1			a, b
	• Locking lever	2	Condition, well running, function	1		1			a, b
10	Temperature indicator	3	Condition, well running, function		2				a, b, d
11	Manometer,double jacket	15	Condition, fastening, function		2				b
			Overpressure indicator				- 0,6 to - 1 bar		b
			Overpressure				approx. 1 bar		d

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 86	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
12	Cooking clock	13	Condition, fastening, function		2				a, b, d
13	Burner	4	Condition, completeness, tight seating of all parts, tightness, function; clean	2		2		2.2.1.6	a, b
	• Fuel tank	18	Observe period of next safety-technical inspection beachten						b
	• Air tank	16							
	• Main nozzle	20	Condition		1				a
	• Burner shield	19	Condition		1				a
	• Rotary switch	17	Condition, well running		1				a, b

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 86	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
	Frame and Accessories								
14	Folding table	7	Condition, well running	1		1			a
15	Ground support	10	Condition, function	2		2			a, b
16	Roof construction		Condition, tight seating		1				a, b
17	Roof tarpaulin		Condition, fastening		1				a, b
18	Gas-pressured dampers		Condition, fastening, function	4		4			a, b
19	Grease fleece		Condition, fastening		1			2.2.1.2	a, b, d
20	Steam exhaust hose		Condition		2				a, b, d
21	Parking brake lever		Condition, well running, function		1				b
22	Box level		Condition		1				a, b
23	Fire extinguisher	6	Condition		1		Within 3 meters of reach during operation		a, b

Overview of Maintenance Locations

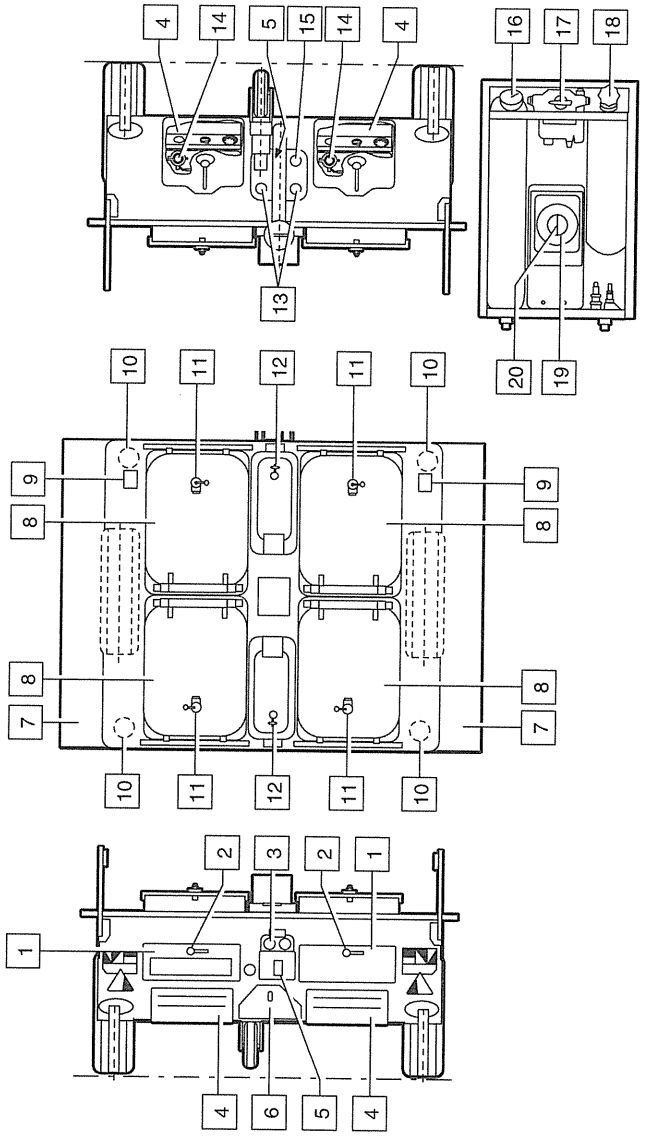


Fig. 86 Technical inspection, cooking operation

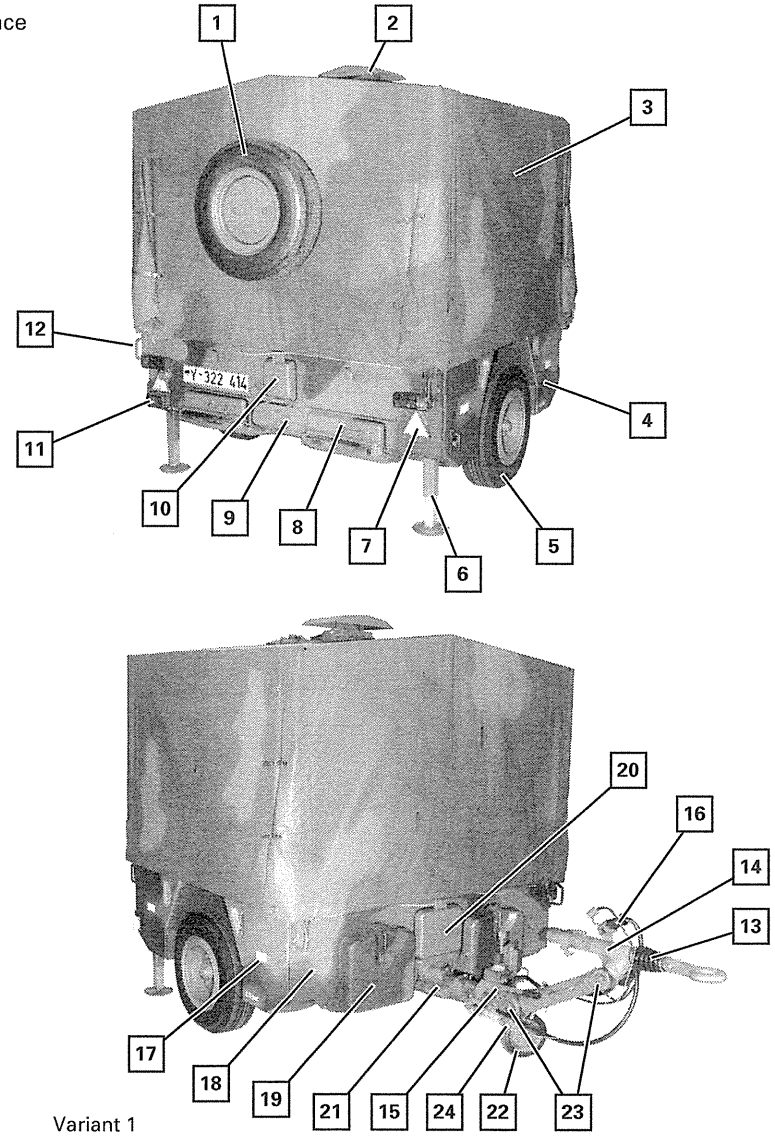
(2) Transportation

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 87	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
1	Trailer, complete		Clean						a
2	Chassis		Condition		1				a, b
3	Folding table, locking device		Condition, fastening; Grease, as required	1		1	Silicone spray	Fig. 86	b
4	Pressure lid		Closed					Fig. 86	a, b
5	Wheels	5	Condition, fastening	1		1	4.3 bar min. 2 mm		a, b, d
6	Swivel pin	23	Firm fit, uncoupled		2				a, b, d
	• Spring clips	23	Firm fit		2				a, b, d
7	Overrun unit	14	Condition, fastening		1				a, b, d
	• Rubber sleeve	13	Firm fit		1				a, b, d
8	Rapid-emergency cable	24	Condition, fastening		1				a, b, d
9	Parking brake lever	15	Condition, fastening		1				a, b, d
	• Lever travel		Function		1		5 teeth, max.		a, b

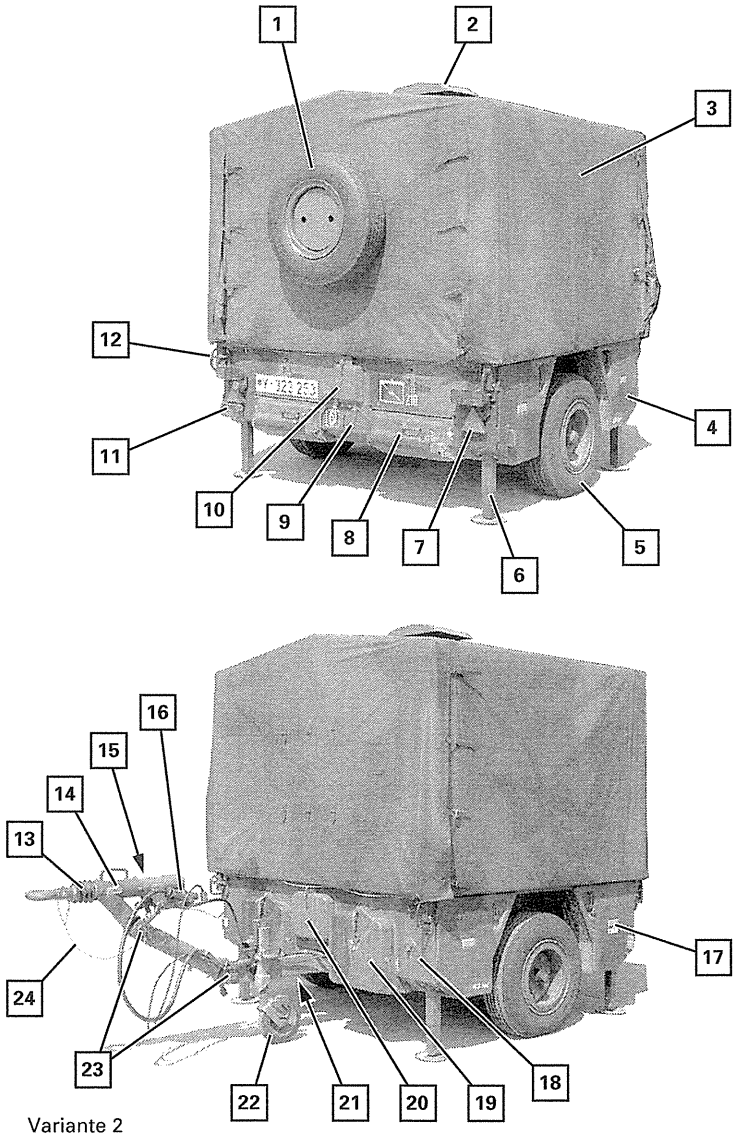
Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 87	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Refer- ence to Section	Period for the Work
10	Actuation gear, brakes	21	Condition, fastening, well running		1				a, b, d
11	Support wheel	22	Tight seating		1				a, b, d
12	Ground supports	6	Fastening	2		2			a, b
13	Burner door, front and rear	19 8	Condition, lock	2		2			a, b, d
14	Instruments/gauges flap, front and rear	20 10	Condition, lock		2				a, b, d
15	Storage space door, rear	9	Condition, lock		1				a, b, d
16	Storage space door, side	4	Condition, lock	2		2			a, b, d
17	Frame sheeting	18	Condition		1				a, b, d
18	Roof construction		Condition, lock	2	2	2			a, b, d
19	Roof tarpaulin	3	Condition, fastening		1				a, b, d
20	Flue hood	2	Condition		1				a, b, d
21	Spare wheel	1	Condition, fastening		1				a, b, d

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 87	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
22	Lighting system	16	Condition, function		1				a, b, d
23	Rear reflector, triangle-shaped	7	Condition, fastening	1		1			a, b, d
24	Reflector, side	17	Condition, fastening	2		2			a, b, d
25	Rear fog light	11	Condition, fastening	1					a, b, d
26	Eyelets and holders for roof supports	12	Condition, fastening	2		2			a, b, d

Overview of Maintenance Locations



Variant 1



Variante 2

Fig. 87 Technical inspection, transportation

2.2.5.2 Schedule and Overview of Maintenance Locations

(1) Scheduled Maintenance According to Time F1, F2 (Maintenance Level 1)

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 88	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
1	Burner door, front	23	Condition, well running	1		1			F2
	• Bearing	25	Drop lubrication	2		2	O-236		F2
	• Lock	24	Condition, well running Drop lubrication	1		1	O-236		F2
2	Instruments/gauges flap, front and rear	5	Condition, well running		2				F2
	• Swivel pin	7	Drop lubrication		4		O-236		F2
	• Lock	6	Condition, well running Drop lubrication		2		O-236		F2
3	Burner door, rear	10	Condition, well running	1		1			F2
	• Bearing	8	Drop lubrication	2		2	O-236		F2
	• Lock	9	Condition, well running Drop lubrication	1		1	O-236		F2
	• Spring		Condition, fastening	1		1			F2

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 88	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
4	Storage space door, rear	13	Condition, well running		1				F2
	• Joint	11	Drop lubrication		2		O-236		F2
	• Lock	12	Condition, well running Drop lubrication		1		O-236		F2
5	Oven door	4	Condition, well running	1		1			F2
	• Joint	2	Drop lubrication	2		2	O-236		F2
	• Locking lever	3	Condition, well running Drop lubrication	1		1	O-236		F2
6	Storage space door, side	16	Condition, well running	2		2			F2
	• Joint	14	Drop lubrication	4		4	O-236		F2
	• Lock	15	Condition, well running Drop lubrication	2		2	O-236		F2
7	Ground support	1	Condition, well running, Grease	2		2	G-450		F2
8	Joints for roof part, front and rear	21	Grease	2		2	G-450		F2

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 88	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
9	Joints for roof part, right and left	22	Drop lubrication	2		2	O-236		F2
10	Grease fleece		Condition, fastening; wash, as required		1			2.2.1.2	F2
11	Relay lever	17	Grease		1		G-450		F2
12	Overrun unit	18	Grease		2		G-450, 20 g		F2
	• Trailer coupling ring	19	Grease		1		G-450, 10 g		F2
13	Parking brake lever	20	Grease		1		G-450, 5 g		F1
	• Toothed segment		Grease		1		G-450		F1
14	Compensating bridge, actuation gear brake system		Grease		1		G-450	Unscrew maintenance lid	F2
15	Support wheel	26	Grease		1		G-450, 10 g		F1
16	Padlock		Oil	4		4	O-236		F2
17	Roof construction		Unstrap roof tarpaulin at the side parts and touch-up paint damage, as required.	1	2	1			F2

Overview of Maintenance Locations

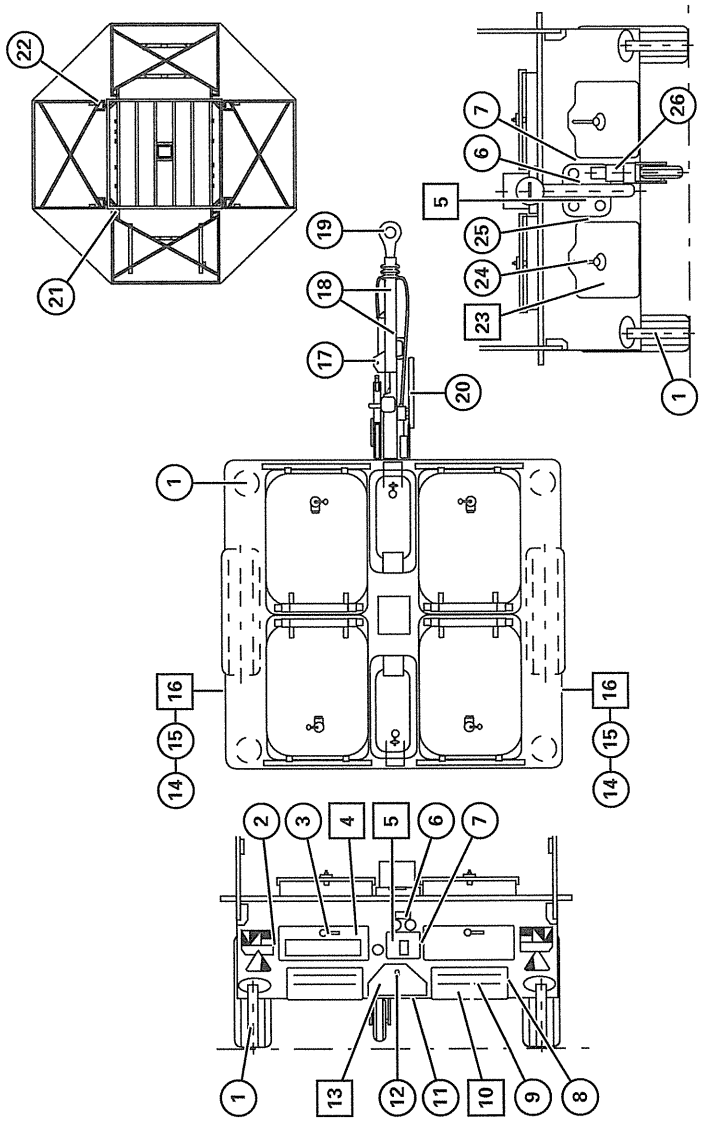


Fig. 88 Overview of maintenance locations F1/F2

(2) Scheduled Maintenance According to Time F1, F2, F4 (Maintenance Level 2)

Ser. No.	Inspection Location/ Designation	Symbol/ Number in Fig. 89	Check/Activity	Quantity l	Quantity m	Quantity r	Required value/ Lubricant	Reference to Section	Period for the Work
1	Frame and set-up		Condition, fastening					3.2.7.4	F2
2	Rocker lever/torsion bar suspension	5	Grease **NOTE** With torsion bar suspension axle free of load.	3		3	G-450, 30 g		F2
3	Wheel hub bearing	3	Check play; grease	1 2		1 2	 G-450	3.2.3.1 3.2.3.3 (3)	F4 F4
4	Wheel brake	4	Check thickness of brake linings	1		1		3.2.4.2	F4
5	Braking cable	1	Condition	1		1			F4
6	Chassis, undercoating		Condition		1				F4
7	Overrun unit	2	Condition, function		1			3.2.4.3	F4
8	Installation kit components		Perform safety-technical check, see 3.3						
9	Burner – air tank	6	Drain condensate	2		2		3.2.6.1	F1

Overview of Maintenance Locations

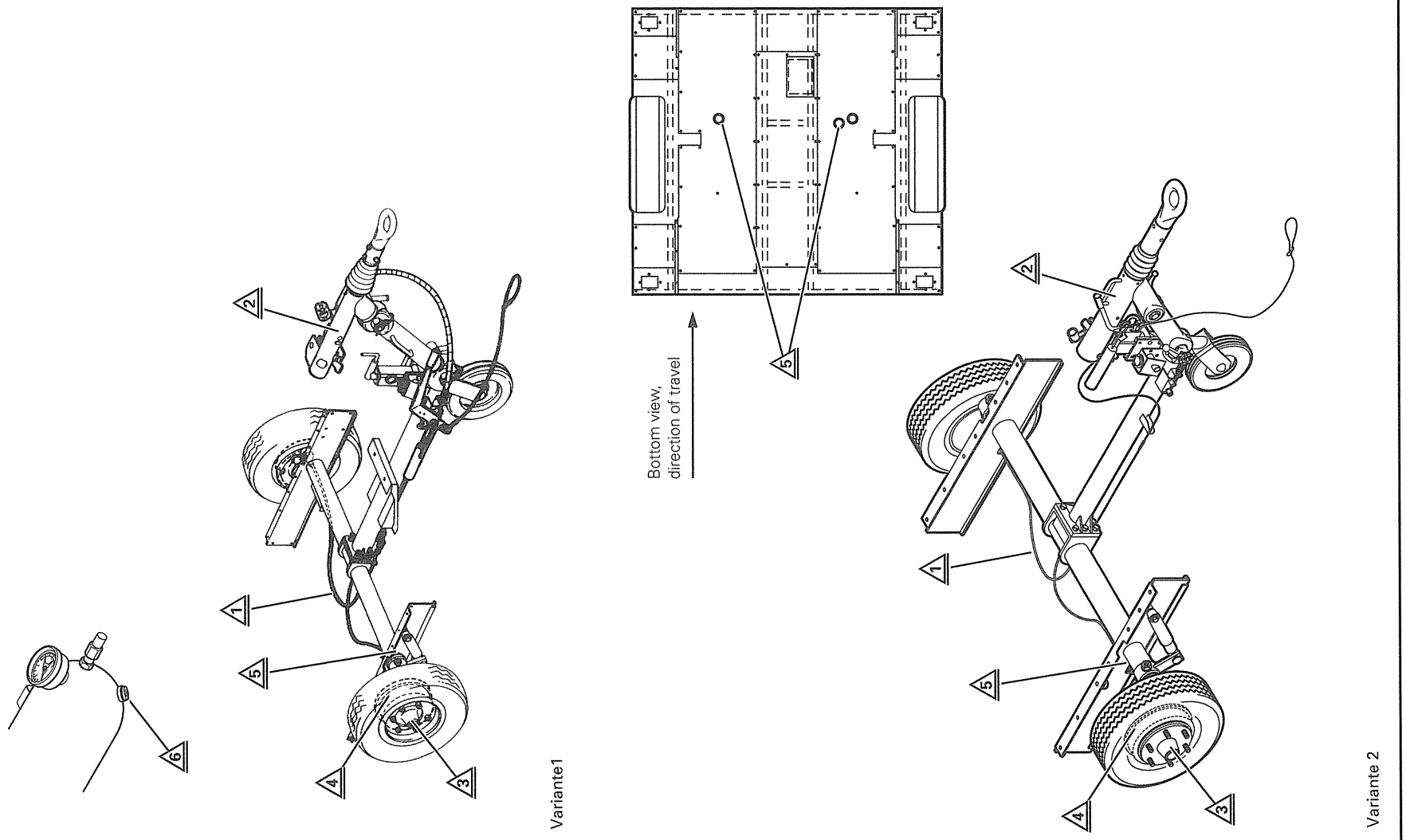


Fig. 89 Overview of maintenance locations F1/F2/F4

2.3 Malfunctions, Faults, Causes, Repair

2.3.1 Cooking Equipment

Ser. No.	Malfunction, Fault	Cause	Corrective Action	MES
1	Pressure lid does not stay open	Leg spring tension too weak	Adjust leg spring (see 3.2.5.1)	2
2	Lid valve blows off too early	Pressure spring damaged or fatigued	Check pressure spring and replace (see 2.2.1.3)	2
3	Lid valve does not show any pressure	Indicator pin stuck	Clean lid valve (see 2.2.1.3), or replace parts as required	1
4	Pressure lid not tight	Seal soiled	Clean seal	1
		Seal damaged	Replace seal	4
5	Lid of hot water boiler not tight	Seal soiled	Clean seal	1
		Seal damaged	Replace seal	2
6	Food does not become hot; cooking time too long	Lack of water in the double jacket	Fill double jacket with water and purge (see 2.1.8.4)	1
		Burner malfunction	see 2.3.2	

Ser. No.	Malfunction, Fault	Cause	Corrective Action	MES
7	Pressure in the double jacket escaping; no overpressure indication on the double jacket manometer	Untight screwed connection at: • Double jacket valve • Purge valve • Manometer neck • Plug	Tighten/seal screwed connections	2
		Double jacket untight	Replace pressure cooker (see 3.2.5.2)	2
		Double jacket valve untight	Doppelmantel-ventil wechseln (see 3.2.5.4)	2
8	Very uneven heating of the pressure cooker	Burner not in working position	Bring burner in working position	1
		Burner burning uneven	see 2.3.2	2
		Double jacket not purged	Purge double jacket (see 2.1.8.4)	1
9	Very uneven heating of the pressure roaster	Burner not in working position	Bring burner in working position	1
		Burner burning uneven	see 2.3.2	2
		Loss of water in the heating tubes	Check heat distribution in the pressure roaster (see 2.1.8.5)	1
10	Exhaust fumes escaping from under the brim of the boiler	Silicone seal damaged	Dismount boiler, clean the sealing surfaces and seal again	2

2.3.2 Burner

Ser. No.	Malfunction, Fault	Cause	Corrective Action	MES
1	**Preheating Phase "V"** Preheating flame does not ignite	Fuel tank empty	Fill fuel tank (see 2.1.3.3)	1
		Pressure in system not given	Check pressure in air tank at manometer; fill air tank with 9 bar of compressed air, if required (see 2.1.3.3)	1
			Check tight seal of tank lid at fuel tank; replace seal in tank lid, if defective	1
			Pressure reducer at safety block defective; replace safety block	4
		Fine filter clogged	Replace fine filter (see 2.2.1.9)	1
		Preheating nozzle in the preheating plate clogged	Replace preheating nozzle (see 2.2.1.8)	1
		Control block defective	Replace control block	4

Ser. No.	Malfunction, Fault	Cause	Corrective Action	MES
2	Preheating flame burns irregularly and/or sooting	Preheating nozzle in the preheating plate soiled	Replace preheating nozzle (see 2.2.1.8)	1
		Pressure in air tank too low	Fill air tank with 9 bar of compressed air (see 2.1.3.3)	1
		Preheating nozzle loose	Tighten preheating nozzle	1
		Condensate in fuel or air tank	Bleed air tank, drain fuel in fuel tank and refill (see 3.2.6.1)	2
		Injector sleeves loose	Tighten injector sleeves	1
		Injector sleeves clogged	Carry out major cleaning	4
		Injector sleeves damaged	Replace injector sleeves (see 3.2.6.2)	2
		Air nozzles in injector sleeves clogged	Replace air nozzles (see 3.2.6.2)	2
		Preheating tube and preheating duct sooted	Carry out major cleaning	4
3	Preheating flame burns irregularly within the complete preheating duct	Excessive fuel output	Check fuel system for leakage; correct leakage	1

Ser. No.	Malfunction, Fault	Cause	Corrective Action	MES
		Control block untight	Replace control block	4
			Check seal at the preheating plate	1
			Check tight seating of preheating plate	1
		Fuel coming out of main nozzle while in the "Stop/Preheating" position	Replace flame safety valve (solenoid valve)	4
4	**Ignition Phase "Z"** Main flame does not ignite when rotary switch is in the "Z" setting	Main nozzle with filter clogged	Replace main nozzle with filter (see 2.2.1.7)	1
		VPreheater not sufficiently preheated	Extend preheating time (4 min max.)	1
		Vaporizer clogged	Carry out major cleaning	4
		Control block damaged	Replace control block	4

Ser. No.	Malfunction, Fault	Cause	Corrective Action	MES
	Main Operation "1 - 3"			
5	Main flame goes out when rotary switch in setting 1	Fuel tank empty	Refill fuel (see 2.1.3.3)	1
		Main nozzle with filter clogged	Replace main nozzle with filter (see 2.2.1.7)	1
		Supply line to the main nozzle clogged	Carry out major cleaning	4
		Control block damaged	Replace control block	4
		Flame sensor defective	Replace flame sensor	4
		Solenoid valve defective	Replace solenoid valve	4
6	Main flame does not reach full power in setting 3 of rotary switch	Main nozzle with filter clogged	Replace main nozzle with filter (see 2.2.1.7)	1
		Supply line to the main nozzle clogged	Carry out major cleaning	4
		Fine filter clogged	Replace fine filter (see 2.2.1.9)	1
		Control valve in control block misadjusted	Replace control block	4

Ser. No.	Malfunction, Fault	Cause	Corrective Action	MES
7	Main flame burns very irregular	Main nozzle with filter clogged	Replace main nozzle with filter (see 2.2.1.7)	1
		Burner shield not positioned in center	Insert burner shield centered	1
		Burner shield defective, parts broken out	Replace burner shield	2
		Main-nozzle holder not in vertical position	Align main-nozzle holder	2
8	Main flame burns yellowish	Faulty fuel	Drain tank – use fuel according to 1.2.9	1
		Air pressure in the system too low	Refill air in air tank (5 bar min.) (see 2.1.3.3)	1
		Pressure reducer defective	Replace safety block	4
9	Main flame does not go out when rotary switch in "STOP" setting	Control block defective	Carefully relieve pressure in fuel tank: flame goes out; replace control block	4
		Fuel system untight	Extinguish flame; check burner for leakage (see 3.2.6.4)	2

2.3.3 Chassis/Brake System

Ser. No.	Malfunction, Fault	Cause	Corrective Action	MES
1	Massive jolts during starting and braking	Trailer hitch not aligned horizontal	Adjust trailer hitch properly (see 2.1.7.2)	1
		Defective damper in the overrun unit	Replace damper (see 3.2.4.6)	2
2	Parking brake shows no effect	Brake setting incorrect	Carry out basic adjustment for brakes (see 3.2.4.1)	2
3	No or bad braking effect	Worn brake linings	Replace brake linings (see 3.2.4.13)	2
		Overrun unit defective	Have overrun unit repaired (see 3.2.4.4)	2
		Brake-transmitting components run heavily	Repair brake-transmitting components (see 3.2.4.3)	2
4	Trailer tends to break out during driving	Towing equipment not adjusted correctly	Check trailer and adjust (see 2.1.7.2)	1

2.3.4 Electrical System

Ser. No.	Malfunction, Fault	Cause	Corrective Action	MES
1	Complete lighting system inoperative	Plug of the connection line is not seated properly	Create firm contact of the connection cable	1
		Circuit breaker has tripped	Lock circuit breaker into position; for this, unscrew the lid of the distribution box	1
		Ground cable disconnected	Repair ground cable	2
2	Individual lights inoperative	Defective bulb	Replace bulb	1
		Power supply line in distribution box not connected	Connect plug connection in distribution box	2

2.4 Preserving and Packing, Storage

2.4.1 Preserving

Treat stainless steel parts with porcelain cleaner or suitable stainless steel cleaner.

2.4.2 Packing and Storage

No such work to be done in maintenance level 1.

2.5 Loading, Transport/Shipment

2.5.1 Railway Transport

CAUTION
When loading trucks and field kitchen trailers, the ZDv 42/20 Regulations – Reporting and Carrying Through Railway Transports – must be observed.
For loading regulations for the DB truck see TDv 2320/054-12, and for loading regulations of the IM truck see TDv 2320/074-12.

Ser. No.	Equipment Designation, PL-No.	Regulation Loading	Conditions
1457	Truck, 5 t tmil, 4x4, by IVECO with built-in and general equipment. Field kitchen truck: 2320-16090 Equipment: Hamburg roof Supply No.: 2540-12-310-8898	Laads	Lower the truck bow, fold in mirrors; position truck on the level part of the loading surface
1458	Truck, 5 t tmil, 4x4, by Daimler Benz with built-in and general equipment. Field kitchen truck: 2320-16090 Equipment: Hamburg roof Supply No.: 2540-12-304-3405	Kbs 442/443 Kbs 442/443	Spriegel absenken, Spiegel anklappen
Loading Class IV	Field kitchen on 2.1 t loading trailer 7360-11386	Kbs/Kls	none

CAUTION
The handles (38/4) for tying down the field kitchen trailer are to be checked for proper condition.
Trailers with repaired or rewelded handles may not be tied down. Have handles replaced.
Operation of the field kitchen during railway transport is prohibited.

2.5.1.1 Railway Transport of Field Kitchen Trailer with Towing Vehicle

- Preparation of the towing vehicle in accordance with Section 2.5.1
- Lashing of the rig according to 90.

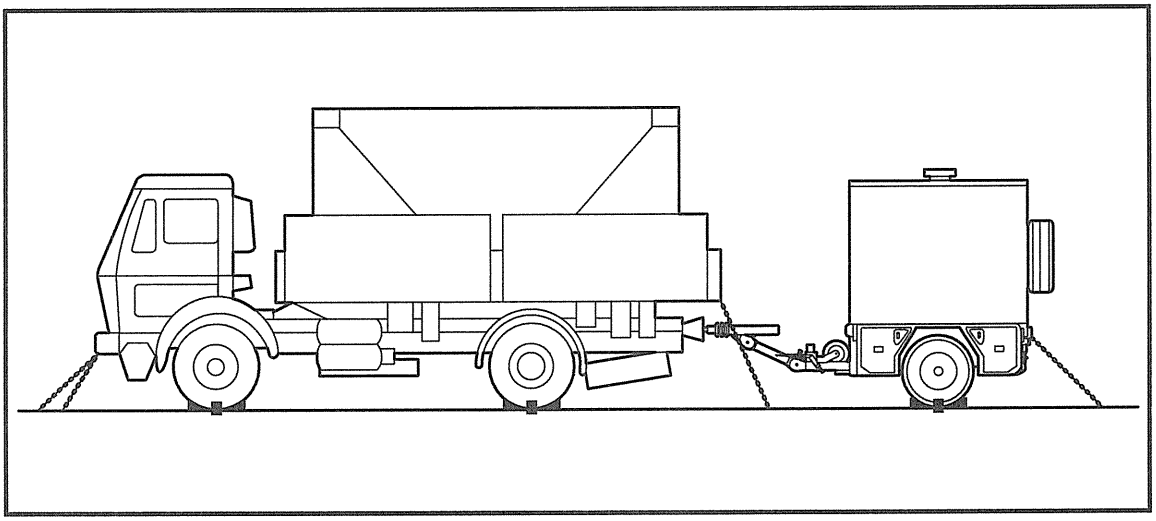


Fig. 90 Truck with field kitchen trailer, loaded and lashed for railway transport

2.5.1.2 Railway Transport of Field Kitchen Trailer

- Lower the rear ground supports, lower the supporting wheel and uncouple the field kitchen trailer.
- Lower the front ground supports and lock the supporting wheel approx. 5 cm above the floor.
- Lashing of the field kitchen trailer according to 91.

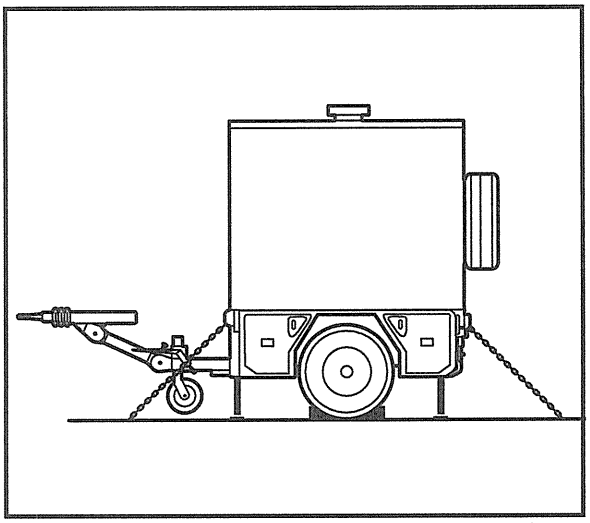


Fig. 91 Field kitchen trailer, transport by itself

2.5.2 Air Transport

The field kitchen trailer is permitted for air transport with the CH-53 helicopter. See TDv 1670/012-15.

The built-in and general equipment on the 5 t truck are not suitable for air transport.

CAUTION
Prior to air transport, the handles (Fig. 38/4) of the field kitchen trailer are to be checked for proper condition.
Trailers with repaired or rewelded handles may not be tied down.
Have handles replaced.

2.6 Technical Safety Regulations, Operational Safety Regulations and Regulation for Environmental Protection

2.6.1 General Regulations

(1) The field kitchen may only be operated by field kitchen personnel who have completed their educational training on this equipment. Use only personnel in the kitchen area and for the handling of food stuffs which is fit for kitchen work according to ZDv 46/28

(2) The adjustments of safety equipment, e.g. valves and lid locks, may not be changed.

(3) For stationary use of the field kitchen, observe the applicable local construction regulations.

(4) Any changes in the form or technical modifications are prohibited unless are specifically ordered by a technical instruction.

(5) Maintenance and repair work may be carried out only by trained staff and when the respective equipment is not pressurized.

(6) All electrical operating equipment (230 V) to be inspected half-yearly by a specialist in accordance with BGV A2.

2.6.2 Prior to Transit

(1) The driving behavior of the field kitchen trailer is impaired when the following faults/defects are given:

- Tire pressure too low.
- Hitch transition piece (68/8, 69/8) not adjusted correctly to the trailer coupling height of the towing vehicle.
- Overrun unit (68/6, 69/9) not adjusted level.
- Tommy bar locking devices of the height adjustment device (68/7, 69/7) not tightened.
- Retaining chains of the securing split pins wedged in the toothing.

The tommy bar locking devices are to be checked for tight seating after 1 km of travel and again after 50 km of travel.

(2) When the trailer is hitched to a civilian truck, the trailer coupling ring, the electrical connection cable and, if required, the bulbs must be replaced (see Section 2.1.9.1).

(3) Roof parts must be locked properly. The gas-pressured dampers are under high pressure and can cause the roof parts to fold up automatically.

(4) The cookers may not be filled higher than their rated contents.

(5) During travel, pressure cookers, pressure roasters and burner must be pressure-free. This does not apply for the double jacket of the pressure cookers.

(6) Before transit, the rapid-emergency cable is to be connected with the trailer coupling of the towing vehicle.

(7) The lids of the cookers, roasters and water boilers must be shut and locked.

(8) Apart from the operating fuel in the fuel tanks of the burners no other combustible fluids may be taken along in the field kitchen trailer.

(9) Wheel nuts must be retightened with 300 Nm upon initial starting of operation or after 50 km after changing a wheel.

2.6.3 During Transit

Cooking operation during transit is prohibited. **Danger to life!**
All burners must be switched off ("STOP" position).

2.6.4 Hitching/Unhitching and Parking the Trailer

(1) Only park the trailer on firm, flat, horizontal ground.

(2) Secure wheels with wheel chocks.

(3) Crank down the supporting wheel and the rear wheel supports and adjust accordingly to the ground conditions.

(4) Standing between towing vehicle and trailer during hitching and unhitching is prohibited. **Danger to life!**

2.6.5 Maneuvering the Trailer Manually

(1) The trailer should only be moved manually on flat, firm ground and in easy terrain for maneuvering purposes.
All burners must be switched off ("STOP" position) and the pressure cookers must be pressure-free. **Danger to life!**
The trailer must be secured against tilting by cranking out the rear ground supports (to approx. 5 cm above ground) as well as the support wheel.

(2) It is prohibited to move the trailer manually on slopes.

2.6.6 Folding Up the Roof Parts

The gas-pressured dampers are under high pressure and can cause the roof parts to fold up automatically. Hold the roof parts firmly and guide them up by releasing slowly.

2.6.7 Railway/Air Transport

(1) When loading trucks and field kitchen trailers, the ZDv 42/20 Regulations – Reporting and Carrying Through Railway Transports – must be observed.

(2) Prior to railway and air transport, the handles (Fig. 38/4) of the field kitchen trailer are to be checked for proper condition.
Trailers with repaired or rewelded handles may not be tied down. Have handles replaced.

(3) Cooking operation during transport is prohibited!

2.6.8 Loading the Trailer

(1) Only fill up or take out food and drinks when the trailer is properly secured (see Section 2.6.2).

(2) When loading the trailer with accessories, proceed according to the loading plan Section 1.5).

2.6.9 General Safety Regulations

(1) Operation of the field kitchen is permitted only on firm ground.

(2) The vicinity must be clear of combustible objects/materials (hay, straw, fuel storage depot, gas cylinder depot, etc.).

(3) Set-up of the field kitchen at location must be inspected/accepted by an expert.

2.6.9.1 Safety Regulations for Burner Operation

(1) Smoking is prohibited in the vicinity of the burner.

(2) Before starting the burner, a fire extinguisher must be placed in an easily accessible and visible position (safety distance approx. 3 m). The operational condition of the fire extinguisher must be checked every 2 years by an expert.

(3) The operating personnel must be instructed on how to use the fire extinguisher.

(4) There is a general risk of fire and burning within the vicinity of 5 meters from the burner flame.
Store operating fuels at least 10 meters away from the cooking locations.

(5) Before starting the burners, check them for operational safety and damage. Do not start any burners which show evidence of defects or leaks, etc., or are not safe for operation.

(6) Operation of the field kitchen in enclosed spaces is permitted only when:
- an expert for indoor ventilation equipment permits the operation.
- developing fumes (flue) are conveyed outside,
- a minimum volumetric space of 40 m^3 is given
  and
- a fresh air inlet coming from the outside and non-lockable, with at least 200 cm^2 surface is given.

NOTE

Air requirement per burner: 30 m^3/h.

(7) Operation of burners in explosion-hazardous spaces is prohibited.
Danger to life!

(8) Ensure that the exhaust gases at the flue can escape freely. Do not place camouflage nettings or anything similar directly over the flue.

(9) The burners may be operated only with petroleum as well as with the alternative fuels mentioned in Section 1.2.9
When using alternative fuels, observe the instruction in Section 2.1.9.
Operation with gasoline is prohibited!
Adding minute amounts of gasoline is not permitted.

(10) Open tank lid without the use of tools. Do not actuate the filler valve, otherwise fuel can enter the air tank. **Danger of fire!**

(11) Refill fuel only when the burner is cold.
Ensure that there is no open flame/ unprotected light within the circumference of 5 meters.
Fill burners only outdoors.

(12) Only start burners after the cookers/roasters and the ovens are filled with the minimum prescribed amount (food or water) and the water boilers are filled with water.

(13) Put the burners into operation only when they are in the burner compartments. The fuel tank must be filled.

(14) Preheating of the burner may be carried out only for the duration of the set preheating phase. Preheating as a means of continuous operation (e. g. for low load) is prohibited!

(15) If the preheating procedure is interrupted, allow at least for a 10-minute cooling down period before repeating.

(16) If the flame goes out during preheating, fuel can collect in the preheating tube and in the fuel collecting pan. Remove any run-out fuel before relighting.

(17) If the lighting of the main flame fails or if the preheating and the main flame go out, immediately set the rotary switch to "STOP"
(wait approx. 10 min.). Correct the malfunction (see Section 2.3.2).

(18) During preheating and operation, the burner function and the burner flame must be controlled.

(19) Refilling compressed air during the preheating phase is prohibited!

2.6.9.2 Safety Regulations for Cooking Operationd

(1) Before heating, check the function and movability of the lid valves and the lid lock. Clean the lid valves after usage, see Section 2.2.1.3.

(2) Before putting the pressure cookers into operation, check the corresponding drain valve for movability and tight seating of the thread connection. The drain elbows must be mounted.

(3) Do not place any object on the lid valves. The cross-sections of the openings may not be clogged.

(4) The cooker and roaster lid must be shut in such a manner that the locking lever engages. The control pins must be visible and protrude approx. 1 mm.

(5) Do not heat empty cookers/boilers.
The pressure cookers must be filled with at least 10 liters of liquid. The hot water boilers must be at least half full.
If the roaster is being heated with the oven empty, a container with water must be placed into the oven.

(6) If the double jacket valve actuates, water must be refilled and the double jacket must be purged (see Section 2.1.8.4).
Fill the double jacket only with clean water (no salt water). The double jacket valve must not be disassembled

(7) Heating the burner without the prescribed water filling in the double jacket is prohibited. A clear sign for lack of water is when the double jacket manometer indicates a relatively rapid pressure increase to 1 bar, and no pressure increase is evident on the lid valve.

(8) It is prohibited to heat the oven in excess of 250 °C.

(9) Roasting, browning and baking are permitted only in the pressure roaster as well as in the oven.

(10) Grease and cooking oil may only be heated with the pressure lids open.
Never leave the cooker unattended!
Never extinguish grease fires with water!

(11) When operating the oven with the pressure roaster empty, the pressure lid of the pressure roaster must always remain open!

(12) Cook foods that tend to froth at first with lid open, then, after foam has reduced itself, cook under pressure.

(13) The pressure cookers may be filled only to 7 cm below the edge of the cooker, the pressure roaster only to 4 cm below the edge of the roaster. Fill foods that foam only to 15 cm below the edge of the cooker. Fill pressure cooker/pressure roaster to a maximum of 15 cm below the edge when cooking with liquids under pressure (without GN containers).

(14) Open lid valve only in steps. When the pressure escapes too quickly, food stuffs can be drawn in the lid valve and clog it. Exercise special caution when cookers are full and with stewed foods.

(15) The lid must not be opened until the cooking pressure is released fully. The lid valve must remain open, otherwise pressure will build up again. Opening the lid with any force is prohibited.

(16) During the cooking, all gauges and indicating devices must be supervised.

(17) Remove snow from the roof and side tarpaulins.

2.6.9.3 Safety Regulations for Scheduled Maintenance

(1) Do not change the length of the springs in the lid valve! Length changes of the springs changes the characteristic of the lid valves.

(2) Do not disassemble the drain valve any further as shown in of Section 2.2.1.5, Fig. 82.

(3) In case fuel escapes after opening fuel-carrying parts, collect these in a suitable container and dispose of properly. Do not drain fuels into the environment!

(4) When using cleaning and disinfection agents as well as chemicals and such alike, observe the safety instructions according to the safety data sheets.

(5) All pressure containers such as pressure cookers with double jacket, pressure roasters as well as the air and fuel tank of the burner are subject to reoccurring inspections by an expert.

2.6.9.4 Behavior in Thunderstorms

(1) The soldier must be informed on how to behave in case of thunderstorms (also see HDv 101/310).

(2) Any cooking operation is to be stopped.

(3) When a thunderstorm approaches, take shelter in the drivers cab. Keep doors closed.

(4) Loitering on stepladder, platforms and walkways on the vehicle is prohibited.

(5) As far as possible, seek shelter in closed vehicles, containers or cabins (Faraday cage effect).

(6) Tents offer only limited protection for persons against direct and indirect discharge of the atmosphere (lightning).

CAUTION
A thunderstorm is dangerously close when the period between the striking of lightning and the thunder is 10 seconds or less. In this case the thunderstorm is less than 3 km away.

2.6.10 Measures for Environmental Protection

(1) Sort and collect packing materials, food waste and food scraps and dispose of properly.

(2) Kitchen waste water is to be disposed of environmentally friendly in accordance with the valid regulations.

(3) Collect condensate from fuel and air tanks and dispose of properly.

2.7 Disarmament

2.7.1 Paralyzing

The field kitchen can be paralyzed by removing the burner shields out of the burners.

2.7.2 Destruction

When ordered to destruct the field kitchen, carry out the following measures:

- **Burner, pressure-free** — Using a hammer, destroy the adjustment knob with spindle and the vaporizer.
- **Cooker, pressure-free** — Pierce all cookers and the thermoports with a pick axe.

For destruction of the trucks refer to the relevant TDv.

Furthermore, observe the regulations of
TDv 031 "Disarmament of military equipment".

Part 3
Repair By Troops and Long-term Storage

3.1 General Information

3.1.1 Special Tools, Measuring and Testing Equipment to Maintenance Level 2

The special tools required for maintenance level 2 are included in the tool bag and are listed in Section 1.4.1.1.

3.1.2 Setting Data and Tolerances

ESP	Test/Inspection	Required Values/ Tolerances
09	Chassis	
	Tightening torque chassis/frame	200 Nm
	Tightening torque wheel nuts	300 Nm
	Tightening torque trailer coupling ring	90 ± 5 Nm
12	Brake system	
	Minimum lining thickness of brake linings	2 mm
	Parking brake travel	5 Zähne max.
	Tightening torque of the fastening bolt for the shock absorber	66 ± 5 Nm (secure with Loctite, as required)
	Play of spring brake actuator	0,5 - 1 mm
	Measure of wear in brake drum	max. ø 301 mm
17	Burner	
	Tightening torque, control block solenoid valve	10 – 12 Nm
	Tightening torque, flame sensor – Screwed socket at control block	3 – 3,5 Nm
18	Frame	
	Tightening torque, eyelets	80 Nm

3.1.3 Operating and Consumption Materials

Ser. No.	Designation	Supply Number, NATO-Code, TKZ	Comment
1	Paint, synthetic resin	8010–12–195–7420	RAL 6031, bronze green, 1/2 liter can
2	Primer	8010–12–198–1790	Without zinc chromate 1/2 liter can
3	Lubricating oil	O–236	
4	Grease	G–353	
5	Grease	G–450/G421	
6	Grease	G–394	
7	Silicone	8030–12–166–7697	
8	Glycerin	8030–12–129–8194	
9	Sealing compound	8030–12–178–6715	
10	Undercoating		K19
11	Sealing band	5330–12–178–0289	Teflon band
12	Liquid screw seal	DELO–ML–5268	Kärcher Co., use only DELO-ML-5268
13	Loctite 243		

3.2 Repair By Troops, Scheduled Maintenance and Setting Work

3.2.1 General Information

- Broken, damaged or worn parts must be replace by new parts. Disassembled parts must be cleaned again before reassembly.
- O-rings and seals must always be replaced by new ones before or during installation or assembly.
- Never leave cleaning agents in contact with seals, electric cables and hoses for extended periods. Leather, rubber and synthetic materials are attacked by such agents, dry out and become unusable.
- After each repair, a performance check is to be carried out. The indicated test and setting values are to be observed.
- Unauthorized modifications to the equipment are prohibited!
- The regulations governing technical safety, operational protection and environmental protection are to be observed.
- Assembly work is to be carried out in reverse order of disassembly, unless otherwise mentioned.

3.2.2 Work on the Electrical System

CAUTION
For all work on the electrical system, disconnect the plug from the towing vehicle.

3.2.2.1 Changing the 12-Pole/7-Pole Plug

Unsolder the defective plug and solder on new plug according to given assignment. Observe minimum cable length from front edge of supporting wheel holder according to the table in Section 3.2.2.2.

3.2.2.2 Repairing the 12-Pole/7-Pole Plug

In the area of the towing hitch between the pipe clamps (92/1), the 12-pole cable as well as the 7-pole cable can be separated and newly spliced together again.

When doing this, observe the cable lengths in accordance with the following table.

	Minimum cable length from front edge of supporting wheel holder	Maximum cable length from front edge of supporting wheel holder
12-Pole cable , incl. plug	1800 mm	2000 mm
7-Pole cable , incl. plug	1800 mm	2000 mm

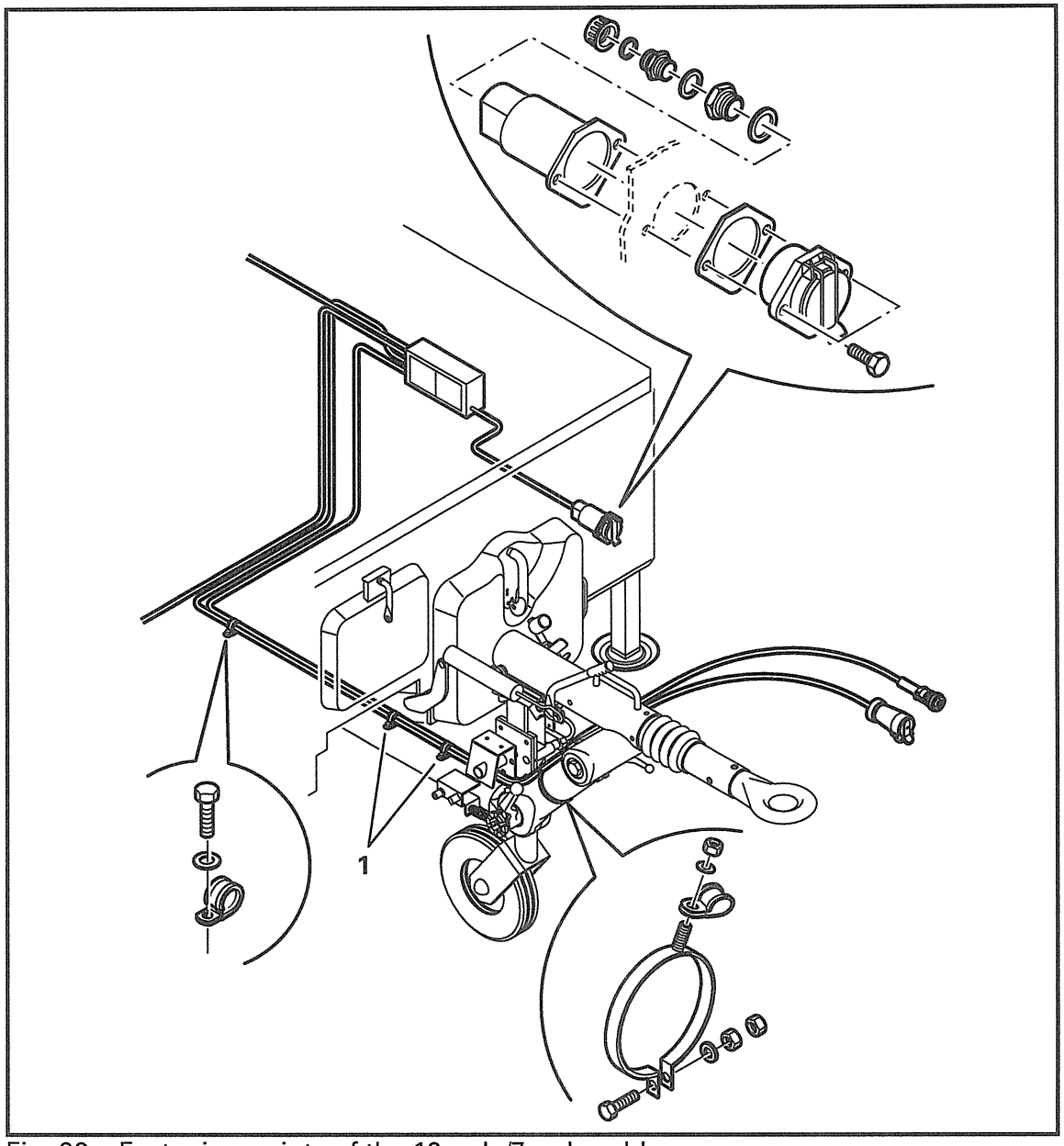


Fig. 92 Fastening points of the 12-pole/7-pole cable

3.2.3 Work on the Chassis

3.2.3.1 Checking and Adjusting the Wheel Bearing Play

(1) Checking

To check the wheel bearing play, raise the trailer with the ground supports until the wheels can be turned. If, when the parking brake is released and the wheel is turned, there is noticeable lateral play, the wheel bearing must be adjusted.

(2) Adjusting

- Pry off the cap (93/1).
- Remove the split pin (93/4).
- Loosen the castle nut, size 36 mm (93/2) and then tighten lightly.
- Turn the castle nut back 1/4 of a turn.
- Turn the wheel.
- Using a screwdriver, pry the washer (93/3) back and forth (in radial direction); the washer must just be able to be moved against the resistance. Adjust play to required amount by turning the castle nut.

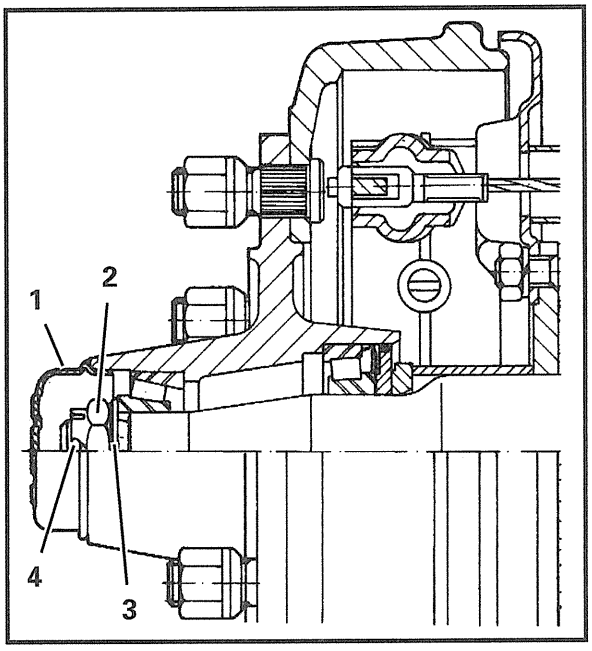


Fig. 93

CAUTION
Excessive tightening of the wheel bearings will damage the bearings.

- Secure the castle nut with a new split pin.
- Fill the cap half full with grease (G-450/G-421) and reassemble.

3.2.3.2 Replacing Wheel Bolts

NOTE
In order to ensure a proper press fit when assembling brake drum and wheel hub, new wheel bolts must be used.
Each wheel bolt replacement must be marked with the letter "X" being stamped in at the respective hole on the wheel hub.
After a maximum of three wheel bolt replacements (hub holes marked "XXX"), the wheel hub must be renewed.

- Remove wheel as described in Section 2.1.8.6.
- Pull off brake drum (94/4) with wheel hub (95/3) (see Section 3.2.3.3 (1)).
- Hammer out the wheel bolt (94/2).

NOTE
Place brake drum (94/4) on support to avoid springing.

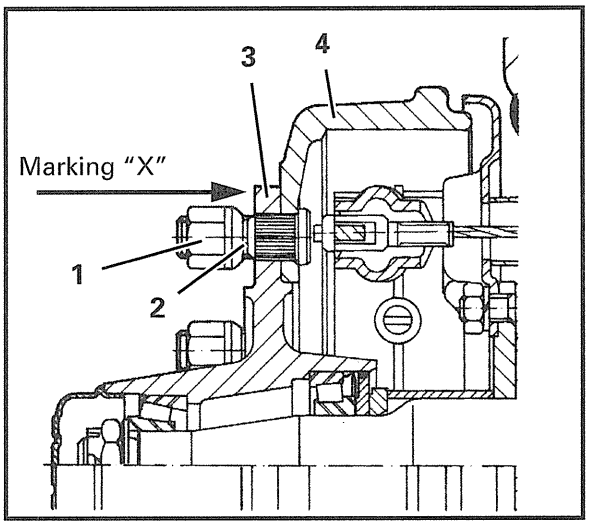


Fig. 94

Assembly:

- Slide the wheel bolt from inside into the hole until the knurl of the wheel bolt touches the hole.
- Attach washer onto the wheel bolt, screw on and tighten wheel nut (94/1).

NOTE
When pulling in the wheel bolt, pay attention that the wheel bolt does not tilt, but is seated in the hole at an exact right angle .

- Tighten the wheel nut until the wheel bolt is seated flush (see Fig. 94).
- Mark the hole on the wheel hub with "X".

3.2.3.3 Replacing a Wheel Bearing

Operating and consumption materials: Lubricating grease G-450/G421

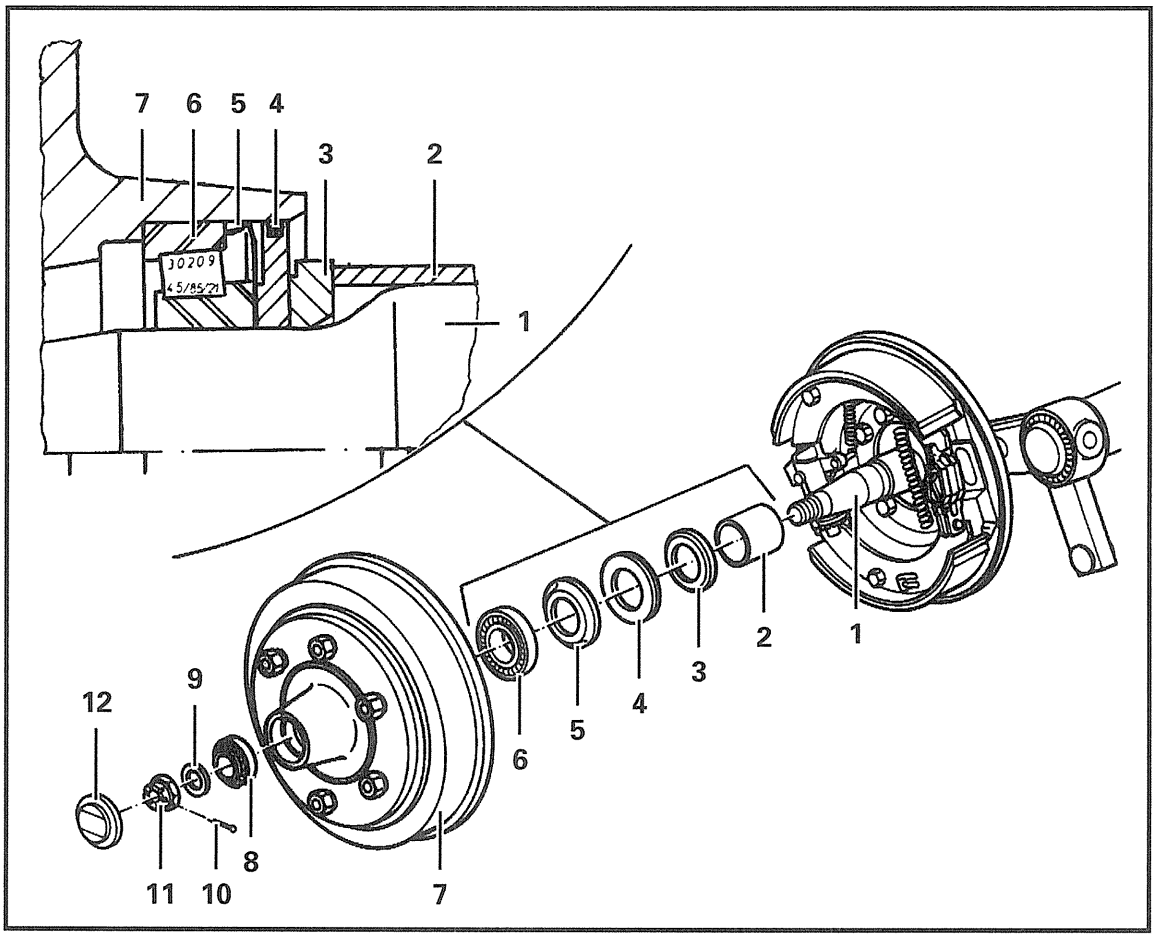


Fig. 95

(1) Removing the Brake Drum

- Take off the wheel according to Section 2.1.8.6.
- Pry off the cap (95/12).
- Pull out the split pin (95/10), unscrew the castle nut (95/11) and remove the washer (95/9).
- Pull the brake drum with the wheel hub (95/7) from the trunnion (95/1).

NOTE
If the brake drum is very tightly seated, carefully apply hammer blows against various points from the inside using a rubber headed hammer. If necessary, use a puller.

(2) Dismantling the Wheel Bearing

- Pull off the grooved ring (95/4) and the sealing ring (95/5).
- Pull off the inner raceway of the large tapered roller bearing (95/6) with a puller.
- Pull off the outer ring of the large tapered roller bearing (95/6) with a puller.
- Drive off the outer ring of the small tapered roller bearing (95/8).

(3) Mounting the Wheel Bearing

NOTE
For proper lubrication of the wheel bearings, the following G-450/G-421 grease amounts must be observed:

- Large tapered roller bearing (95/6) 20 g (approx. 20 cm^3),
- Small tapered roller bearing (95/8) 10 g (approx. 10 cm^3).

- Place the outer rings of both tapered roller bearings onto the wheel hub and drive them in.
- Slide the spacer tube (95/2), the spacer ring (95/3), the grooved ring (95/4) and the sealing ring (95/5) onto the trunnion (95/1) and drive the inner raceway of the large tapered roller bearing (95/6) on.

NOTE
Observe the proper build-in position according to the sectional view in Fig. 95!

- Place the brake drum with the wheel hub (95/7) onto the trunnion and insert the inner raceway of the small tapered roller bearing (95/8).
- Adjust wheel bearing play (see Section 3.2.3.1 (2)).
- Secure the castle nut.
- Fill the cap half full with grease (G-450/G-421) and reassemble.

3.2.3.4 Replacing the Brake Drum or Wheel Hub

Operating and consumption materials: Lubricating grease G-450/G421

NOTE
The brake drum and the wheel hub are not connected with a press fit. If only the wheel hub needs to be changed, the brake drum can be used again.
The 1. Note in Section 3.2.3.2 applies for changing the wheel hub. When assembling brake drum and wheel hub, use new wheel bolts.

- Remove the wheel according to Section 2.1.8.6.
- Pull the brake drum (96/4) with the wheel hub (96/3) from the trunnion (see Section 3.2.3.3 (1)).
- Dismantle the tapered roller bearings (96/1 and 6) (see Section 3.2.3.3 (2)).

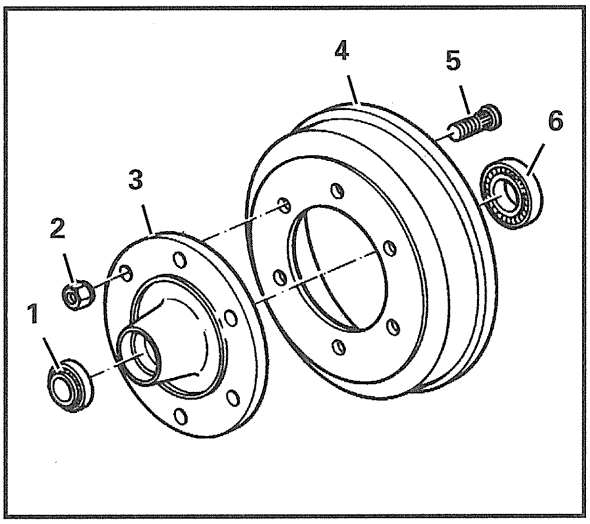


Fig. 96

Mounting:

- Assemble brake drum and wheel hub (see Section 3.2.3.2).
- Mount brake drum with wheel hub onto the trunnion (see Section 3.2.3.3 (3)).

NOTE
Lubricate the tapered roller bearings with G-450/G-421 lubricating grease. The grease amounts mentioned in Section 3.2.3.3 (3) are to be observed. Fill cap (95/12) half full with G-450/G-421 lubricating grease.

- Adjust wheel bearing play (see Section 3.2.3.1).

3.2.3.5 Replacing the Shock Absorbers (Chassis)

Operating and consumption materials: Loctite 243

- Remove wheel(s) according to Section 2.1.8.6.
- Unscrew two hexagon screws (97/2); remove washers (97/4), toothed discs (97/3) and shock absorber (97/5).

NOTE
When installing, pay attention that the piston (97/5) is mounted on the rocker lever (97/6).

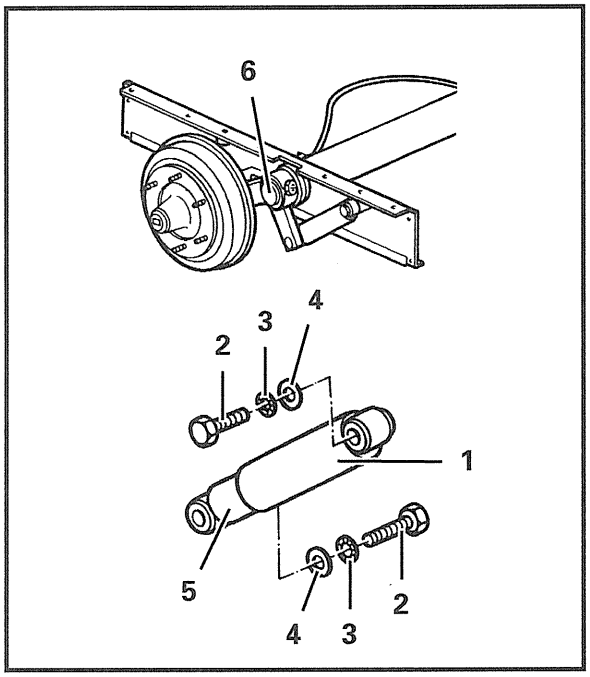


Fig. 97

3.2.3.6 Replacing the Rocker Lever

Operating and consumption materials: Lubricating grease G-450/G421

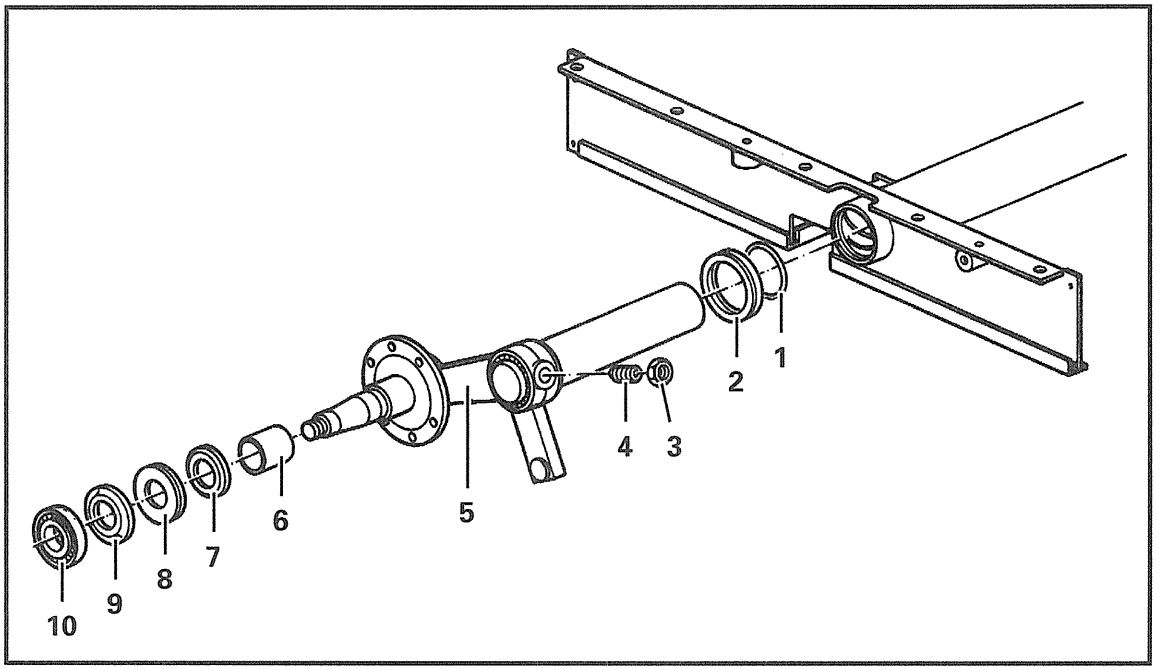


Fig. 98

- Remove wheel(s) according to Section 2.1.8.6.
- Remove brake drum with wheel hub (see Section 3.2.3.3 (1)).
- Pull off the inner raceway of the large tapered roller bearing (98/10), the sealing ring (98/9), the grooved ring (98/8), the spacer ring (98/7) and the spacer tube (98/6) from the trunnion.
- Dismantle the brake anchor plate (see Section 3.2.4.12).
- Dismantle the shock absorber (see Section 3.2.3.5).
- Loosen the hexagon nut (98/3).
- Unscrew the setscrew (98/4).
- Pull off the rocker lever (98/5) with the axle collar (98/2) and O-ring seal (98/1).

NOTE
After assembly, grease the rocker lever bearing bushes with G-450/G-421 lubricating grease.
For greasing of the axle, the axle must be free of load.

3.2.3.7 Replacing the Torsion Bar

- Dismantle both brake drums with wheel hubs (see Section 3.2.3.3 (1)).
- Release both brake cables from the brake anchor plates (see Section 3.2.3.3).
- Dismantle both shock absorbers (see Section 3.2.3.5).
- Loosen the hexagon nuts (98/3) on both sides and screw out the setscrews (98/4).
- Dismantle the right rocker lever (98/5).
- Pull the torsion bar (99/1) to the right out of the axle tube.

NOTE
The torsion bar is removed from left to right and mounted from right to left.

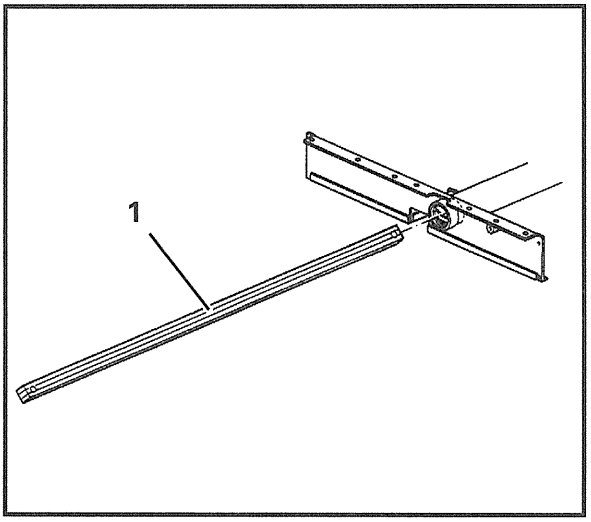


Fig. 99

3.2.3.8 Replacing/Adjusting the Box Level

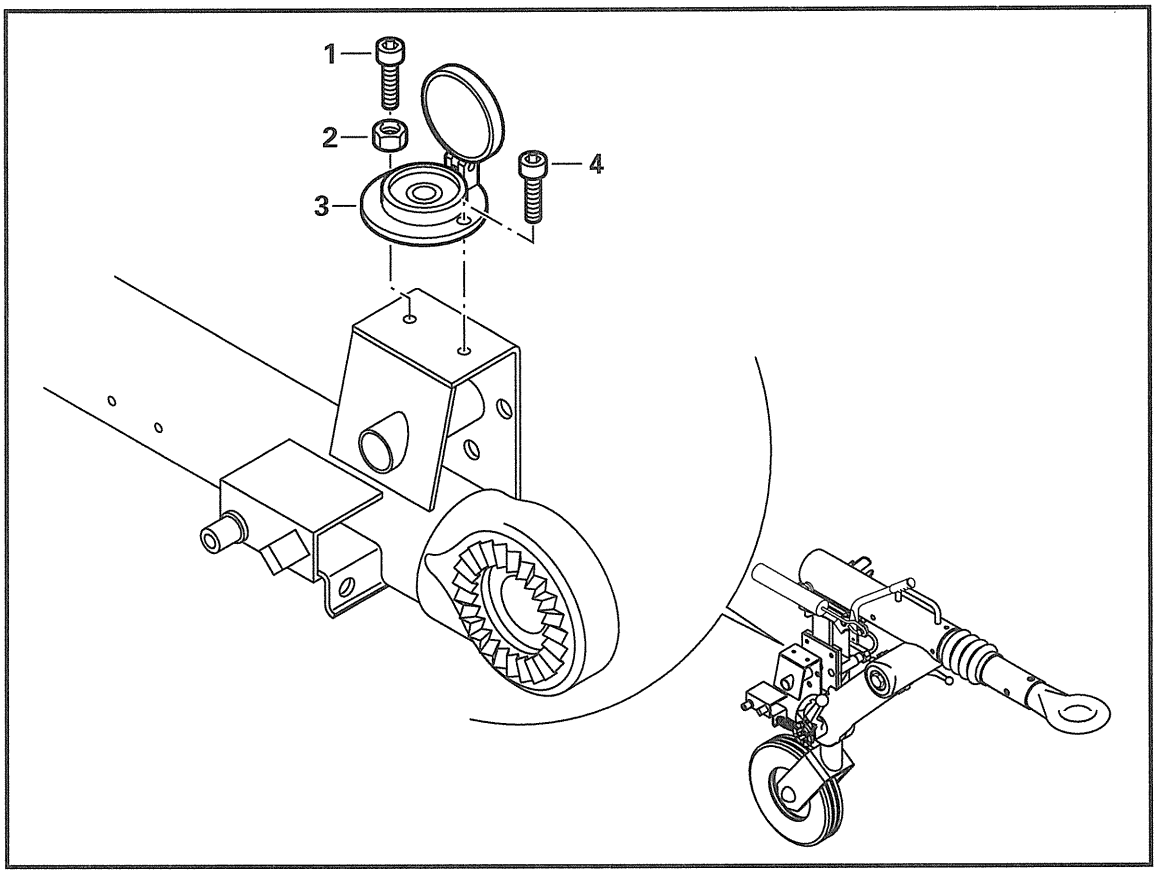


Fig. 100

(1) Replacing the Box Level

- Unscrew the two fastening screws (100/4). Attach the adjusting screws (100/1) and locknuts (100/2) to the new box level.

(2) Adjusting the Box Level

- Screw in the two fastening screws just far enough to allow slight play to the box level (100/3).
- Set the trailer level with the ground supports; do this by placing level in pressure roaster, or fill in approx. 5 mm of water.
- Adjust the box level with the adjusting screws(100/1) in such a manner that the bubble is centered.
- Tighten the two fastening screws (100/4).
- Lock the adjusting screws with the locknuts (100/2).

3.2.3.9 Replacing the Trailer Coupling Ring

- Unscrew two hexagon nuts (101/3) and remove together with the hollow discs (101/2) and hexagon screws (101/1).
- Pull out the trailer coupling ring (101/4 bzw. 5).

NOTE
Use new hexagon nuts (101/3).
Upon assembly, tighten the nuts with 90 ± 5 Nm.

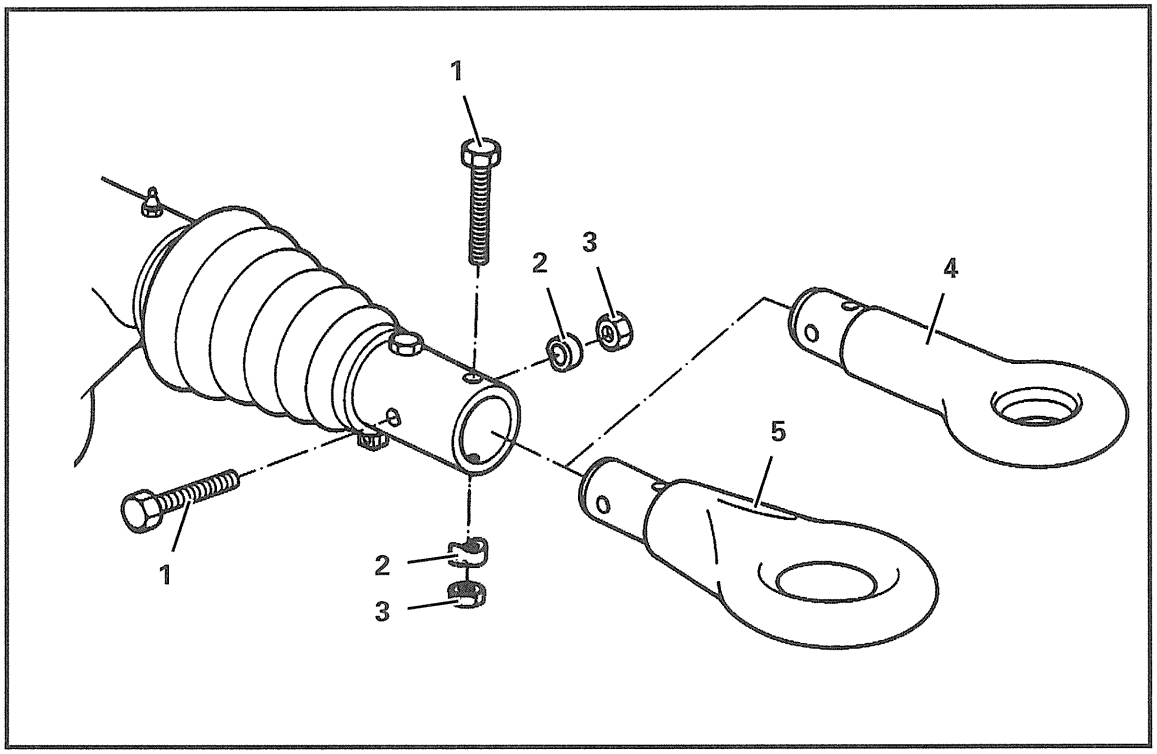


Fig. 101

1 Hexagon screw
2 Hollow disc
3 Hexagon nut, self-locking
4 Trailer coupling ring, DIN
5 Trailer coupling ring, NATO

3.2.3.10 Repairing the Supporting Wheel

Operating and consumption materials: Lubricating grease G-450/G421

(1) Replacing the Supporting Wheel

- Rest the trailer on the supports.
- Remove the clamping covers (102/8) on the left and right.
- Drive out the wheel axle (102/10).
- Remove the supporting wheel (102/9).

(2) Completely Disassembling the Supporting Wheel

- Rest the trailer on the supports.
- Unscrew the screw (102/14), remove the spring washer (102/15) and washer (102/16).
- Pull off the complete supporting wheel; remove washer (102/17).
- Unscrew the pedestals (102/19).
- Drive out the slotted spring pin (102/18).
- Pull out the handle (102/20).
- Drive out the slotted spring pin (102/2).
- Remove the crank (102/6) with securing ring (102/5), washer (102/3) and compression spring (102/4).

NOTE
Renew both clamping covers upon reassembly and grease the threaded spindle with G-450/G-421.

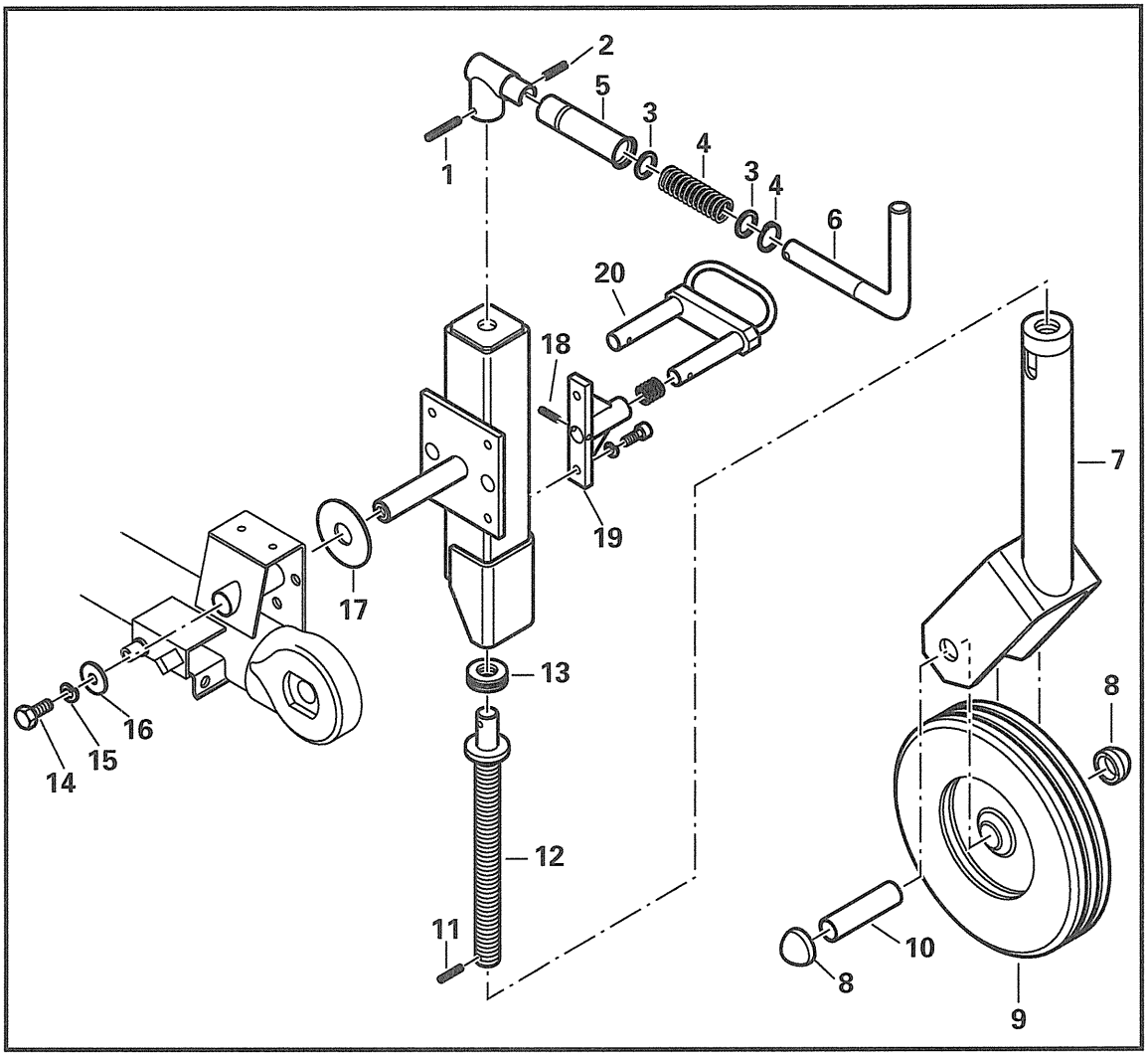


Fig. 102

3.2.4 Work on the Brake System

3.2.4.1 Adjusting the Wheel Brakes

(1) Variant 1

- Rest the trailer on the supports.
- Pull out the trailer coupling ring (and thus the sliding tube) to the stop.
- Set the parking brake lever (103/7) to the neutral position.
- Screw off the maintenance lid in the base sheet.
- Lock the swivel mechanisms (103/11) through the upper fastening hole (103/10) on both wheel brakes from the rear using a split or cotter pin (Ø 3.7 mm).
- Rotate the adjusting nut (103/12) in clockwise direction by levering with a screwdriver until the brake shoes make contact with the drum.
- Pull the parking brake several times to the stop, in order to center the brake shoes.
- Check the position of the compensating bridge (103/8). It must be positioned at a right angle to the brake linkage (103/1) (according to Fig. 103). If necessary, correct its position by means of the fork heads (103/9).
- Rotate the adjusting nut in clockwise direction until a light braking effect can be felt at the wheel.
- Screw the turnbuckle (103/4) in until there is a noticeable braking effect at the wheels.
- Unscrew the turnbuckle 1/2 turn.
- Check that the wheels turn freely; if necessary, loosen the turnbuckle further.
- Check that there is a clearance of 0.5 – 1 mm between the washer of the spring brake actuator (103/2) and the self-locking nut(103/3), if necessary adjust.
- Check that there is play at the brake lever (103/5), if necessary readjust forkhead (103/6).
- Pull out the split or cotter pins; lower the trailer to the ground.

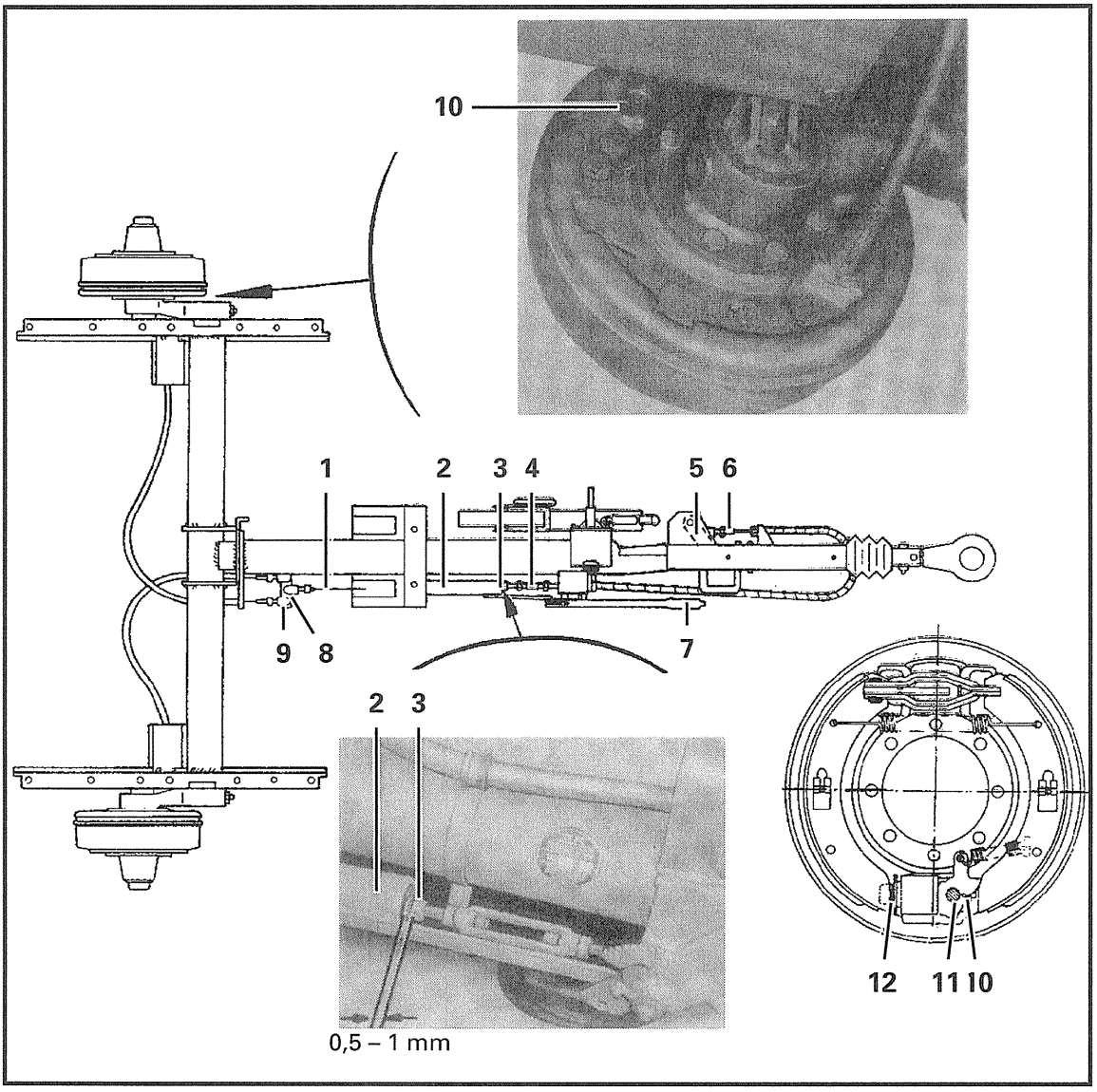


Fig. 103

(2) Variant 2

- Jack up the trailer.
- Release the overrun unit and the parking brake lever (free of pull).
- Lock the swivel cams of the wheel brakes from outside through the fastening holes using ø 4 mm pins (104/1).
- Rotate the adjusting nut (104/3) at the wheel brakes by levering with a screwdriver until the run of the wheel in the direction of travel is hindered.
- Pull the parking brake several times in order to center the brake shoes.

- Turn back the adjusting nut by approx. 3 to 5 teeth until no more braking effect is noticeable when rotating the wheel in the direction of travel.
- Check the position of the compensating bridges with the parking brake pulled.
  Right-angled position of the brake linkage = equal play of the wheel brakes; readjust setting as required.
- As a test, lightly pull the parking brake and check the braking moment at the wheels (in the direction of travel).
- Remove the pins, ø 4 mm (104/1).
- Adjust actuation linkage free of force and play. Pay attention that all compensating bridges are at right angles to the brake linkage.
- Tighten all locknuts within the brake actuation.

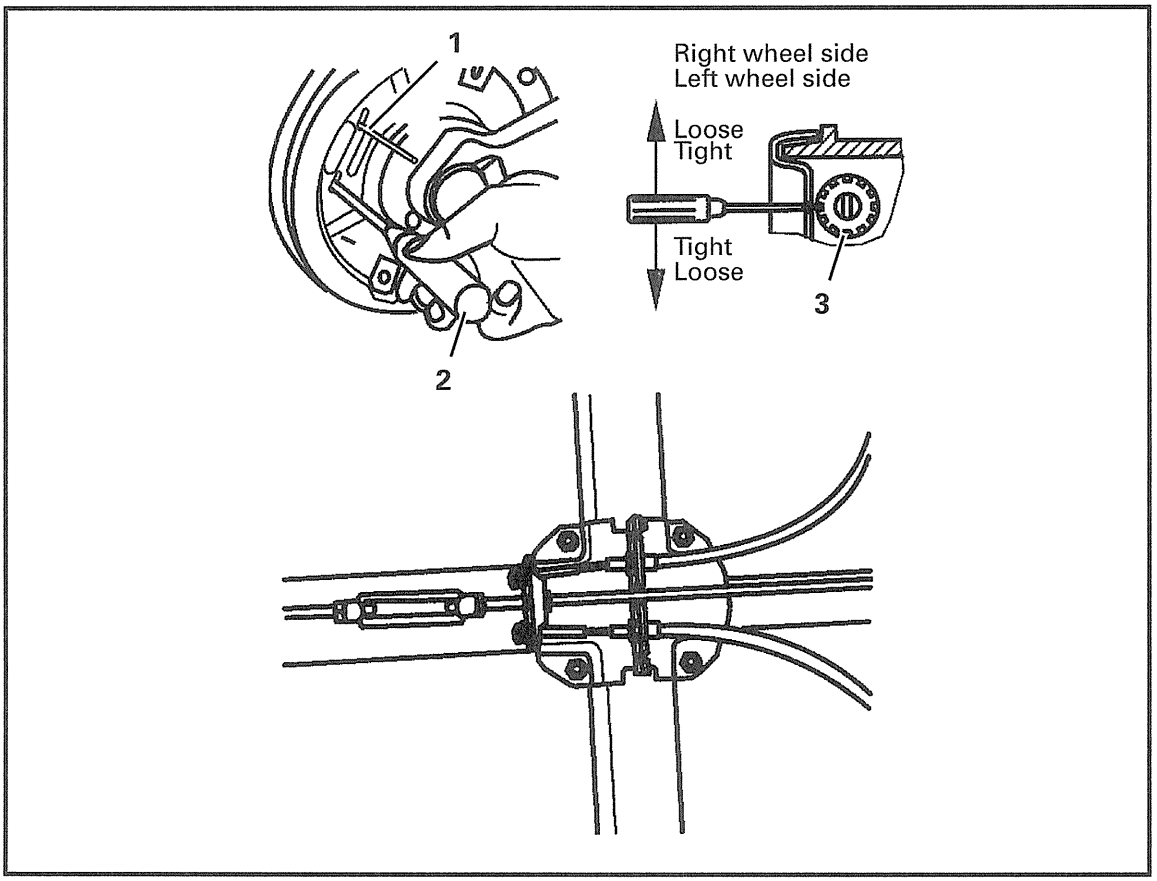


Fig. 104

3.2.4.2 Checking the Brake Lining Thickness

- Dismantle the brake drum (see Section 3.2.3.3 Section (1)).
- Check brake lining thickness. The thickness of the brake linings must be at least 2 mm at the thinnest point. If necessary, replace the brake linings together with the brake shoes.

3.2.4.3 Checking the Overrun Unit

(1) Checking the Sliding Tube for Easy Movement and Bearing Play

- Remove the shock absorber (105/6) (see Section 3.2.4.6).
- Loosen the rubber sleeve (105/7) and check its condition.
- Pull the parking brake lever to the end position so that the cams of the brakes can be laid over. (If required, the swiveling motion of the cams can be made easier by moving the wheels backwards). This frees the overrun distance so that the sliding tube can be inserted manually in order to check the ease of movement.
- Check the condition of the sliding tube (105/5).
- Variant 1 only
  Remove the split pin (105/2) and pull out the bolt (105/1).
- Pull out the sliding tube and check the following:
  - Wear at the closing cap of the sliding tube.
  - Slots and holes (screw holes)
  - Wear on the sliding surface.
- Measure the bearing play.

  NOTE
  Maximum allowed bearing play: 0.6 mm.

(2) Checking the Shock Absorber (105/3)

- Push in the piston rod.

  NOTE
  The movement of the piston rod must be even.

The shock absorber is defective when:

- there is no more retracting force to push the piston rod back out to the starting position,
- the piston rod suddenly pushes in easily over parts of the distance.

  NOTE
  During driving, a defective shock absorber is noticeable through hard jolts while starting and braking.

- Variant 1:
  Check the pins (105/1 and 3) for condition and wear.
  Variant 2:
  Check the threaded bolt (105/8) for condition and wear.

(3) Assembling the Overrun Unit

Assembly of the unit is carried out in reverse order. Note:

Assemble the sliding tube in the same position as when disassembling (not turned by 180°!); the glossy bearing location (from rubbing) of the front bearing must face upward again.

- Grease sliding surface with G-450/G-421.
- Apply Molykote to the sliding surfaces of the relay lever at the sliding tube cap as well as to the pin (105/1) or threaded bolt (105/8).
- Use new locknuts and split pins.

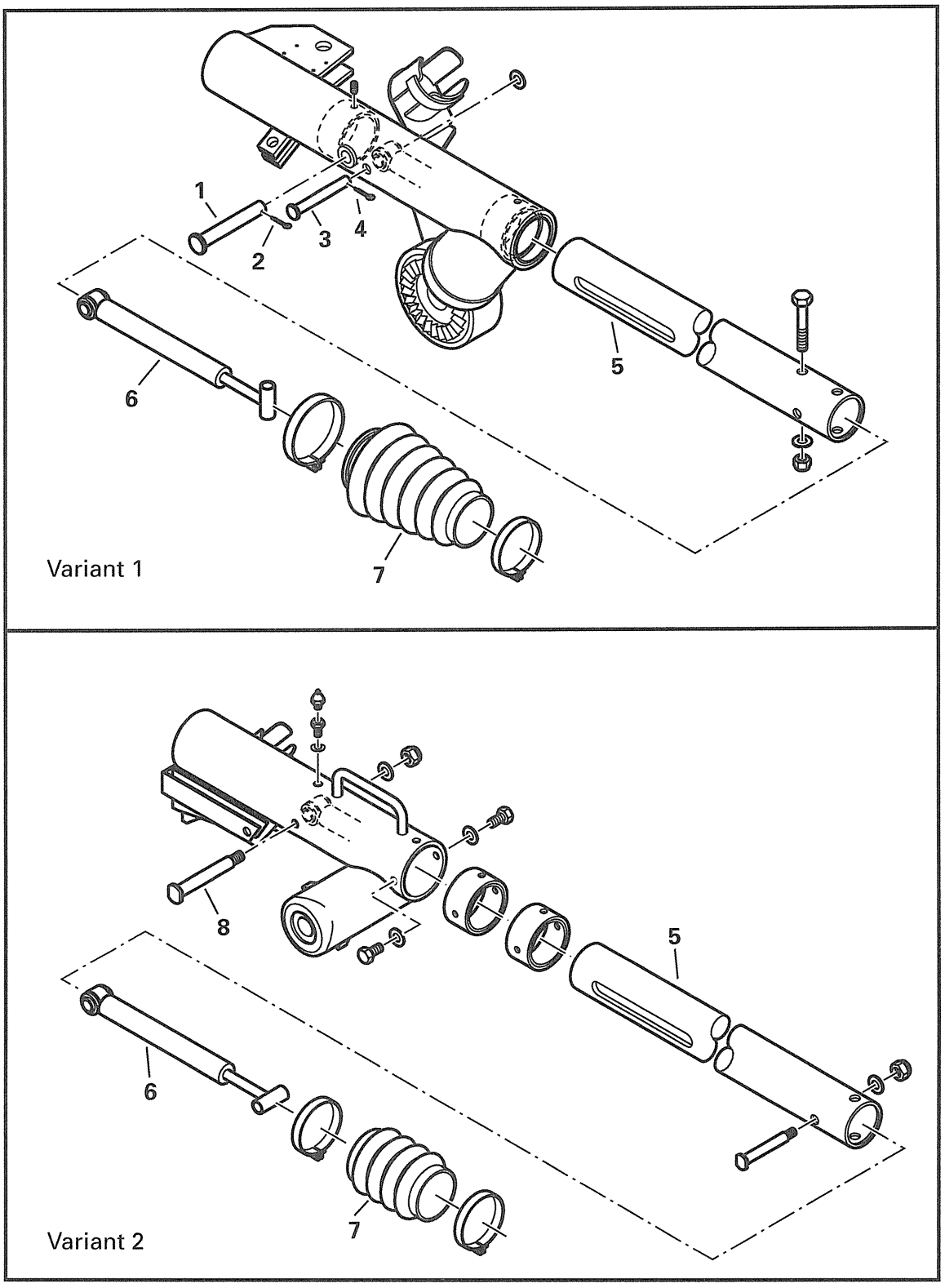


Fig. 105

3.2.4.4 Replacing the Overrun Unit

Operating and consumption materials: Lubricating grease G-450/G421

(1) Variant 1

- Dismantle the trailer coupling ring (see Section 3.2.3.9).
- Remove the split pin (106/1) and washer (106/10); drive out the bolt (106/2).
- Remove the relay lever (106/3).
- Push out the pin (106/4).
- Unscrew the fork head (106/5) and hexagon nut (106/6).
- Pull off the rubber sleeve (106/7).
- Unscrew the locknut (106/8) and pull the brake cable (106/9) out of the holder (106/11).
- Unscrew the hinge pin (106/12) and remove the overrun unit from the hitch transition piece.

NOTE
Lightly grease the relay lever upon reassembly. Mount the brake cable in such a manner that when the trailer coupling ring is completely pulled out, the relay lever has no play (see Fig. 111).

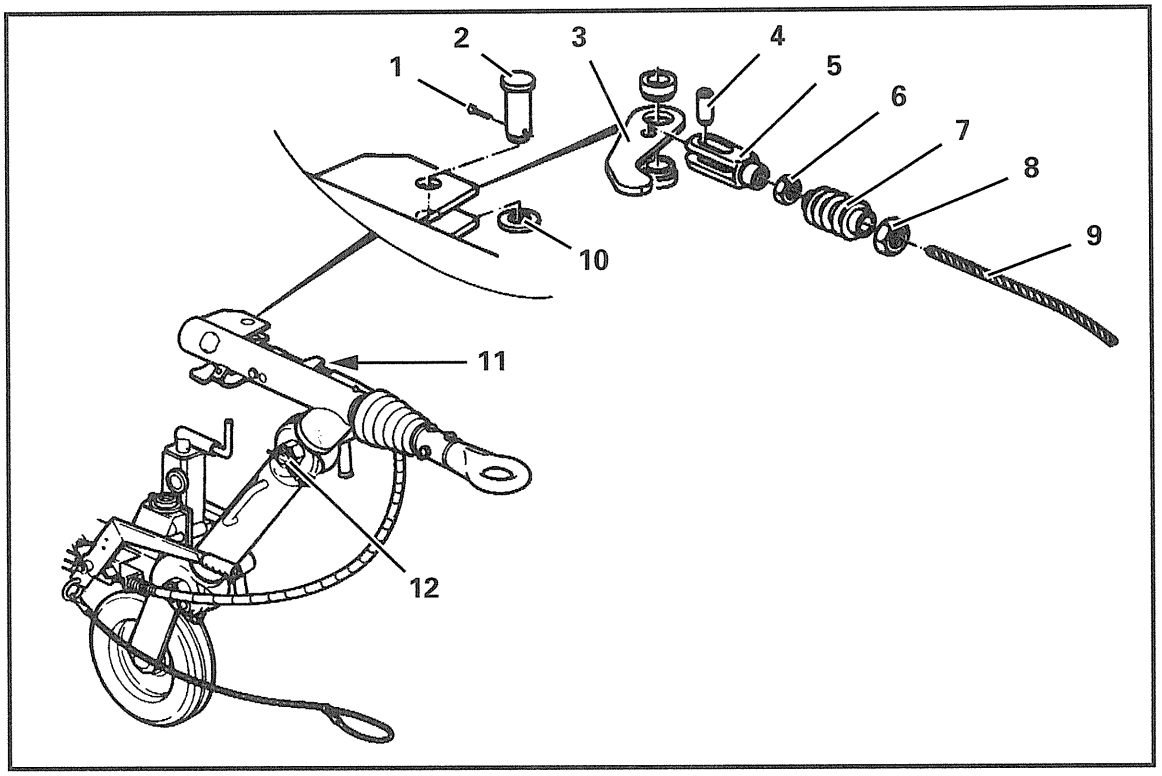


Fig. 106 Variant 1

(2) Variant 2

- Dismantle the trailer coupling ring (see Section 3.2.3.9).
- Loosen the parking brake lever.
- Unhook the tension spring (107/13).
- Pull off securing fixture (107/1), press out the bolt (107/3) and remove the fork head (107/2).
- Remove the split pin (107/5) and washer (107/6).
- Drive out the bolt (107/12).
- Remove the relay lever (107/4) and the parking brake lever (107/11).
- Pull the hairpin (107/8) and unscrew the tommy nut(107/9).
- Push out the threaded bolt (107/7) and remove the overrun unit.

NOTE
Lightly grease the relay lever upon reassembly. Mount the brake cable in such a manner that when the trailer coupling ring is completely pulled out, the relay lever has no play.

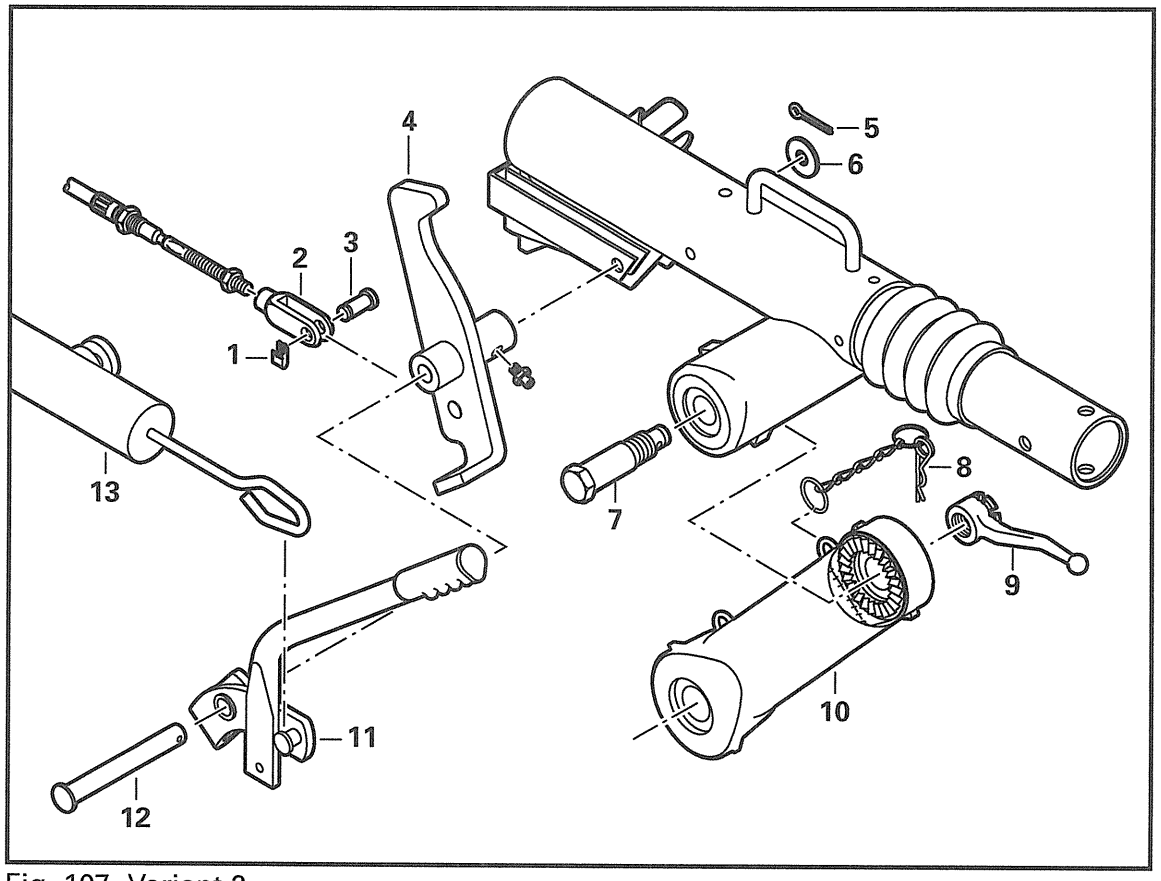


Fig. 107 Variant 2

3.2.4.5 Replacing the Sliding Tube

Operating and consumption materials: Lubricating grease G-450/G421

- Dismantle the trailer coupling ring according to Section 3.2.3.9 and the shock absorber (108/5) according to Section 3.2.4.6.
- Loosen the pipe clamp (108/4).
- Variant 1 only:
  Remove the split pin (108/2) and pull out the bolt(108/1).
- Pull out the sliding tube (108/3).

NOTE
After assembling, grease the sliding tube with G-450/G-421.

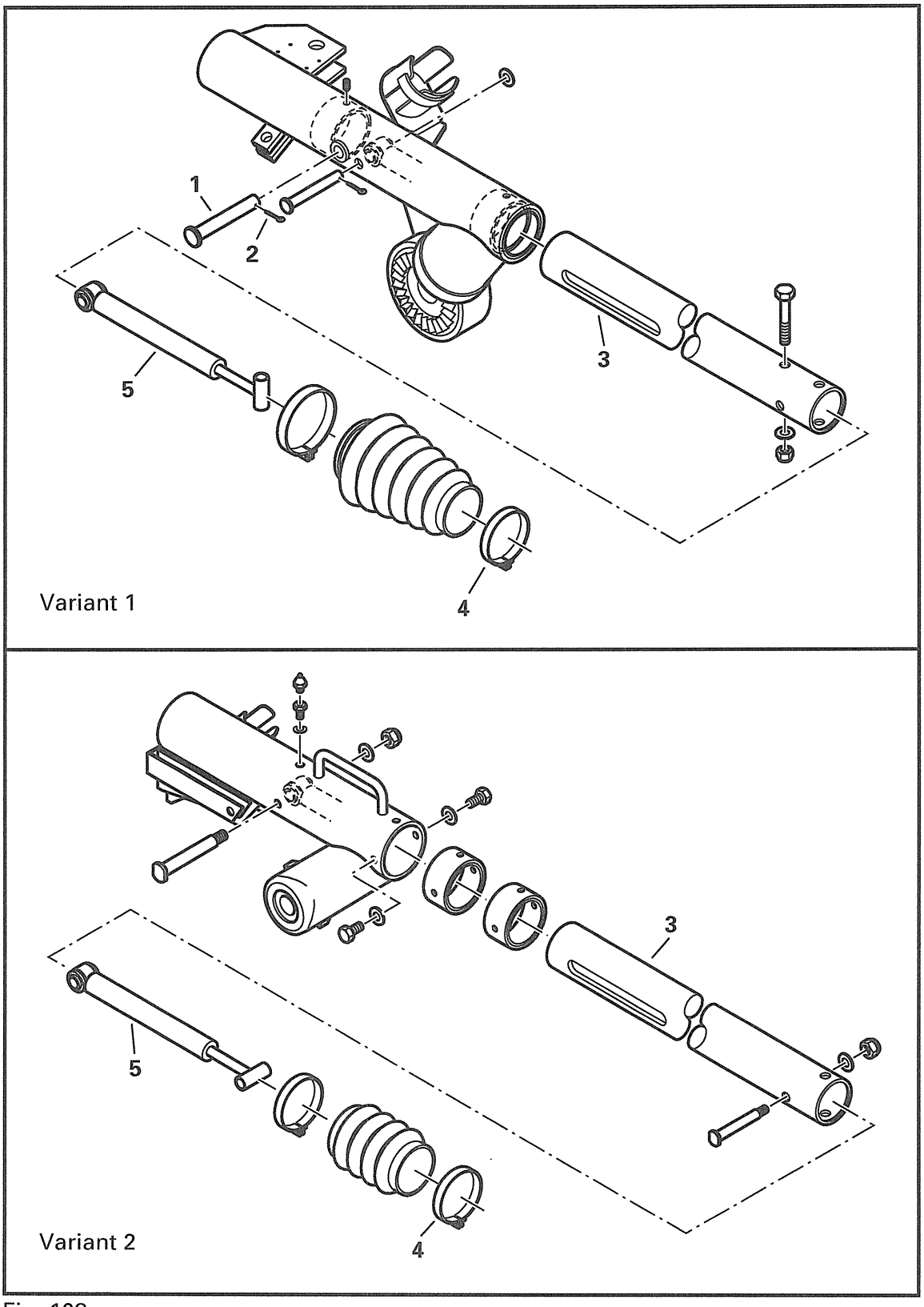


Fig. 108

3.2.4.6 Replacing the Shock Absorber (Overrun Unit)

- Dismantle the trailer coupling ring (see Section 3.2.3.9).
- Unscrew the self-locking nut (109/5) and pull out the bolt (109/4).
- Variant 1:
  Pull the split pin (109/2) and drive out the bolt (109/1).
- Variant 2:
  Unscrew the self-locking nut (109/8) and pull out the screw (109/7).
- Pull the shock absorber(109/6) out of the sliding tube (109/3).

NOTE
After assembling, tighten the self-locking nut with 90 ±5 Nm.

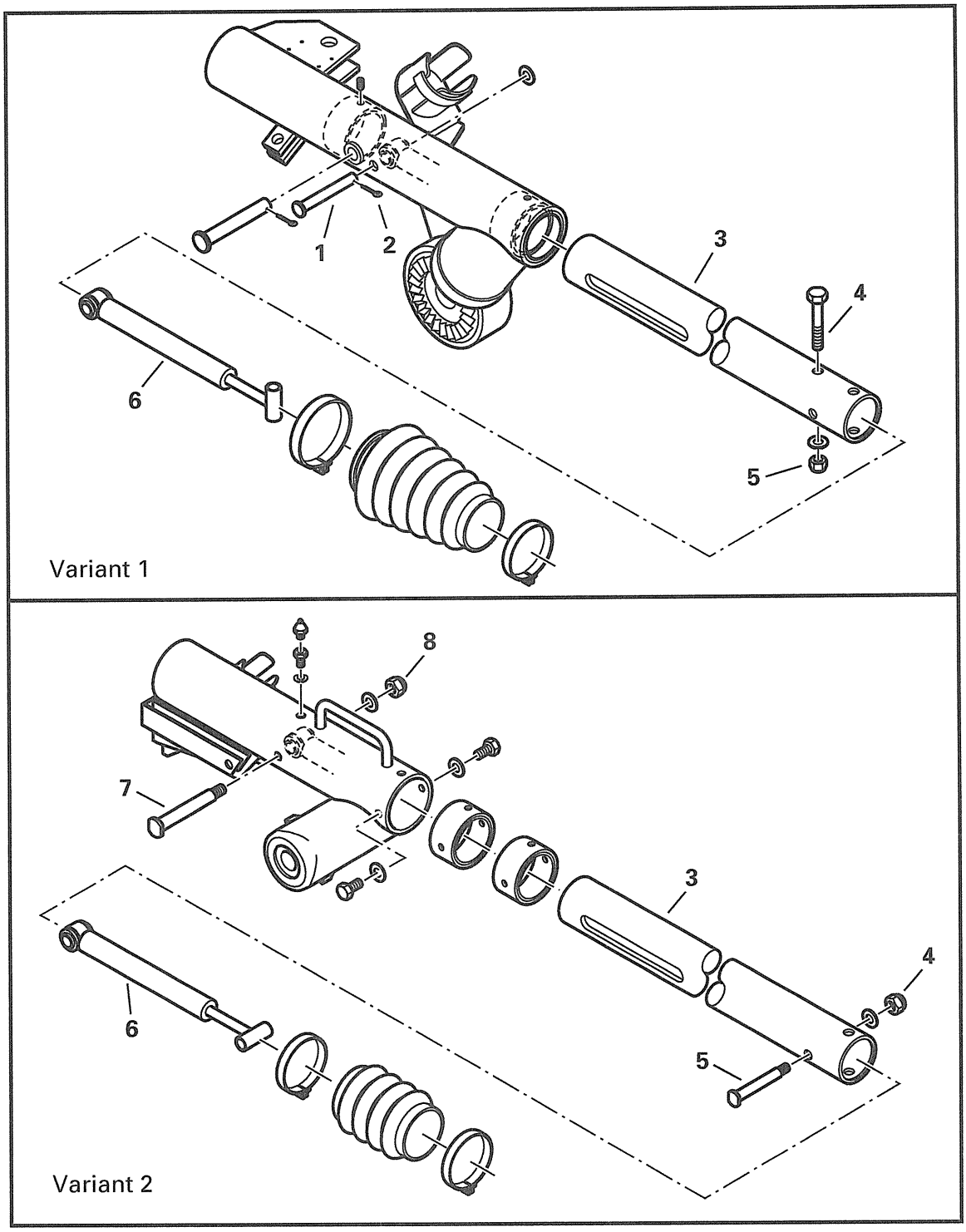


Fig. 109

3.2.4.7 Replacing the Parking Brake Lever

Operating and consumption materials: Lubricating grease G-450/G421

(1) Variant 1

- Pull the split pin (110/3) , press out the pin (110/2) and remove washer (110/5).
- Unscrew the hexagonal screw (110/7); remove the parking brake lever (110/1), the toothed segment (110/4) and the washer (110/6).

NOTE
Grease the bearing of the parking brake lever after assembly.

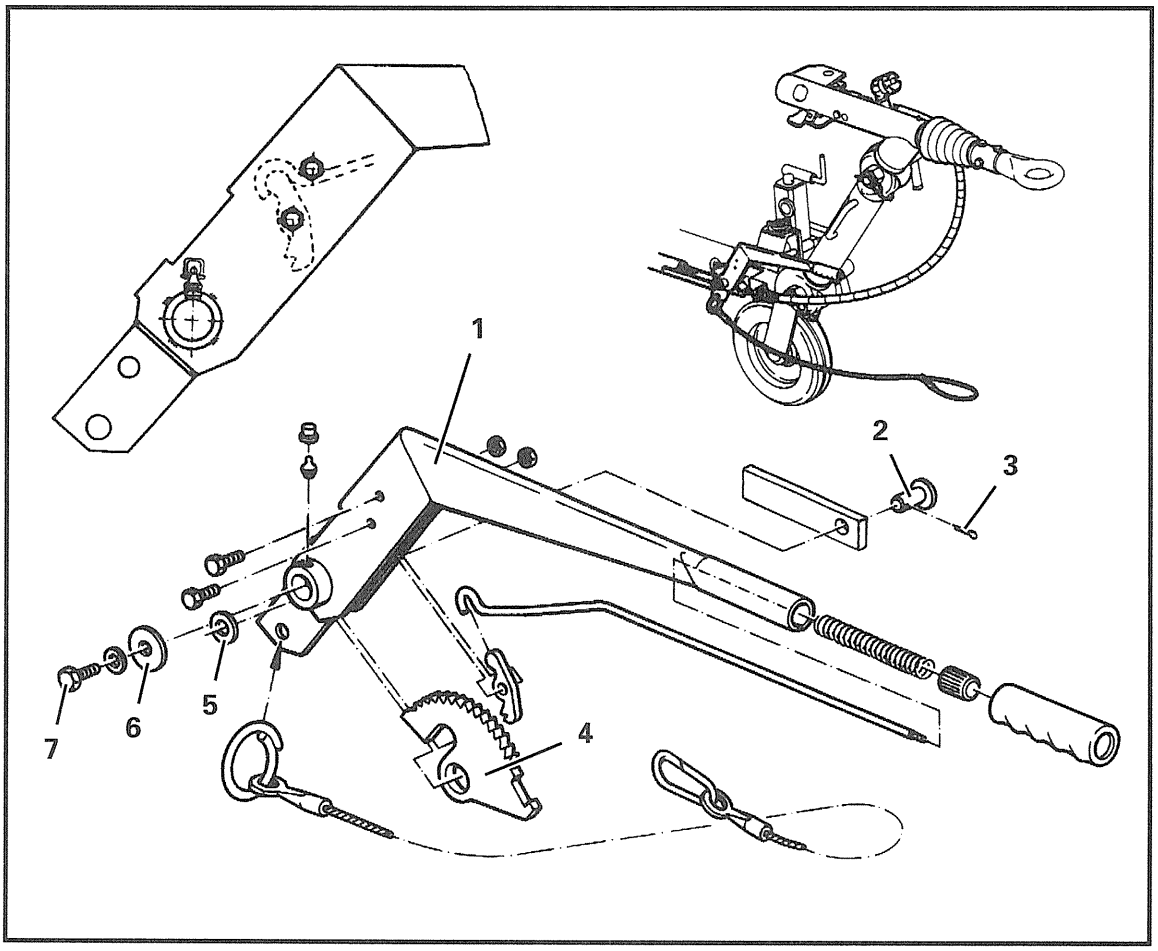


Fig. 110

NOTE
Check the setting of the self-locking nut (111/2) . In the neutral position of the parking brake lever, there must be a clearance of 0.5 – 1 mm between the self-locking nut (111/2) and the spring brake actuator (111/1) . If necessary, adjust the self-locking nut.

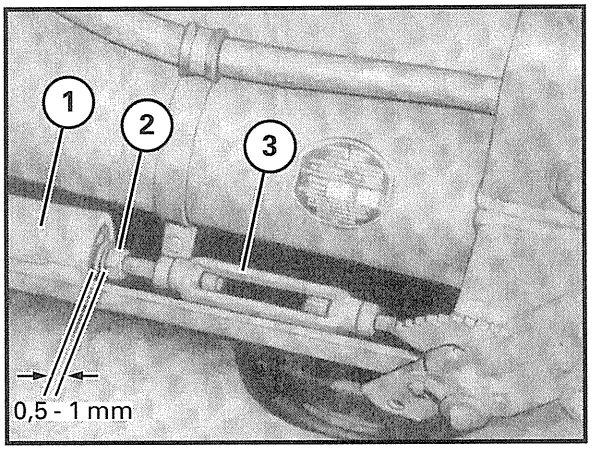


Fig. 111

(2) Variant 2

- Completely release the parking brake lever.
- Remove the split pin (112/2) and the washer (112/3).
- Drive out the pin (112/5).
- Unhook the spring brake actuator (112/6).
- Remove the relay lever (112/1) and the parking brake lever (112/4).

NOTE
Lightly grease the relay lever upon reassembly. Mount the brake cable in such a manner that when the trailer coupling ring is completely pulled out, the relay lever has no play.

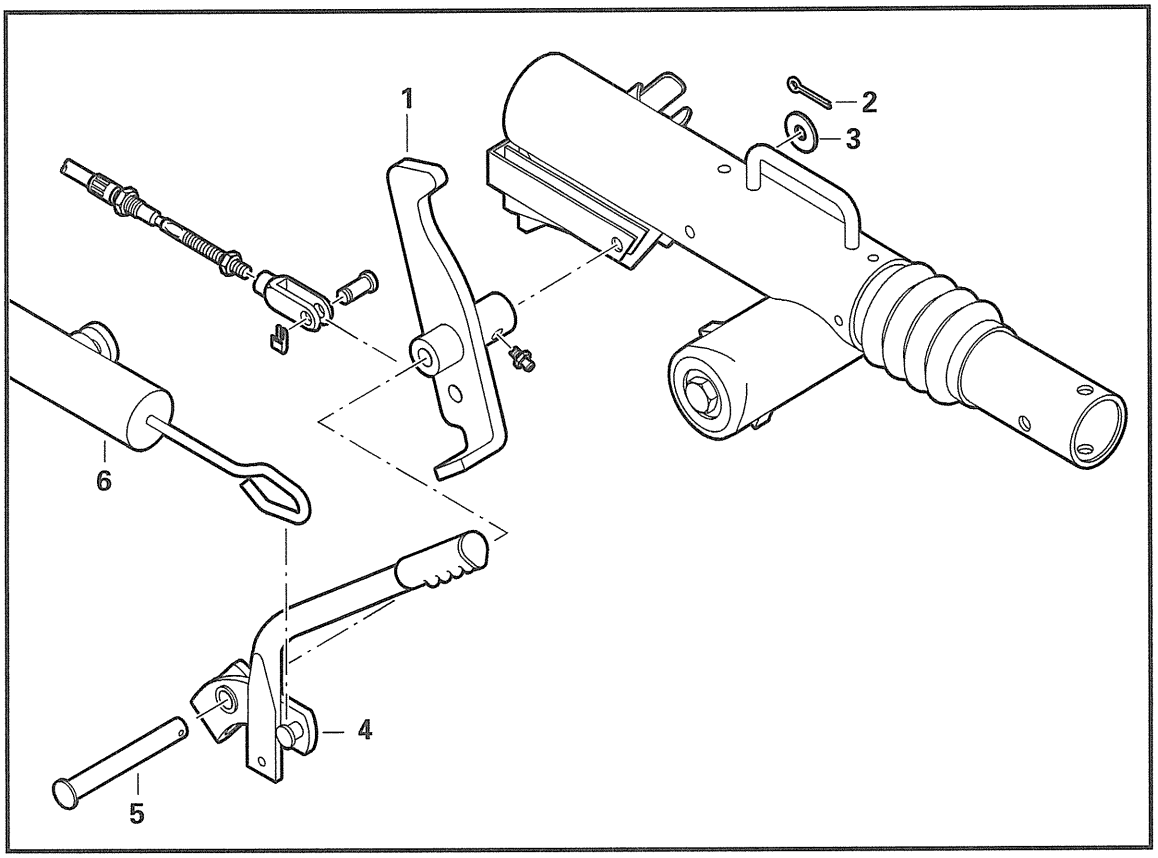


Fig. 112

3.2.4.8 Replacing the Spring Brake Actuator

(1) Variant 1

- Completely release the parking brake lever.
- Pull the split pin (110/3), press out the pin (110/2) and remove the washer (110/5).
- Screw the self-locking nut (111/2) in toward the turnbuckle (111/3).
- Unscrew the turnbuckle (111/3).
- Screw off the self-locking nut (111/2).
- Pull the spring brake actuator (111/1) away from the brake linkage.

NOTE
After assembly, set the clearance of 0.5 – 1 mm between the self-locking nut and the washer in the spring brake actuator according to Section 3.2.4.7 (1).

(2) Variant 2

- Completely release the parking brake lever.
- On the spring brake actuator (112/6), unscrew the locknut (113/1) and the nut (113/2).
- Unhook the spring brake actuator.

NOTE
After assembly, adjust the clearance of 80±2 mm according to Fig. 113.

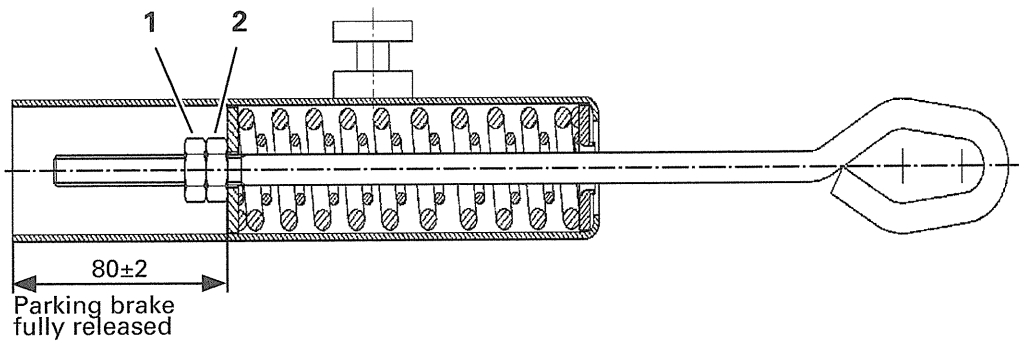


Fig. 113

3.2.4.9 Replacing the Brake Linkage

(1) Variant 1

- Completely release the parking brake lever.
- Release the locknut (114/8) on the turnbuckle(114/9).
- Screw the self-locking nut (114/7) on the spring brake actuator (114/6) against the locknut.
- Screw off the maintenance lid in the base sheet.
- Remove the safety clamp (114/2) from the fork head (114/3).
- Separate the fork head from the compensating bridge (114/1).
- Screw the brake linkage (114/5) out of the turnbuckle.
- Completely unscrew the locknut and the self-locking nut.
- Pull out the brake linkage through the spring brake actuator to the rear.
- Loosen locknut (114/4) and unscrew the fork head.

NOTE
After assembly, adjust the brake system according to Section 3.2.4.1.

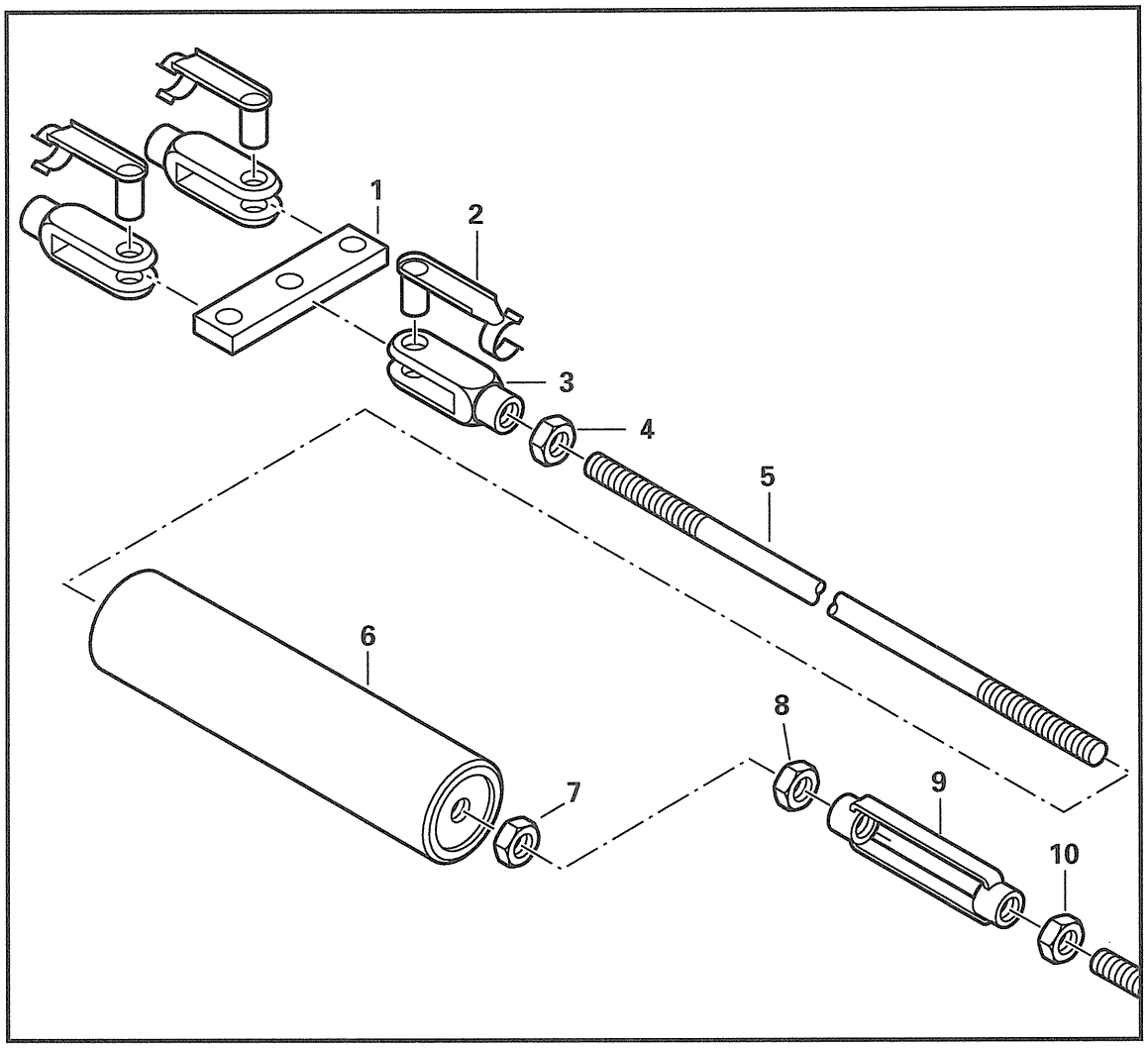


Fig. 114

(2) Variant 2

- Completely release the parking brake lever.
- Release the locknut (115/6) at the turnbuckle (115/7).
- Remove the safety clamp (115/2) from the fork head (115/3).
- Separate the fork head from the compensating bridge (115/1).
- Screw the brake linkage (115/5) out of the turnbuckle.
- Loosen locknut (115/4) at the fork head and unscrew the fork head.

NOTE
After assembly, adjust the brake system according to Section 3.2.4.1.

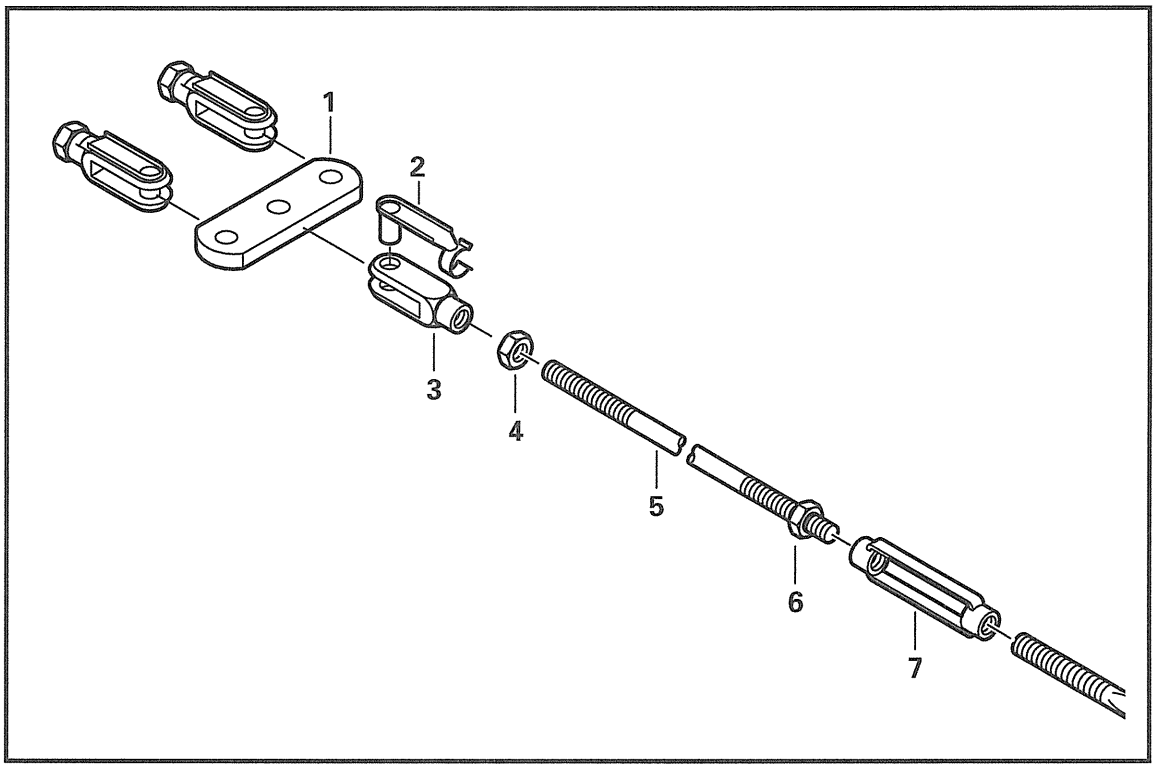


Fig. 115

3.2.4.10 Replacing the Control Cable

Operating and consumption materials: Lubricating grease G-450/G421

(1) Variant 1

- Completely release the parking brake lever.
- Measure the distance between locknut (116/5) and fastening nut (116/3) (covered) and write it down.
- Dismantle relay lever (116/1) according to Section 3.2.4.4.
- Release the control cable (116/2) on the overrun unit according to Section 3.2.4.4.
- Loosen the locknut on the turnbuckle (116/6).
- Loosen the fastening nut (116/3).
- Screw the control cable out of the turnbuckle, unscrewing the locknut and pulling off the rubber sleeve (116/4) (covered).

Assembly:

- Screw the control cable in the turnbuckle until the distance written down is reached.
- Tighten the locknut and the fastening nut.
- Grease the relay lever and mount together with the fork head according to Section 3.2.4.4.
- Check the clearance of 0.5 - 1 mm between the locknut and the and the spring brake actuator, and check the play of the relay lever. If required, adjust according to Section 3.2.4.1.

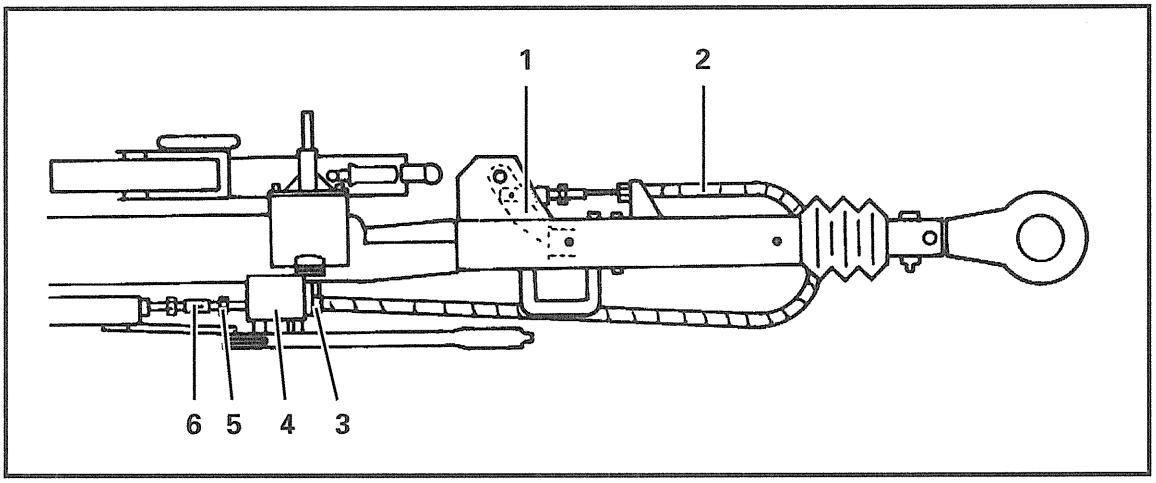


Fig. 116

(2) Variant 2

- Completely release the parking brake lever.
- Pull off the securing clamp (117/11), press out the pin (117/9) and remove the fork head (117/8) from the relay lever (117/10).
- Loosen the locknut (117/7) and unscrew the fork head from the control cable (117/4).
- Loosen the locknut (117/6) and remove the control cable from the holding bracket (117/5).
- Loosen the locknut (117/2) and remove the control cable from the bracket (117/3).
- Loosen the locknut (117/1) and unscrew the control cable from the turnbuckle (117/12).

NOTE
When assembling, mount the control cable so that the relay lever (117/10) is seated with no play.

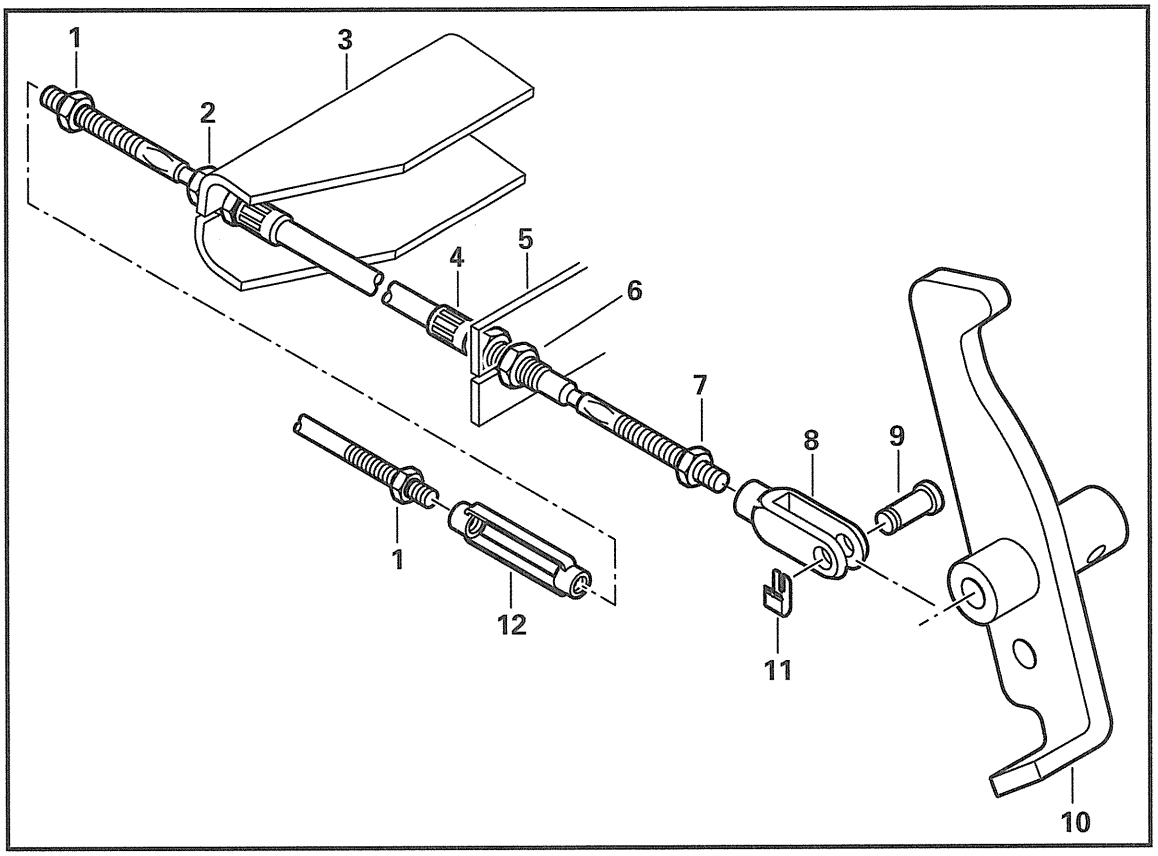


Fig. 117

3.2.4.11 Changing the Brake Cable

- Completely release the parking brake lever.
- Screw off the maintenance lid in the base sheet.
- Remove the safety clamp (118/1) and separate the fork head (118/2) from the compensating bridge (118/3).
- Loosen the locknut (118/4).
- Unscrew the fork head and locknut.
- Unscrew nut (118/6).
- Dismantle the brake drum (see Section 3.2.3.3 (1)).
- Dismantle brake components (see Section 3.2.4.13).
- Pull the brake cable out of the brake cable support (118/9) and pull it through the rubber bushing (118/8).

NOTE
After assembly, adjust the brake system (see Section 3.2.4.1).

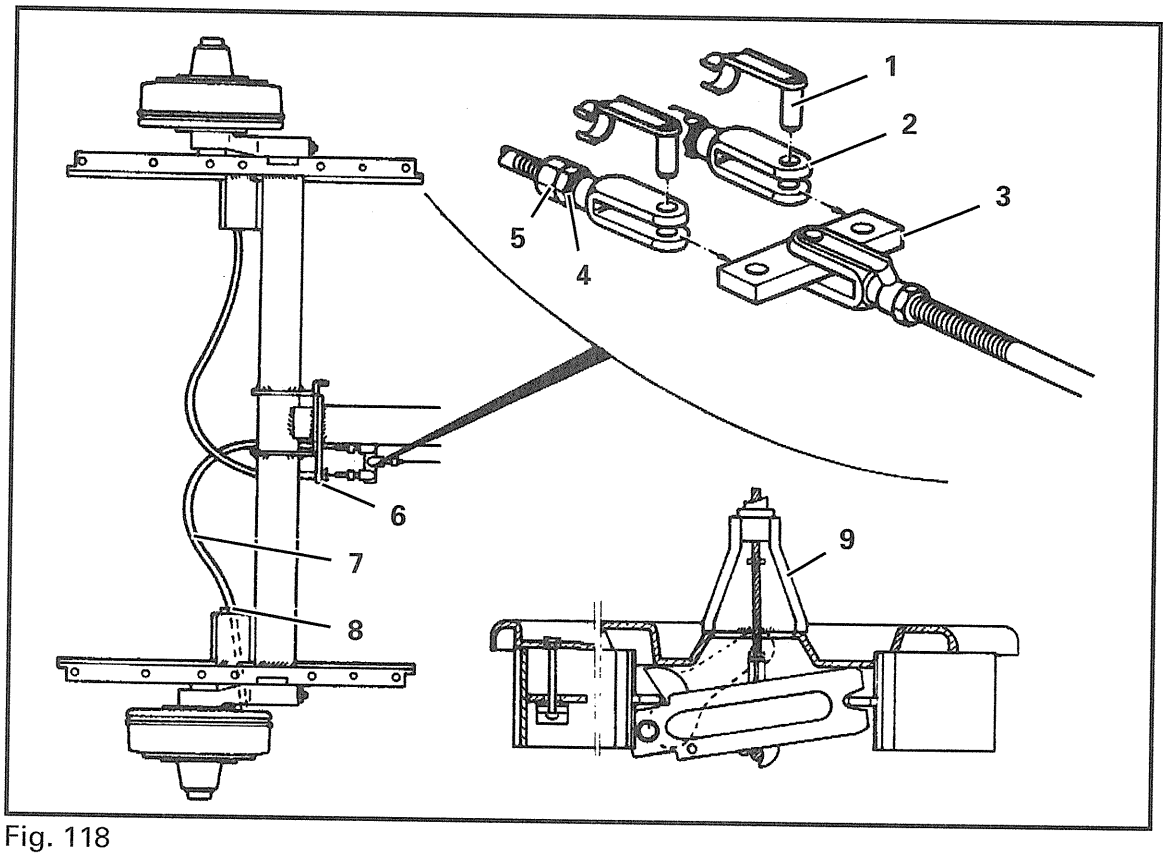


Fig. 118

3.2.4.12 Replacing the Brake Anchor Plate

- Dismantle the brake cable (see Section 3.2.4.11).
- Dismantle the brake components (see Section 3.2.4.13).
- Unscrew eight hexagon nuts (119/1).
- Pull the brake anchor plate (119/2) from the rocker lever (119/3).

NOTE
After assembly, adjust the brake system (see Section 3.2.4.1).

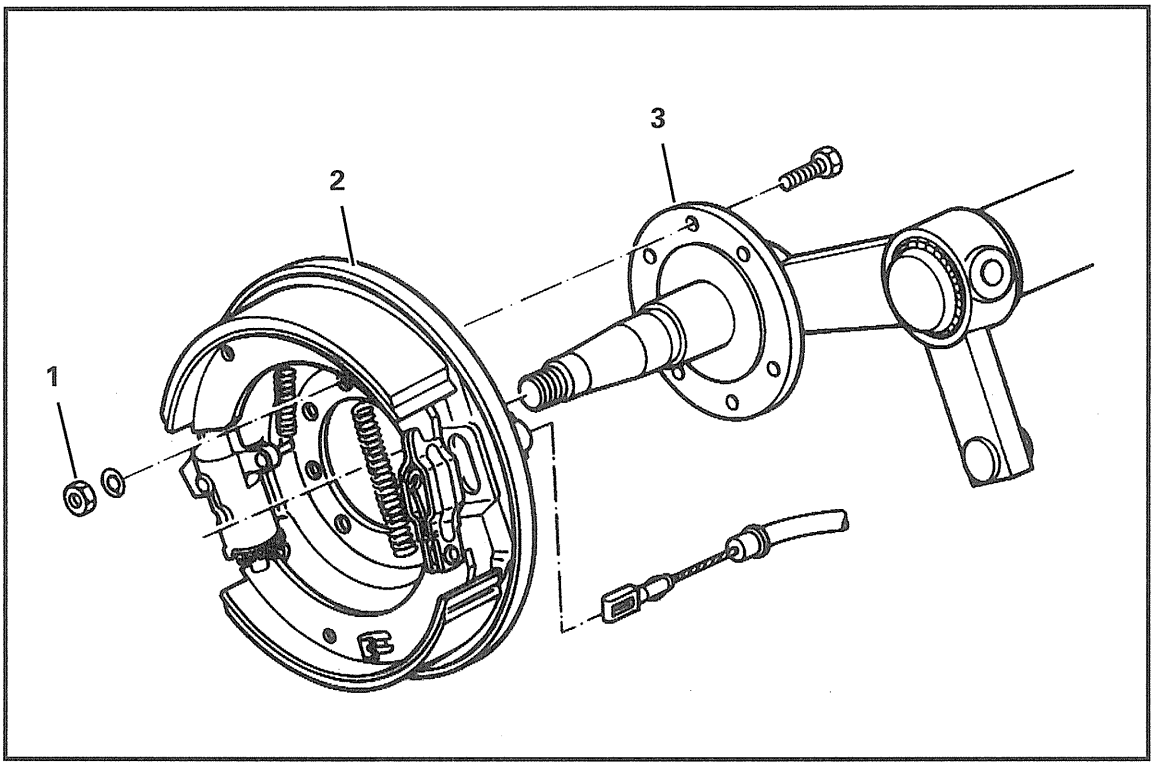


Fig. 119

3.2.4.13 Replacing the Brake Shoes and Return Spring

Operating and consumption materials: Lubricating grease G-353

- Dismantle the brake drum (see Section 3.2.3.3 (1)).
- Unhook the tension spring (120/1).
- Take off the clamping keys (120/13) and remove the clamping pins(120/7).
- Take off the brake shoes (120/2).
- Unhook the return spring (120/5).

NOTE
Renew the return spring when fitting new brake shoes.

- Pull the adjusting nut (120/9) with the adjusting screw (120/8) out of the bearing bush (120/10).
- Push the locking plate (120/11) to the right and remove with the bolt (120/12).
- Pull the swivel unit (120/4) out of the bearing bush.

Assembly:

- Lightly grease the expanding lever (120/3), the contact surfaces on the brake anchor plate (120/6), the adjusting nut and the swivel unit (120/4) with G-353 grease.
- Screw the adjusting screw into the adjusting nut.
- Hook in the return spring.
- Fasten brake shoes with clamping pins and clamping keys.
- Mount the brake drum.
- Adjust the brake; see Section 3.2.4.1.

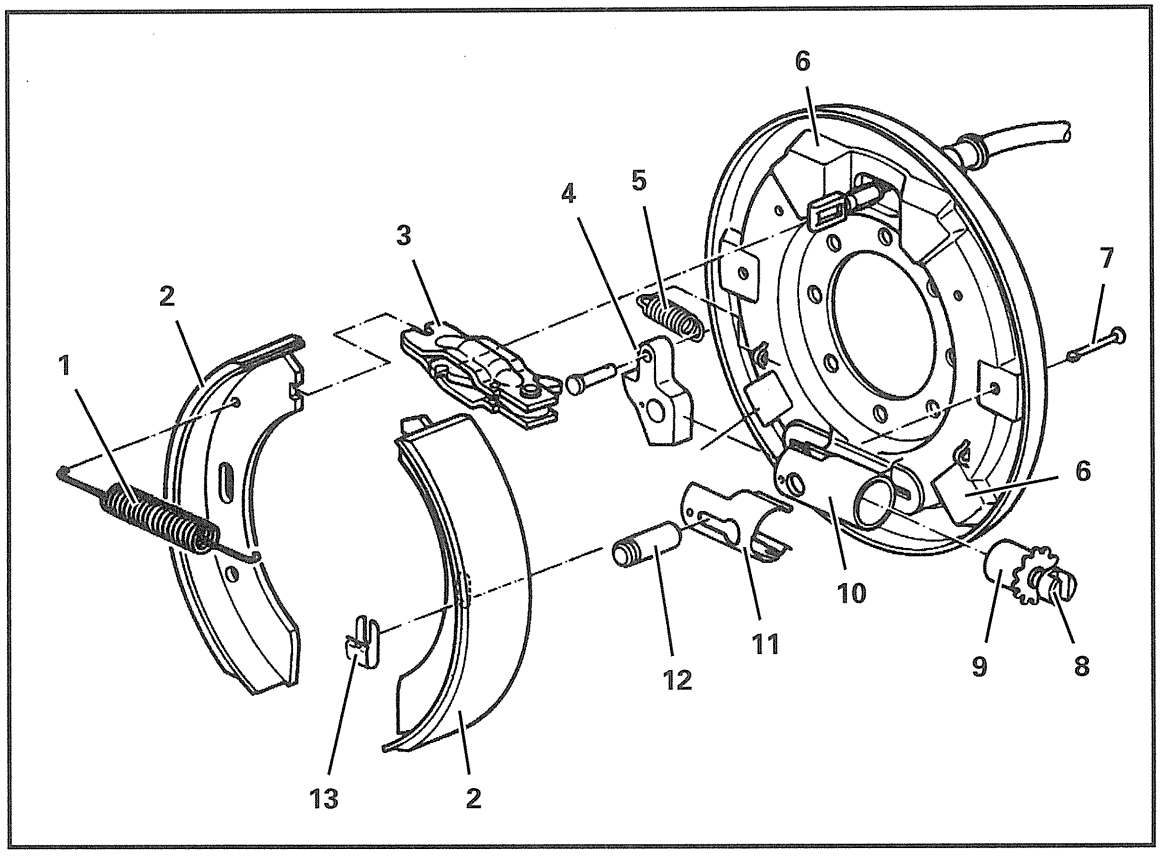


Fig. 120

3.2.5 Work on the Built-in Equipment

3.2.5.1 Adjusting the Pressure Lid

Tools: Tensioning bar and tensioning pipe (accessories)

NOTE
Tow persons are required when adjusting the pressure lid.

- Unscrew the cover (121/2) for the leg spring (123/2).
- Release the clamping screw (121/1).
- Open pressure lid(123/1).

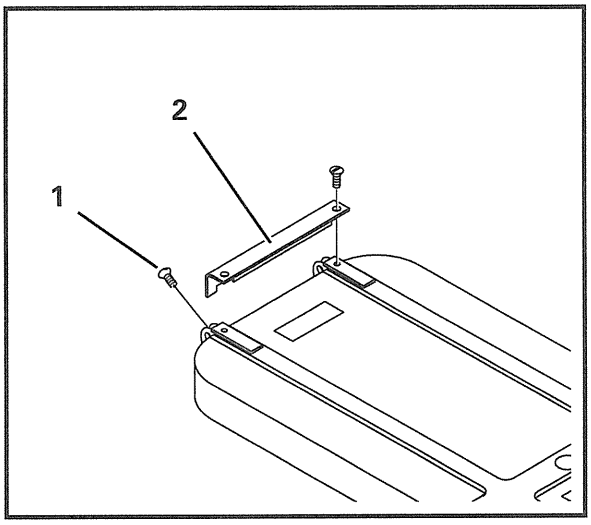


Fig. 121

- Insert one tensioning bar (122/2) into the tensioning ring hole (123/5) closest to the pressure lid, and extend the bar with the tensioning pipe (122/1).
- Turn the tension bar (arrow in Fig. 122) and hold it until the bolt (123/4) can be pulled out of the tension ring.

CAUTION
Leg spring is under high tension.

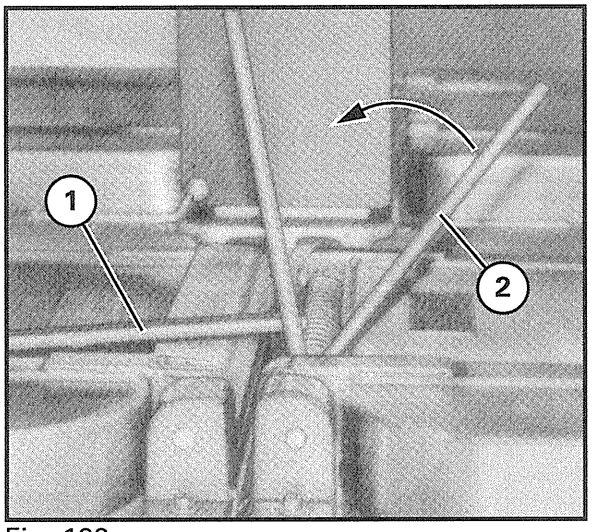


Fig. 122

- Turn the tension ring with the tension bars until the lid (123/1) is held at approx. 45° in opened position.
- Insert the bolt (123/4) into the hole of the tension ring which is closest to the stop (123/3).
- Turn the tension bar slowly until the bolt faces against the stop.
- Tighten the tension screw (121/1)in such a manner that the pressure lid is held in any open position.
- Tighten cover.

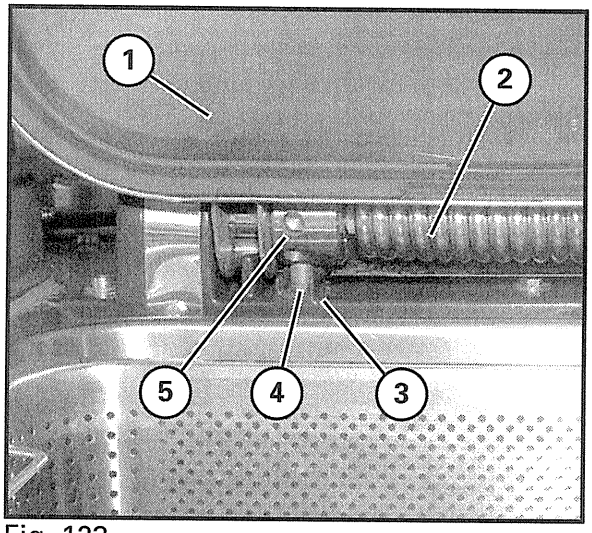


Fig. 123

3.2.5.2 Replacing the Pressure Cooker

(1) Dismantling

NOTE
The pressure cooker must be replaced with the lid mounted, otherwise an inspection in accordance with the regulations for pressure tanks will be required.
Consumption materials are included with the new cooker. The date when the next inspection is due should correspond at least with that of the field kitchen.

- Remove the front hot water boiler, see Section 3.2.5.5.
- Dismantle the drain valve (124/6).

NOTE
The connection piece (124/5) and the threaded sleeve (124/4) are bonded with an adhesive and must be released by means of a heat gun.

- Screw out the connection piece (124/5); observe left-handed thread.
- Unscrew the threaded sleeve (124/4) using the hook wrench.
- Dismantle the sheet metal piece below the hot water heater.
- Unscrew the double jacket manometer according to Section 3.2.5.3.
- Unscrew the screwed socket (124/10).
- Remove the seals (124/8, 9).

- Remove the double jacket valve according to Section 3.2.5.4.
- Unscrew the safety plate (124/14).
- Unscrew the screwed socket (124/15).
- Unscrew union nut (124/12).
- Unscrew the safety plate (124/13).
- Unscrew the screwed socket (124/11), remove the seals and dispose of.
- Unscrew the spring cover (124/1).
- Unscrew three screws (124/2) at the bracket for the lid and remove with washers.
- Unscrew four countersunk screws (124/3) at the front of the pressure cooker and remove with washers.
- Close the lid and lift pressure cooker on the handle side using suitable wooden supports.
- Cut through silicone at the contact surface using a knife.

  NOTE
  Thoroughly cut through the silicone all around the contact surface. Otherwise the cover can be damaged when lifting out the cooker.

- Lift out pressure cooker.
- Remove remainders of silicone on the contact surface.

(2) Assembly

NOTE
Pressure cookers are suitable for assembly on left or right side.
All seals to be renewed when assembling.

- Shut the upper free connection sleeve (on the side of the water boiler) with screw plug, using DELO – ML – 5268 adhesive and seal.
- Apply a bead of silicone all around the contact surface.
- Insert pressure cooker and screw tight.
- Remove excess silicone (with soap suds).
- Completely remove any adhesive remainders from the threaded sleeve (124/4) and connection piece (124/5).
- Apply DELO – ML – 5268 adhesive to the connection piece(124/7) (right-handed thread) of the pressure cooker; screw on the threaded sleeve (124/4) hand-tight and turn it back 1/2 revolution.
- Renew seals.

- Apply DELO – ML – 5268 adhesive to the connection piece (124/5) (left-handed thread) and screw in hand-tight. Secure the threaded sleeve against turning using the hook wrench.
- Completely mount the drain valve (124/6) and align lever horizontal.
- Tighten threaded sleeve with hook wrench.
- Allow adhesive to air out and cure for 24 hours.
- The rest of the assembly is carried out in reverse order.
- After the adhesive has cured, perform a leakage and function test.
- Fill double jacket according to Section 2.1.8.4 füllen and vent.

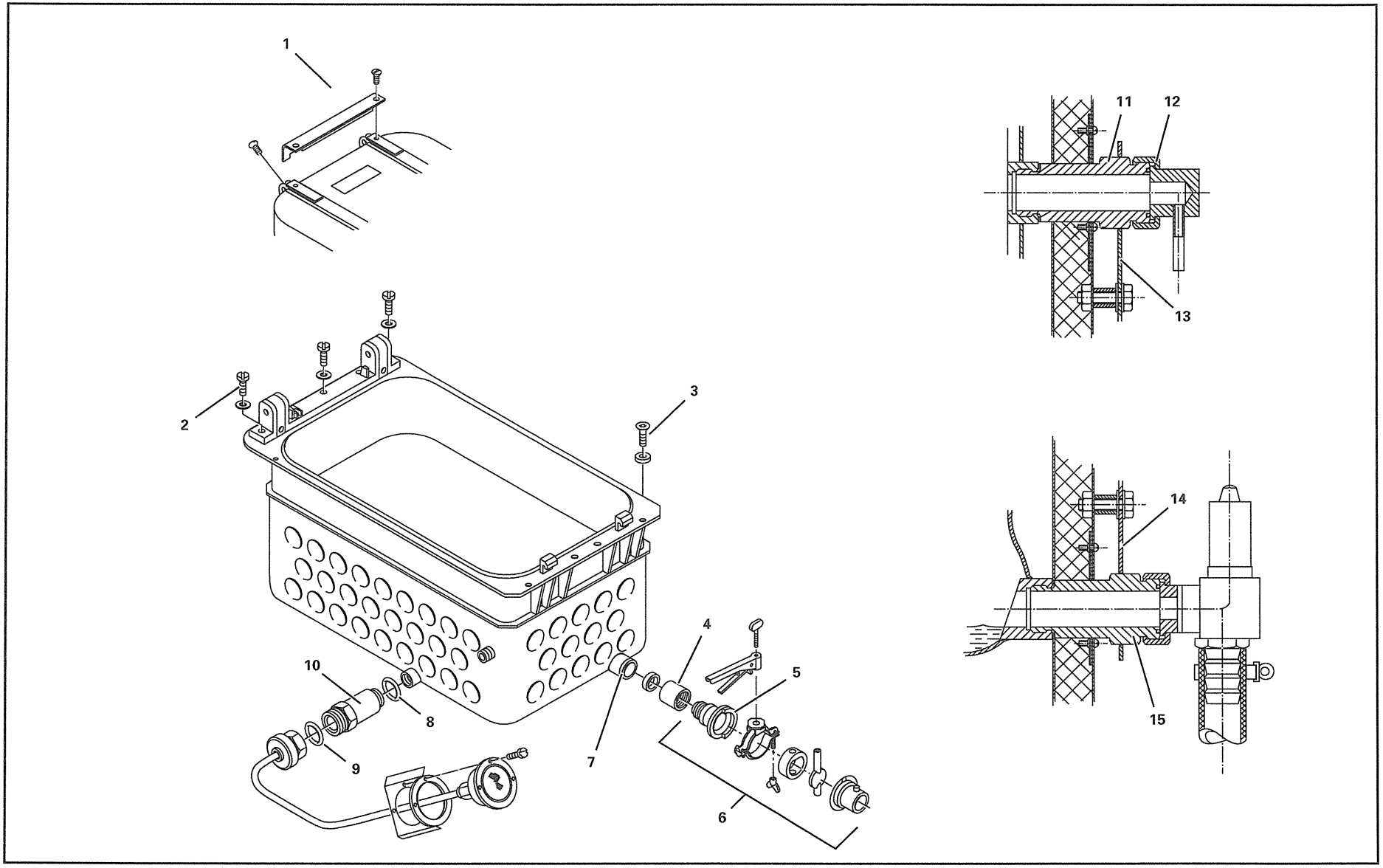


Fig. 124 Replacing the pressure cooker

3.2.5.3 Changing the Double Jacket Manometer

Operating and consumption materials: Silicone

- Remove the front hot water boiler (see Section 3.2.5.5).
- Dismantle the plate under the hot water boiler.
- Unscrew three Phillips screws (125/1).
- Unscrew the union nut (125/5) from the screwed socket; remove the manometer (125/2) and the seal (125/3).

CAUTION
The manometer (125/2) and the capillary tube (125/4) may not be cut off.

NOTE
When reassembling, use new O-ring (125/6). Clean the thread thoroughly. Lay the capillary tube with the largest possible curve radius.

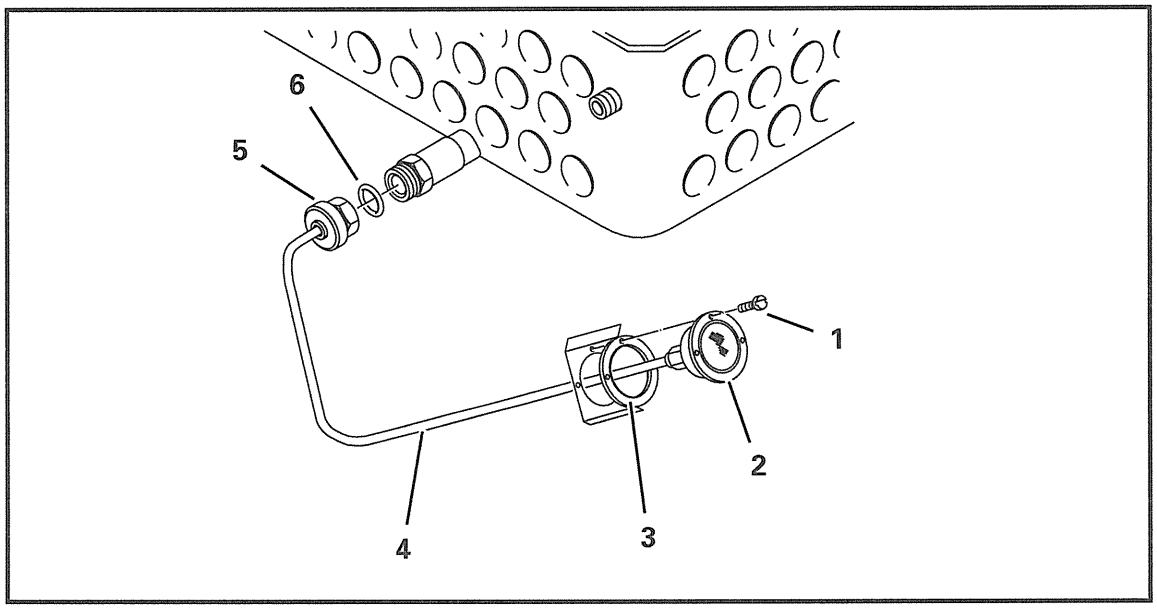


Fig. 125

3.2.5.4 Replacing the Double Jacket Valve

NOTE
Replace double jacket valve only in case of leakage.

- Unscrew hose clamp (126/6) and pull off hose (126/7).
- Unscrew the union nut (126/3) from the screwed socket (126/1) and remove the O-ring (126/2).
- Remove the complete double jacket valve (126/4).
- Unscrew the elbow hose fitting (126/5) from the double jacket valve.

NOTE
The double jacket valve (126/4) may not be disassembled.

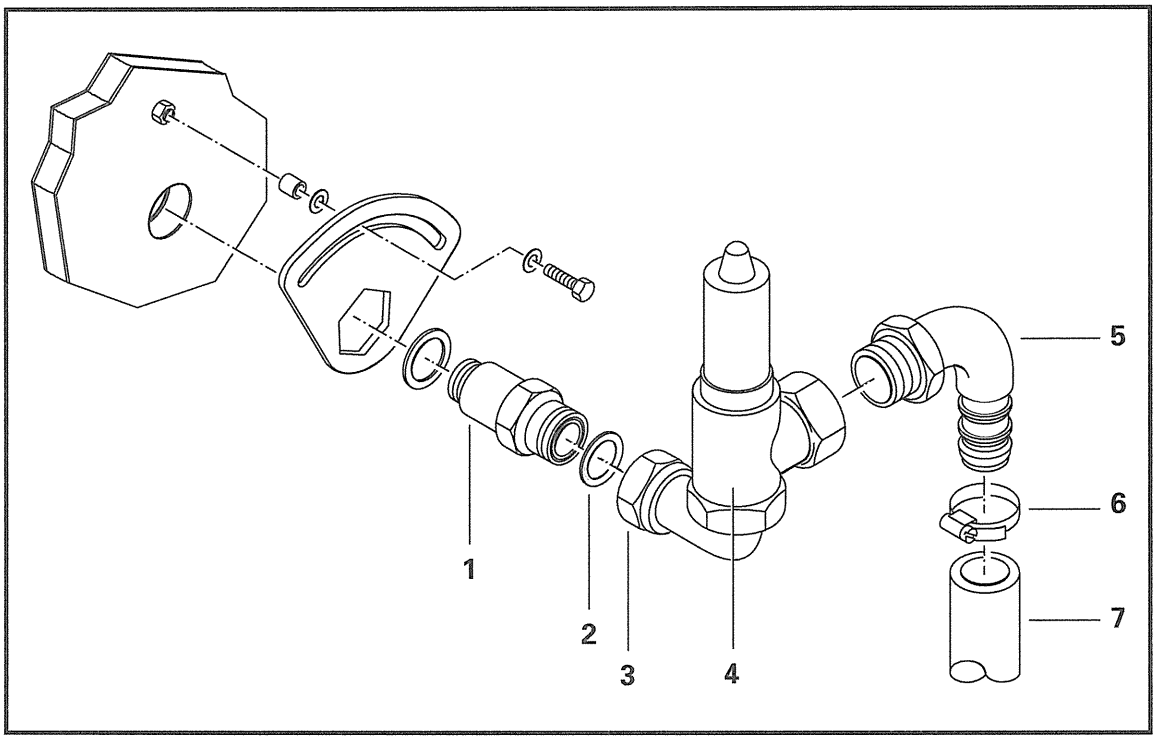


Fig. 126

3.2.5.5 Replacing the Hot Water Boiler with Lid

Operating and consumption materials: Silicone, Teflon tape

- Unscrew the drain valve (127/1) and the reducing sleeve (127/2).
- Unscrew four countersunk screws (127/3); Remove washers (127/4).
- Cut through silicone at the contact surface using a knife.

NOTE
Thoroughly cut through the silicone all around the contact surface. Otherwise the cover can be damaged when lifting out the hot water boiler.

Notes for reassembly

- When reassembling, seal the threads of the drain valve and the reducing sleeve with Teflon tape.
- Renew silicone on the contact surfaces.
- Check the drain valve and the reducing sleeve for tightness against leakage (fill in water, check visually).

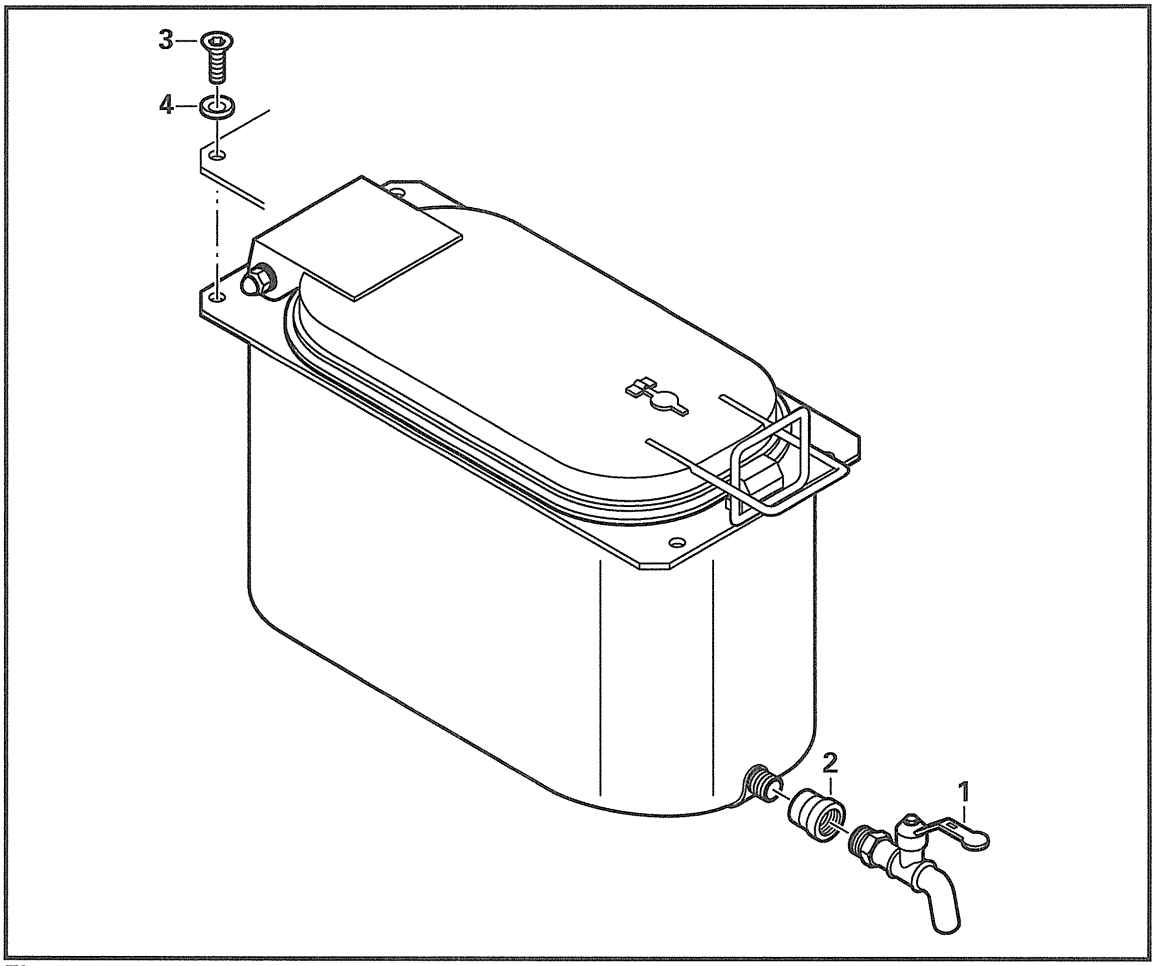


Fig. 127

- Check the lid lock for proper function.
- The lid seal must rest uniformly around the edge of the container.

NOTE
The seal of the lid is fastened by vulcanization. Replace lids with defective seal completely. Remove excess silicone.

3.2.5.6 Replacing the Oven

- Unscrew the fastening screws (128/2).
- Carefully pull out the oven (128/1) approx. 10 cm.
- Slide the temperature sensor (128/3) out of the holder.
- Completely pull out the oven.

NOTE
Before reinserting the oven, insert the temperature sensor in the upper groove of the oven.
While assembling, do not bend or pinch the cables of the temperature sensor.

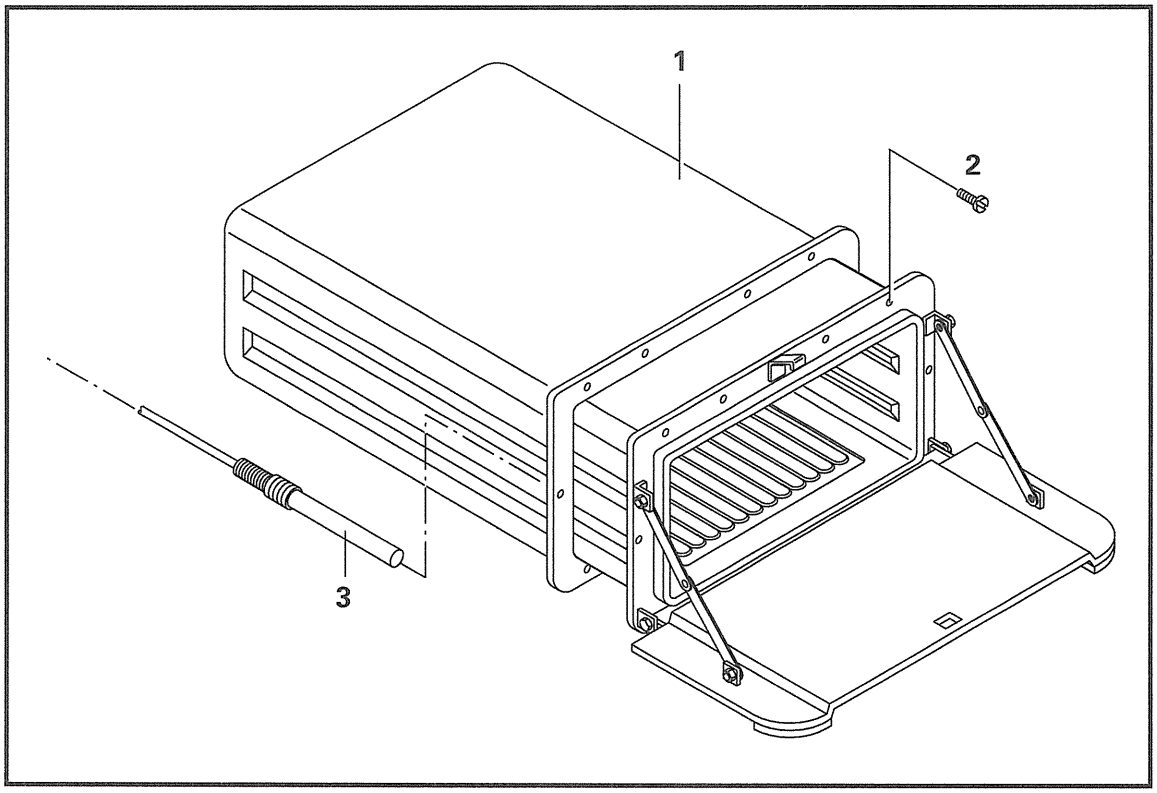


Fig. 128

3.2.5.7 Replacing the Pressure Roaster

(1) Dismantling

NOTE
The pressure roaster must be replaced with the lid mounted, otherwise an inspection in accordance with the regulations for pressure tanks will be required.
Consumption materials are included with the new roaster. The date when the next inspection is due should correspond at least with that of the field kitchen.

- Remove the oven (see Section 3.2.5.6).
- Unscrew the spring cover (129/1).
- Unscrew three screws (129/2) at the bracket for the roaster lid and remove with washers.
- Unscrew four countersunk screws (129/3) at the front of the pressure roaster and remove with washers.
- Close the lid and lift pressure roaster on the handle side using suitable wooden supports.
- Cut through silicone at the contact surface using a knife.

NOTE
Thoroughly cut through the silicone all around the contact surface. Otherwise the cover can be damaged when lifting out the roaster.

- Lift out pressure roaster.
- Remove remainders of silicone on the contact surface.

(2) Assembly

- Apply a bead of silicone all around the contact surface.
- Insert pressure roaster and screw tight.
- Remove excess silicone (with soap suds).
- Install oven.

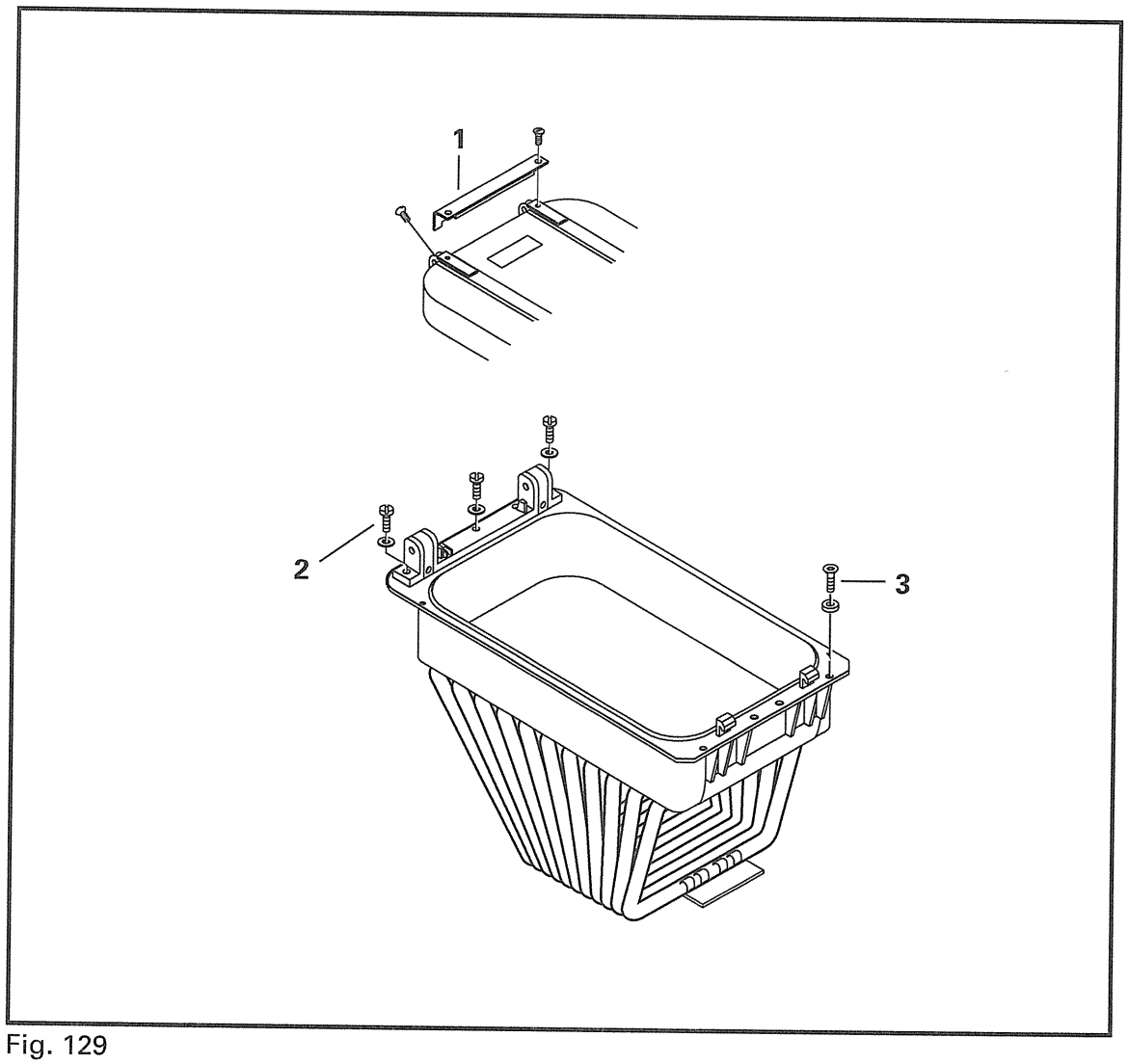


Fig. 129

3.2.5.8 Replacing the Temperature Sensor

- Remove the oven (see Section 3.2.5.6).
- Unscrew three Phillips screws (130/4); lift out the temperature indicator (130/5) with the holder (130/3).
- Unscrew the hexagon nut (130/2) and disconnect the temperature sensor (130/1) from the temperature indicator.

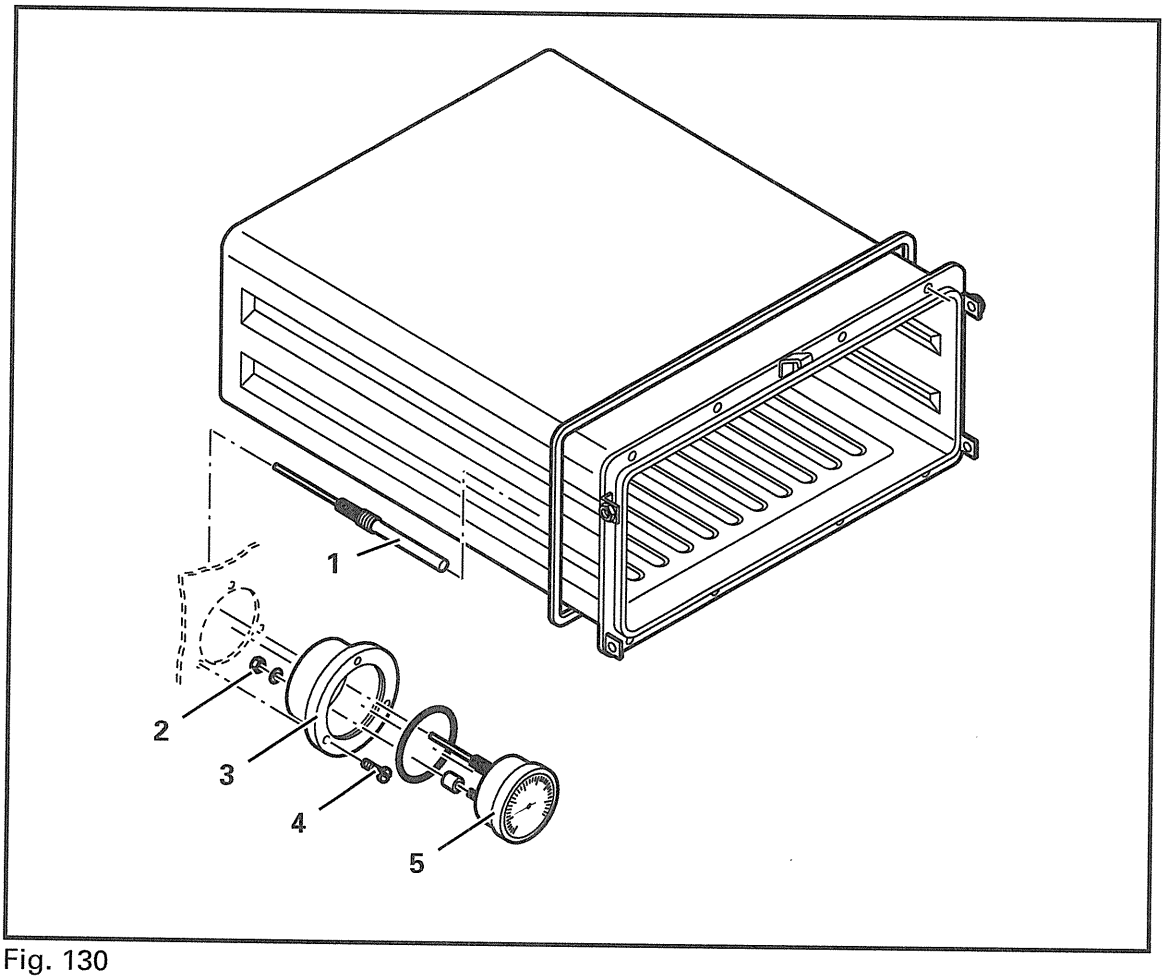


Fig. 130

3.2.6 Work on the Burner

CAUTION
Before any work on the burner, release the pressure; this is done by screwing off the tank cap; then screw it on again.

NOTE
After any work at which tubes/pipes have been disconnected, check the burner for tightness (see Section 3.2.6.4).

3.2.6.1 Air Tank: Draining Condensate

- By releasing the tank cap slowly, free the fuel tank and air tank from pressure.
- Shut the tank cap again.
- Unscrew the drain screw (131/1) on the air tank.
- Tilt the burner sofar to the front that condensate in the air tank can drain out of the drain opening.
- Tighten the drain screw again.

NOTE
Collect the condensate and dispose of properly.

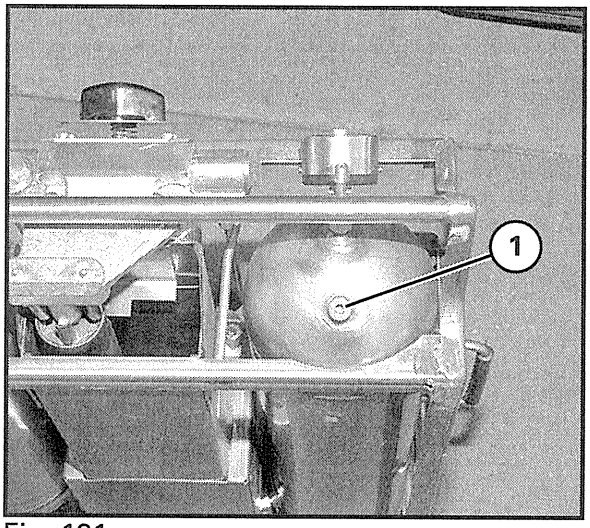


Fig. 131

3.2.6.2 Replacing the Air Nozzle

- Set the rotary switch at the control block (132/1) to the "STOP" setting.
- Relieve the pressure via the tank cap by unscrewing and screwing on again.
- Unscrew two Phillips screws (132/2,134/2) and remove the preheating plate (134/3).

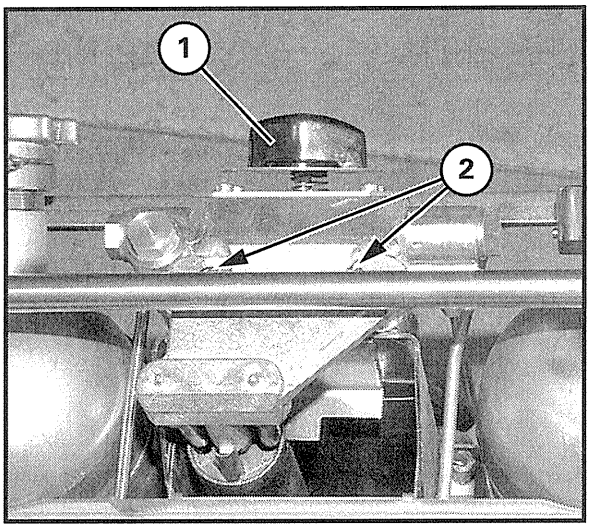


Fig. 132

- Unscrew the injector sleeve (134/6) ; for this, insert the two cams (134/4) on the preheating plate into the holes (133/1) as a counter support.
- Pull the air nozzle (134/5) out of the injector sleeve.
- When reassembling, pay attention for proper condition and seating of the O-rings (134/1).

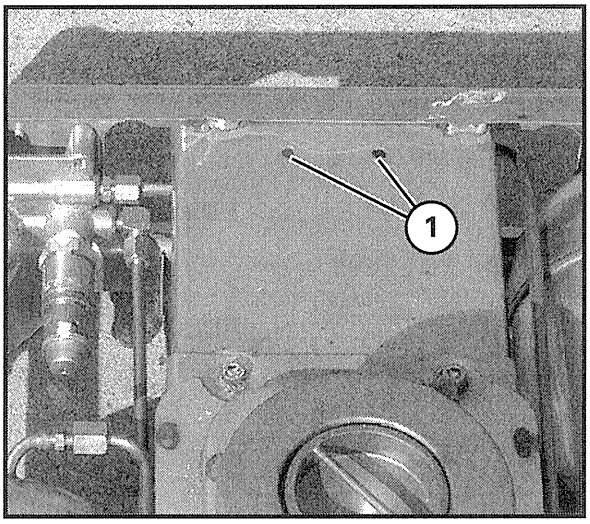


Fig. 133

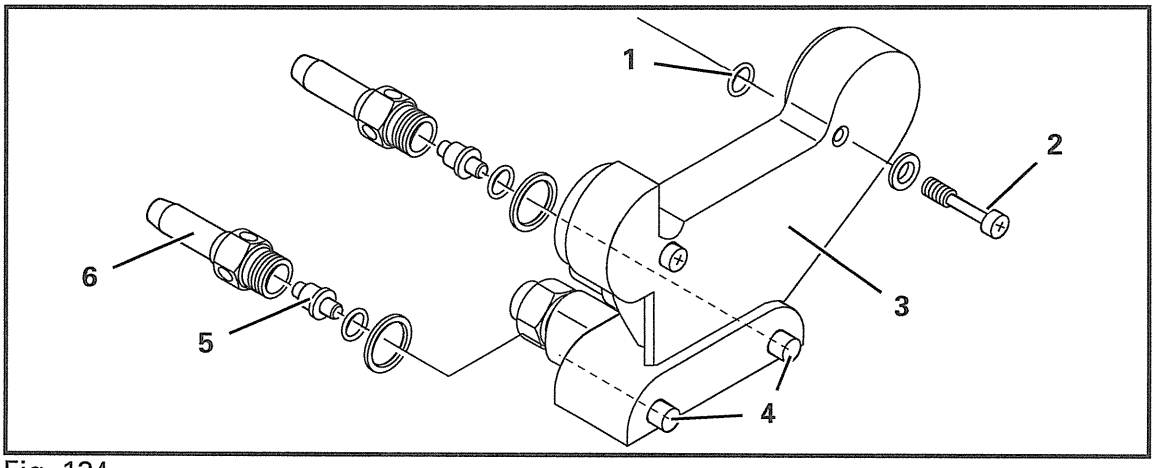


Fig. 134

3.2.6.3 Replacing the Manometer

- Depressurize the burner.
- Remove the burner cover.
- Unscrew the manometer (135/1) using the open-end wrench, size 14 mm. (SW14).
- Remove the sealing ring (135/2) (may be seated on tank).

NOTE

- Upon assembly, always use a new sealing ring (135/2).
- Screw in the manometer hand-tight; then, continue to screw in with wrench until the numbers are vertical, but at least 1/4 of a turn.

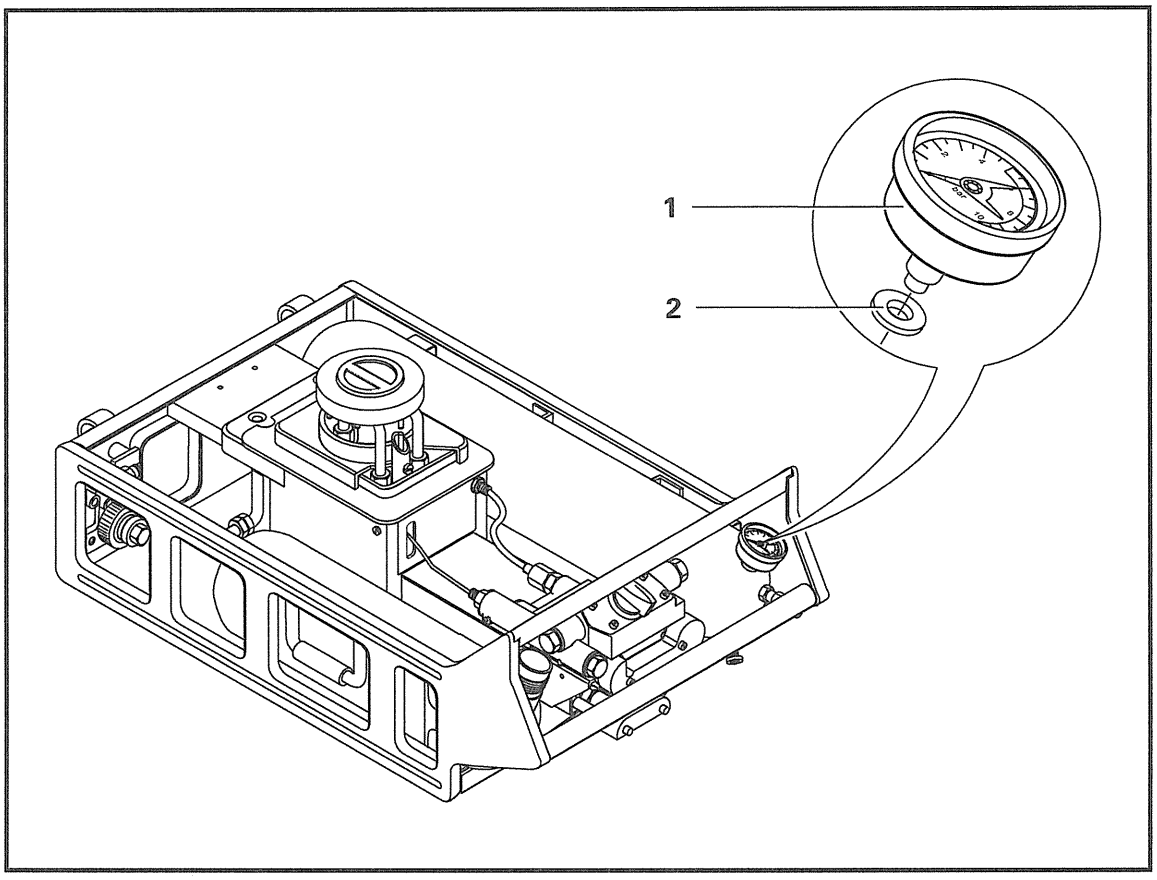


Fig. 135

3.2.6.4 Checking the Burner for Tightness

NOTE
For this test, a plug manufactured of a used main nozzle is required. The nozzle bore is to be welded shut.

- Depressurize the burner.
- Remove the burner cover.
- Remove the burner shield.
- Replace the main nozzle with the plug.
- Shut the fuel tank with the tank cap.
- Set the rotary switch to position 3.

CAUTION
Do not actuate the rotary switch during the test.

- Fill the air tank to 6 bar.
- Wait for approx. 1 minute, and correct the pressure in the air tank to 6 bar.
- Remove the sheet cover of the control block and tighten the control block with the fastening screw.
- Check all screwed connections for tightness. The pressure may not decrease over a period of 20 minutes.
- Check the fuel regulation valve in the control block for tightness.
- Rotary switch in the "STOP" setting.
- Release pressure via tank cap.
- Unscrew the plug and screw in the main nozzle.
- Further assembly is carried out in reverse order.

3.2.6.5 Checking the Burner Function

Put the burner into operation and carry out the following checks:

- Lighting performance of the preheating flame.
- Pressure increase during the preheating phase.
- Stability of the preheating flame.
- Lighting performance of the main flame.
- Flame appearance, level 1: yellow/yellow-red.
- Flame appearance, level 3: blue/light blue.
- Radial symmetry of the flame.
- Extinguishing period of the flame (less than 3 minutes).

3.2.7 Work on the Frame

3.2.7.1 Ground Support: Changing the Support Plate

Operating and consumption materials: Lubricating grease G-450/G421

- Lower the support plate far enough to allow access to the slotted spring pins (136/1).
- Drive out the slotted spring pins (Ø 6 mm) using a punch; remove the supporting plate (136/2).

NOTE
Before mounting the support plate, ensure that the ball and the cup are clean. Grease the ball with G-450/G-421 lubricating grease.

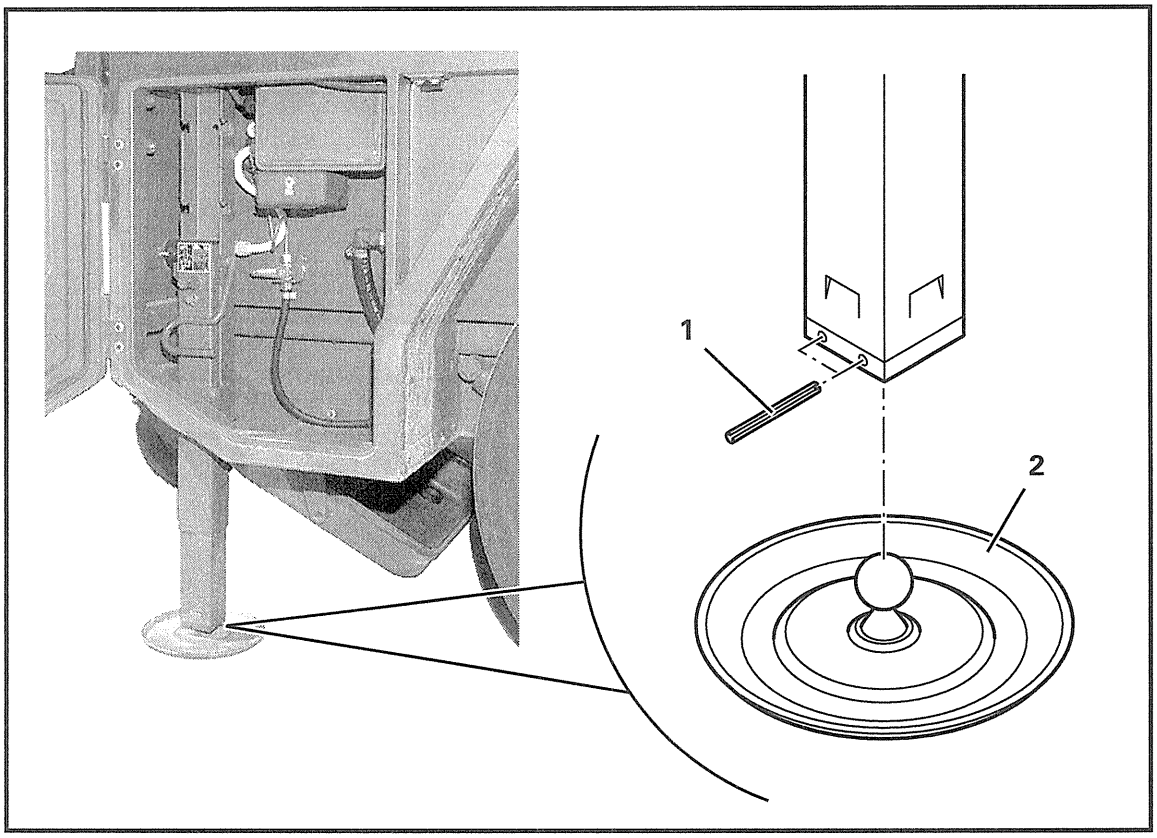


Fig. 136

3.2.7.2 Adjusting Doors and Lids

(1) Adjusting the Burner Compartment Doors, Front

- Release the hexagon screw (137/3) on both sides of the burner compartment door (137/1).
- Rotate the eccentric (137/2) with an open-end wrench until the burner compartment door bottom edge seal is in contact with the frame.
- Tighten the hexagon screws (137/3).

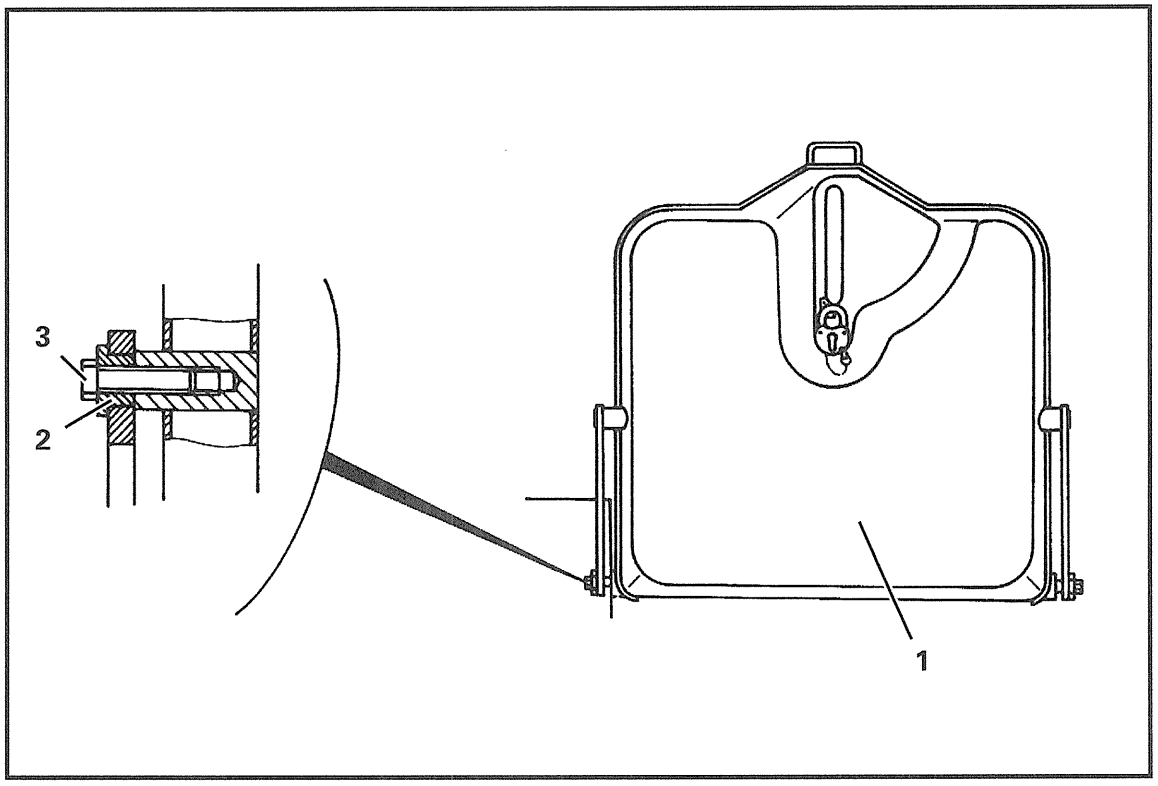


Fig. 137

(2) Adjusting the Burner Compartment Doors, Rear

- Loosen three hexagon screws (138/3) on both sides of the burner compartment doors (138/2).
- Adjust the burner compartment door with the longitudinal holes of the bracket (138/1) so that it fits hermetically all around the circumference of the frame.
- Tighten the hexagon screws (138/3).

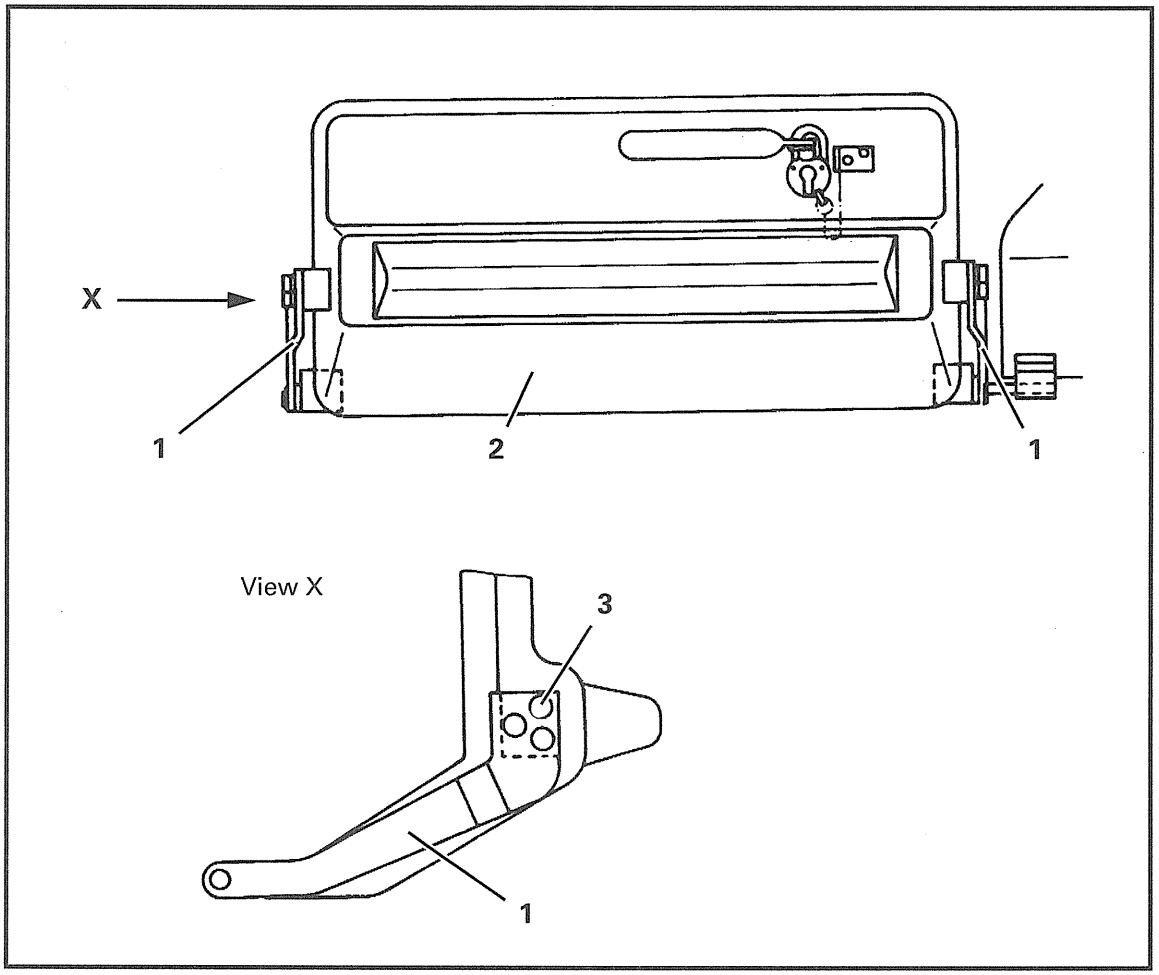


Fig. 138

(3) Adjusting the Storage Space Doors, Rear

- Loosen/unscrew 6 screws (139/4) on the hinge (139/1).
- Underlay washers (139/3) as necessary, until the storage space door (139/2) closes hermetically on the frame.
- Tighten the screws (139/4).

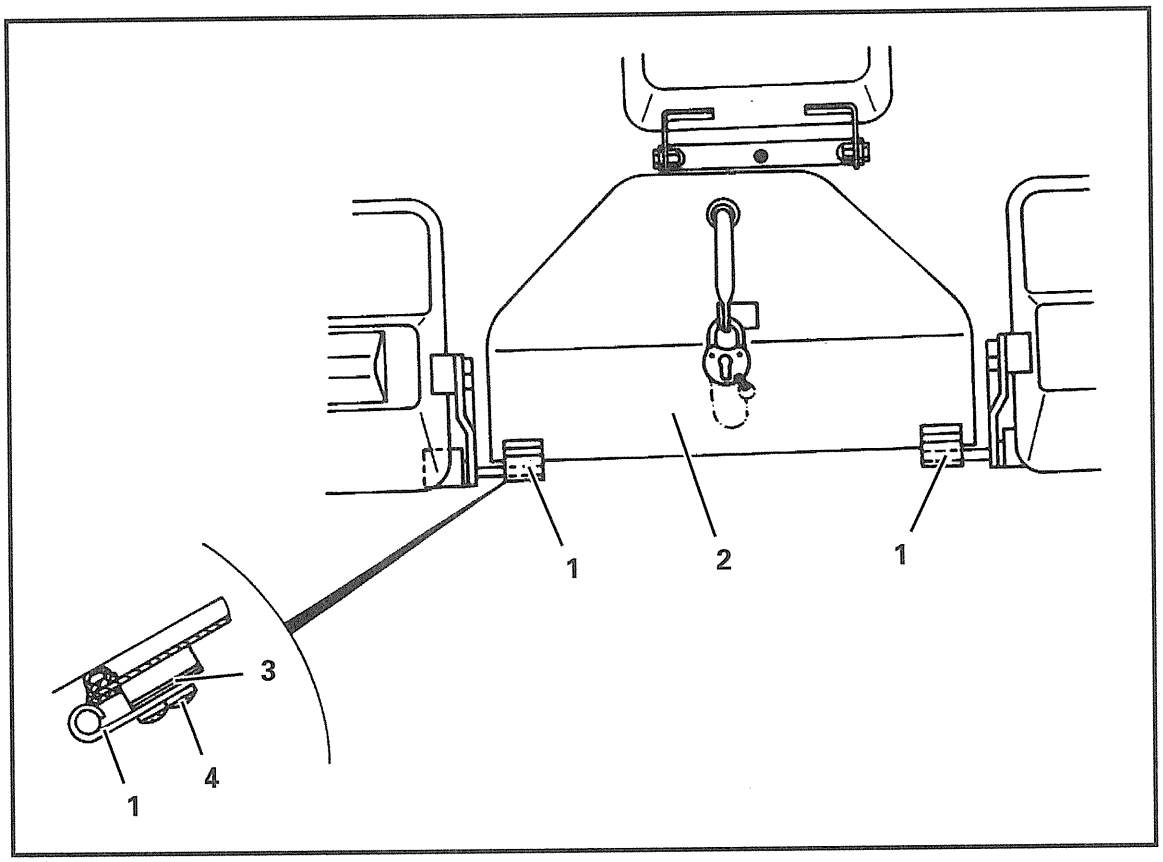
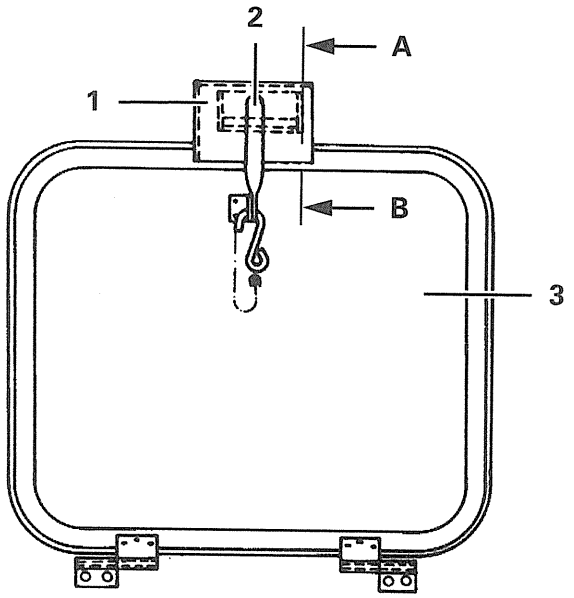
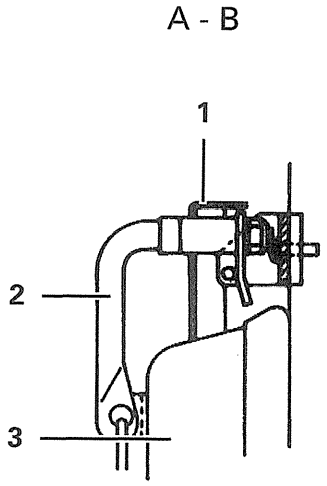


Fig. 139

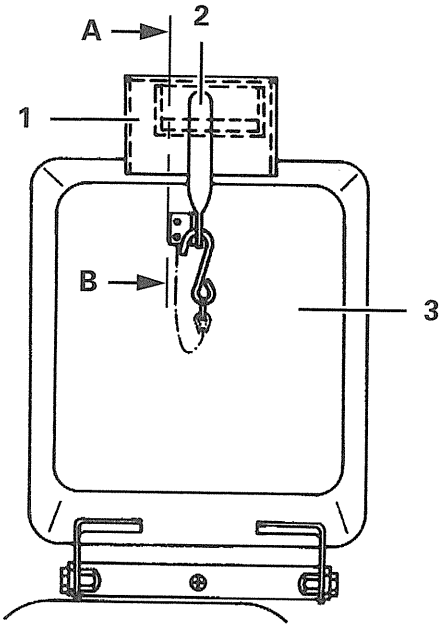
(4) Adjusting the Instruments/Gauges Flaps, Front and Rear

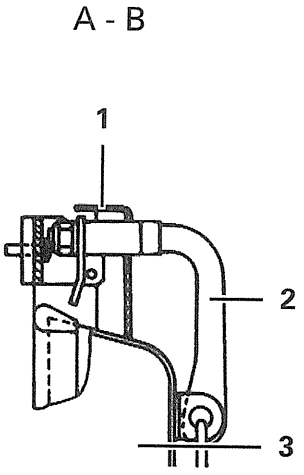
- Align the handle retainer plate (140/1) until the instruments/gauges flap (140/3) closes hermetically all around and the lock (140/2) can be closed without considerable force.





Instruments/gauges flap, front





Instruments/gauges flap, rear

Fig. 140

(5) Adjusting the Two Lateral Storage Space Doors, Left and Right

- Release two screws (141/3) on the latch retainer (141/2).
- Adjust the storage space doors (141/1) on the longitudinal holes of the latch retainer so that it seals on the frame.
- Tighten screws (141/3).

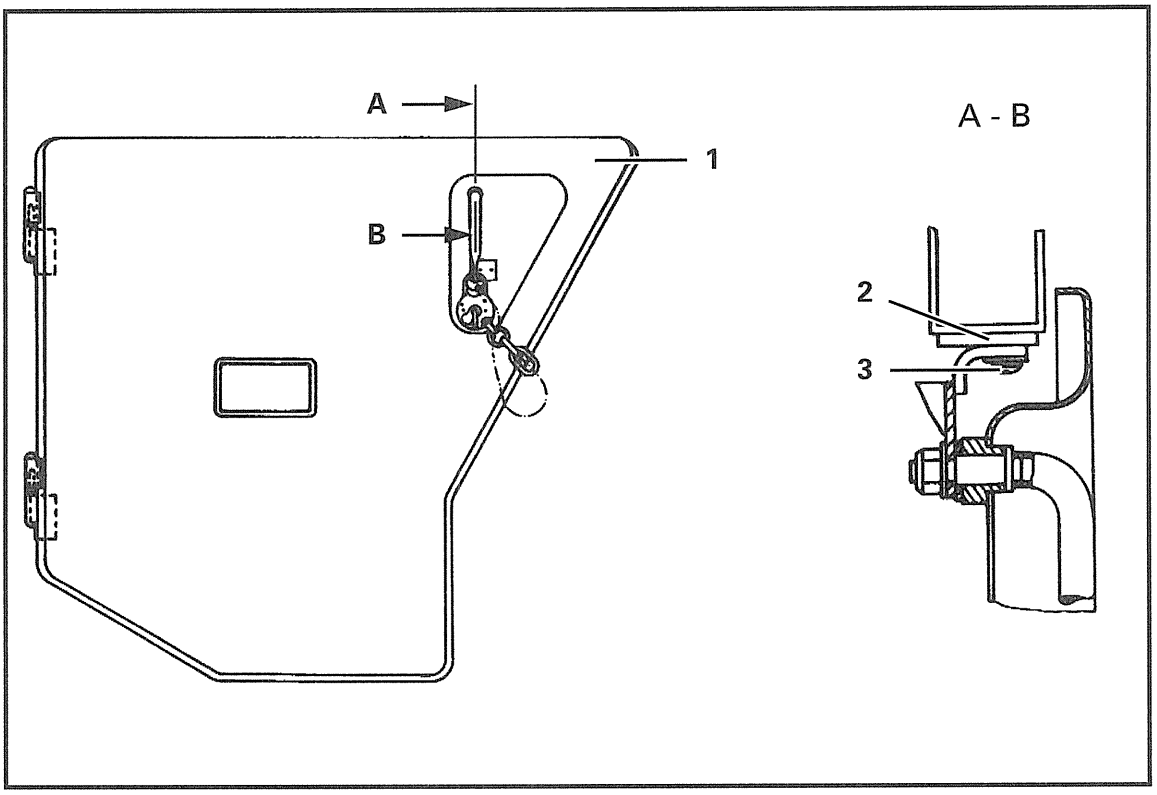


Fig. 141

3.2.7.3 Touching Up the Undercoating

Operating and consumption materials: Undercoating

NOTE
In addition to the following instructions, observe the regulations of the TI 025.

- The surface intended to be coated with undercoating must be dry and free from grease or be treated with an appropriate primer.
- Before applying the undercoating, close any openings leading to components of the brake system and cover any rubber parts.
- After application of the undercoating, observe the drying times.

3.2.7.4 Checking the Condition of the Frame and Surface Mounting

- Check all screwed connection components for firm seating. Renew fastening screws when deformed.
- Align deformed linkage of the surface mounting. Have parts that cannot be aligned repaired or replace.
- Check the four holders (142/1) of the roof supports for firm seating. Replace deformed holders.
- Tighten the fastening screws (142/2) with a tightening torque of 80 Nm.

CAUTION
The handles (142/3) are used for lashing in railway and air transport. Alignment and welding work on the holders/eyelets are not permitted.

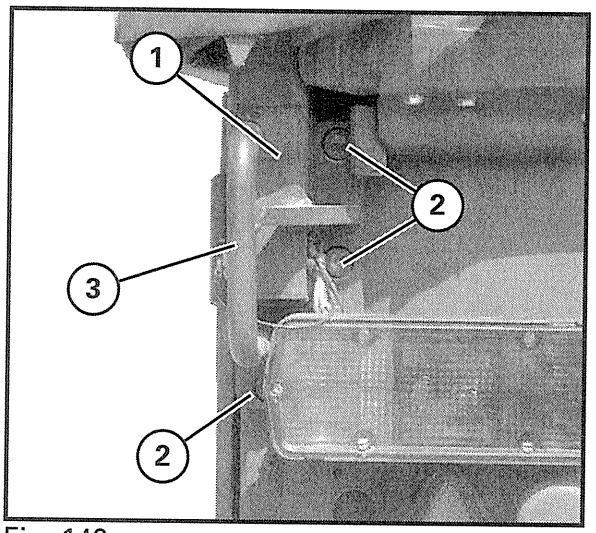


Fig. 142

3.3 Safety Inspections and Tests

Ser. No.	Designation Check/Equipment	Performed by	Date	Proof of Inspection	Regulations/ Instructions	Remarks
1	2	3	4	5	6	7
1	First aid kit	SanGrpSgt	Yearly (F3)		VWH 4 and VWH 40	
2	Fire extinguisher - Visual check - Main inspection	Expert personnel Expert	Half-yearly (F2) Every 2 years (F4)	Inspection list Inspection tag	TI 4210/004-14 TI 4210/004-14	
3	Technical material check	Mat.Insp. Cdo.	Every 2 years (F4)	Equipment log, part 10	VWH 53 and HDv 142/100	
4	Pressure container - Pressure cooker - Double jacket - Pressure roaster - Burner - air tank and fuel tank	Expert	Every 2 years (F4) Every 10 years in addition to internal inspection (F6) and pressure test	Equipment log, part 10 and inspection tag	Inspection regulations according to pressure tank regulations	

3.4 Work to be Carried Out When Putting Out of Operation for up to 12 Months

3.4.1 Work Before Putting Out of Operation

1. Clean trailer thoroughly; allow to dry well; eliminate corrosion damage; touch up paint damage and carry out scheduled maintenance after time which are due within the planned period for putting out of operation.
2. Empty fuel tanks of the burners and drain condensate from the air tanks.
3. Empty cookers and ovens, clean and shut lids/covers.
4. Open lid valves of the cookers.
5. Check accessories and supply for completeness and condition, and stow away.
6. Lubricate joints and hinges (O-236, G-450/G-421).
7. Clean rubber parts (e. g. rubber sleeves) and apply glycerin.
8. Fold down roof construction and lock. Stow away side tarpaulins and accessories in clean and dry condition; observe folding plan (see Section 3.6, Fig. 145).
9. Check the air pressure in the tires and refill, if required.
10. Raise the trailer with the ground supports until the wheels are relieved.

3.4.2 Work to be Carried Out During Lay-up

1. Check tire pressure and refill air, if required.
2. Check accessories and supply for completeness.
3. Check trailer for paint damage and touch-up, if necessary.

3.4.3 Work to be Carried Out When Putting Back into Service

1. Check tire pressure and refill air, if required.
2. Check condition, function and operating ability in accordance with the, "Technical Inspection after Use" (see Section 2.2.5.1).

3.5 Work to be Carried Out in Case of Long-term Storage (Minimum 5 to 10 Years) Within the Troop Range

3.5.1 General

The aim of the long-term storage (LTS) measures is to maintain full operatability of the field kitchen during the complete storage duration.

The measures are to be applied when the field kitchen is not subject to operation for 5 years or longer.

3.5.2 Requirements for Long-term Storage

3.5.2.1 Requirements for the Storage Location

The field kitchen trailer is generally intended for storage in halls or mobile enclosures with controlled humidity (45-50 %).

3.5.2.2 Condition of the Field Kitchen Trailer

All defects and damage must be repaired/corrected prior to the begin of the storage. Only field kitchen trailers in perfect condition may be stored long-term.

3.5.3 Technical Material Testing/Safety Inspection/Correction of Faults

Prior to LTS, technical material testing (TMT) or repair according to requirements are to be carried out and to be finalized with a safety inspection (SI).

Periodical inspections and scheduled maintenance are suspended during LTS.

When putting into operation again, the technical inspections are to be carried out according to Section 2.2.5.1.

3.5.4 Lubricants

Use lubricants according to TI 7360/005-13 for the preservation work.

3.5.5 Tires

The given periods for usage according to BesAnVH SDNo. 2 must be observed. In order to avoid damage to tires, the field kitchen trailer is to be raised with the ground support until the tires are relieved (no contact with the ground).

3.5.6 Accessories

The accessories are to be checked for completeness and to be replaced by the supplies unit, if required.

3.5.7 Collecting of Data

Upon Storage, the field kitchen trailers within the stock of the troops are to be recorded in BVK 52, ZK "R" and to be reported with ZMK.

Proof that this measure has been carried through must be given in Part 9 of the equipment log.

3.5.8 Work to be Carried Out on the Field Kitchen Trailer before Putting into the Storage System

1. The stainless steel surfaces (including pressure cookers and pressure roasters) are to be checked for rust film, and, if required, cleaned with a commercial stainless steel polish or with Etolit porcelain cleaner (supply No. 7930-12-336-1731).
2. Thoroughly clean the trailer and accessories; allow to dry well; correct and/or touch-up corrosion/paint damage.
3. Empty the fuel tanks of all burners and drain condensate from the air tanks.
4. Empty cookers and oven, and clean.
5. Remove all rubber seals from the cooker lids and clean throughout. Also thoroughly clean the sealing surfaces and reinsert the clean lid seals again.
6. Lubricate the joints and hinges of the trailer (not of the kitchen facilities).
7. Apply glycerin to the rubber parts.
8. Check condition and completeness of accessories and supply.
9. Leave lids and covers open.

10. Leave the roof construction folded up. Stow accessories in clean and dry condition.
11. Raise the field kitchen trailer with the ground supports until the tires are relieved.

3.5.9 Work to be Carried Out During LTS (Quarter-yearly)

1. Check the air pressure of the tires and refill, as required.
2. Check trailer for paint damage and touch-up, if required.

3.5.10 Work to be Carried Out When Putting into Operation Again

1. Check tire pressure and refill air, if required.
2. Carry out the technical material testing (TMT) and the safety inspection (SI).
3. Check completeness of accessories and supply.
4. Forward change-report to ZMK.
5. Record in BVK.

3.6 Plans/Diagrams

- Wiring diagram, variant I
- Wiring diagram, variant II
- Folding plan, side tarpaulins

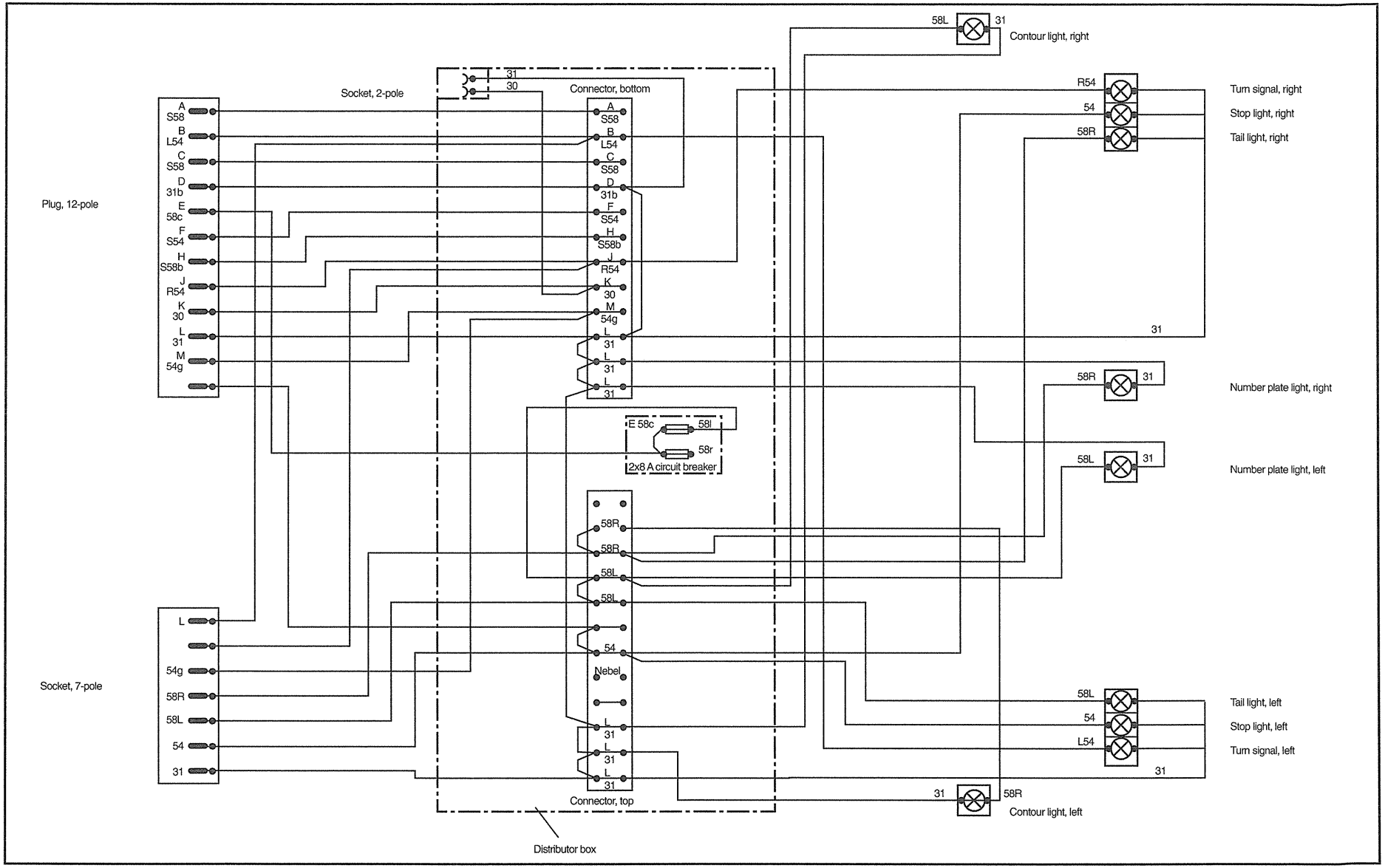


Fig. 143 Wiring diagram (for models to 1991)

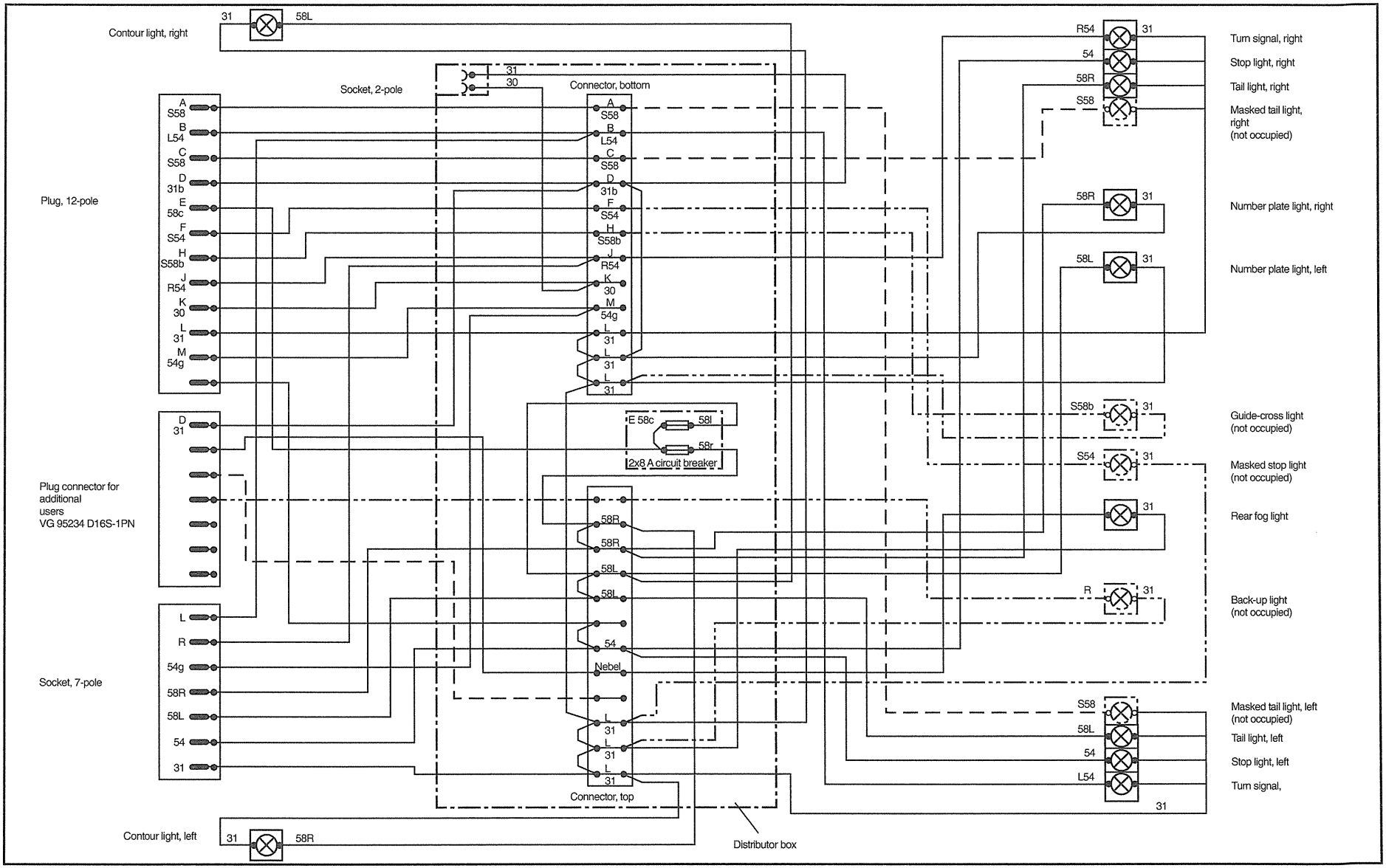
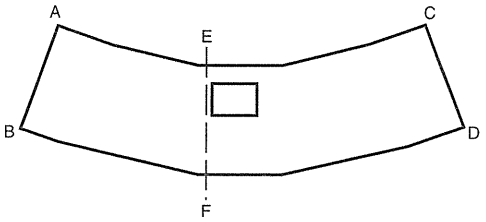
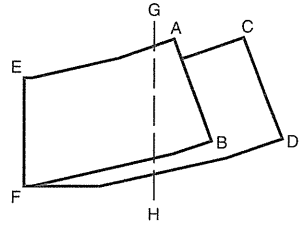


Fig. 144 Wiring diagram (for models from 1992 on)

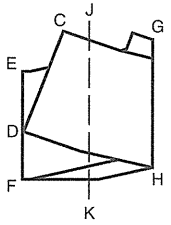


1. Lay out wall part on ground with the inner side facing up (window can be seen).
2. Grasp A–B and fold over toward C–D until the crease reaches the window edge (E–F).

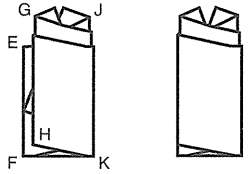


CAUTION
Do not crease the window!

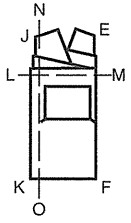
3. Grasp C–D and fold over to the left until the corner D lies on edge E–F.



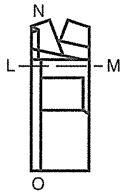
4. Grasp G–H and fold over to the left again until the edge G–H lies on the edge E–F.



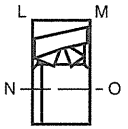
5. Turn tarp around the E–F edge (the window lies on top now).



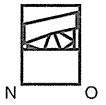
6. Fold the edge J-K over the line N-O to the right.



7. Fold down the upper part above the window over edge (L–M).



8. Fold bottom part over N-O to the middle.



9. Fold once more.

Finished size: 85 cm x 45 cm

Packlist for tent accessories bag

In 3 tent accessory bags (8340-12-120-1895) are per bag 6 tent pegs (8340-12-120-1890) to be packed.

In 1 tent accessories bag (8340-12-120-1895) are
4 tent pegs (8340-12-120-1890)
1 hammer, 3 kg (5120-12-120-5265) and
1 tent peg puller, grounding rod (8340-12-120-7875) to be packed.

Fig. 145 Folding plan, side tarpaulins

TFK 250

Verification of Carried Out Cleaning and Disinfection Measures

Surface, facility/equipment: _____

(The cleaning and disinfection is to be verified by signature of person carrying out the work.)

Week, from ..... to .....

Date/Time	Cleaning	Disinfection
Mo.		
Tu.		
We.		
Th.		
Fr.		
Sa.		
Su.		

Week, from ..... to .....

Date/Time	Cleaning	Disinfection
Mo.		
Tu.		
We.		
Th.		
Fr.		
Sa.		
Su.		

Week, from ..... to .....

Date/Time	Cleaning	Disinfection
Mo.		
Tu.		
We.		
Th.		
Fr.		
Sa.		
Su.		

Checked:

_____ _____

Signature of hygienic manager Signature of the facility manager

Maintenance Schedule TFK250 : ....

Date of beginning: .... Date of storage: ....

Maintenance	F1	F1	F1	F1	F1	F1	F2	F3	F4	F6
Date of Performance										
Signature										

Maintenance	F1	F1	F1	F1	F1	F1	F2	F3	F4	F6
Date of Performance										
Signature										

Maintenance	F1	F1	F1	F1	F1	F1	F2	F3	F4	F6
Date of Performance										
Signature										

Maintenance	F1	F1	F1	F1	F1	F1	F2	F3	F4	F6
Date of Performance										
Signature										