

BPW Zugverbindende Einrichtungen  
BPW towing attachments  
Dispositifs d'attelage BPW  
Sistemi di traino BPW

- Baureihen ZAF-2
- Series ZAF-2
- Séries ZAF-2
- Serie costruttive ZAF-2

WARTUNGS- UND BEDIENUNGSANLEITUNG  
MAINTENANCE AND OPERATING INSTRUCTIONS  
INSTRUCTIONS DE MAINTENANCE ET DE SERVICE  
ISTRUZIONI CDI MANUTENZIONE E USO

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## Maintenance instructions

The following installation, operating and maintenance instructions relate to BPW towing equipments. They are a constituent part of the warranty conditions. Adhere to the relevant operating instructions of the vehicle manufacturer or of the other vehicle component manufacturers.

Completion of the maintenance work in accordance with the prescribed intervals is essential in order to maintain the operating safety and roadworthiness of the vehicle.

The correction of any defects found or the replacement of any worn parts should be carried out by a BPW after-sales service workshop, unless the vehicle user has at his disposal appropriately skilled in-company workers and the necessary technical facilities.

**When installing spare parts, it is strongly recommended that only original BPW components are used. Parts approved by BPW for trailer axles and suspensions regularly undergo special test procedures and as a result BPW is able to guarantee their quality.**

**However, BPW cannot assess for every single third-party product whether it can be used for BPW trailer axles and suspensions without any risk to safety. This applies even if such products have already been tested by an accredited test authority.**

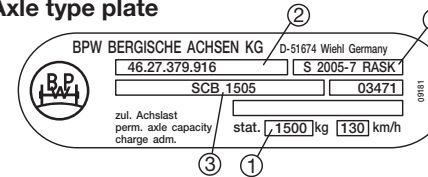
**Our warranty becomes null and void if spare parts other than original BPW parts are used.**

Valid January 2005

Subject to change without notice.

## Technical data on axles, brakes and overrun hitches

### Axle type plate



### Overrun hitch type plate



### Procurement of spare parts:

The code and type numbers of the axle and chassis components enable us to quickly determine your exact spares requirements when ordering from our BPW agencies and service stations. It is therefore recommended that you enter the data shown on the type plate in the following table so that it is readily available when required.

The type plate or the imprint is located on the axle tube or on the housing of the towing equipment and couplings.

Manufacturer of trailer or caravan		Type of trailer or caravan
		Serial no.
① Permissible axle load (for tandem axles, axle front / rear)	front	kg
	rear	kg
② Type number of axle (for tandem axles, axle front / rear)	front	
	rear	
③ Type code of axle (for tandem axles, axle front / rear)	front	
	rear	
④ Type of wheel brake		
⑤ Type or make of towing hitch		
⑥ Code number		
⑦ Permitted towing hitch load		kg
Type or make of coupling		
Chassis number		
Permissible total weight		kg
Max. payload Difference between unladen vehicle weight and permissible total weight		kg

## Basic principles

Never overload axles, brakes or chassis!

Therefore:

- No illegal overloading of the vehicles in excess of the permissible total weight.
- No over-stressing of the hitch or suspension system due to reckless or aggressive driving or mishandling. Avoid subjecting the axles to any impacts or jolting. Adapt your driving speed at all times to the road conditions and the load condition of the trailer. This applies particularly when negotiating bends.
- No one-sided loading as due to this the caravan or trailer will lean to one side. This is particularly so in the case of caravans, the load should be stowed over the axle and as low as possible to optimize road holding and achieve the best possible braking effect.
- Ensure that wheels and tyres are not overloaded so much that wheels are out of alignment or tyres are unbalanced.

Only use the jacking points provided by the vehicle manufacturer.

Important: Make sure the jack is secure (danger of tipping over or crushing).

## Operating instructions which should also be adhered to by the driver

### - Prior to each run -

#### Inspections

- Tyre pressure / Tyre condition
- Wheel fastening
- Functioning of lighting and braking systems
- Raise and secure drawbar jockey wheel. The jockey wheel should be parallel to the direction of travel at all times.
- Inspect the hitch. The ball joint must fully enclose the ball-head and be locked. Check screwed joint on firm seating.
- Secure the breakaway cable to the towing vehicle.
- Release parking brake.
- In the case of a height-adjustable towing facility, check the joint connection for a tight fit.

### - In the case of a new vehicle -

#### After the first run under load conditions -

- Check wheel bolts for firm seating using a torque wrench. See page 12. The same applies after each wheel change.
- Recommendation: Check the brake system after approx. 500 km and readjust, if necessary.

We wish you a safe journey!

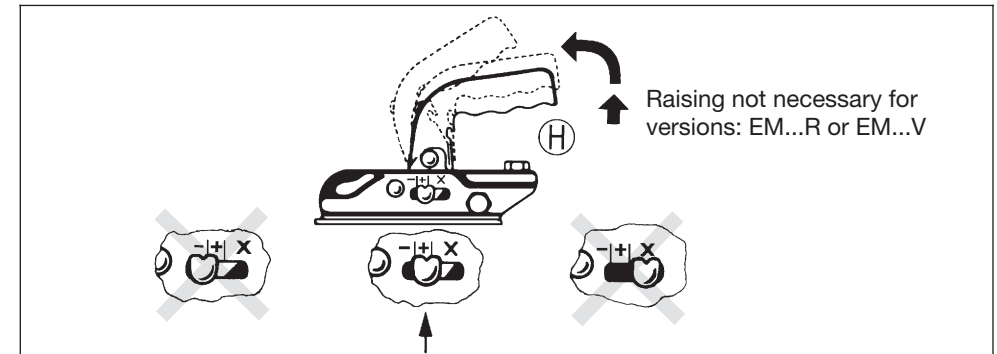
## Handling (Operation)

### Uncoupling and coupling

Note: The handle of the ball hitch and the handbrake lever must not be used as a manoeuvring aid. There is a risk of damage to the internal components!

The trailer hitch (ball-head hitch) on your BPW chassis is design-tested. The maximum support load at the coupling point must not be exceeded. When coupling lower the jockey wheel to the ground. Reverse the car up to the trailer or, in the case of a small trailer, manoeuvre the trailer up to the car's trailer coupling.

### “Berndes” Coupling head



#### Coupling:

Open coupling jaw by pulling lever H vigorously upwards in the direction of the arrow until lever locks open. Lower the opened hitch onto the ball-head vehicle coupling and the lever will automatically release. Closing and locking are carried out automatically. Heed the "+" (Fig.) position! Connect the breakaway cable and electrical plug to the towing vehicle. Raise the jockey wheel up fully and secure by firmly clamping it. Release parking brake before setting off.

**Visual check: the ball-head should no longer be visible in coupled condition.**

#### Uncoupling:

Lower the jockey wheel down. Disconnect breakaway cable and electrical plug. Pull lever H vigorously upwards in the direction of the arrow and hold. Wind down jockey wheel and lift the trailer off the ball-head of the towing vehicle. Secure the trailer by means of a wheel chock and/or by applying the parking brake.

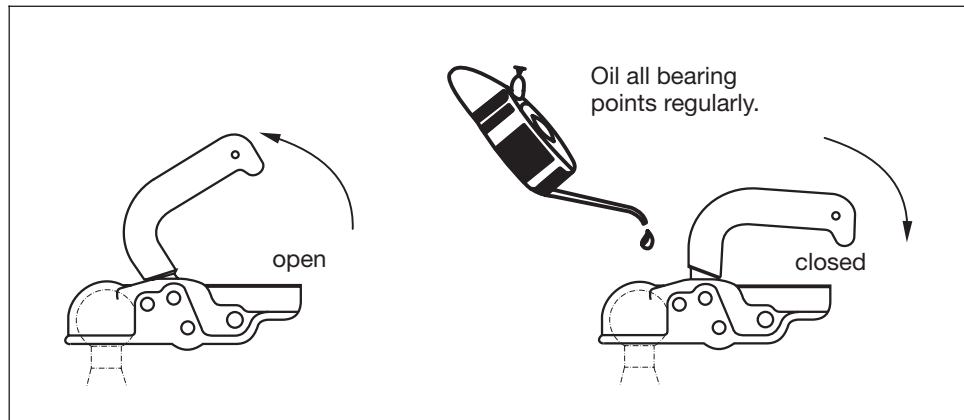
## Handling (Operation)

### Uncoupling and coupling

Note: The handle of the ball hitch and the handbrake lever must not be used as a manoeuvring aid. There is a risk of damage to the internal components!

The coupling head (ball-head hitch) on your BPW chassis is design-tested. The maximum load supported at the coupling point must be complied with. Lower the jockey wheel to the ground. Reverse the car up to the trailer or, in the case of a small trailer, manoeuvre the trailer up to the car's trailer coupling.

### “Winterhoff” Coupling head



#### Coupling:

Mount open ball-head hitch on the ball and press downwards until the operating lever is horizontal to the ball-head hitch. Connect the breakaway cable and electrical plug to the towing vehicle. Wind the jockey wheel up fully and secure by firmly clamping it. Release parking brake before setting off.  
**Visual check: the ball-head should no longer be visible in coupled condition.**

#### Uncoupling:

Lower the jockey wheel down. Disconnect breakaway cable and electrical plug. Open the ball-head hitch by swinging the operating lever in the direction of travel and lift up off the ball. Secure the trailer by means of a wheel chock and/or by applying the parking brake.

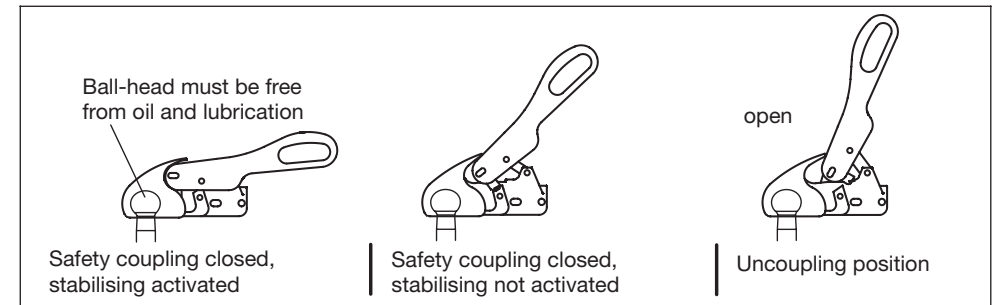
## Handling (Operation)

### Uncoupling and coupling

Note: The handle of the ball hitch and the handbrake lever must not be used as a manoeuvring aid. There is a risk of damage to the internal components!

The coupling head (ball-head hitch) on your BPW chassis is design-tested. The maximum load supported at the coupling point must be complied with. Lower the jockey wheel to the ground. Reverse the car up to the trailer or, in the case of a small trailer, manoeuvre the trailer up to the car's trailer coupling.

### Winterhoff safety coupling “WS 3000 D”



#### Coupling:

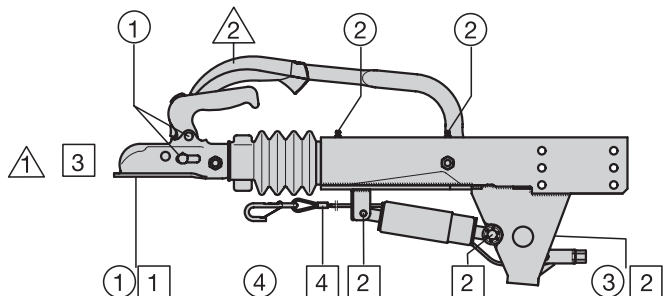
Place the open ball-head hitch on the ball-head of the towing vehicle (grease-free). If pressed simultaneously downwards - usually the support load is sufficient - the ball-head is closed automatically and locked securely. The stabilising device is activated by moving the operating lever down to the stop, i.e. opposite of direction of travel. In doing so the spring element is tensioned, thus generating via the friction elements the contact pressure force onto the ball-head of the coupling. Connect the breakaway cable and electrical plug to the towing vehicle. Raise jockey wheel fully upwards and secure. Release parking brake before setting off.

**Visual check: the ball-head should no longer be visible in coupled condition.**

Noises may occur during driving as a result of friction between the elements and the ball hitch. However, these noises do not have any effect on the function of the trailer ball hitch.

#### Uncoupling:

Lower the jockey wheel down. Disconnect breakaway cable and electrical plug. Lift the operating lever in opposite travel direction to the open position. Lift the safety coupling. Secure the trailer by means of a wheel chock and/or by applying the parking brake.



### Lubrication and maintenance work

For detailed description see pages 9 - 11

### Function test

- ⚠ Check coupling.
- ⚠ Apply the handbrake lever and observe the linkage.

### Lubricate

- ① Lubricate the coupling head.
- ② Drawbar bearings at the housing of the overrun hitch.
- ③ Oil or grease brake lever.
- ④ Oil or grease moving parts such as bolts and joints.

### Maintenance work

- ① Overrun hitch function check.
- ② Check drawbar, handbrake lever, spring actuator, reversing lever, linkage and all movable parts for ease of movement.
- ③ Check permitted vertical play.
- ④ Check safety cable for damage.

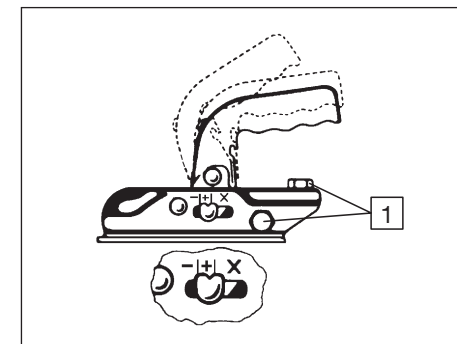
	prior to each run	Every 10000 - 12000 kilometres or annually
⚠	△	
⚠	△	
①		○
②		○
③		○
④		○
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③		□
④		□

### Function test

#### ⚠ Check coupling head

– prior to each run –

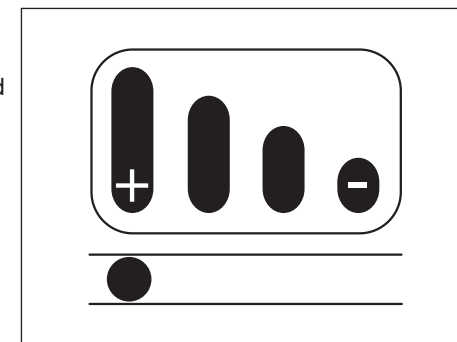
Check coupling head for wear and correct operation.  
Check the wear indicator (use within the "+" range only).  
Check the coupling head fastenings (see item 1) at regular intervals for firm seating.



#### Safety coupling Winterhoff "WS 3000 D"

##### Checking the stabilising facility

The condition of the friction linings can be checked after coupling and activating the stabilising facility. The name plate attached to the operating lever shows a triangle marked with +/- signs parallel to the slot in the lever which runs in the direction of travel. The ball-head hitch is factory set so that the head of a pin visible in the slot lies beside the triangle side marked with the + sign.



#### ⚠ Apply the handbrake lever and observe the linkage.

– prior to each run –

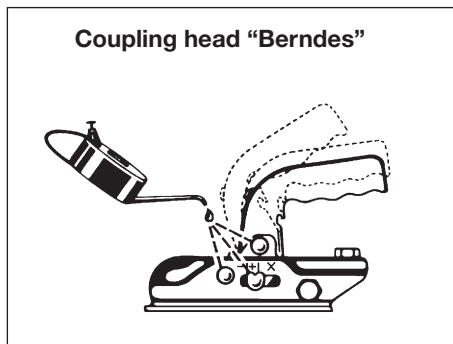
## Lubrication work

- ① **Lubricate the coupling head**  
 – every 10,000 - 12,000 kilometres or annually –

Oil ball hitch at regular intervals at the specified locations and moving parts. Grease the contact surface of the ball of the towing vehicle.

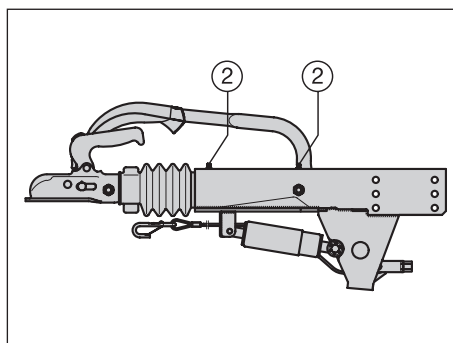
**Caution:**

If safety couplings are used (e.g. Winterhoff "WS 3000 D") the connection hitch / trailer must be free of grease and oil.



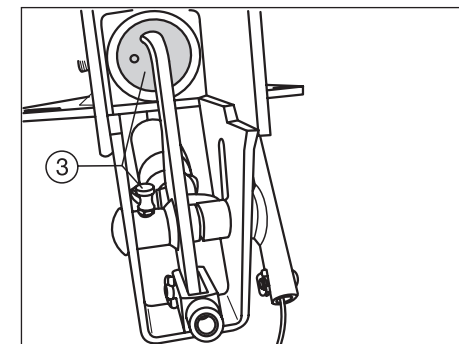
- ② **Pull rod bushes on the housing of the overrun hitch**  
 – every 10,000 - 12,000 kilometres or annually –

Apply general purpose grease via the grease nipples.



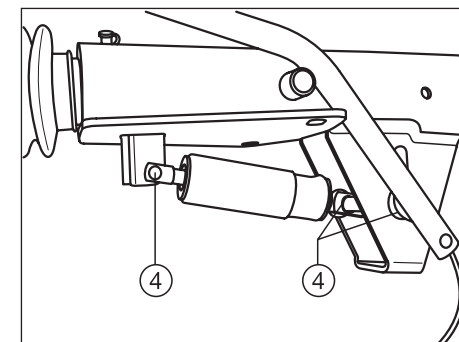
- ③ **Reversing lever**  
 – every 10,000 - 12,000 kilometres or annually –

Check reversing lever for ease of motion. If fitted, apply general purpose grease via the grease nipple until fresh grease can be seen emerging from the bush. If grease nipples are not fitted, then apply oil to the reversing lever bush. Lubricate the contact surface between the steering lever and the push rod plate.



- ④ **Moving parts such as bolts and joints to be oiled or greased.**  
 – every 10,000 - 12,000 kilometres or annually –

All moving parts of drawbar, handbrake lever, spring actuator, reversing lever, linkages etc. to be oiled or greased as required.

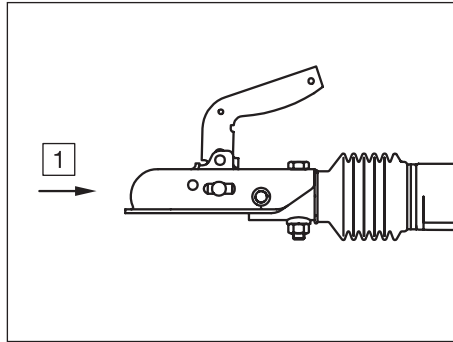


## Maintenance work

### 1 Overrun hitch function check

– every 10,000 - 12,000 kilometres or annually –

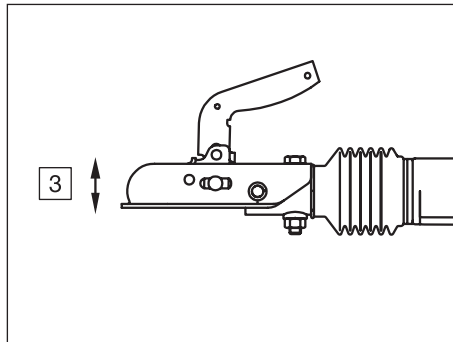
Press the hitch against the gas spring. The pull rod must automatically return to its initial position.



### 2 Check drawbar, handbrake, lever, spring actuator, reversing lever, linkage and all movable parts for ease of movement

– every 10,000 - 12,000 kilometres or annually –

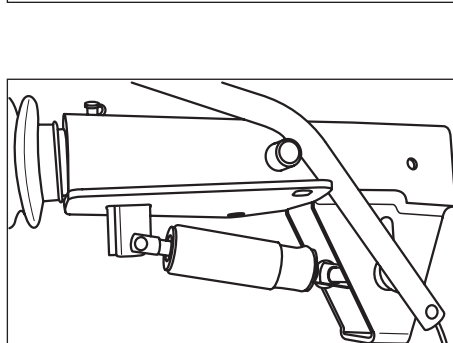
Check all parts can move freely.



### 3 Check permitted vertical play

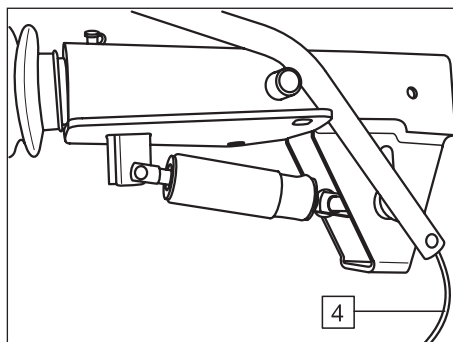
– every 10,000 - 12,000 kilometres or annually –

Check the ball hitch for vertical play. The vertical play measured at the ball head must not exceed 3 mm.



### 4 Check safety cable for damage.

– every 10,000 - 12,000 kilometres or annually –



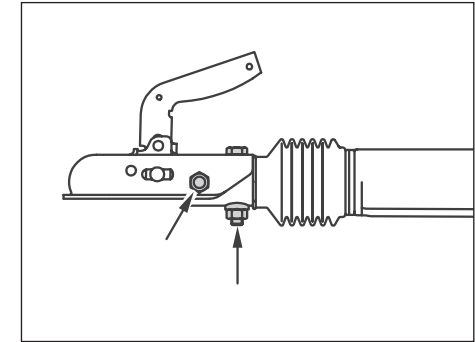
## Changing the ball hitch or the towing eye

**Only to be performed by a specialist workshop**

### Dismantling:

When renewing the towing eye or ball hitch, unscrew the locknuts and pull out the bolts (arrows).

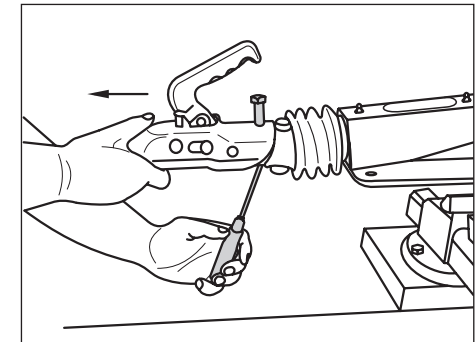
The hitch can now be removed and the reinforcement tube, if fitted, can be pulled out of the pull rod.



### Ball hitch installation:

Use a screwdriver or a drift to line up the rear hole in the pull rod with the bush in the overrun damper.

Install the ball hitch with bolt.

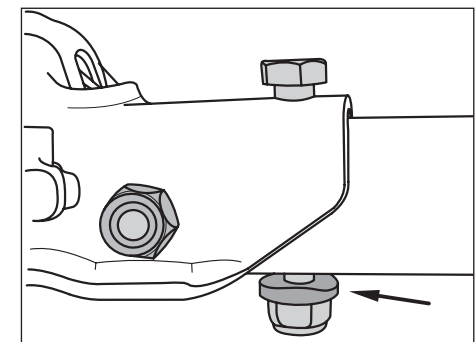


### Towing eye installation:

Install the towing eye with bolts and shims.

Install shim and locknut. Make sure the shim is in the right place (arrow). Install the front bolt, screw on a new locknut and tighten both locknuts to a specified tightening torque of 80 – 90 Nm.

Pull the bellows over the screw connection.



## Removing the overrun damper and the pull rod

Ensure trailer is securely chocked.  
Disconnect brake linkage.  
To facilitate handling, we recommend unscrewing the overrun hitch from the chassis and securing it in a vice.  
The ball hitch or towing eye must be removed in order to remove the overrun damper (see page 13).

If the overrun hitch has a towing eye, remove the rear bolt of the pull rod.

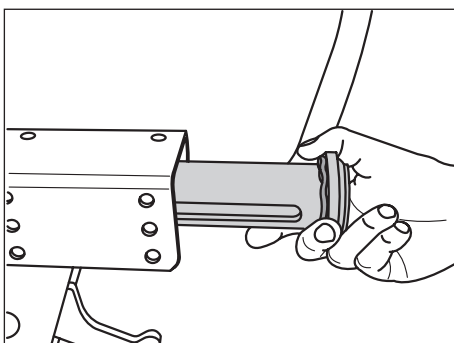
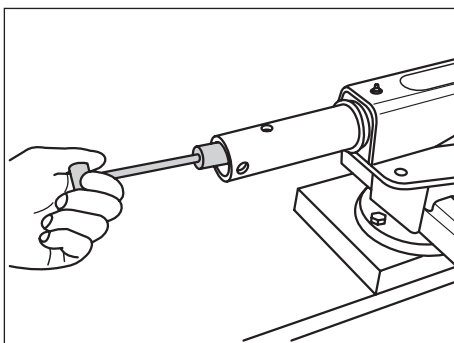
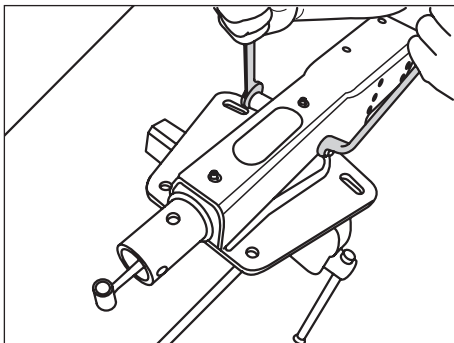
Push in the pull rod.

Unscrew the locknut from the bolt and pull out.

Pull the overrun damper out of the pull rod.  
Check the overrun damper for wear and leaks and replace it if necessary.

To change the pull rod, it is necessary to remove accessories (e.g. jockey wheel holder) that are installed in the rear part of the overrun hitch!

Pull the pull rod and bump stop (corrugated ring) backwards out of the housing.  
Check the bump stop and the pull rod for damage and wear and replace them if necessary.



## Installing the overrun damper and the pull rod

Before installing, apply grease to the pull rod (1) and push it from the rear into the housing with the tightening damper until the slot in the pull rod lines up with the hole in the housing.

Insert the threaded bolt for locking, push the pull rod backwards and pull the threaded bolt out again.

Guide the overrun damper into the pull rod with the pressure body foremost until the rear overrun damper eye lines up with the slot in the pull rod and the hole in the housing.  
Grease the pull rod via the grease nipple.

Install the threaded bolt, screw on a new locknut and tighten to a specified tightening torque of 30 – 40 Nm.

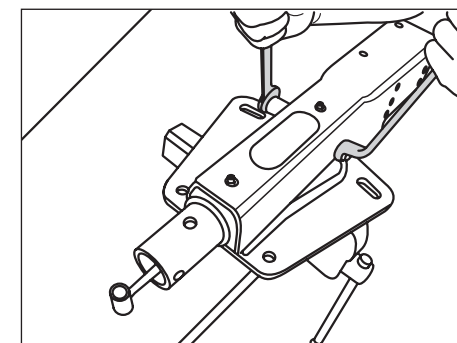
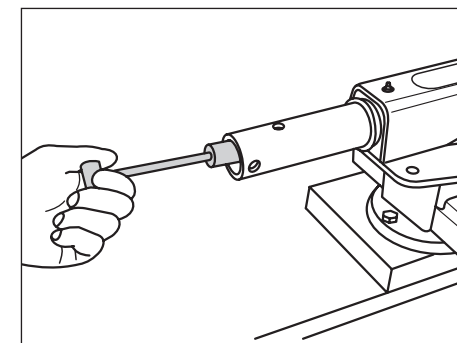
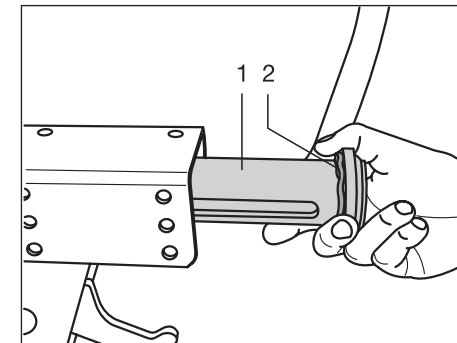
Pull the pull rod forwards out of the housing.  
Fit the bellows.

Overrun hitch with towing eye:

Use a screwdriver or a drift to line up the rear hole in the pull rod with the bush in the overrun damper.

Push through the bolt and install a new locknut. Tighten the locknut to the specified tightening torque of 30 – 40 Nm.

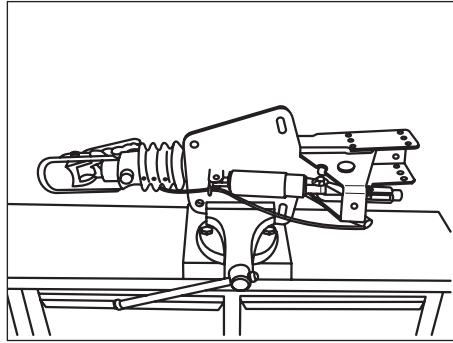
Install the hitch, see page 13.





## Removing the spring-type actuator

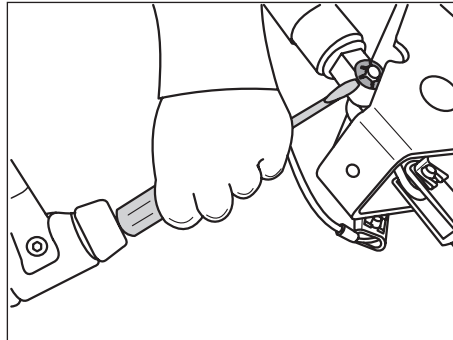
Ensure trailer is securely chocked.  
Disconnect brake linkage.  
To facilitate handling, we recommend unscrewing the overrun hitch from the chassis and securing it in a vice.



Remove the locking washer from the driver of the handbrake lever.

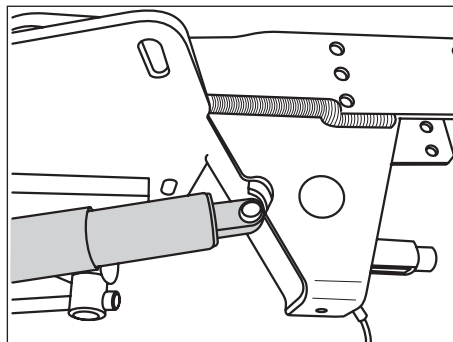
Move the handbrake lever in the operating direction (guide the handbrake lever).  
Pull down the bolt lock of the bolt attaching the spring-type actuator at the front and remove the bolt.

Pull the spring-type actuator out of the front fastening clip.



Move the handbrake lever to the released position.  
The spring-type actuator can now be removed.

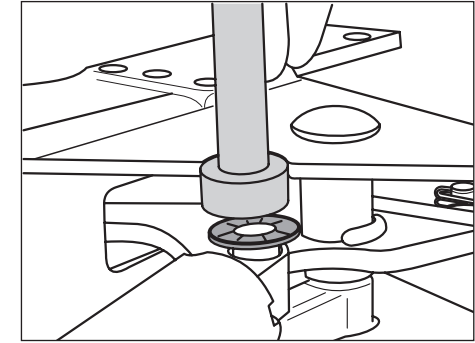
**Danger of accidents!**  
**Do not dismantle the spring-type actuator.**



## Installing the spring-type actuator

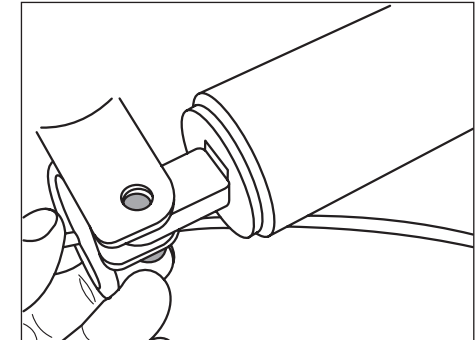
Push the spring-type actuator onto the driver of the handbrake lever.

Push on the locking washer and drive it onto the driver using BPW assembly tool 12.102.00.010.



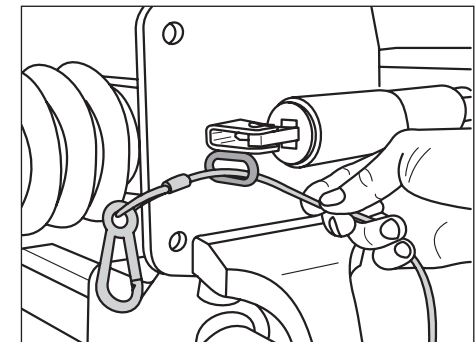
Pull the handbrake lever backwards until the front spring-type actuator eye lines up with the hole in the clip.

Fit the bolt and secure it with the bolt lock.



Check the safety cable for damage and replace it, if necessary.

Install the safety cable through the cable guide from the rear.

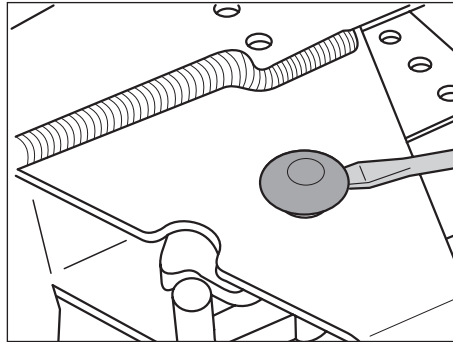


## Removing the handbrake lever

The spring-type actuator must be removed in order for the handbrake lever to be removed, see page 16.

Lever the locking washer and embellisher plate off the bolt of the handbrake lever.

Pull the handbrake lever down through the keyhole and remove it with the steering lever.



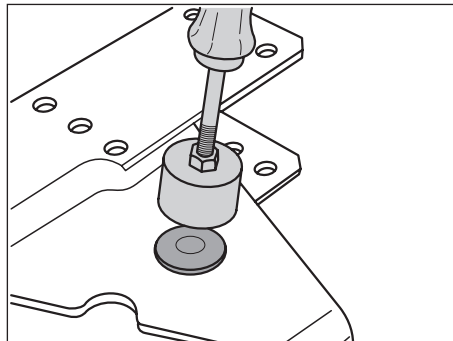
## Installing the handbrake lever

Insert the handbrake lever from below through the keyhole.

Push on the steering lever and push the handbrake lever through as far as the stop.

Move the handbrake lever to the released position.

Press the locking washer and embellisher plate onto the bolt of the handbrake lever and secure by striking with BPW assembly tool no. 12.102.00.011.



Install the spring-type actuator as described on page 17.

## Re-adjustment of the brake linkage

### Wheel brake

- every 2,000 - 3,000 kilometers of travel -

Jack up the trailer. Release the overrun hitch and handbrake lever and brake linkage (free from tension).

Lock the reversing cam of the wheel brake from the outside by means of a locking pin (item A, pin Ø 4 mm) through the backplate.

Using a screwdriver (item b) rotate adjuster wheel (item c) or with an 8 mm spanner turn hex. adjuster until the wheel locks in the forward direction of travel.

Activate the parking brake several times to centralise the brake shoes.

**Version 1:** Turn hex. adjuster anti-clockwise until wheel is running free in forward direction of travel (approx. 1 full turn).

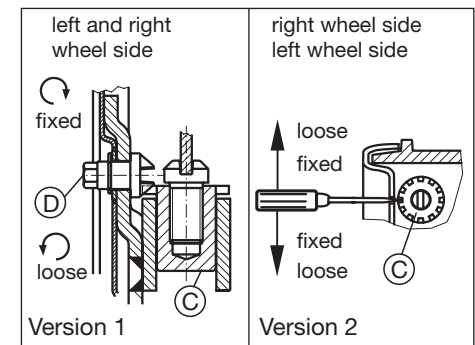
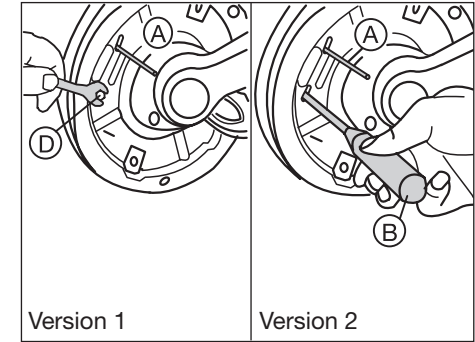
**Version 2:** Rotate adjuster wheel approx. 3-5 teeth until wheel is running free in forward direction of travel.

With parking brake activated check equaliser bar is at right angles to brake rod. It may be necessary to readjust the brakes or adjust length of brake cables (screw clevis in/out as required).

To test, partially apply parking brake and check for similar brake torque on all wheels (in forward direction of travel).

### Caution:

Remove 4 mm locking pin from reversing cam. If the locking mechanism is not removed, there is a danger of accidents due to failure of the brake to operate when reversing.



## Setting the brake linkage

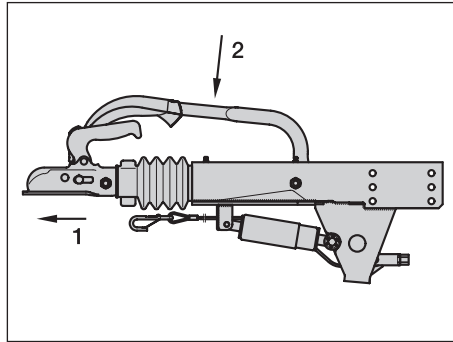
Make sure the wheel brake is correctly set in accordance with the relevant BPW installation instructions.

Set the handbrake lever (1) to the released position.

Pull the pull rod (2) of the overrun hitch out forwards as far as the stop.

Install the brake cables.

Use the thread lengths of the linkage and the brake cables to even extents. The equaliser must be aligned at right angles to the brake linkage.



Tighten the setting nut (3) (according to version) or turnbuckle (4) until the cable strands are tensioned.

Tighten the handbrake lever manually several times to 200 N to 300 N and return to the released position (2).

Operate the setting nut (3) (according to version) or turnbuckle (4) until the cable strands are slightly tensioned.

**Important: The wheel brakes are not allowed to be pre-expanded.**

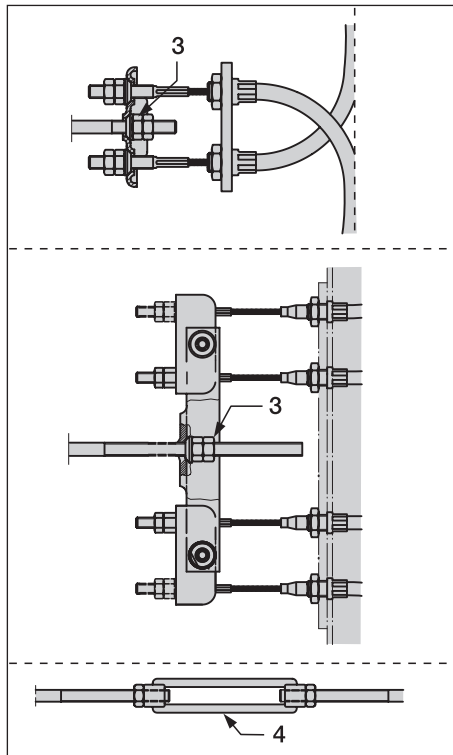
When doing this, ensure that when the trailer is removed from supports, the transmission linkage is set without play or force on the clamp lock or the counterweight.

Tighten all locknuts on the transmission device and recheck that they are firmly seated.

### Tightening torques for locknuts

Thread	Tightening torque M ±10 % (Nm)
M 8	M = 12 Nm
M 10	M = 24 Nm
M 12	M = 40 Nm

**Important: Hold the brake linkage in position when tightening the locknuts!**



## Operating Instructions

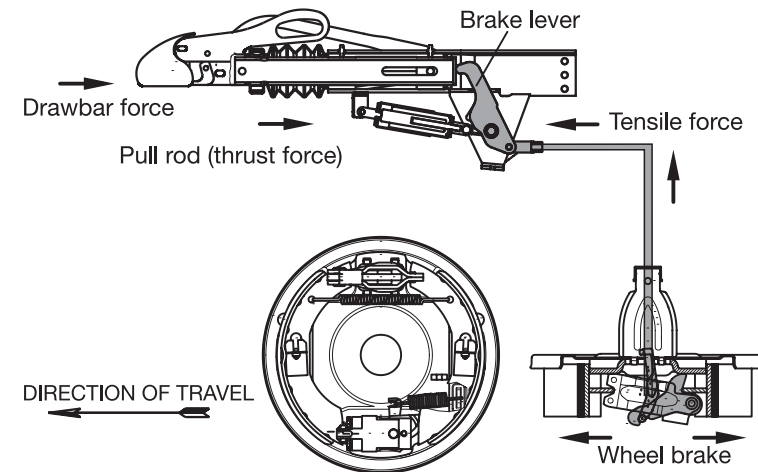
### BPW Overrun brake systems

The BPW overrun brake system consists of a BPW towing hitch, wheel brakes and transmission devices.

The BPW wheel brake "-7" permits easy changing from forward to reverse travel. After each change the system is again immediately ready for operation.

### Overrun devices

BPW towing hitches are mechanical devices with a gas-pressure-supported hydraulic shock absorber. The drawbar force (thrust force) generated by the braking of the towing vehicle results in the insertion of the pull rod after the response threshold has been overcome. The thrust force is converted by the reversing lever into tensile force which activates the wheel brakes through the transmission device.



BPW connecting assemblies in series ZAF-2 are equipped with a over-centre handbrake lever with a spring-type actuator as parking brake system.

In these versions, the handbrake lever must be pulled tight with a 400 – 600 N operating force as far past the TDC position as possible.

The spring forces provide adequate braking even when the actuation travel is increased by the automatic reversing operation. It must be noted that, with the parking brake activated, the vehicle can roll back about 30 cm until the braking force takes full effect.