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Drawbar ball coupling with stabilising facility type: WS 3000 design: D, EC No. 00-0065 e1, ABG No. F 4198
H, EC No. 00-0337 e1

Assembly and operating instructions

1. Technical features

1.1 The drawbar ball coupling WS 3000 D is suitable for use on central axle drawbar trailers with an admissible total weight of 2700 kg, an actual minimum weight of the trailer of 200 kg upwards and an admissible static support load on the coupling point of 150 kg. In contrast to these specifications, the WS 3000 H has the following features: admissible total weight: 2000 kg, admissible static support load on the coupling point: 100 kg.

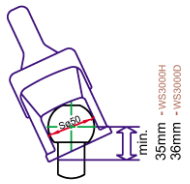

Fig. 1: Ball tow bar of towing vehicle

1.2 The drawbar ball coupling is fitted with spring-loaded friction linings which enclose the coupling ball of the towing vehicle from the front and behind. Pitching and swerving motions of the trailer are thus reduced or totally prevented.

Optimum cushioning is achieved with new friction linings after a certain run-in period. During travel, noises may occur owing to friction between the linings and the coupling ball but they do not impair the functioning of the drawbar ball coupling.

1.3 The drawbar ball coupling WS 3000 can only be used together with coupling balls to DIN 74058 / ISO 1103 if the ball neck is free from attachment parts within a range of 35 mm in the case of the WS 3000 H, or within a range of 36 mm in the case of the WS 3000 D (Fig. 1).
It is not permitted to use the WS 3000 in conjunction with ball pins with a screw attachment without an additional positive-connection device (Fig. 2).

2. Assembly

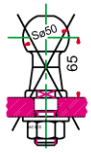

Fig. 2: Ball pin, screwed

2.1 The drawbar ball coupling WS 3000 is supplied for the drawbar connection diameter of 50 mm. The shims are packed separately for the following different connection diameters:

Diameter 46 mm	Shim i = 2.0 mm
Diameter 45 mm	Shim i = 2.5 mm
Diameter 40 mm	Shim i = 5.0 mm
Diameter 35 mm	Shim i = 5.0 and i = 2.5 mm

The WS 3000 H is supplied for a drawbar connection diameter of 46 mm.

2.2 The drawbar ball coupling can be mounted with a longitudinal ①+② or cross ①+③ screw connection and the hole spacings of 40/50/54 mm. The drawbar ball coupling WS 3000 H can be mounted with cross ①+③ screw connection and a hole spacing of 40 mm. The attachment material is included in the scope of delivery and is to be used as follows (Fig. 3):
WS 3000 D:
Hexagon head screw M12 x 95 with washers on both sides and self-locking nut for slot ①;
hexagon head screw M12 x 90 with self-locking nut for second bore for longitudinal connection ②,
hexagon head screw M12 x 80 with self-locking nut and cross ③ screw connection.

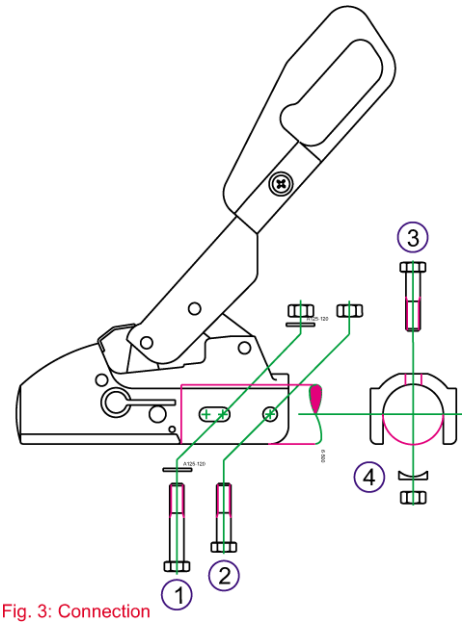

Fig. 3: Connection

WS 3000 H:
Hexagon head screw M12 x 80 with self-locking nut for bore ①+③.
Assembly the fixing screw ③ screw with the stop (4). The stop is not included in the scope of delivery.
Self-locking nuts may only be used 1x.
Tightening torque for hexagon head screws M 12, 10.9:
WS 3000 H - 80 Nm min.
WS 3000 D - 100 Nm min.

2.3 If the drawbar ball coupling WS 3000 is used to replace a different coupling type, care must be taken with overrun assemblies to ensure that the shock absorber is mounted again correctly and any spacer tubes in the drawbar are installed correctly. Please use the bolts supplied with a diameter of 12x34mm or 12x49mm, depending on the diameter of the drawbar. Use the bolts to back up the fixing screw ② or ③ (Fig. 3), depending on the way in which the shock absorber is mounted, and leave the bolts in the drawbar when mounting the drawbar ball coupling in order to center the shock absorber. Remove the bolts again when pushing the fixing screw through.

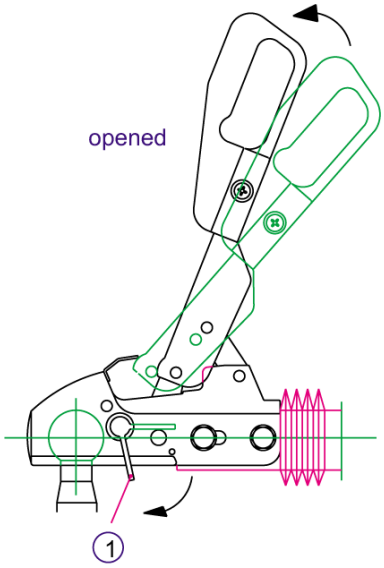

Fig. 4: Coupling position

2.4 In order to install the bellows supplied with the WS 3000 D, proceed as follows:
In the case of drawbar diameters of 40 ... 50 mm, simply push the bellows over the drawbar. In the case of diameters of 60 ... 70 mm, use a knife, for instance, in order to cut the small connecting piece before the rubber lip. In the case of a cross screw connection, additionally cut out the lower, marked bore. In the case of a longitudinal screw connection, cut out both laterally marked bores.

3. Operating instructions

3.1 Coupling operation
The opened drawbar ball coupling is mounted on the coupling ball of the towing vehicle (Fig. 4).
Downward pressure - the supporting load is normally sufficient - makes the drawbar ball coupling and the locking device ①engage automatically.

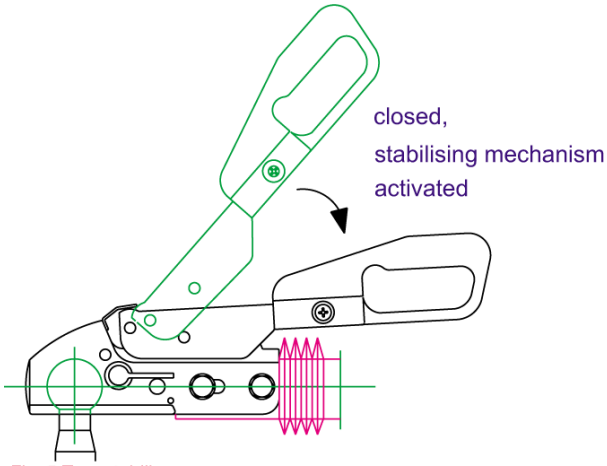

Fig. 5 Turn stabiliser on

3.2 Activating the stabilising mechanism
To this end the operating lever must be moved out of the closed position fully downwards (Fig. 5). This applies a load to the spring assembly which generates the pressing force through the friction elements onto the coupling ball. The operating lever then lies roughly parallel to the drawbar axis. It is possible to travel without a stabilising mechanism, and under certain road conditions, e.g. ice and snow, may be even desirable.

3.3 Switching the stabilising facility off
Slowly move the operating lever upwards to switch off the stabilising feature (Fig. 6).

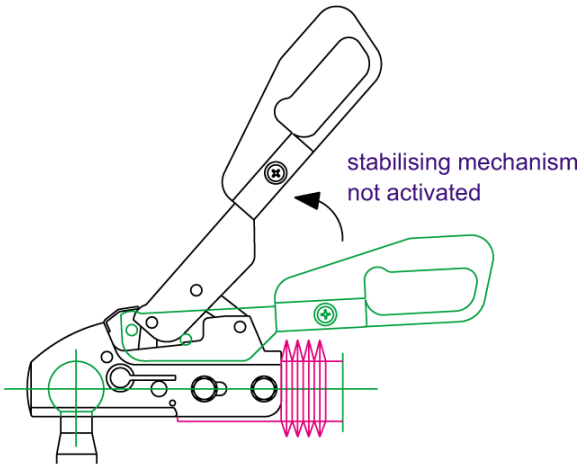

Fig. 6: Stabilising facility switched off

3.4 Uncoupling operation
Press locking device ① down fully and hold it there until the operating lever has been moved upwards into the opened position (Fig. 4). After the light connector and safety cable have been detached, the trailer can be uncoupled from the towing vehicle, e.g. using a drawbar running wheel.
It is recommended for a prolonged period out of use to park the trailer with the drawbar ball coupling closed. Lift the opened operating lever (Fig. 4), and at the same time pull the ball pan (moving element with a friction surface - Fig. 8) forward, and slowly close the drawbar ball coupling.

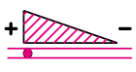

Fig. 7: Wear indicator

3.5 Checking the stabilising facility

After coupling and activating the stabilising facility, the condition of the friction linings can be checked. The nameplate 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 (Fig. 7). The drawbar ball coupling is set at the works so that the head of a pin visible in the slot lies beside the triangle side marked with the +/- signs.

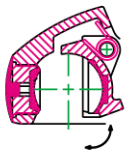

Fig. 8: Arrangement of the friction linings

3.6 Anti-theft device:

The WS 3000 drawbar ball coupling can be fitted with the ROBSTOP WS anti-theft device, with the WS LOCK or with the DISKUS WS protection device.

4. Maintenance

4.1 Coupling ball ∅ 50 mm on the towing vehicle

It should be dimensionally stable, undamaged, clean and free of grease. In the case of coupling balls coated with dacromete-coated (mat-silver corrosion protection coat) and painted coupling balls, use emery paper, grain size 100-120, in order to remove the coat completely, so that accumulation of the coating on the surface of the friction line is not possible.
A damaged or dirty coupling ball results in increased wear to the friction linings, a greased or coated coupling ball reduces the stabilising action considerably.
Thinners or spirits, for example, are suitable for cleaning the ball.

4.2 Drawbar ball coupling

The interior of the drawbar ball coupling around the friction linings is to be kept clean and free of grease (Fig. 8). All the moving bearing parts and pins are to be oiled slightly. Regular maintenance and care will extend the service life and increase the functionability and safety of your WS 3000.

4.3 Replacing the friction lining

The front friction lining can be changed in the event of wear. For this purpose we supply a replacement set containing the following parts:
1 screw with glued-on friction lining
1 setscrew M8
and 1 key each for the socket head screws 4/10 mm
Please observe the detailed assembly notes in the replacement set.
The dimensions of the rear friction lining are large enough, so that replacement of this lining is not necessary.

4.4 Driving noise:

When the vehicle is in motion, friction between the linings and the coupling ball may cause noise which is, however, irrelevant for the function of the drawbar ball coupling.
Noise can also be caused by:

- Accumulation of dirt between friction lining and coupling ball
- Dry running of the drawbar / tow bar in the bushes of the overrun assembly
- Removable coupling balls at the towing vehicle.

Remedy:
Maintenance of coupling ball / drawbar ball coupling in accordance with sections 4.1/4.2.
In the case of dry running of drawbar / tow bar, grease the bushes by means of the grease nipple, and remove the bellows in order to grease the exposed drawbar.
Regrease the removable coupling ball at the interlocking mechanism (see the operating instructions for the trailer).