

Installation- and operation instructions for automatic trailer coupling Ringfeder type 2020, only suitable for connection with drawbar eyes 40 acc. to DIN 74054 or drawbar eyes 40mm ISO 8755 or drawbar eyes class S acc.to directive 94/20 EC with the same dimensions.

EC – type approval: e1 00 – 1494

Technical data, approved values:

Automatic drawbar coupling of class S, Bulged coupling bolt , diameter 38 mm, Version 120x55 and version 83x56

Adm. D-value 30 kN , Adm. Dc-value 30 kN , Adm. stat. Vertical load 350 kg, Adm.V-value 18 kN, **see special using**

Using of the coupling for a D-value or Dc-value exceeding 18 kN:

Using of the coupling type 2020 for a D-value or Dc-value exceeding 18 kN is only permitted for such vehicles for which the use of bigger jaw-dimensions is impossible due to technical reasons and if, furthermore, there are special circumstances such as visual aids for ensuring safe execution of the automatic coupling procedure

or , if the use is restricted for connection to centre axle trailers up to 3,5 tonnes maximum permissible mass.

Fitting to the vehicle: (only to be carried out by a professional workshop)

When fitting (replacing) the trailer coupling please attend to the relevant statutory regulations and the particular information from the vehicle manufacturers. The installation of the mechanical coupling device to the vehicle is to be done in accordance with the requirements given in Annex VII of the directive 94/20 EC.

The automatic trailer couplings Ringfeder type 2020 are complete mounted and must be fitted with 4 hexagonal screws min quality 8.8 and 4 safety nuts min. quality 8 to the truck or trailer onto a plane plate at the vehicle with a flange size 120x55 or 83x56. Under nuts and screw heads you have to use washers DIN 125, hardness min. 200 HV. Alternatively to that you can use flange screws and safety flange nuts.

Type	version	flange size	thread	quality	tightening torque
2020	120x55	120x55	M14	8.8	135 Nm
2020	83x56	83x56	M10	8.8	49 Nm

Always attend to screws and nuts qualities given by the vehicle manufacturers, that may possibly deviate from the present specifications!

Operation:

Coupling and uncoupling must be done acc. to the regulation to avoid accidents. To avoid getting in trouble, coupling and uncoupling should be done on plane streets.

Drawbar eyes on the trailer to be connected: drawbar eyes 40 DIN 74054 or drawbar eyes 40mm ISO 8755 or drawbar eyes class S acc. to directive 94/20 EC with the same dimensions

Coupling

Make sure, that the trailer is braked. Adjust drawbar eye to the highness of the trailer coupling.

Pull hand wheel of the bolt- safety device (10) of the trailer coupling outwards and turn it then clockwise until it stops. To open the coupling Move the handle (3) upwards until it engages . Now the coupling bolt (8) is on top, the coupling is ready to be connected. Drive back the truck slowly.

When inserting the drawbar eye the coupling mechanism is released by lifting the coupling bolt. The coupling bolt slips through the drawbar eye bush and is automatically double secured in its lowest end position in the hole of the bottom guide bush (wear plate 13) by the locking lever (7) blocking up against the bevel of the coupling bolt and by the locking pin (14) of the bolt- safety device located over the coupling bolt. After each coupling process you have to check, if the bolt-safety device is completely inserted, which is perceptible (also by touch control) by the end plane of the locking pin is flush with the end plane of the housing of the bolt-safety device. Only in this working condition the trailer coupling is closed and double secured (see figure) so that the trailer may be operated.

If the locking pin of the bolt- safety device protrudes over the housing of the bolt-safety device the trailer coupling is not closed and secured and the coupling procedure must be repeated.

Uncoupling

Make sure, that the trailer is braked. Make sure, that the trailer cannot roll forward or backwards. (Support drawbar of centre axle trailer by landing gears). Pull hand wheel of the bolt-safety device of the trailer coupling outwards and turn it then clockwise until it stops. To open the coupling move the handle upwards until it engages. Now the coupling bolt is on top, the coupling is ready for uncoupling.

The vehicles can become separated by driving the truck forwards. By driving out the drawbar eye the coupling mechanism is released again by lifting the coupling bolt and the coupling closes automatically.

Maintenance:

On every inspection and in regular intervalls the trailer coupling should be checked for wear. If the wear limits indicated below should be exceeded the specific parts have to be replaced by new ones.

The movable parts of the coupling will be subject to less wear if they are always kept well lubricated. In particular after cleaning with high – pressure washers the coupling has to be lubricated. (Over grease nipple when the coupling is opened, opened to avoid trouble of function by over-lubrication, additionally the movable parts of the bolt-safety device)

Checking of wear: Coupling bolt in its bulged area (min 36,5mm), Clearance of the coupling bolt in the bore hole of the wear plate (max. 2mm) , Axial play of the coupling bolt (max. 5mm) , Distance between top of the coupling bolt and wear plate (max 27mm)

Repair:

Repair works may only be carried out by professional workshops and scilled personnel!

Before any repair works started the coupling must be closed!

Mounting criteria for fitting or replacement of an automatic bolt coupling with EC type approval in accordance with the directive 94/20 EC

When fitting the trailer coupling please attend to the relevant statutory regulations.

The trailer coupling may only be fitted on those vehicles being appropriate for the purpose.

Always attend to the construction regulations/instructions from the vehicle manufacturers.

Fitting of the trailer coupling on the vehicle has to be made in accordance with the pertaining installation and operating instructions from the manufacturer and in compliance with the requirements laid down in appendix VII of the directive 94/20 EC.

Rear drawbeam must not show any incipient cracks or fissures (in particular when these are adjacent to bores).

It has to be safeguarded that the trailer coupling is sufficiently designed for the towing vehicle and that restrictions, if any, are observed.

The EC type approval mark and the approved characteristic values for the trailer coupling as well as the application range are to be taken from the particulars on the manufacturers plate and from the pertaining installation and operating instructions.

The specifications of the towing vehicle necessary for dimensioning the trailer coupling may be taken from the vehicle manual.

Calculation of admissible trailer load of the coupling to be mounted

Full trailer

The permissible trailer load R of the trailer coupling for operation with full trailers (trailers where the drawbar is free to move in the vertical plane) is calculated by the formula for the D-value:

$D = (g \times T \times R) / (T + R)$ or by:

$R = (T \times D) / ((g \times T) - D)$ (if D is less than $g \times T$)

where:

R = technically permissible maximum mass in tonnes of the full trailer (trailer cross weight)

T = technically permissible maximum mass in tonnes of the towing vehicle

D = theoretical reference force in kN for the horizontal force between towing vehicle and trailer

$g = 9.81 \text{ m/s}^2$ (acceleration due to gravity)

Rigid drawbar trailer/centre axle trailer

The permissible trailer load of the coupling device for operation with rigid drawbar trailers/centre axle trailers (i.e. trailers equipped with a rigid drawbar which transmit vertical loads) is calculated by the formula for the Dc value:

$D_c = (g \times T \times C) / (T + C)$ or by

$C = (T \times D_c) / ((g \times T) - D_c)$ (if Dc is less than $g \times T$)

where:

C = sum of the axle loads of the centre axle trailer carrying maximum permissible load (permissible trailer load for rigid drawbar trailers/centre axle trailers) in tonnes

T = technically permissible maximum mass in tonnes of the towing vehicle

Dc = theoretical reference force in kN for the horizontal force between towing vehicle and rigid drawbar trailer/centre axle trailer

$g = 9.81 \text{ m/s}^2$ (acceleration due to gravity)

and by

$C = V/a$ (with S up to 1000 kg)

where:

$a = 1.8 \text{ m/s}^2$ for towing vehicles with air suspension on the rear axle

$a = 2.4 \text{ m/s}^2$ for towing vehicles with other suspension on the rear axle (e.g. leaf spring)

V = V-value of the trailer coupling to be mounted in kN

S = permissible static vertical load at the coupling point in kg

The lower value each for C resulting from both calculations is decisive as a value for the permissible trailer load of rigid drawbar trailers/centre axle trailers for the trailer coupling to be mounted.

Mounting of the drawbar coupling on the vehicle type has to be made in accordance with the requirements defined in annex VII of the directive 94/20 EC as described below

Easy and safe coupling operation

Drawbar couplings must be mounted on the vehicle type in such a manner that they are easy and safe to operate. In addition to the function of opening (and closing, if applicable) this also includes checking the position of the indicator for the closed and secured position of the coupling pin and thus, of the drawbar coupling itself (by sight and touch).

In the area in which the person operating the coupling must stand, there must be no points of possible danger such as sharp edges, corners, etc. inherent in the design or they must be protected so that injury is unlikely. The way of escape from this area must not be restricted or barred on either side by any attached objects.

Accessibility of the drawbar coupling

The distance between the centre of the coupling pin and the rear edge of the vehicle body- work must not exceed 420 mm.

However, the distance of 420 mm may be exceeded if technical necessity can be demonstrated:

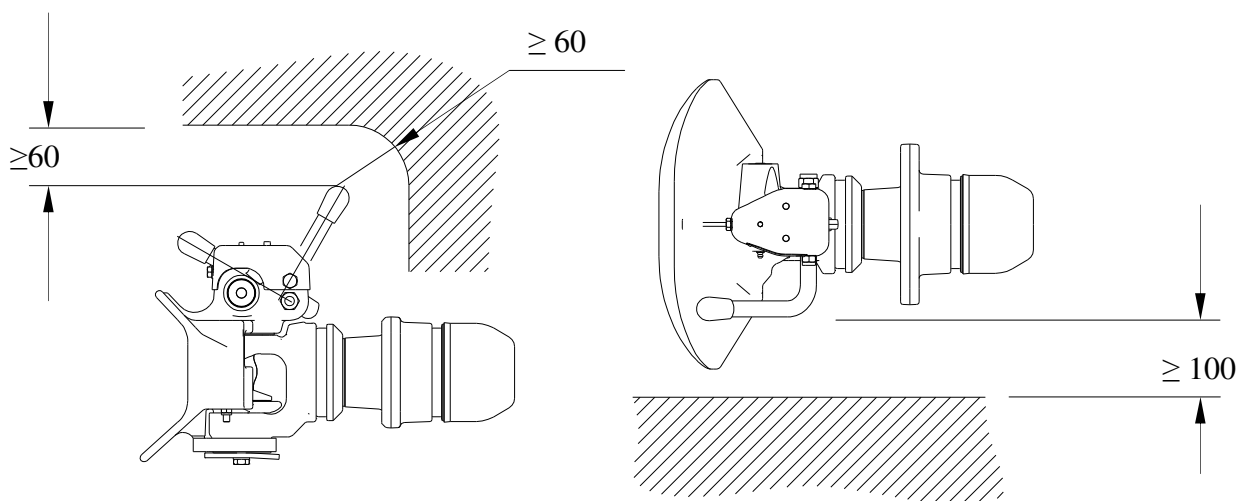
1. a distance of up to 650 mm for vehicles with tipping bodies or rear-mounted equipment;
2. a distance of up to 1 320 mm if the unobstructed height is at least 1 150 mm;
3. car transporters with at least two loading levels when the trailer vehicle is not separated from the towing vehicle in normal transport operation, provided easy and safe actuation of the drawbar coupling is not adversely affected.

Clearance for the hand lever of 60 mm and 100 mm, respectively

In order to permit safe operation of drawbar couplings there must be adequate free space around the hand lever.

The dimensions of clearance given below are regarded as sufficient.

The dimensions are also applicable as appropriate for drawbar couplings having hand levers pointing downwards or of a different design.



If one or more of these rules regarding easy and safe operation, accessibility or clearance for the hand lever cannot be met, a coupling with a remote control device must be used.



Anhängekupplung geöffnet:

Handhebel oben
Sicherungsstift steht über der Verriegelungshülse hervor

Drawbar coupling opened:

Handle up
Locking pin protrudes over the housing of the bolt-safety device



Anhängekupplung **nicht** geschlossen und gesichert!
Handhebel unten, jedoch Sicherungsstift steht über der Verriegelungshülse hervor

Drawbar coupling not closed and secured!

Handle down but locking pin protrudes over the housing of the bolt- safety device



Anhängekupplung vorschriftsmäßig geschlossen und gesichert:
Handhebel unten und Sicherungsstift schließt bündig mit der Stirnfläche der Verriegelungshülse ab.

Drawbar coupling closed and secured correctly:

Handle down and end plane of the locking pin is flush with the end plane of the housing of the bolt- safety device.