Configuration of drawbar assemblies
acc. to Directive 94/20/EC

The most important characteristic values for drawbar assemblies acc. to EC Directive 94/20EC are calculated as follows: The V value must be calculated in vehicle combinations with centre axle drawbar trailer and is defined as a theoretical comparative force for the vertical component of the thrust on coupling between towing vehicle and centre axle drawbar trailer (unit of measurement is kN).

The maximum permitted V values are stated for BPW connecting assemblies such as hitch blocks and drawbars. The smallest **V value** of all connecting assemblies used in a vehicle combination is decisive.

Mechanical connecting assemblies that transmit drawbar loads, such as drawbars and hitch blocks in centre axle drawbar trailers, must be marked with a maximum permitted **Dc value**.

Mechanical connecting assemblies that cannot transmit any drawbar load, such as drawbars and hitch blocks in turntable drawbar trailers must be marked with a maximum **D value**.

The V value can be calculated based on the vehicle data:

X = Length of the load bed of the trailer (mm)
L = Theoretical drawbar length (mm)
a = Vertical acceleration at connection point 1.8 m/s2 for towing vehicles with air suspension, 2.4 m/s2 for towing vehicles with other suspension
C = Total weight of the trailer

$$V = \left\{\frac{X}{L}\right\}^2 \cdot a \cdot C$$

The Dc value can be calculated as follows:
T = Gross vehicle weight rating of the towing vehicle in tonnes
C = Total weight of the trailer
g = 9.81 m/s2
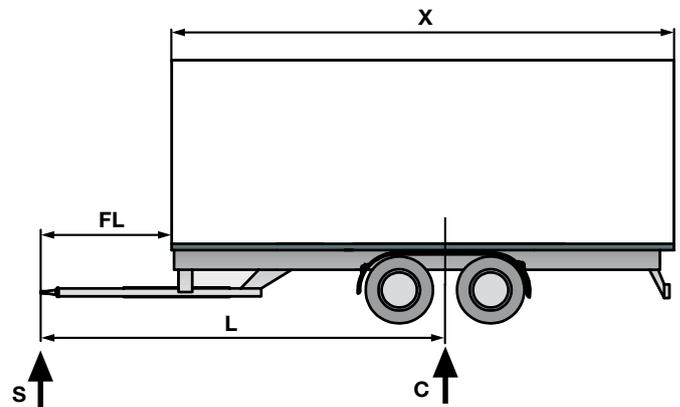
$$D_c = \left\{\frac{T \cdot C}{T+C}\right\} \cdot g$$

The D value can be calculated as follows:
T = Gross vehicle weight rating of the towing vehicle in tonnes
R = Gross vehicle weight rating of the turntable drawbar trailer in tonnes
g = 9.81 m/s2

$$D = \left\{\frac{T \cdot R}{T+R}\right\} \cdot g$$

Sample calculation for the configuration of a centre axle tractor/trailer combination

Total weight of the tractor vehicle	T = 20,000 kg
Vertical acceleration of towing vehicle with air suspension	a = 1.8 m/s2
Drawbar load	S = 1,000 kg
Total weight of the trailer	C = 18,000 kg
Length of the load bed of the trailer	X = 7,820 mm
Theoretical free drawbar length	L = 6,555 mm
Free drawbar length	FL = 2,300 mm

The BPW drawbar **ZD 18** (**Vmax.** = 51.8 kN/Dc = 110 kN) and the BPW hitch block **AB 75** (**Vmin.** = 75 kN/Dc = 130 kN) are sufficient for this requirement.

On request, we will be happy to calculate the **V** and **Dc values** for your vehicle combination in order to select the appropriate BPW connecting assembly (BPW drawbar and BPW hitch block). (You can download a corresponding data sheet from our website.)

$$V = \left\{\frac{X}{L}\right\}^2 \cdot a \cdot C$$

$$V = \left\{\frac{7{,}820\,mm}{6{,}555\,mm}\right\}^2 \cdot 1.8\,m/s^2 \cdot 18{,}000\,kg$$

$$V = 46112\,N = 46.1\,kN$$

$$D_c = \left\{\frac{T \cdot C}{T+C}\right\} \cdot 9.81\,m/s^2$$

$$D_c = \left\{\frac{22 \cdot 18}{22+18}\right\} \cdot 9.81\,m/s^2$$

$$D_c = 97.12\,kN$$

7,820mm

2,300mm

6,555mm

1,000 kg

18,000 kg