BA_TASC_400037   Version a

MONTAGE- UND BETRIEBSANLEITUNG
INSTALLATION AND OPERATING INSTRUCTIONS
**INSTRUCTIONS DE MONTAGE ET D'UTILISATION**

13.09.2021

BESTIMMUNG DER KENNWERTE ZUM VORSCHRIFTS-MÄßIGEN BETRIEB VON VERBINDUNGSEINRICHTUNG-EN AN NUTZFAHRZEUGEN

CALCULATION OF CHARACTERISTIC VALUES FOR CORRECT OPERATION OF COUPLING DEVICES ON COMMERCIAL VEHICLES

DETERMINATION DES VALEURS CARACTERISTIQUES POUR LE FONCTIONNEMENT CONFORME AUX INSTRUCTIONS DE L'ATTELAGES SUR LES VEHICULES COMMERCIAUX

CALCULATION OF CHARACTERISTIC VALUES FOR CORRECT OPERATION OF CONNECTING DEVICES ON COMMERCIAL VEHICLES

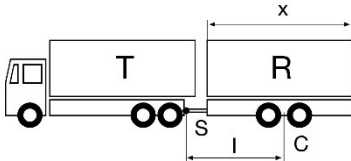**1. TOWING VEHICLE WITH MULTI-AXLE TRAILER (D VALUE)**
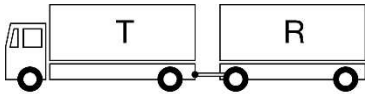
The **D value** is defined as the theoretical representative force for the horizontal component of the force between vehicle and trailer in longitudinal axis of the vehicle. The D value is calculated from the two admissible total weights (tractor and multi-axle trailer) as follows:

$$D = g \times \frac{T \cdot R}{T + R} \text{ in kN}$$

T: admissible total mass of the vehicle in tons
R: admissible towed mass in tons
g: acceleration due to gravity = 9.81 m/s^2

The D value calculated for the tractor/trailer combination may be less than or equal to the D value of the connecting device.

2. TOWING VEHICLE WITH RIGID DRAWBAR TRAILER (Dc VALUE, V VALUE, VERTICAL LOAD S RESPECTIVE S-VALUE)

The **Dc value** is defined as the theoretical representative force for the horizontal component of the force between vehicle and rigid drawbar trailer in longitudinal axis of the vehicle. The D value is calculated from the two admissible total weights (tractor and rigid drawbar trailer) as follows:

$$Dc = g \times \frac{T \cdot C}{T + C} \text{ in kN}$$

T: admissible total mass of the vehicle in tons, incl. static vertical load of the rigid drawbar trailer
C: sum of the axle loads of the max. loaded rigid drawbar trailer in tons
g: acceleration due to gravity = 9.81 m/s^2

The Dc value calculated for the tractor/trailer combination may be less than or equal to the Dc value of the connecting device.

Sample calculation:
T = 20 t; C = 18 t   ⇨ $Dc = 9{,}81 \times \frac{20 \cdot 18}{20 + 18} = 92{,}9 \cdot kN$

The **V value** is defined as the theoretical representative force for the vertical component of the force between vehicle and rigid drawbar trailer in longitudinal axis of the vehicle. The V value is calculated depending on the rear axle suspension as follows:

$$V = a \times \frac{x^2}{l^2} \times C \text{ in kN}$$

a: equivalent vertical acceleration at the coupling point in m/s^2
    a = 1,8 for air suspension or systems with equivalent damping characteristics
    a = 2,4 for other types of suspension

C: sum of the axle loads of the max. loaded rigid drawbar trailer in tons
x: length of the loading area of the trailer in m
l: distance from the centre of the drawbar eye to the centre of the axle assembly in m
$x^2/l^2 \geq 1,0$ (If less than 1,0, the value of 1,0 shall be used)

The V value calculated for the tractor/trailer combination may be less than or equal to the V value of the connecting device.

Sample calculation for a vehicle with air suspension:

C = 18 t; x 7 = m; l = 6 m $\qquad \Rightarrow \qquad$ $V = 1,8 \times \dfrac{7^2}{6^2} \times 18 = 44,1 \cdot kN$

The **static vertical load S** is defined as the load transmitted by the rigid drawbar trailer at the coupling point in static state.
The maximum admissible vertical load is a maximum of 10% of the total mass of the trailer or 1000 kg (whichever is smaller).