

Trade-off certificate

On request we have analyzed a vehicle type combination comprising a 3-axle truck, a 2-axle dolly with rigid drawbar and a 3-axle semitrailer, for usage in Finland. The combination has a gross combination weight of 68 tonnes, i.e. axle load on truck is 26 ton, axle load on dolly is 18 ton and axle load on semitrailer is 24 ton.

The vehicle combination shall be equipped with the coupling equipment as below:

Coupling: VBG 575V-2, certificate: E11*55R-018247
 $D = 200 \text{ kN}$, $D_c = 130 \text{ kN}$, $V = 75 \text{ kN}$, $S = 1000 \text{ kg}$

Drawbeam: VBG DB 75V-2, certificate: E11*55R-018244
 $D = 200 \text{ kN}$, $D_c = 130 \text{ kN}$, $V = 75 \text{ kN}$, $S = 1000 \text{ kg}$

Drawbar eye: VBG DBE 917, certificate: E4*55R-010333
 $D = 250 \text{ kN}$, $D_c = 130 \text{ kN}$, $V = 75 \text{ kN}$, $S = 1000 \text{ kg}$

The minimum length of drawbar (measure from center of drawbar eye to center of the axle group on the dolly) is defined to **2,0 m**. With defined prerequisites the worst case required performance value for the vehicle combination is calculated to:

$$D_c = 158 \text{ kN}, V = 45 \text{ kN}, S = 1000 \text{ kg}$$

Trade-off calculation according to UNECE Regulation 55 allows a reduction of V-value to increase the Dc-value.

$$\text{If } D_c \text{ req} \leq D_c \text{ cert} \text{ Shall } V \text{ req} \leq V \text{ cert}$$

$$\text{If } D_c \text{ cert} \leq D_c \text{ req} \leq D \text{ cert} \text{ Shall } V \text{ req} \leq V \text{ cert} + \frac{-0,5 - V \text{ cert}}{D \text{ cert} - D_c \text{ cert}} (D_c \text{ req} - D_c \text{ cert})$$

req = required performance value for specified combination, cert = certified performance value of product used

Hence we can endorse that the vehicle specified above and equipped with the coupling equipment described may be operated in normal service.

NOTE: This certificate only applies to the VBG equipment listed in this certificate. It does not qualify any other coupling equipment brand nor coupling equipment model installed on the vehicles concerned.

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