

Brake System Design for Trailers in Denmark

1. Brake Calculation with EBS Control

For trailers and semi-trailers registered and operating in Denmark, the brake force curve to be calculated within the EC Brake Band should preferably be in the upper range of the tolerance band.

For brake system designs with EBS, the response pressure can be calculated within the range from 0.5 to 0.9 bar. This should then be carried out at 0.5 bar.

The linear specification at Pm 2.0 bar should be at least linear or, if possible, in the upper third of the EC Brake Band.

The level of the maximum deceleration at maximum cylinder pressure is unaffected by this.

2. Brake Calculation with Pneumatic Control

For trailers and semi-trailers registered and operating in Denmark, the brake force curve to be calculated within the EC Brake Band should preferably be in the upper range of the tolerance band.

The brake system should be designed with the largest possible cylinders or, for trailers and semi-trailers with drum brakes, with the largest possible lever length.

In order to achieve a better response, a pre dominance is to be recommended here, where possible.

Note:

For trailers and semi-trailers that do not immediately achieve the theoretical deceleration values in the homologation test, the brakes have to be conditioned (formation of carbon abrasion). Deceleration values that are too low before conditioning are not attributable to poor quality or manufacturing errors. These are regional characteristics or transport variants.

3. Trailer Retesting

The minimum deceleration rates demanded by national law in Denmark are 45% for semi-trailers and 50% for all other trailers.

In the retest in accordance with the Danish national regulations, a test rig factor of 0.9 is employed.

It is the mechanics of the brake system that are essentially crucial for the deceleration. During the test, the cylinder sizes, lever lengths, piston rod lengths and free movement of the camshafts must be checked and corrected in accordance with the manufacturer's instructions, if necessary.

The settings and functions of all the relevant valves in the trailer or semi-trailer must conform to the manufacturer's specifications; correct, if necessary.

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Not later than 5,000 km after initial operation, a tractor/trailer brake harmonization must be carried out. Here the braking force distribution between truck and trailer is determined and adjusted, if necessary, so that each vehicle carries out the braking work for its own dead weight.

If any of the above points is not observed, the specified deceleration of the vehicle to be achieved cannot be attained. The cause of a deviating or inadequate braking effect is not to be found in the friction material or the mechanics of the brake system.

4. Test Conditions for the Retest under Danish Law

Actuating pressure in the calculation (function test) = 0.3 bar

If the control ratio of the load sensitive valve is set to a specified brake cylinder pressure of 6.5 bar or higher, the actuating pressure of 0.3 bar must be subtracted during the extrapolation. According to national regulations, the maximum permitted brake cylinder pressure may be 6.7 bar.

If the control ratio of the load sensitive valve designed for a load-controlled brake cylinder pressure is less than 6.5 bar, then only the actuating pressure of 0.3 bar is not subtracted there during the extrapolation to the max. controlled brake cylinder pressure.

The function test may only be based on a maximum control pressure (P_m / yellow line) of 6.5 bar.

The minimum brake cylinder pressure to be achieved during the function test is 2.5 bar.

Trailers Registered before 1 April 2001

On registration, a type test data sheet ("Typegodkendelse") is drawn up that is available to the test centers as a technical data sheet for the retest. The conformity of the brake system-related data is checked by all components.

If the control pressure (yellow line) for a particular trailer is up to max. 6.1 bar, then a value for the control pressure (yellow line) of 0.6 bar higher can theoretically be assumed for the extrapolation.

If the control pressure (yellow line) for a particular trailer is up to max. 6.5 bar, then a value for the control pressure of 0,2 bar higher can theoretically be assumed for the extrapolation. In both cases, however, the actuating pressure of 0.3 bar must be subtracted from the control pressure and the cylinder pressure.

Trailers Registered after 1 April 2001

The binding figures for the extrapolation here are the figures in the type test data sheet. These figures must correspond to the figures for the trailer or semi-trailer.