

LONGER TRUCK COMBINATIONS IN GERMANY - TRIAL START IN 2012

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Abstract

According to the EU Regulation 96/53/EG truck combinations in Europe (and Germany as well) may not exceed a length of 18,75 m for truck trailer units and 16,50 m for tractor-semitrailer units. The gross vehicle weight is limited to 40 t or 44 t in combined transport respectively. In a trial in Germany, beginning in January 2012, truck combinations of up to 25,25 m will be allowed on special routes defined by the Federal States, but not all Federal States take part in that trial. The maximum gross vehicle weight (GVW) will remain at 40 t or 44 t respectively. Five new longer truck combinations will be allowed in Germany in the trial: Elongated tractor-semitrailer combination (+1,30 m) [without route restrictions], tractor-semitrailer and additionally a center axle trailer, truck, (steerable) dolly and semitrailer, B-double, truck and trailer with max. length of 12 m each. The trial is applied for a five year period. The Federal Highway Research Institute (BASt) is commissioned by the German Ministry of Transport, Building and Urban Development to evaluate the trial with the longer truck combinations.

Keywords: Heavy Vehicles, Freight Transport, Longer Truck combinations

1. Introduction

According to the EU Regulation 96/53/EG truck combinations in Europe (and Germany as well) may not exceed a length of 18,75 m for truck trailer units and 16,50 m for tractor- semitrailer units. The gross vehicle weight is limited to 40 t or 44 t in combined transport respectively.

In a trial in Germany, beginning in January 2012, truck combinations of up to 25,25 m will be allowed on special routes defined by the Federal States, but not all Federal States take part in that trial. The maximum gross vehicle weight (GVW) will remain at 40 t or 44 t respectively. The remaining GVW in Germany's trial is in contradiction to other trials and legislation in Europe, where the GVW was increased accordingly to the increase in length to 60 t. Therefore the increased volume of up to 160 m³ together with decreased payload (the tare weight of these new truck combination will be increased) will lead to transports of goods with (very) low specific weights only. Therefore a business competition with rail transport –rail is favorable in transport of heavy loads - will be minimized and a possible overloading of one of the 30.000 bridges in the major road network can be avoided.

Five new longer truck combinations will be allowed in Germany in the trial:

1. Elongated tractor-semitrailer combination (+1,30 m) without route restrictions
2. Tractor-semitrailer and additionally a center axle trailer
3. Truck, (steerable) dolly and semitrailer
4. B-double
5. Truck and trailer with max. length of 12 m each

All new longer truck combinations must be capable for combined transport by railway and may pass the so called 'BO-Kraftkreis' (external circle diameter of 12,50 m and internal circle diameter of 5,30 m) to assure that these combinations can pass roundabouts without destroying parts of the infrastructure. All longer truck combinations must be equipped with driver assist systems of the latest development state, such as ABS, LDW, ESP, EBS and, what is really new, on board WIM on each axle except steering axle. Special demands for the driver performance are fixed in the exemption regulation as well as a general prohibition of overtaking for those combinations. Prohibited is the transport of dangerous goods, fluids in big tanks, live stock, and swinging loads on trailer-ceilings for safety reasons.

The trial is applied for a five year period. The Federal Highway Research Institute (BAST) is commissioned by the German Ministry of Transport, Building and Urban Development to evaluate the trial with the longer truck combinations. It will be interesting to see, which of the new truck combinations will be chosen by the truck operators and how they behave in practice. A lot of practical questions, like driving behavior, influence on traffic flow, fuel consumption and CO₂ emission and logistics' questions have been examined which have to be studied in the time frame of this trial.

2. General Instructions

The German Long Truck Trial Regulation was published by the German Federal Ministry of Transport, Building and Urban Development at 19.12.2011 and came into force at 1.1.2012 [1]. The exemption regulation duration will be five years. No border crossing is envisaged for Long Truck Combinations.

The regulation specifies the requirements for those operators who will take part on the trial, specifies the road network which may be used for travelling and the (five) vehicle combinations which are allowed (weights and dimensions and technical demands, see below). It is specified that all truck trailer combinations must be able to be used in combined traffic (waterborne and/or rail) as well. Rear load overhang is forbidden. Prohibited is the transport of dangerous goods, fluids in big tanks, living animals or swinging loads from the box ceilings. Overtaking is forbidden for the drivers of the longer truck combinations, except vehicles with less than 25 km/h.

The drivers of the longer trucks may have a truck driver license for at least five years and five years truck driving experience. Another demand is a driver training of the longer truck combination of at least two hours.

As annex to the regulation all permitted national routes which were provided by the participating Federal States are listed as “positive net”. (Only 7 out of 16 Federal States take part in the trial). A provision is made to increase the positive net during the duration of the exemption regulation if e.g. operators ask for a special destination and the route is suitable for long truck operation.

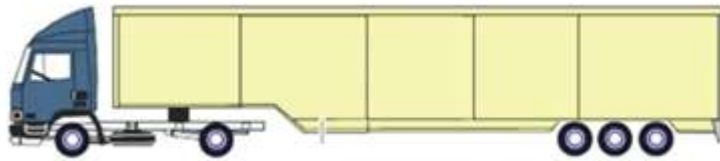
For scientific monitoring of the trial all operators have to provide BASt with all documents regarding vehicles, routes, freights etc. [2]. It is expected that BASt staff can interview drivers, can take part as co-drivers on longer truck combinations and can use these for short times for experimental work at no charge, too.

3. Technical Demands

The five possible Long Truck Combinations for Germany are listed in Figure 1. The gross vehicle weight is limited as in the past to 40 t and 44 t for combined traffic respectively. Existing axle load limits are not affected. So the Long Truck Combinations may have at least 5 axles. The regulation allows two trailers instead of one. Different length limits are specified for the different combinations, see Figure 1.

The regulation describes further the technical demands and safety equipment for the new combinations:

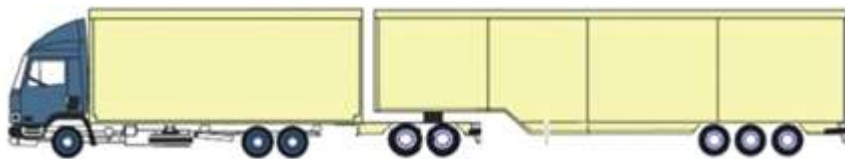
- Side edge lamps on the trailer(s)
- Air springs on all axles except steering axle
- Differential lock or traction control
- Electronic breaking system (EBS) acc. UN/ECE 13
- Disc brakes and retarder on the towing vehicle
- Automatic weigh control for all air spring axles
- Lane departure warning
- Electronic stability control acc. UN/ECE 13
- Automatic headway control or emergency break assist
- Rear mirrors acc. 2003/97/EG
- Video camera on the rear end of the rearmost trailer combined with a monitor in the driver's compartment
- Retro reflecting side markings acc. UN/ECE 48
- Retro reflecting sign on the rear end of the rearmost trailer with the written text “Lang-LKW” (Long Truck) with letter height of 13 cm.
- Digital tachograph acc. 3821/85 EG



Type 1: Tractor-Semitrailer Combination, max length 17,80 m (before 16,50 m)



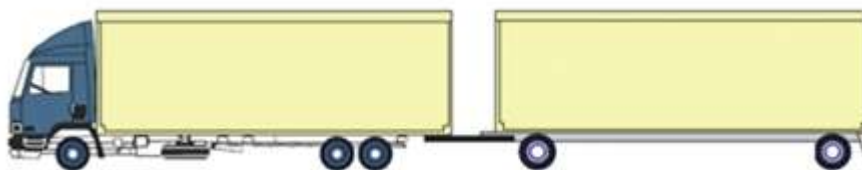
Type 2: Tractor-Semitrailer and Center Axle Trailer, max. length 25,25 m



Type 3: Tractor, (steerable) Dolly and Semitrailer, max. length 25,25 m



Type 4: B-Double, max. length 25,25 m



Type 5: Tractor Trailer Combination, max. length 24 m

Note 1: Number of axles in reality may be lower than shown in the graphs.

Note 2: For Type 1 vehicles no route restriction

Figure 1: The five possible Long Truck Combinations allowed for the German trial [2]

The long trucks need an approval certificate of an automotive technical expert that all technical requirements are fulfilled and the driver has to carry a copy of this certificate while driving.

4. Research Program for the Scientific Evaluation

Based on previous studies [3] and international experience, e.g. in Scandinavian Countries or the Netherlands, topics for the scientific evaluation of BASt were examined. In May 2011 an expert colloquium had been carried out by BASt to specify possible problems with longer

truck combinations based on the experience of previous trials in single Federal States in Germany, too (e.g. [5]). The evaluation concept of BASt is described and published now and can be found in [2], [6].

The evaluation concept is structured in three phases. The first evaluation phase has duration of about one year. It consists of collecting statistical data of routes, vehicles, carried loads, fuel consumption etc. and a questioning of operators and drivers. Further on a survey of long vehicles by BASt staff will take place with the objective to monitor the interaction of the long vehicles with the infrastructure and the behavior in the traffic flow. The monitoring will be focused on e.g. long trucks passing working sites or turning procedures at traffic junctions and roundabouts.

In parallel some experimental and theoretical approaches will be carried out in this first phase, (hopefully) supported by the operators of the long truck combinations. Some research projects will be allocated to third parties, like universities, namely:

- Implication of long trucks on traffic safety and on environment,
- psychological examination of other road users in connection with long trucks,
- effects on traffic demands,
- change in road wear,
- traffic ability of at-grade junctions and grade separated junctions,
- traffic ability at working sites,
- problems with parking at rest areas,
- accident simulations of long trucks with guard rails,
- evaluation of problems by overtaking long trucks,
- fire protection requirements for tunnels.

The second phase starts in parallel with the first phase and consists of monitoring reduced data. As example, the collection of accident data will be carried out over the complete five years duration of the exemption regulation. The police are involved in the accident reporting scheme, too.

The third phase is the post evaluation which starts about a half year before the trial will be finalized, approximately in summer 2016. The statistical data in phase three will be compared with the data of working phase one. The results of the final evaluation of the Long Truck Trial will be published by BASt afterwards.

It is easily to understand that the success of the trial evaluation for some aspects is strongly connected with the number of long vehicles which cannot be foreseen in the moment.

5. Current State

In the preparation phase of the Long Truck Trial Regulation about 400 operators had shown interest to take part in the Long Truck Trial but without knowing the restrictions in routs which were not examined at this time. Up to now, mid of June 2012, only 9 operators with 15 trucks are registered at BASt. The vehicle types registered are: three of type 2, eleven of type 3, one of type 5 and no combinations type 1 and type 4.

There might be several reasons, why the operators hesitate to take part in the trial. Besides the capital investment for trucks, trailers and additional equipments one reason might be the unfavorable relationship between box volume and payload by the restriction to 40 t gross

vehicle weight [7]. The optimum cargo density of current standard vehicles lies between 0,26 t/m³ and 0,30 t/m³ and for the long truck combinations only at 0,16 t/m³. So only the transport of light weight materials will be efficient by long truck combinations.

Another reason is the route restrictions because only 7 of the 16 Federal States in Germany take part in the trial. There is a north-south connection throughout Germany but –because the biggest Federal State, North Rhine Westphalia, does not take part in the trial – there is no west-east connection. So it can happens that long truck combinations have to take a longer route to the final destination because roads of one single Federal State may not be allowed to use.

Further on in some cases it can happen that the 'last mile', the distance from a federal trunk road to the loading points within the local network, is not in the positive route net and therefore the whole destination cannot be served.

Up to now the number of operating long vehicles in Germany is too small, to make any conclusion.

6. References

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