

Position Paper

Why mandatory ABS on tractors does not make sense: unassessed risks, high costs & other, more urgent priorities

The European Commission's plans to make ABS systems obligatory for tractors between 40-60km/h must be shelved

December 2016

Executive Summary

In the EU, fast tractors (driving more than 60 km/h) have been required to have Anti-lock Braking Systems (ABS) installed since 2016. The question the EU now needs to decide on is whether ABS should be made mandatory for tractors with maximum design speeds between 40-60 km/h by 2020/21. The questions that thus need to be answered are:

- Will the introduction of ABS deliver a statistically significant reduction in road accidents?
- Does the duty cycle of a tractor mean that it should be treated as an on-highway vehicle?
- Will the benefits outweigh the costs?

Statistical Benefit – The available evidence shows that the main cause for tractor accidents is not a lack of braking performance. The two prime causes of recorded accidents are: low speed (compared to other road vehicles) and low visibility. In line with this, prior analysis has clearly demonstrated that **ABS would not help to improve road safety in any statistically significant way**. In fact, with an average fleet renewal rate of 1.7% of total EU-28 tractor sales, **it would take more than 20 years before the first fatal accident could statistically be avoided**. By contrast, improving, for instance, the lighting and signalling of Europe's entire tractor fleet could prevent up to 70 fatal accidents each year.

Duty Cycle – An agricultural tractor by its very nature spends most of its time off-highway or on unpaved roads (80% on average off-highway). Less than 8% of tractors each year specified by customers are capable of over 40km/h. Some manufactures already offer ABS as an option to customers who choose this because they spend more time at higher speed. The duty cycle of the average tractor does not warrant the need for ABS as standard. A tractor is not an HGV or car.

Cost Benefit – Due to the necessary adaptations and testing procedures, effective overall cost increase for farmers and agricultural contractors to buy tractors with ABS could **range from 2.0% to up to 10% of the vehicle price and reach up to 5,000€ per machine**. The European Commission has recently underlined that farm-related innovations need to deliver both proven societal benefits and improve farmers' bottom line.

A technology such as mandatory ABS on tractors, which does not deliver statistically significant benefits while exerting a significant cost burden on farmers' bottom line is unacceptable, particularly in light of the current farm crisis, and particularly when better, proven, and cost-efficient solutions are available. In light of this, the Commission's plans to make ABS systems obligatory for tractors between 40-60km/h need to be abandoned.

1. Duty Cycle – braking-specific needs differ between cars and trucks and tractors & agricultural trailers

The duty cycle of an agricultural tractor is significantly different from that of any on-highway vehicle. Treating them as if they are the same or need to be the same in the future is not sensible. The choice of brakes for a vehicle depends on **vehicle-specific parameters**, i.e. its: use, allowed speed, design, roads travelled, and hazards & hazardous situations to be avoided.

Unlike other road-going vehicles agricultural tractors pull a great variety of implements both braked and un-braked, therefore the impact of ABS on agricultural tractors will be different.

It is not possible to copy and impose without proposer assessment and adaptation the braking systems and specifications of other vehicles on tractors and agricultural vehicles.

2. Braking performance

In terms of braking performance, Regulation 167/2013 provides that the following criteria need to be met by tractors and their trailers:

(a) vehicles with a maximum design speed of more than 40 km/h meet an equivalent level of functional safety with regard to brake performance and, where appropriate, anti-lock braking systems as motor vehicles and their trailers;

In other words, the Regulation provides:

1. to ensure that there is an equal level of brake performance as heavy-duty vehicles; and
2. to explore whether ABS is necessary to achieve this.

Provision 1. has by now been ensured thanks to the EU's new Braking Regulation 2015/68 which updated the legal braking requirements for agricultural vehicles, improving the braking performance overall and significantly in terms of reaction time, braking distance, and safety of the braking systems.¹ The Regulation also made ABS mandatory for vehicles with design speeds above 60 km/h. Moreover, some manufacturers already offer ABS as optional technology on some of their high-end tractor models.

Regarding Provision 2., ***the question that needs to be decided now is whether ABS should be made mandatory for tractors with maximum design speeds between 40 and 60 km/h. This assessment will start in November 2016.***

1. The Regulation provides that the hydraulic braking systems on the majority of tractors has to comply with the same performance criteria as the pneumatic brakes of heavy-duty vehicles.

3. Statistical benefit: ABS will not improve road safety for tractors in a statistically significant way – while improved lighting and signalling does!

Each year, around 170,000 tractors are sold in the EU in total. Of these, currently around 12,825 tractors are tractors with design speeds between 40 and 60 km/h.

Making a technology – such as ABS – a mandatory feature can only be justified if there is significant evidence of the presence of a related risk and sound proof of the fact that the technology in question can help to reduce or avoid it in a statistically significant way.

With regards to ABS on tractors, the available evidence shows that ABS would not help to improve road safety in a statistically significant way.

Already in 2008, a TRL study indicated that the cost-benefit ratio for ABS inclusion was weak due to the lack of evidence on possible accident prevention. In 2011, a profound, dedicated study on accident reporting with agricultural vehicles from the German insurance association GDV confirmed that ABS introduction would be practically irrelevant for the improvement of road safety in Germany, the major EU market for tractors above 40 km/h.² With regards to the average speed of a tractor involved in an accident, the main accident situation, and the main causes of accidents the study established that:

- the average speed of a tractor encountering an accident is 28 km/h;
- the two main causes of accidents are low visibility and low speed relative to other vehicles;
- 3 out of 4 accidents happen at crossroads (when the tractor is crossing or turning left).

With regards to ABS, the study concluded that:

- only 1% of fatal road accidents in the EU involve a tractor;
- only 1% of fatal tractor accidents in Europe could be avoided if ALL tractors had ABS installed

With an average fleet renewal rate of 1.7% of the total EU28 tractor sales, it would take about 20 years until 2039 before the first fatal accident could statistically be prevented!

According to the study, other measures could lead to far bigger and statistically significant accident reductions: a 16% reduction could be achieved by **improving and ensuring the lighting and signalling on agricultural vehicles is fully operational** and an additional 7% by using optimised direction indicators. EU Member States and industry experts have therefore revised the applicable UNECE Regulation 86 whose content is now applicable for all new agricultural vehicles under EU type approval. If these requirements were also applied ~~and retro-fitted to all existing agricultural vehicles in the EU (which is, technically speaking, possible),~~ **up to 70 fatal accidents could be avoided each single year!**

2. Germany is one of the countries that is most critical for assessing the need for mandatory ABS above 40 km/h. They have the highest share of tractors registered > 100 kW and almost half of the new fast

tractors registrations in the EU28. Fast tractors up to 50 km/h can be homologated nationally in Germany since 1997 and tractors up to 60 km/h since 2006. It can thus be assumed that the results of the study in Germany can be extrapolated for the rest of Europe.

4. No proven benefits (2): the hazardous traffic situations in which ABS can help are not statistically relevant for tractors

ABS avoids the locking of the wheels. When braking very hard or in case of wet/slippery surfaces the wheels can stop moving, resulting in an effective locking of the wheels. The locking means that the vehicle may no longer be steered and that stability may be lost.

ABS can be useful in a number of different hazardous situations – yet none of them is statistically relevant for tractors:

- 1. Sudden stop of a line of vehicles:** i.e., traffic jams (particularly on highways) where hard braking and evasive steering actions may be required to avoid collision. ABS enables such evasive actions.

Relevance for tractors? LOW: *Even a fast tractor is still likely to be the slowest vehicle when compared to a car or a truck. Tractors are unlikely to get involved in such accidents, in contrast to heavy-duty trucks which are renowned for the considerable damage they can cause in head-tail accidents on highways.*

- 2. Sudden obstacles (parked cars, exiting vehicles):** ABS allows an evasive steering action in case of wheel-lock.

Relevance for tractors? LOW: *With their lower speeds the chances for this situation to occur for tractors are low and cannot be derived from the available evidence (German GDV Study). Moreover, tractor operators are placed high above the road with a privileged overview of traffic, lowering the risk of encountering sudden obstacles. In the case of all cases, there may still be no benefit (a problem also known for heavy-duty vehicles), as any potential evasive action risks to still cause considerable or even greater damage.*

At the very least, the benefit of ABS needs to be evaluated thoroughly before it is made mandatory on tractors capable of travelling between 40-60km/h.

5. High costs: mandatory ABS inclusion on tractors cannot be justified

The total costs for ABS relate both to the purchase of the different ABS parts and the necessary adaptation. To adapt the ABS system to off-road use, it needs encapsulation (most current tractor brakes are already encapsulated). To add the necessary controllers, converters etc. place has to be found on the vehicle, and designs need to be adapted. Above and beyond that, the systems in every separate tractor model need to undergo the necessary physical testing and homologation. As a result, the effective overall cost increase for tractors due to ABS fitment could be as high as **5,000 €**.

The structural challenge in the agricultural machinery industry is that, due to the low volumes per model, there will be no significant economies of scale. In other words, **the cost increase for farmers and agricultural contractors could range from 2.5 % to up to 10% depending on the total cost of the tractor (low-end versus high-end).**

For agricultural trailers, the cost of ABS is equally significant with the price for optional ABS ranging between 3,000 € and 4,000 €. This would entail an additional cost of 2 - 4 % (high-end trailers) and a lot more for trailers produced in low series.

ABS on tractors will never be as cost-effective as it is for high-volume on-highway vehicles. Even the most high-volume tractor models are produced in a fraction of the volume of on-highway HGVs and cars.

The European Commission has repeatedly stated during the past months that – to be viable – ***any farm-related innovation needs to deliver both societal benefits and improve farmers' bottom line. A technology such as mandatory ABS on tractors, which does not deliver statistically significant benefits while exerting a significant cost impact on farmers' bottom line is unacceptable, particularly in light of the current farm crisis, particularly when better and cost-efficient solutions are available.***
