



Insight in the conformity of agricultural machinery to European legislation



Introduction

The European agricultural machinery industry provide technical solutions to efficiently satisfy such basic human needs as feeding the growing world population. High costs for land in Europe result in European demand for highly efficient and innovative solutions for farming, making the European industry global technology leaders. Without the latest machines, the modern, efficient and competitive agricultural sector would not exist.

*European machinery makers rely on effective market surveillance which guarantees fair competition in the Internal Market to maintain their **competitiveness**. Market surveillance ensures **safety** at workplace, rewards **innovation** and helps protect the **environment**.*

To support market surveillance authorities this brochure provides an insight in the conformity of agricultural machinery by explaining the different machines and the applicable legislation and standards.

Distinctiveness of agricultural machinery

Agricultural machinery shows specific design and use aspect that might influence safety measures and market surveillance:

- **Tractor implement combinations:** are the dominant technique used in agriculture. Standardized interfaces (mechanics, hydraulics, pneumatics, electrics and electronics) allow the compatibility and the free choice between tractors and implement for the customer. The safety requirements are separately dealt with in the Tractor Directive and in the Machinery Directive supported by the harmonised European standards. They are specified in such a way that the safety of the individual tractor implement combination assembled by the customer is ensured. (see next)
- **Regulations & certification:** Agricultural machinery are faced with EC Directives according to the New and type approval Approach. Agricultural and forestry tractors are completely covered by the Directive 2003/37/EC dealing with all aspects of operator, road and environment safety and are subject of a type approval procedure (third party certification). The safety of operators and bystanders with respect to agricultural machinery, and with respect to sprayers (pesticide application equipment) also environment related aspects, are specified by the Machinery Directive 2006/42/EC and harmonised European standards (*Figure 1 & 2*).

Figure 1 - Application of tractor and machinery directive



- **Operating conditions:** Agricultural machinery are used seasonally and under a wide range of very different crop, weather and soil conditions. Machines shall be available at any time and allow the customer to use the optimum time window to perform the work. Robustness and reliability are therefore important characteristics of these machines.
- **Machine functions:** Machinery working tools are in direct contact with soil and crops. With respect to the operating conditions high volumes of material must be processed, picked-up, worked, stored and distributed again or overloaded. For both - the economic and safe process - the unhindered material flow is one of the most important design objectives and involves specific risks to be covered. Examples of the latter are interventions by operators (e.g. clearing blockages). A high degree of functionality implies a high degree of safety.
- **Mechanical drives:** are still the dominant power transmission used in agricultural machinery. These drives allow the transmission of wide power ranges and high degrees of efficiency. By this, mechanical drives contribute to energy-efficient work processes and agricultural production. But mechanical drives are also characterised by missing or less means of controlling the speed and torque of the transmission towards the implements.

Figure 2 - Categories of agricultural machinery and the most important regulations

	Safety	Road transport	Environment protection
Agricultural & forestry tractors	2003/37/EC		
Trailers	2006/42/EC	2003/37/EC respectively NR	–
Interchangeable towed machinery	2006/42/EC	2003/37/EC respectively NR	2009/127/EC NR ¹⁾
Interchangeable mounted machinery	2006/42/EC	NR	2009/127/EC NR ¹⁾
Self-propelled machinery	2006/42/EC	NR	97/68/EC 2009/127/EC NR ¹⁾

2003/37/EC: Directive on type-approval of agricultural or forestry tractors, their trailers and interchangeable towed machinery

2006/42/EC: Directive on safety of machinery

2009/127/EC: Amendment to 2006/42/EC on pesticide application equipment

97/68/EC: Directive on the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery

NR: National regulations

NR¹⁾: Relevant for (solid & liquid) fertilizer distributors

Application of Machinery Directive 2006/42/EC



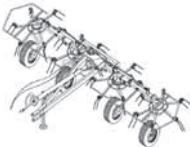
According to the general principles of the Directive the relevant essential health and safety requirements and the appropriate measures for risk reduction shall be determined by carrying out a risk assessment.

With respect to the specific conditions in agriculture and of agricultural machinery the risk assessment is a challenging process for the manufacturer when developing the machine and for market surveillance authorities when supervising the compliance of products. Harmonised standards are an important tool for the manufacturer in order to achieve presumption of conformity, but they are not compulsory. For market surveillance authorities the main reference, beside the standards, will be the technical documentation by the manufacturer that explains the criteria followed for the machine design and specifically the choices in view of fulfilling the EHSR.

Figure 3 shows the available standards for typical agricultural machinery drafted by international and European committees representing all interested parties.

Figures 4 and 5 illustrate the safety requirements supporting the essential health and safety requirements of the Directive.

Figure 3 - Examples of harmonised European standards for agricultural machinery

Regulation number	Regulation title	
EN ISO 4254-1	General requirements	
EN 15811	Guards for moving power transmission parts	
EN ISO 4254-5	Soil working equipment	
EN ISO 4254-6	Sprayers and liquid fertilizer distributors	
EN ISO 4254-7	Combine and forage harvesters	
EN ISO 4254-10	Tedders and rakes	

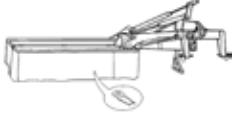

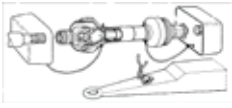
Regulation number	Regulation title	
EN ISO 4254-11	Balers	
EN ISO 4254-12	Rotary and flail mowers	
EN 690	Manure spreaders	
EN 703	Silage loading & mixing machines	
EN 706	Vine shoot tipping machines	
EN 707	Slurry tankers	
EN 709	Motor hoes	
EN 908	Irrigation machines	
EN 909	Irrigation machines	
EN 1853	Trailers	
EN 12525	Front loaders	
EN 12965	PTO drive shafts & guards	
EN 13118	Potato harvester	
EN 13140	Sugar beet harvesters	
EN 13448	Inter-row mowing units	
EN 14017	Fertilizer distributors	
EN 14018	Seed drills	

Figure 4 - Example: Forage harvester - Requirements specified by EN ISO 4254-1 & -7

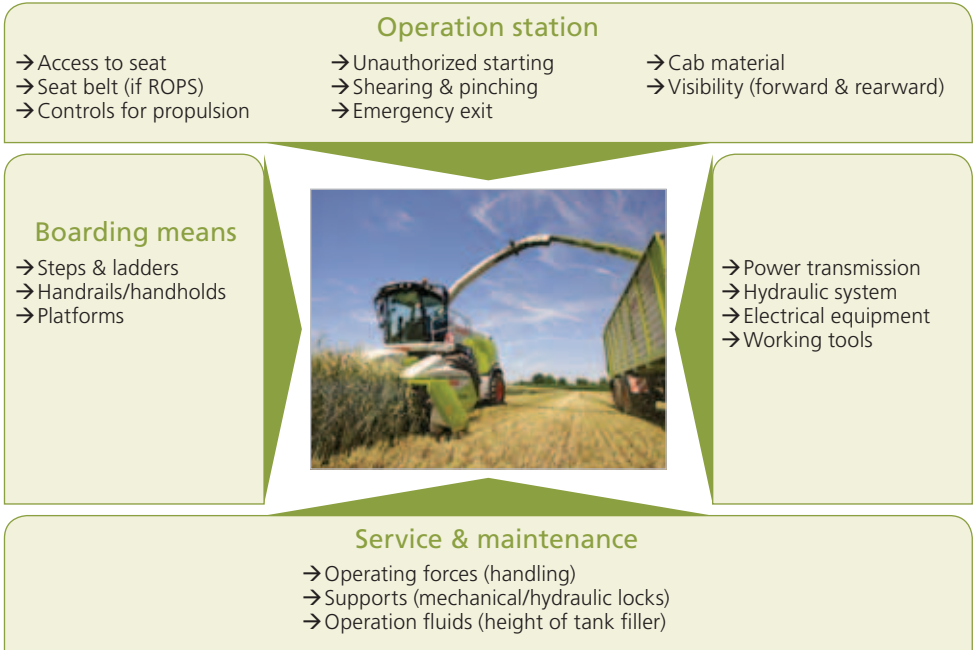
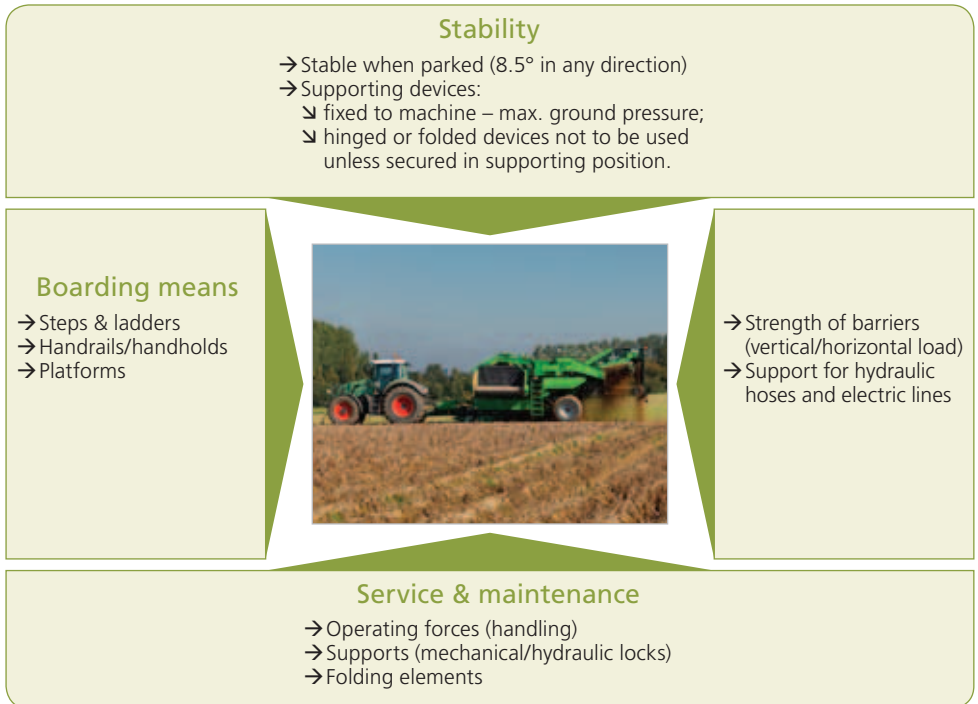


Figure 5 - Example: Towed potato harvester - Requirements specified by EN ISO 4254-1 & EN 13118



Recommendations for market surveillance measures

1. Have market surveillance performed by people familiar with agricultural machine design and use. When market surveillance provisions are foreseen for tractors, the advice of type approval authorities, as experts, should be the basis for any actions and should not be ignored.
2. Focus on technical aspects relevant for the safety of the operator & bystanders and the environment (with respect to pesticide application equipment).
3. Preferably put emphasis on inspection of the first placing on the market (level of manufacturer - not on dealer or user level). After market surveillance should be aimed at detection of any incorrect modifications by anybody other than the manufacturer or at detection on appropriate tractor-implement combinations.
4. Inspection whether or not the machine is in compliance with the relevant harmonised European standard(s) - if not, review of the machine design with respect to the essential health and safety requirements by carrying out the risk assessment.
5. Directly take contact with the manufacturer of the machine in question (or his representative) independently in which Member State the manufacturer is located.
6. Request to the manufacturer to present this part of the technical documentation which is relevant for the justified complaint.

AND

7. Involvement in standardization to allow the continuous improvement of standards and product safety by providing all available information
8. To organize exchange on accident data on European level based upon harmonized data collection system





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