



Actions undertaken in France for the adaptation of tractors



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Speaker

2

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Irstea

3

Irstea, French National Research Institute of Science and Technology for Environment and Agriculture is a public scientific and technical institute in joint supervision with the Ministry of Research and the Ministry of Agriculture created in 1981 under the name of CEMAGREF.



Initiating, implementing, coordinating and supporting, on the medium and long-term, on its own initiative or at the request of the government, all scientific and technological research in the areas of developing sustainable land management, especially agricultural and natural land, and their resources.



Irstea activities for tractors safety

4

In the fields



In factories



In research laboratories



Autonomous vehicles



Active systems to avoid rollover

5

Iristea activities for tractors safety

In the fields



In factories



In research laboratories



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Actions undertaken :

- Rollover Protective Structures (ROPS),
- Falling Objects Protective Structures (FOPS),
- Foldable roll-bars,
- Seat belts



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6

Key dates in France (for tractors in use)

- **1st January 2002:** The sale of used farm tractors of categories T1 or T2 and without rollover protective structure has been prohibited.
- **5 December 2002:** Entry in force of obligations for employers to protect health and safety of workers :
 - Where the risk of rollover of a tractor can not be completely avoided, it shall be fitted with a protective structure. If it is not technically feasible measures must be taken to prevent the risk of rollover such as restriction of use, speed or fitting-out of work areas.
 - If there is a risk that the driver, during a rollover, being crushed between parts of the tractor and the ground, the tractor is provided with a restraint system that keeps the driver on the seat.
 - When the risk of falling objects can not be completely avoided, tractors shall be equipped with a protective structure against this risk.
- **1st January 2010:** All the tractors in use in farms had to be fitted with a rollover protective structure.

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➔ **We had to provide employers, farmers and dealers with the means to meet these obligations.**

Actions undertaken : ROPS

7

To equip tractors in use with a rollover protective structure it was necessary to have a method of design and construction:

- Able to meet individual request,
- Economically viable,
- Reliable,
- Easy to implement,

with at least the same level of safety to that of test methods or codes used for new tractors.

Resulting of an IRSTEA (Cemagref) research commissioned by the Ministry of agriculture, the design method takes the form of an EXCEL spreadsheet and instructions for use that could be freely download by anyone.



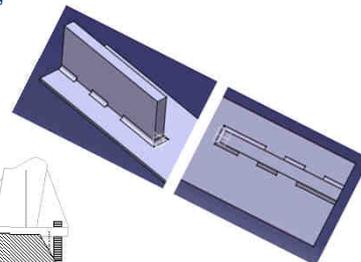
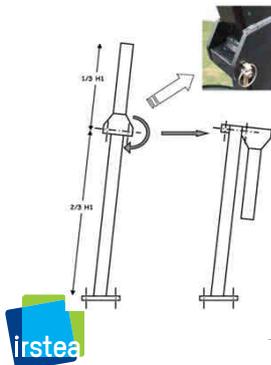
→ <http://www.agriculture.gouv.fr>

Actions undertaken : ROPS

To design method allows to build rear roll-bars for tractors up to 4000 kg.

Regularly updated since 2004 it includes advices to tackle some difficulties or specific cases:

- Foldable roll-bars
- Narrow tractors
- Examples of fixing,
- Rules for welding.





Actions undertaken : ROPS

9

Intended for tractors in use this method is also currently and often use in our approval of single vehicle process that applies to tractor in use coming from outside of Europe (mainly Japan) and that are considered as new tractors.

Its entry in force was encouraged by several demonstrations, presentations and communication tolls promoted by French agricultural social insurance (MSA) and safety advisors (Ministry of agriculture).

A step by step illustrated example is available on internet.

There is no official figure about the number of tractors that have been fitted with a ROPS using this method. We could imagine that the reality is somewhere between 2000 and 5000 tractors.




Actions undertaken : ROPS

10

In order to avoid any duplication of works and to provide users with the possibility to use other methods that have been available later the French Ministry of agriculture commissioned IRSTEA to analyze Spanish "ESTREMA" software and Italian "LINEA GUIDA".

These two methods were judged as equivalent with regard to the safety level and introduced in the French regulation as alternative methods.

The "ESTREMA" Software and a great part of the "Linea Guida" were translated in French and, with agreement of University of Navarra and INAIL, made available for French users.



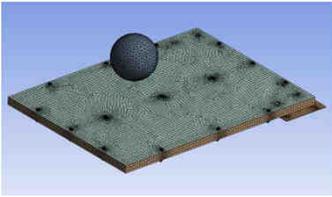
11

Actions undertaken : FOPS

Following the same approach as for protection in case of rollover (ROPS) researches are carried out at IRSTEA in order to issue a method aims to design protection against falling object (FOPS) for tractor in use.



Numerous validation tests and the use of digital models were necessary to develop a method giving a level of safety at least equivalent to that of test codes for new tractors.



Use of modelling



Validation tests

12

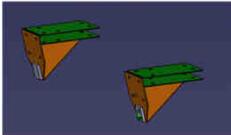
Actions undertaken : FOPS

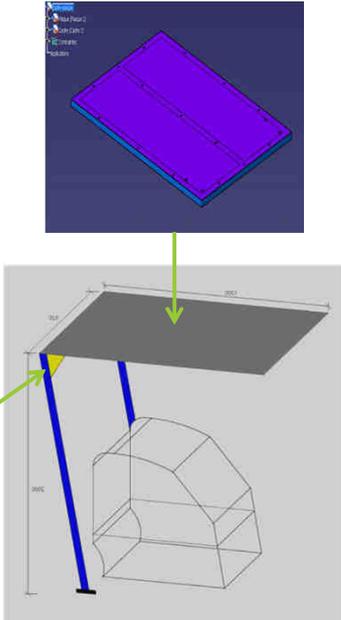
This method, available by the end of this year, will be merged with the software dedicated to ROPS.

It will allow the possibility to design FOPS:

- fitted on rear roll-bar or frame,
- with different materials for the roof.

Instructions for use will contain rules for the design of flanges and their positioning on the ROPS.

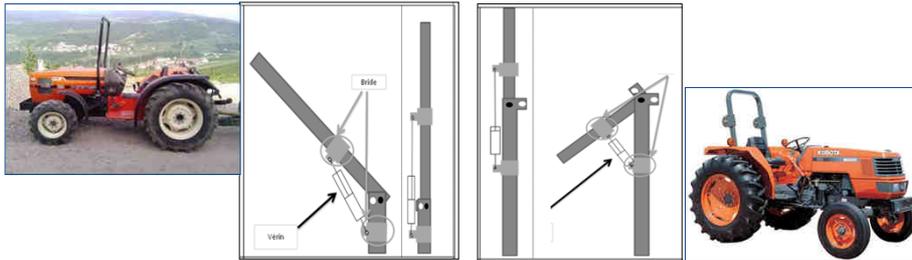




Actions undertaken : foldable roll-bars

13

The French agricultural social insurance (MSA) entrusted Irstea with a study on the improvement of the safety of tractor in use equipped with foldable ROPS.. Based on the analyze of accidents and technologies that are developed by manufacturers or researchers, the study led to the definition of technical specifications of a hydraulic device for the handling of foldable roll-bars.



Even if this solution does not fully meet all the problems, it can significantly reduce the difficulty of the operation and the risks associated with the handling of the roll-bar.

Actions undertaken : foldable roll-bars

14

Hydraulic components:

- ✓ are standardized commercial components
- ✓ provided by dealers.

Flanges: A guideline addresses the following subjects:

- ✓ How to design and fix the flanges ?
- ✓ Where to fix the flanges ?

The guideline explains how to chose the hydraulic components and connect them to the tractor.



15

Actions undertaken : seat belts

Guide for the installation of seat belts on tractors in use

Version 1.1 - 12/05/2014

16

Actions undertaken : seat belts

This interactive guide contains informations and advices on:

How to select and fit a new seat :

Siège du conducteur

INDICATION DU TYPE DE TRACTEUR DE LA CATEGORIE A AUQUEL LE SIEGE EST DESTINE :
I : siège pour les tracteurs de la catégorie A de classe I
I et II : siège pour les tracteurs de la catégorie A de classes I et II
I, II et III : siège pour les tracteurs de la catégorie A de classes I, II et III
 Si aucune indication ne figure, il s'agit d'un siège destiné à un tracteur de catégorie B.

NUMERO D'HOMOLOGATION CE : correspond au numéro de la fiche d'homologation CE établie pour le type de siège.

How to select and fit a seat belt:



Thank you for the attention !

