

Evaluation of Tractor Safety Frames Structural Deterioration with Age

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Objectives

An investigation was undertaken to determine the structural severity and practical implications of tractor safety frames (ROPS) structural deterioration with age in Italy. The research aimed in particular to verify if this kind of ROPS can maintain the minimum security level required by the standards currently in force.

Methods

A detailed survey of frames deterioration level fitted on a significant amount of used tractors, manufactured over a wide time period (between 1965 and 2000) was carried out in some Italian northern regions.

A statistical analysis of the Italian used tractors fleet was primarily provided, followed by a field analysis, carried out through the creation and the implementation of a structured questionnaire, then applied of about 150 used tractors equipped with safety frames differently aged.

A strength test was finally carried out on a sample of a 4-pillar safety frame, able to adequately represent the situation of the surveyed fleet, ascertained in the previous study step.

Results

The results of the approval tests carried out more than 30 years ago were essentially confirmed, and therefore reasonably confirming the minimum safety requirement defined in the standards currently in force.

The fairly positive results recorded in the strength test do not therefore underestimate what highlighted in the field investigation, where critical ROPS conditions were frequently found, due to time and above all corrosion wearing, incongruous repairing, interventions and accidental damages.

These troubles always change (inevitably for the worse) the strength of the ROPS.