

Review of the ISO 12357-3 development



Initiation

During 2004 the 5 year review of the standard ISO12357 (N347 (SC15)) and in connection with the discussions on European Modular vehicle Systems the demand for a Coupling standard for multi-vehicle systems was identified.

In the process of development of the ISO12357-2 for special applications different proposals were brought up to handle dollies and multi-vehicle combinations. Investigations including dynamic simulations were presented. (N391, N400, ...)

In Milan April 2006 it was decided to treat Multi-Vehicle combinations separate from ISO 12357-2. (N359, N362, ... (SC15)) (N455)

Review of the ISO 12357-3 development



History

In 2001 (N380) a first reference was made to the Australian standards.

In 2002 (N391) the Italian delegation proposed to use the Australian formulae.

WG4 in 2002 (N400, N401, ...) had the opportunity to review simulation results from Australia concerning stability and loads in road trains.

The Italian delegation in 2004 (N437) proposed a modified adaptation of Australian formulae. In essence this was making away with the regression based components in the Australian formulae.

At the same time (N438) The Dutch delegation proposed formulae that for D -/ D_c -value used total mass up- and down-stream of coupling point considered. For the V -values a formulae was introduced that accounted for vehicles further away than next to the coupling point under consideration.

Review of the ISO 12357-3 development



History (Cont.)

The Swedish delegation in 2005 (N448) offered to make a special investigation on some of the multi-vehicle combinations proposed.

The N451 from March 2006 proposed Australian formulae to be used for the multi-vehicle combinations studied.

A need to survey what multi-vehicle combinations to consider was identified and a survey was launched. (N452)

From the survey 5 combinations were identified (N457).

A modified set of formulae was introduced by the Swedish delegation. The leading theme of these formulae was to have the general structure of the basic 94/20/EU formula but an elaborated treatment of the masses not directly connected to the coupling point under consideration. The formulae were also thought to eventually have potential to account for combination outside the five chosen. (N457)

Review of the ISO 12357-3 development



History (Cont.)

The Italian delegation in 2006 proposed a modified treatment for the V-value from a dolly.(N460)

Support for the general outline of the formulae was expressed however the latest proposal of the V-value formulae shall be kept on-hold until more experience is available. (N463)

The French delegation introduced an alternative formulae to treat the V-values. This incorporate a concept of dynamic amplification based on a structural damping (N466). Further there was a reasoning in terms of loading history making a statement of considerably lower test load.

The Swedish delegation presented some results from experimental model tests (Shaking masses). (N470) These results were not conclusive and could not be the basis for a decision on which formulae philosophy to pursue. Road test was requested. (N471)

Review of the ISO 12357-3 development



History (Cont.)

The vehicle combinations were prioritized as candidates for the road tests. (N478) Eventually a rigid truck + CAT + CAT was put into test. Preliminary results were shown in December 2007 (N480)

The final "road test" results were presented at the Schaffhausen meeting in 2008. (N519) Four objectives were set up for these tests:

- confirm / reject the shape of the D-value formula for two masses.
 - Within $\pm 10\%$ of concave curve, low level of confidence
- to study the value of qD for vehicle combination with three masses
 - Consistently lower for 3 masses than for 2 masses
- to study the influence from the second CAT on the V-value for the first coupling
 - Low influence
- to study the simultaneity for the vertical and the horizontal forces, for the D_c -value.
 - Peak value for longitudinal and vertical forces never coincided.

In essence the measurements represented a too small sample to make solid judgment.

Review of the ISO 12357-3 development



History (Cont.)

Comparative studies for different number of masses in a vehicle combination was reported in N520-Annex. I shows decreasing coupling forces with increasing number of masses given the same total mass.

Further N520 outlines a new text for the ISO12357-3. This outline was commented in N535. Further responses to the compiled in the N535_Annex.

In the resolutions from Suresnes The project leader for ISO 12357 was assigned with the tasks to elaborate and clarify a number of issues. This was expected to be done to January of 2009. The experts were supposed to respond to the material being communicated from the project leader during the spring of 2009.

Hence a new proposal should be presented to the SC15/WG4 in May 2009.

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