Minutes of the meeting

GRRF IG R 55 Task Force Agricultural
Couplings (TFAC)
Small Group for definition of Formulas and Test procedure for agricultural towing devices
Components: Mr. Inverardi, Mr. Afflerbach, Mr. Conrads, Mr. Mc Mahon Mr. Stokreef, Mr. Graser,
Mr. Hermann and Mr Gunneriusson

TUEV NORD ESSEN, 04 December 2014

1- Opening of the meeting

Mr. Conrads welcomed all the participants and open the meeting at 10.00.

2- Roll call of participants

Partecipants: Mr. Conrads, Mr. Afflerbach, Mr Graser and Mr. Stokreef.

3- Formulas for V-value and Fv vertical dynamic test force calculation

The following formulas have been reconsidered in order to finalize the proposal:

- Calculation of the V-value factor for agricultural towed vehicles:

$$V = a*C*[x/l]^2$$

having:
    a=1,8
    x/l=1,2

- Test force in case of Dynamic test:

$$Fv = g*S + 0,3*V$$

After deep and strong discussion again appear that the fixed values for the coefficients "a" and "x/l" are the best parameter in order to represent the total variety of different trailers and, more general, different towed vehicles normally used in the agricultural applications.

4- Formulas for theoretical check in case of simple design of the device

As in the actual ECE R55-01 Annex VI, Paragraph 3.6 for Drawbars the type approval authority or technical service may waive an endurance test if the simple design of a component makes a theoretical check of its strength possible.
In this case the group agreed that the formula used for the calculation has to be the same as already used in TA31 for the same purpose. In this case the V-value can be calculated with the following expression:

$$Vt = (0,85*(C+S/1000)-2,8)*9,81*0,4$$

where x/l is assumed fixed value and equal to : x/l = 0.4

The reference force for calculation is:

$$Fvt = (g*S/1000) + Vt$$

This formula give a value of Fvt bigger than the previous Fv formula for endurance fatigue test but the justification is that in case of theoretical check more safety margin has to be taken.

Attached there is an excel sheet with the comparison of different values calculated with the above formulas. This is the base of all the reasons used to become at this conclusion.

Permissible Stress value

The permissible stress value of material to be used as reference for the comparison with the calculation results has to be assumed in accordance with the prescriptions of the **ISO 7641-2012 Chapter 4.3.4**
Permissible stress on weld seems 90 N/mm²

5- Application of this test procedure

It is clear that the field of application of this test procedure is restricted to towing devices used only on agricultural vehicles due to the special construction and speed limitation. Only Devices tested for commercial and heavy transport vehicles with the prescriptions of the existing ECE R55-01 Regulation can be used on agricultural vehicles but not the opposite. This must be specified in the new Regulation.

6- Devices with double use and approval

As already stated in the existing ECE R55-01 there is the possibility to have one device (clear example is the 40mm drawbar eye) that can be subjected to different tests, for example, one for road vehicle such a truck trailer with appropriate D, Dc, S and V values and one for agricultural trailer with different D, Dc, S and V values.
In this case there must be considered by the new Regulation the possibility to apply at such component the two different approvals with the different combination of values.

Existing example is the T class dedicated coupling with 94/20/EC and ECE R55-01 approvals

7- Conclusion

After this meeting the small group will prepare a draft proposal for the "Test Procedure" chapter of the new Regulation.

Meeting is closed at 16.00