

Report from the ad hoc working group ASEP,
issued by the Chairman, August 29, 2007
(containing the feedback of the whole working group)

1. Task of the Group

Abstract of the Terms of Reference: the group shall deliver an additional test (ASEP test, Annex 10) to complement the test defined in Annex 3 of R51. This additional test shall broaden the control range of Annex 3 and be suited to detect attempts of cycle beating.

Product to deliver: A proposal to GRB for the text (test method, limits and control range) of annex 10, and - if needed - proposals for necessary changes in the main body.

2. COP

The Majority of the group has the opinion ASEP should be part of the COP demands. Only France do not want ASEP requirements in the COP demands.

3. Three Methods in discussion

A French/German proposal, an OICA proposal and a method from the Dutch expert.

They are not variants of a same approach, they differ fundamentally. Flow charts of the methods are in preparation and will be available the next meeting of the informal group. If GRB wish so, the inventors of the methods will clarify their brainchild's in more detail.

The German/French method:

This method derives a limit curve from a simple model of the sound emissions of a vehicle. Basis is the annex 3 test: it gives a point in the engine speed - noise diagram. From this point a limit line is drawn with a slope of $X \text{ dB(A)}/1000 \text{ revs}$. The idea is X should be 3-6 dB(A), with or without a margin.

The point can be derived from the Annex 3 test result or from the Annex 3 limit value. It was understood this method could be supported by Japan with some improvements. Part of the method is in some cases a separation between tyre and engine noise, and a recalculation of these sources for other operating conditions.

The OICA method.

This method aims to check the degree of the linearity of the sound emissions with regard to the engine speed.

The OICA method can be characterized in this way:

Method determines irregular high noise deviations from the typical noise behavior for the

concrete vehicle design. Therefore at least four additional measurements are needed (and the test results from annex 3 can be overtaken). Test methods allows application of equal limitation to all vehicle design.

However it is necessary to extract the "regular" sound behavior from the measurements, which might be taken wrong if irregular sound values are taken into account.

Therefore a compensation algorithm needs to be applied, if the test results are not very linear. This will require more measurements, which can be accepted, because at this stage a vehicle is already suspected to be irregular. With more measurements a better and clear picture of the sound behavior can be drawn.

The method of the Dutch expert.

This method is a performance based predicting model. It calculates the expectation of the noise behavior of the vehicle on basis of vehicle speed and acceleration. The limit is the difference you accept between the measured value and the predicted value.

Remaining issues under discussion

How to deal with tyre noise

One of the changes of the French/German proposal with respect to the original German proposal was a correction for the noise of the tyres. It was done to improve the accuracy of the method.

However there is no full support for this correction: there are doubts about issues like the real need, the cost/workload and the uncertainty.

One of the problems of this approach: 'what to do with vehicles with a high part of tyre noise in the annex 3 test' seems to be solved.

With the available data members of the group will be able to make the calculations for the both options. So we can compare them the next meeting and reach a conclusion.

Limit derived from test result: punish silent vehicles?

In the original French/German proposal the limit was derived from the annex 3 test result.

Industry showed data of vehicles which behave normal in higher revs but are extra silent in the low revs area. Although these vehicles behave better they show a borderline behavior according to the original German/French proposal. Depending on the limitation they can be rejected.

The common feeling of the group is such vehicles should be approved.

A solution could be an annex 10 limitation derived from the annex 3 limit value instead of the annex 3 test result.

This improvement for the French/German proposal is available.

Based on the evaluation of pros and cons of limit respectively test result anchoring of the ASEP limit curve, the result was that the group has a strong preference for an anchor point which is based on the legal limit value.

This issue does not apply for the other methods (OICA, Dutch expert). The OICA method always refers to the annex 3 test results. The method of the Dutch expert always refers to the annex 3 limit value.

1. The process

It's very positive to have alternatives, and challenging for the 'fathers of invention' to further improve their methods. But of course we have to make a choice. More measurement will be done this summer. With these measurements we expect to come closer to the choice in our next meeting (September 2007).

Special item of interest is the applicability of the method for hybrid vehicles and vehicles with automatic gears or CVT.

This summer also measurements are made with these special vehicles.