



Norwegian Public Roads Administration

European Commission
DG ENTERPRISE & INDUSTRY – D/5
45 Avenue d'Auderghem
B-1049 Brussels
Belgium

Att: Philippe Jean

Behandlende enhet:
Vegdirektoratet

Saksbehandler/innvalgsnr:
Ingunn Milford - 22073643

Vår referanse:

Deres referanse:

Vår dato:
16.06.2011

CARS 21 - Legislative measures to reduce motor vehicles' noise emissions

In the March 2011 WG 4 meeting the chairman invited participants to send in comments to the discussions. The invitation was repeated at the May 18 meeting of the Noise Regulatory Committee. The Norwegian Public Roads Administration (NPRA) and the Norwegian Climate and Pollution Agency (NCPA) would like to use this opportunity to further elaborate our view. The NCPA also gave a short written contribution to the CARS 21 Public Hearing 13 May.

The preview proposal from the Commission

The vehicle noise emission limits have not been changed since 1992¹. Action against vehicle noise emissions is therefore long overdue.

At the meeting of CARS 21 WG4 in March, and the meeting of the Noise Committee 18 May, DG Entr gave a "sneak preview" of possible new noise limits:

- Lower limit values in two steps of each 2 dB(A) for passenger cars, buses and light trucks; for heavy duty vehicles a reduction of 1 dB(A) in the first step and 2 dB(A) in the second step.
- The first step two years after coming into force of the amendment; the second step after a further two years.
- Proposed reduction based on the equivalent noise values resulting from the application of the new test method.

We have been asked to respond to the following questions:

¹ The test procedure was modified in 1996 (96/20/EC)

- Are changes required to the new test method as discussed in the UN/ECE expert groups, in particular with regard to the choice of tyres?
- Are the new limit values ambitious enough to achieve the envisaged environmental noise reduction and to decrease the negative impact of noise to citizens?
- What risks could be identified that would prevent industry from achieving the noise targets?
- What would be a realistic timeframe for industry to comply with a 2 step noise reduction of 2 dB(A) for each step (for heavy duty vehicles 1 dB(A) in the first step) and would there be a need to differentiate further on the basis of certain vehicle categories?
- Do you agree with the envisaged measures for low noise electric and electric-hybrid vehicles?

Comments to questions:

Noise limits

Since many vehicles have already noise levels below the new noise limits, it is doubtful whether the proposed noise limits reduction of 3-4 decibels will translate to noise reductions in European streets and roads of 3-4 decibels.

The suggested limits are steps in the right direction. There is, however, a strong need for further noise reductions and probably a longer timeframe, and this also should be scheduled now, in order to give the industry sufficient lead time. *More stringent noise limits are urgently needed in order to better protect the health and welfare of European citizens.* See the paragraph “A higher ambition”

Time frame

The manufacturers have been expecting stricter noise limits. In 2008 they were prepared for a 2 dB reduction in noise, and could adapt to this in a very short time, i.e. in time with the Euro 6 requirements.^{2,3} Research projects have been carried out in order to better prepare for higher reductions.⁴ The proposed time frame for the two step approach gives the industry sufficient time to comply. It is important, however, to give the industry sufficient lead time to adopt to even more ambitious noise limits, and this is the most important argument why additional steps for noise reduction should be included now. See the paragraph “A higher Ambition”.

² See page 7 in <http://www.google.no/url?q=http://www.agence-nationale-recherche.fr/documents/aap/2008/finances/VTT-presentations-2008.pdf&sa=U&ei=EanKTeDDJqWOpOLidwH&ved=0CBMQFjAC&usq=AFQjCNHqg8p7VEcANz8rWidwT5a1dE0ovg>

³ See page 38 in *The design of low-noise vehicles for air, road, and rail transportation*. [Report from a CAETS workshop June 2-4, 2008] Pages 13-58 in *Noise/News International* Vol 18 No 1 (March 2010) http://www.noisenewsinternational.net/archives/nmi_181.pdf

⁴ Pages 11-12, 49-50, and 53-54 in <http://www2.ademe.fr/servlet/getBin?name=5A123775F94EB90E42109AA74FC3AB661194512998817.pdf> (See also *Sous-thème 1.B* in <http://www2.ademe.fr/servlet/getBin?name=AD506D44D17B2D4173B1CA324C5EE1E41265814479935.pdf>)

Other noise abatement measures

A question that has been raised repeatedly is whether low noise road surfaces, and other (local) noise abatement measures may obviate the need for stricter noise limits for vehicles, The CARS 21 Working Group 4 has been charged with the task to determine

What combination of measures are the most effective in technical, economical and social terms to reduce noise pollution? How to integrate the contribution of road surface and infrastructure?

The recent impact assessment report indicates that reducing the noise emission of vehicles is a very effective way to reduce noise pollution; the benefits are very much higher than the costs. Hardly any other measure can compete. To achieve the envisaged environmental noise reduction and to decrease the negative impact of noise in Europe other measures are also needed, but must be regarded as complementary.

Minimum noise level for electric and hybrid vehicles:

Requirements for minimum noise levels for low noise vehicles (electric and hybrid) are discussed, and a working group on minimum sound levels for silent vehicles has been set up by UN/ECE. 'Approaching Vehicle Audible Systems' (AVAS) should be voluntary and remain an option under the discretion of the vehicle manufacturers. To make such requirements mandatory should be decided on a national level, as there are diverging arguments for and against this. There is not enough justification for a mandatory equipping of our future quiet vehicles with extra artificial noise or warning sounds⁵. If needed at all, there are also better options which are non-acoustical.

A higher ambition

The “sneak preview” proposal from the Commission has a short time-frame. We are concerned it may take another 20 years to get a third and fourth step of reduction if it is not introduced now.

A study by EC from 2004⁶ indicates that the limits for heavy duty vehicles could be lowered by 3-5 dB(A) in two steps within 10 years, based on a new measurement method (which is now proposed by the Commission). For passenger cars and light duty vehicles, the limits could be tightened by 3-6 dB(A) in two steps within the same timeframe. It has already gone 7 years since this study, and the technology has improved. The higher figures of these intervals are proposed as a step 3 below. A step 4, 12 years after coming into force, should reflect the best technical means and go even a bit further than step 3.

To ensure a lasting focus on noise reduction and give the industry required lead time we propose two additional steps to lower noise limits for vehicles:

Step no	years after entry into force	Reduction in limit value Light vehicles	Reduction in limit value Heavy vehicles
1 (Commission proposal)	2	2 dB	1 dB
2 (Commission proposal)	4	2 dB	2 dB
3	6	2 dB	2 dB
4	8	1 dB	2 dB

⁵ Are vehicles driven in electric mode so quiet that they need acoustic warning signals? Ulf Sandberg (1), Luc Goubert (2) and Piotr Mioduszewski (3), ICA 2010

⁶ EFFNoise Final report Volume 1, 2004, commissioned by the EC – DG Environment

May it be possible to have a very substantial reduction of noise pollution?

For the first time in 20 years the noise limits for vehicles will be revised. We see this as a historic opportunity. In the years that have passed between noise limit changes there has been a tremendous technical development of vehicles. It is our common responsibility to reconsider our ambitions and to evaluate the possibilities to introduce much more stringent noise limits, and possibly supplementary vehicle related policies as well. Noise limits for vehicles have mainly been a topic for "experts", and have hardly been given priority at higher decision levels. Available information indicates that it may be possible to reduce the noise levels from vehicles substantially. Appendix 1 quotes an opinion put forward by the Volvo Group Global on their web-pages. We welcome the opportunity afforded by the CARS 21 process to give priority to this long neglected task. As elaborated on the next pages, there are also possible synergies between noise abatement measures for vehicles, climate and air pollution.

Supplementary information

In the 1980s the environmental authorities in several countries established a target to reduce the noise limits for vehicles to 80 dB for heavy vehicles and 75 dB for light vehicles. The German Umweltbundesamt – in cooperation with German manufacturers - made a very important innovation by developing low noise versions of a number of vehicles. Encapsulations were used for these vehicles. A large part of the job was to ensure that the engine cooling continued to work adequately and that no components in the engine compartment could be overheated⁷. These low noise vehicles were presented at Internoise in Munich in 1985. Magirus Deutz was the first to market a low noise truck - a 7.5 ton truck (1984?). Daimler Benz followed in 1985 with the Mercedes 190 car. The diesel version of this car had an encapsulated engine as standard. This development paved the way for the Austrian night noise limit for trucks (1989), the noise limit was 80 dB, and encapsulated low noise versions of heavy trucks soon became available from the manufacturers. However, changes in the test procedure may explain why these vehicles were not as quiet as expected in real life. Also noise control technology for engines advanced somewhat and soon rendered encapsulations unnecessary for the Austrian night noise limit and for the new EU vehicle noise limits.

It will be possible to redeploy encapsulations and thereby significantly reduce noise emissions from HGVs in the short-medium term. This link illustrates how engine noises still have free exit, especially through the bottomless engine compartment:



Ctrl + Click here to start the video:

<http://www.miljostatus.no/PageFiles/11916/P1040613.MOV>

The Volvo Group Global⁸ suggests we should aim for “putting an end to noise pollution”, and writes on their website (see also appendix 1) :

⁷ Insulated exhaust manifolds became available and helped to solve this problem

⁸ The manufacturer of Volvo trucks, Renault trucks (France) and Mack trucks (USA)

“How quiet can a truck get?”

Nobody really knows. But our sound engineers estimate that special trucks with embedded acoustic solutions and under driving conditions adapted to marshalling (speeds below 25 km/h) in sensitive areas can fulfil a Sound Pressure Level of 72 dBA at 7,5m.

One thing is for sure: when stricter demands are introduced, quiet trucks will make a large improvement of the automotive industry! “

Both the knowledge from the 1980s and the above text from the Volvo Group illustrate the fact that noise reduction and encapsulation are not news to the industry, but already well known technology. In our opinion there is a need for investigation as to what noise reductions can be achieved with today’s knowledge and reasonable resources. The potential for a more ambitious alternative than the present proposal is, as far as we are aware of, not considered. For the present proposal the benefits by far outweigh the costs for the industry⁹.

Potential co-benefits

CARS 21 Working Group 4 has been given the task of answering the following question:

How to harvest potential co-benefits of CO2 reductions, air quality improvements and noise pollution reduction measures? What improvements can be expected from internal combustion engine technology, taking into account physical limits?

Encapsulations will probably be necessary if strict noise limits are introduced. Acoustical encapsulations of engines have potential to allow for important co-benefits in terms of less fuel consumption, less air pollution, and less adverse influence on our climate. There are several reasons for this:

- new, *lighter* and more efficient acoustical materials being developed for stricter noise limits will substitute part of the existing acoustical package in vehicles and lead to reductions in weight¹⁰
- undershields are essential parts of encapsulations and will reduce the resistance to air flow under the vehicles¹¹. They are beginning to come into use now for this reason (Golf 6 and Alfa Romeo 147 are examples)

Acoustical insulation also means thermal insulation of the engine (and this thermal insulation may be further optimised). The insulation will slow down the cooling of engines after a stop. Often the engine will be partly warm when the next trip starts. The excess cold start fuel consumption and exhaust emissions will thus be reduced.¹²

With Euro 6 the exhaust emissions from hot engines will become very low, but excess cold start exhaust emissions will remain. We urge the Commission to determine whether a synergy between measures to reduce noise emissions and exhaust emissions can be affected. With the curbing of emissions from industry and power generation, the cold start emissions will probably constitute a bigger part of the air pollution problem in Europe, contributing to long range secondary PM_{2,5} and to ozone, with related consequences for human health. The ozone

⁹ TNO report VENOLIVA, March 2011.

¹⁰ Page 53 of <http://www2.ademe.fr/servlet/getBin?name=5A123775F94EB90E42109AA74FC3AB661194512998817.pdf>

¹¹ http://www.atzonline.com/index.php?do=auth/site=a4e/sid=8053019804dcd404a08ef4068058140/alloc=3/id=10801/key=d24e3720ec4ec50bfef2afbd1e946eb3/pdfdir=atzww/pdf_filename=a01-10-04.pdf and further references given there

¹² See for instance page 68-69 of <https://www.press.bmwgroup.com/pressclub/p/gb/download.html?textId=64581&textAttachmentId=83192>

may possibly also contribute to the SLCF (short lived climate forcers) and melting of the arctic ice and have adverse consequences for the northern climate.

Complementary measures for vehicles

Labelling of “Low noise vehicles”?

Renault Trucks, with support from the French PREDIT program and from the EU (the FIDEUS project) has developed a Low Noise Urban Truck (LUT) which has a 3 dB lower noise level in the type approval test procedure. *In addition it can be operated in a low noise mode, reducing the noise level a further 3 dB*¹³. The vehicle has been tested in night traffic, in Barcelona. A special low noise mode for use in i.e. densely populated areas, city centres and low emission zones may be very useful. City authorities need tools to regulate i.e. night noise, and a labelling system for vehicles should be introduced to promote “low noise vehicles” and/or “low noise mode”.

Voluntary top speed limiters to allow for low noise tyres?

Today it is required to use tyres adapted to the highest speed that the car can attain, even if the speed is illegal in most countries and the owner do not want to drive that fast. This makes it very much more difficult to make low noise tyres. Voluntary speed limiters are now offered by some manufacturers. Such limiters may be beneficial for traffic safety, CO₂ emissions and for noise. It would be very beneficial if voluntary speed limiters could be used to limit top speed to pave the way for low noise tyres.¹⁴

Soft nose for heavy trucks?

It has been suggested to amend present regulations for the length of trucks to allow for a soft nose to make it simpler to encapsulate engines for heavy trucks and to increase traffic safety¹⁵. This is an idea that may possibly be considered in connection with CARS 21.

Conclusions

The manufacturers have hardly ever been forced to explore the potential for exterior noise reduction. For emissions the story is quite different. The first Euro 1 exhaust emission standard was promulgated in 1991 and has since been subject to change a number of times. The most recent Euro standards, Euro 5 and 6, were promulgated in 2007. We would like to stress the fact that exhaust emissions regulations have been tightened on average every 4th year. During the same period the vehicle noise regulations have remained unchanged. We believe that noise reduction for vehicles and tyres should now be given the same high priority.

About 250 million people in Europe are exposed to noise levels above L_{den} 55 dB. The goal of noise reduction from a health perspective is 10-15 dB. This can only be achieved with strict

¹³ Page 11-12 of

<http://www2.ademe.fr/servlet/getBin?name=5A123775F94EB90E42109AA74FC3AB661194512998817.pdf>

¹⁴ See [page 37](#) in *The design of low-noise vehicles for air, road, and rail transportation*. [Report from a CAETS workshop June 2-4, 2008] Pages 13-58 in *Noise/News International* Vol 18 No 1 (March 2010)

http://www.noiseneewsinternational.net/archives/nni_181.pdf

¹⁵ See [page 37](#) in *The design of low-noise vehicles for air, road, and rail transportation*. [Report from a CAETS workshop June 2-4, 2008] Pages 13-58 in *Noise/News International* Vol 18 No 1 (March 2010)

http://www.noiseneewsinternational.net/archives/nni_181.pdf

regulations on both vehicles and tyres in addition to use of low noise road surfaces and measures like noise barriers and façade insulation on "hot-spots". Measures to reduce noise at-source are more cost-effective than measures designed to hamper its propagation.

We would therefore argue for much more ambitious noise limits and a longer term perspective on reducing noise pollution from vehicles.

Yours sincerely,

Karin Sørhoel
Head of vehicle standard section
Norwegian Public Roads Administration

Hans Aasen
Head of section
Norwegian Climate and Pollution Agency

Copy to: DG ENVIRONMENT, Unit C3
Industrial Emissions, Air quality & Noise
B - 1049 Brussels

Appendix 1

Excerpt from the web pages of Volvo Group Global

Reducing noise pollution

Compared to air and water pollution, noise tends to get a low priority.

Still, the European Union estimates that some 20% of its population suffers from noise levels that scientists and health experts consider unacceptable.

That's close to 80 million people being annoyed and getting their sleep disturbed - in Europe alone. And many more live in areas where noise reaches seriously annoying levels during the day.

Transport part of the problem

Aircraft, motor vehicles and transportation systems are major sources of man-made noise in the world. For obvious reasons, it is in urban areas that noise is a major issue.

Some noise pollution can be eliminated through urban and traffic planning. But since commercial transport in many respects is the life blood of the economy, less noisy vehicles are called for.

Sound engineering

The current noise emission limit for heavy trucks in most parts of the world including the EU, India and South Korea is 80 decibels (dB).

The Volvo Group is continuously working to measure noise and vibration characteristics in engine and driveline components. Our sound engineers use both insulation and alternative design solutions to make everything from engines and transmissions to axles, fans and air intakes quieter.

How quiet can a truck get?

Nobody really knows. But our sound engineers estimate that special trucks with embedded acoustic solutions and under driving conditions adapted to marshalling (speeds below 25 km/h) in sensitive areas can fulfil a Sound Pressure Level of 72 dBA at 7,5m.

One thing is for sure: when stricter demands are introduced, quiet trucks will make a large improvement of the automotive industry!

http://www.volvogroup.com/group/global/en-gb/researchandtechnology/transport_society/reducing_noise/Pages/putting_an_en_%20to_noise_pollution.aspx?print=yes