
EUROMOT POSITION

27 September 2013



Amendment of the Nonroad Mobile Machinery Directive 97/68/EC: A perspective on policy options for emissions regulations for Small Petrol Engines

Manufacturers of small petrol engines and Diesel engines share the following positions which have already been addressed in more depth in a previous Euromot paper on policy options for CI engines:¹

- The characteristics of the non-road engine and machine business are very different to those of the on-highway industry with respect to the heterogeneity of applications, variety of operating conditions and market volumes;
- It is essential to take account of the global nature of non-road products. The non-road engine and equipment industry relies upon the harmonisation of emission regulations in order to spread the cost of developing new products over the largest possible geographical market, due to the high development costs and relatively low production volumes.
- Whilst engine manufacturers support the objective of emission reductions, with associated air quality and health benefits, if further levels of ambition beyond alignment with US limits are being considered the technical impact and cost-effectiveness of further levels of ambition **MUST** be individually assessed for different power classes. It is **ESSENTIAL** that **BEFORE** any such limit values are finalised the European Commission engage with EPA to discuss how appropriate limits could be jointly determined, both in respect to stringency and timing. To do otherwise would jeopardise the opportunity to develop products for the combined EU and US market and would be in direct contradiction to the objective of the current EU-US transatlantic trade discussions.

¹ Reference is made to the Euromot position paper "97/68/EC Review Impact Assessment EUROMOT Position 2013-09-15" as submitted to European Commission - DG ENTR on 15 Sept 2013

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ENGINE IN SOCIETY

A European Interest Representative (EU Transparency Register Id. No. 6284937371-73)

A Non Governmental Organisation in observer status with the UN Economic Commission for Europe (UNECE) and the International Maritime Organisation (IMO)

- There will be no contribution from a more ambitious stage of non-road emission regulation if the machines become unattractive for the end-user to purchase, either due to high first cost, high cost of ownership, or constrained functionality in comparison to maintaining existing machines.
- It is the opinion of engine manufacturers that the fastest action that could be taken by EU for SI engines would be the introduction of fully aligned US-EPA limits, including the US-EPA classification. This would provide cost-effective emission reductions whilst achieving a larger aligned market for manufacturers.
- It is important to highlight that whilst some respondents to the European Commission consultation clearly understood the purpose and limitation of in-service conformity (ISC), it is clear that the majority of respondents did not understand certain fundamental aspects. Much of the apparent support for ISC came from respondents that mistakenly understood this activity to be a process to check that an engine is being maintained correctly and free of tampering in-service. This is incorrect. ISC does not fulfil this function. Euromot would like to make clear that its support for the ISC program has so far been limited to variable speed CI non-road engines 56 – 560 kW. Euromot does not support expansion of ISC to SI engines without an assessment of the practical implications and development of an appropriate test methodology for each power class and application. SI engines present particular challenges, primarily with respect to installation, operation and handling requirements;

1. Updated inventory for 2-stroke SI Engines

Based upon previous investigations which were carried out by JRC in 2005/06 and which resulted in the publication of their report in 2007,² an update of the inventory for 2-stroke SI engines was conducted according to the following methodology:

- The inventory reflects the requirements according to Art. 3 of Directive 2002/88/EC, hence is taking into consideration 2-stroke emission data only;
- Market data from EU27 instead of EU15 member states;
- Sales figures of 2010 instead of 2005. Consequently, very low sales due to the 2009 financial crisis and a currently negative trend in southern Europe are not taken into consideration:

Annual sales	EU 27 (2010)
chain saw hobby	3.958.000
chain saw professional	242.000
trimmer hobby	2.055.000
trimmer professional	105.000
other hobby	467.465
others professional	82.535

² <https://circabc.europa.eu/sd/d/36c150d2-0263-4bd9-bc13-226eb42afd0d/Final%20Report%20NRMM%20Review%20Part%20I.pdf> and <https://circabc.europa.eu/sd/d/d11bead9-9201-449b-aa1c-e006905ee241/Final%20Report%20NRMM%20Review%20Part%20II.pdf>

- A general “correction-factor” was applied to each of the categories of the 2005 JRC data:

Annual sales	EU 27 (2010)	Factor (EU 15 (2005) to EU 27(2010))
chain saw hobby	3.958.000	3,87
chain saw professional	242.000	1,09
trimmer hobby	2.055.000	3,02
trimmer professional	105.000	1,16
other hobby	467.465	1,18
others professional	82.535	1,21

- Forecasts for the years 2015 and 2025 are based upon the 2010 market volume. By using 2010 instead of today's market figures, the predicted numbers might slightly overestimate future sales;
- Due to rapid technical development, a higher substitution rate than originally predicted is observed for the 2-stroke engines market. Besides 4-stroke technology, a quick penetration of battery-based products has begun to substitute small SI engines in the lower power range. This trend has been fully taken into account for the 2015 and 2025 forecasts;
- Furthermore, it is assumed that all engines which are and will be placed on the EU 27 market are meeting the emission limits. In reality this is not the case, hence the predicted figures assume functioning market surveillance and a competitive level playing field ;
- Scientific evidence that PM from 2-stroke engines are predominantly of liquid nature, i.e. unburned soluble organic oil/fuel compounds from scavenging losses of the engine;

The absolute PM emissions from small 2-stroke petrol engines for the years 2005, 2015 and 2025 are, based on above assumptions, given by the following table:

Year	2005	2015	2025
(PM = 1,85 von HC+Nox) [to/a]	892	480	409
PM solid fraction = 5% of total [to/a]	45	24	20

2. Policy options on measures to further reduce PM emissions from small 2-stroke petrol engines

Euromot believes there is no justification for policy options proposing to introduce PM emission requirements for SI engines in general and for 2-stroke SI engines in particular based on the following points:

- As clearly illustrated by the figures given above, existing emissions regulations in conjunction with the rapid penetration of new technologies into the EU27 markets will cut the already very low PM emissions from 2-stroke small petrol engines by another more than 50% over the next decade;

- Only a very minor fraction of PM emissions from 2-stroke SI engines is of solid nature (less than 5% m/m) and are hence negligible within the context of overall PM emissions from nonroad mobile machinery;
- Policy options based upon the assumption of similarity in technology of small nonroad petrol engine with their on-road counterparts do not take into account that more than 99% of the former are carburetted or indirect injection engines. EU5/6 regulations on the other hand regulate PM emission limits for SI engines with direct injection technology only;
- USEPA 40 CFR 1054 limit values for small petrol engines <19 kW are not including any PM emissions limits. Introducing PM emission limits would require our manufacturers to develop unique solutions for the European market only, which would put very substantial financial and administrative burden on companies operating already in a very competitive environment, including a non-functioning EU market surveillance;

Consequently, Euromot supports full alignment with USEPA 40 CFR 1054 limit values and categorisation for small petrol engines <19 kW.

3. Policy options for compliance with emission requirements

Euromot supports alignment with USEPA Phase 3 requirements for all engine classes (SN and SH), including ABT (Averaging, Banking and Trading of emission credits) as it is anticipated to deliver the most favourable cost/benefit ratio.

As the European legal framework for emission regulations is different to the US, Euromot understands that it will be challenging to reach a consensus for implementing ABT provisions. In terms of a ranking for all three measures, averaging is considered the tool with the highest positive impact on costs, therefore is strongly recommended to be thoroughly considered. To enable efficient monitoring of type approval data and the averaging of emission credits by the individual manufacturers, Euromot proposes the implementation of a database. Additionally we are offering our support for setting up and maintaining an appropriate system. Such a database would offer the authorities a better control over real world product compliance with emission regulations as well as a strong basis for market surveillance. Introducing Phase 3 emissions requirements with and without averaging would result in an estimated 10% and 25 to 35% increase in unit sales prices, respectively.

4. In Service Conformity

Compared to most of the other NRMM applications, small SI engines <19 kW show a considerably different operation pattern, i.e. they are operated typically for a much shorter period of time and much less frequently. Hence, DF tests for these engines are very well reflecting their actual in-use hours, i.e. during type approval the engines are aged up to or very close to their end of life. Therefore, type approval data is anticipated to be in good correlation with real world emissions.

Euromot does therefore not support to implement provisions for “in service conformity” for small SI engines.

5. Provisions for "large" SI engines (LSI)

Any policy options for these engines need to consider the following LSI characteristics:

- Some engines are based on on-road technology; others are not;

- The regulated US market show equivalent price levels to the unregulated EU market;
- Additional compliance costs for the EU are supposed to be mainly certification costs;

Euromot supports the complete alignment with USEPA 40 CFR 1048 emission limits.³ In order to prevent loopholes and to facilitate a level playing field, we furthermore recommend including LSI engines and small spark ignited engines into a future framework for gaseous fuelled engines, including the usage of LPG and CNG fuels.

We are yet in preparation of an analysis of market data to provide a robust inventory for this category. For the time being, we estimate roughly 80.000 LSI engines/year for EU27.

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³ Reference is made to the Euromot position paper as of 15 April 2013, "Euromot response on the Stakeholder consultation on the Revision of 97/68/EC Directive on Emissions from Non-road Mobile Machinery Engines: Proposal for the inclusion of large spark ignited engines (petrol-fuelled, 19-56 kW)" as submitted to European Commission - DG ENTR, available under <https://circabc.europa.eu/sd/d/70e7327b-b13a-43f8-8fb4-66a431a05fe2/Euromot%20-%20European%20Association%20of%20Internal%20Combustion%20Engine%20Manufacturers.pdf>

EUROMOT is the European Association of Internal Combustion Engine Manufacturers. It is committed to promoting the central role of the IC engine in modern society, reflects the importance of advanced technologies to sustain economic growth without endangering the global environment and communicates the assets of IC engine power to regulators worldwide. For more than 20 years we have been supporting our members - the leading manufacturers of internal combustion engines in Europe, USA and Japan - by providing expertise and up-to-date information and by campaigning on their behalf for internationally aligned legislation. The EUROMOT member companies employ all over the world about 200,000 highly skilled and motivated men and women. The European market turnover for the business represented exceeds 25 bn euros. Our **EU Transparency Register** identification number is **6284937371-73**.

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