

10/04/2015

Revision of Directive 97/68/EC on exhaust emissions from non-road mobile machinery

EGMF position on the European Commission proposal for a regulation on non-road mobile machinery regarding CI engines in lawn and turf equipment

EGMF represents the major European garden, landscaping, forestry and turf equipment manufacturers.

EGMF supports the Commission's intention to revise directive 97/68/EC by proposing a regulation rather than another directive, as well as the measures proposed to simplify the existing legislative framework and improve enforcement.

The Stage V emission limit values will however impose substantial redesign efforts to be undertaken by garden machinery manufacturers who will need to use engines requiring a diesel particulate filter for the first time. In addition, the lawn and garden industry has certain specificities (e.g. seasonality, diversity of models) that will be detailed in this paper in order to explain the difficulties facing manufacturers when redesigning their machinery with Stage V engines under the given transition period (18 months in total following the implementation date of Stage V, namely 1 January 2019). Another issue causing concern to EGMF members is related to the provisions on in-service conformity testing for which further clarification is needed.

1. Transition period

The transition period proposed for the introduction of Stage V engines is 12 months with an additional 6 months to place the products on the market. EGMF equipment uses **Compression Ignition (CI) engines, many of which are in the power bands between 19 kW and 56 kW** which are placed in the first set of engine categories in the proposed transition scheme. In other words, the transition period foreseen is between 1 January 2019 and 1 January 2020, with 6 additional months for placing on the market. Due to the size of garden machinery and the seasonal nature of its operation, EGMF is seeking an extension of the transition period to 30 months for production, plus 6 months to place the machine on the market.

Using current state-of-the-art technologies, lawn and garden equipment using Stage V engines in the NRE-v-3 and above sub-categories will require a Diesel Oxidation Catalyst (DOC) and a Diesel Particulate Filter (DPF) in order to comply with the proposed PM and PN requirements.

The combination of a DOC and a DPF is by design a large component (see annex I), the use of which will require an extensive redesign of any product that will require such an exhaust after treatment, as the volumetric space needed to house the power unit will be substantially increased. Furthermore, to use a DPF effectively, its condition must be monitored electronically and, when required, a regeneration programme must be used to clean the filter by incinerating the soot that has been collected within it. Accommodating this new function will require an extensive redesign of the wiring systems.

Additionally, it is foreseen that a common rail fuel injection system will be required to meet the proposed Stage V emission requirements. The operation of such a system will necessitate the use of an Engine Control Unit (ECU) to control complex multiple injections of fuel, the timing and quantity of which will be continuously varied to suit the demands on the engine whilst meeting the emission limits. This technology will be new in the 19 – 56kW power range. The use of ECUs will require OEMs to redesign their electrical systems to accommodate the new complex technology.

Our members' products are used seasonally and, as such, the 12-month transition period will create significant problems in the development of new, and the redesign of existing, machines. The design and development process requires rigorous testing in the field during normal operations. Initially a small number of prototype machines are tested; this practical testing is essential to ensure that errors are identified so that corrective measures and further improvements can be made to the machine's design. This is especially important when the designs are incorporating new technologies into the product such as a common rail injection system and a DPF that require the support of complex electrical systems that have not previously been tested in this environment, as well as the control of high temperature exhaust gases created during the regeneration phase in an environment of dry, combustible grass debris.

The European lawn and garden machinery market currently contains over 50 models that utilise engines in the 19 – 56kW power range. A redesign of the range of machines within the proposed time frame will be extremely challenging and will detract from manufacturers' R&D time being focused on developing better and more efficient designs.

Previous legislation has made it possible for manufacturers to redesign their fleet in a phased manner after the introduction date. The proposal has significantly reduced the transition period to 18 months allowing only a 12-month period of production. This transition period is too short for manufacturers to redesign their product lines.

We propose that a transition period of 36 months in total, comprising 30 months production limit and 6 months sell-off period, would allow manufacturers to spread the burden of R&D and allow them to produce well tested and proven machines for the market, whilst allowing continued product development.

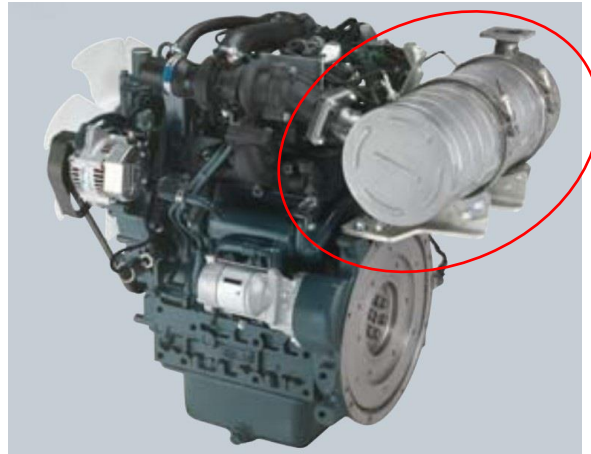
2. In-service conformity testing

The proposed in-service conformity testing raises concerns within our industry, as it is not clearly defined at this stage and it is unclear how it can be accurately and consistently carried out. Many products that are produced for the lawn and garden industry are serviced outside of the dealer network. This will bring into question the quality of the servicing, the components and lubricants used in the servicing and the accuracy of adherence to the manufacturer's recommended service intervals. Additionally many products have no method of recording the duty times, making it impossible to accurately determine when a product has reached a specific point in its lifecycle. Any in-service testing requirements deterioration factors must take into account these uncertainties.

The current Portable Emission Measurement Systems (PEMS) are too bulky to use on garden equipment (see annex II), because they are not designed for the size of equipment used in the lawn and garden industry and are therefore unsuitable.

EGMF is keen to cooperate with the European Commission and the Member States to possibly provide expert input specifically for the garden equipment in question, in view of the planned pilot programmes to develop testing procedures which are not yet in place for the engines categories used by EGMF products.

Annex I



Pictures from Kubota

Increase in size caused by a typical DOC + DPF exhaust treatment (circled)

Annex II



Picture from Toro



Picture from Ransomes Jacobsen

Typical size of large mowing machines



Pictures from European Commission – Joint Research Centre

PEMS test equipment (circled) mounted on NRMM