

January 12, 2007

Clerk of the Board  
Air Resources Board  
1001 I Street, 23<sup>rd</sup> Floor  
Sacramento, CA 95814

**RE: Comments to ARB's Notice of Public Availability for the Adoption of New Emission Standards, Fleet Requirements, and Test Procedures for Forklifts and Other Industrial Equipment**

IMPCO Technologies, Inc. (IMPCO) respectfully submits the following comments regarding the subject proposed modifications:

**MY07+ Field-Test Emission Standards**

CCR 2433, 40 CFR 1048.101<sup>1</sup> and 1048.140

EPA Tier 2 and Blue Sky emission standards allow for more lenient in-use field-test emission standards to reflect the observed variation in emissions from in-field testing due to varying engine operation, and the projected effects of ambient conditions on different technologies.

ARB does not specify more lenient field-test standards in either of the following:

- MY10+ Tier 2 Standards (1048.101)
- MY07+ Optional Lower-Emission Engines (1048.140)

Until data is collected which indicates to the contrary, ARB should include separate, more lenient field-test emission standards consistent with those allowed by EPA.

IMPCO considers this issue to be of paramount importance.

**Units Used for Emission Standards and Power**

CCR 2430, 2433, 2434, 2438, 2775, 2775.1, 2781, 2782, 2786, 40 CFR 1048 and 1065

Terms of grams per brake horsepower-hour (g/bhp-hr), grams per kilowatt-hour (g/kW-hr), horsepower (hp), and kilowatt (kW) are used inconsistently throughout the proposed text. To align with EPA terminology and minimize confusion for certification, labeling, and reporting purposes, the primary units should be in terms of g/kW-hr and kW, optionally referencing g/bhp-hr and hp in parenthesis.

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<sup>1</sup> All CFR references within this document relate to the proposed changes to the 40 CFR references in ARB's "Proposed California Exhaust and Evaporative Emission Standards and Test Procedures for New Off-Road Large Spark-Ignition Engines".

**MY07-09 Tier 2 Emission Standards and MY07-09 Optional Lower-Emission Standards (“OLES”)**

CCR 2433, 40 CFR 1048.101, 1048.140

1. The difference between the MY07-09 Tier 2 (1048.101) and OLES (1048.140) emission standards is not clear.

Manufacturers are allowed to certify to the Tier 2 emission standards using one of two methods:

- a.) Certify to 2.7 g/kW-hr HC+NO<sub>x</sub> and 4.4 g/kW-hr CO, or
- b.) Use the formula  $(\text{HC}+\text{NO}_x) \times \text{CO}^{0.784} \leq 8.57$ , as long as HC+NO<sub>x</sub> does not exceed 2.7 g/kW-hr and CO does not exceed 20.6 g/kW-hr

The first three sets of HC+NO<sub>x</sub> and CO values identified under the OLES emission standards are:

Model Year	Engine Displacement	Durability Period	Standard – g/bhp-hr (g/kW-hr)	
			HC+NO <sub>x</sub>	CO
2007-2009	> 1.0 liter	5000 hours or 7 years	1.5 (2.0)	4.8 (6.4)
			1.0 (1.3)	8.3 (11.1)
			0.6 (0.8)	15.4 (20.6)

These OLES HC+NO<sub>x</sub> and corresponding CO values are identical to those found using the formula  $(\text{HC}+\text{NO}_x) \times \text{CO}^{0.784} \leq 8.57$  under the Tier 2 standards.

Further clarification of the difference between engines certified under the Tier 2 emission standards (1048.101) and the OLES emission standards (1048.140) is appreciated.

2. MY07-09 Proposed OLES Emission Standards (1048.140)

ARB has proposed the following addition to 1048.140:

“...”OLES” engines must meet all the requirements in this part that apply to **2010** model year engines...”

2010 model year engines are subject to substantially different requirements as compared to those for MY07-09 engines. IMPCO does not believe that ARB’s intent was to make it more difficult for a manufacturer to certify a MY07-09 engine to a lower emission standard, by requiring that all of the MY10 requirements are met.

**MY07-09 Severe-Duty Engines**

40 CFR 1048.101(a)(2)

ARB issued a December 18, 2006 Errata notice specifying the following HC+NO<sub>x</sub> emission standard for MY07-09 severe-duty engines:

“For severe-duty engines, the HC+NO<sub>x</sub> standard is **0.8** g/kW-hr and the CO standard is 130.0 g/kW-hr...”

The MY07-09 Tier 2 HC+NOx emission standard is **2.7** g/kW-hr. Therefore, the severe-duty engine HC+NOx standard specified in the Errata notice is far more stringent than the MY07-09 Tier 2 standard. This 0.8 g/kW-hr value should be revised to read 2.7 g/kW-hr, consistent with EPA and ARB MY07-09 Tier 2 exhaust emission standards, and EPA MY07+ severe-duty engine standards.

**Consistency between the CCR and Modified CFR Sections**

CCR 2434, 2436, 40 CFR 1048.120, 1048.135

IMPCO suggests that ARB update the following CFR sections to remain consistent with the text contained within the CCR:

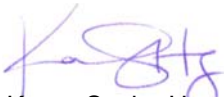
- MY07+ Emission-Control Labels  
CCR 2434, 40 CFR 1048.135
- MY07+ Emission Control System Warranty Statement  
CCR 2436, 40 CFR 1048.120

**LPG Fuel Quality**

ARB recognizes the importance that clean fuels play when developing new technologies to meet lower emission standards. Because LPG fuel quality is critical in meeting in-use emission standards, IMPCO appreciates the efforts that ARB is making towards better understanding the quality of fuel used in the field, and working towards enforcing fuel quality used for industrial equipment. We look forward to continued involvement in these efforts.

Thank you for the opportunity to publicly comment on this proposal. Please give me a call if you have any questions.

Respectfully,



Karen Szabo Hay  
Certification and  
Regulatory Affairs