STATE OF CALIFORNIA
AIR RESOURCES BOARD

Notice of Public Hearing to Consider Technical Status and Proposed Revisions to On-Board Diagnostic System Requirements for Heavy-Duty Engines, Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles and Engines	**)**	**Hearing Date: August 23, 2012** **Agenda Item 12-5-2**

COMMENTS OF THE TRUCK AND ENGINE MANUFACTURERS ASSOCIATION

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COMMENTS OF THE TRUCK AND ENGINE MANUFACTURERS ASSOCIATION

The Truck and Engine Manufacturers Association (EMA) is the national trade association representing worldwide manufacturers of internal combustion engines. EMA's members include the major manufacturers of heavy-duty engines used in vehicles between 8,500 and 14,000 lbs. GVWR ("medium-duty engines and vehicles") and over 14,000 lbs. GVWR ("heavy-duty engines") that are the subject of the proposed amendments to the existing on-board diagnostic ("OBD") rules (the "proposed amendments").

I. Background

Although ARB uses the term "medium-duty" to describe engines and vehicles in the 8,500-14,000 lbs. GVWR range, engines in this range actually are "heavy-duty" engines as defined in the federal Clean Air Act. The heavy-duty engine industry (which also encompasses those engines and vehicles regulated by the medium-duty OBD rule; "OBD II") is unlike the passenger car and light-duty industry. The heavy-duty industry is generally a non-integrated industry, where the manufacturers of engines are not typically the manufacturers of the chassis or vehicles in which those engines are used. Rather, heavy-duty manufacturers produce and sell engines to customers who then incorporate the engines into many different types of chassis or vehicles, with many different types of customer specifications and performance requirements. In contrast, in the light-duty industry, a single manufacturer produces both engine and vehicle, integrating all systems into a single product for sale to consumers.

Heavy-duty engines and vehicles also play a far more significant role in commerce than do light-duty vehicles. Heavy-duty engines and vehicles are used to perform work – from construction to goods transport, tow trucks to utility vehicles, waste haulers to delivery trucks. Such vehicles are commercial assets of their respective businesses, and represent a significant capital investment by their owners. Any regulatory provisions covering heavy-duty engines and vehicles must account for the fact that such vehicles engage in a wide range of commercial activities supporting California's economy and the economy nationwide.

A. ARB's Obligation To Adopt Technologically Feasible Requirements

In recognition of the nature of this industry and its importance in commerce, the U.S. Congress established unique provisions and protections in the federal Clean Air Act for engines used in vehicles over 6,000 lbs. GVWR, which encompasses the heavy-duty engines covered by the proposed amendments. Those provisions of the CAA, as well as California law, require ARB to adopt technologically feasible and cost-effective standards. Manufacturers have raised with Staff their substantial feasibility concerns with the existing OBD thresholds and requirements and the proposed amendments to those thresholds and requirements.

While ARB has had OBD requirements for heavy-duty engines in place since 2005, and for medium-duty engines and vehicles even longer, those requirements have evolved into more sophisticated and complex provisions with each new round of OBD amendments. Manufacturers have spent and continue to spend significant resources in meeting the OBD requirements. Each time that changes to the OBD rule are adopted and new technological challenges are added, manufacturers are forced to expend still more resources to meet those challenges. Yet, many times those challenges have proven to be infeasible, requiring last-minute fall-back changes, and wasting the limited resources available to manufacturers. Once again, with the current proposed amendments, many aspects of this rulemaking are not feasible and manufacturers fear they will have to be corrected later even though they have been compelled, in the interim, to waste their resources attempting to meet such infeasible and unreasonable requirements.

As Staff explains in the Staff Report: Initial Statement of Reasons for Proposed Rulemaking ("ISOR" or "Staff Report"), some of the thresholds and requirements that ARB adopted in 2005 and amended in 2009, despite manufacturers' best efforts, are not feasible and now must be revised (ISOR, p. 59). While such relief is absolutely necessary in this instance, ARB should not again adopt requirements that are beyond technological reach, thereby again causing manufacturers to use limited resources and precious test cell time in vain attempts to meet them.

B. The Realities And Impact Of ARB's Rulemaking Process

Providing reasonable notice of the requirements that manufacturers must meet, and giving them enough time in which to attempt to comply with those requirements, is not just a legal or academic exercise. It is absolutely essential to the way manufacturers do business.

Manufacturers must devote substantial time and resources to the process of researching, developing and producing engine emissions control technology and OBD monitoring technology to meet the standards that ARB and other regulators adopt. It is not an easy task and cannot be done "on the fly." Manufacturers first must research possible technology options, develop those that look promising, and spend countless hours in the test cell to engineer products that can meet the standards. It is not necessarily a linear process, either, as technologies are tried, tested, adjusted or

abandoned, and then developed and tested all over again. After years of going through the development process, manufacturers begin the production and certification process, which requires testing in accordance with strict regulatory procedures, measuring the compliance of the technology (both engine emission control technology and OBD monitoring technology) to the required standards, and seeking approval from the regulatory agencies. Because of the way in which "model year" is defined by law, engine manufacturers may certify (both "emission-certify" and "OBD-certify") their 2013 products, for example, as early as January 2, 2012. Once manufacturers begin the process of certifying their products, it is generally too late to make design changes.

There are a number of ways in which ARB's rulemaking process – and this rule in particular – disregards the real notice and timing issues that manufacturers face. The most obvious of these is ARB's proposal for new continuous misfire monitoring requirements with less than sufficient leadtime. In other words, ARB is making changes to the rule and adding new requirements when it is already far too late in the design, engineering and production processes that manufacturers must utilize.

In the ISOR, Staff focuses on the aspects of the rule that are being "relaxed" in order to provide manufacturers more leadtime to comply (ISOR, p. 59). While manufacturers support those changes as absolutely necessary to their ability to meet the OBD requirements, this need for "relaxation" of the requirements points out one of the inherent problems with ARB's approach – ARB goes beyond the limits of technological feasibility in establishing OBD regulations, "holding manufacturers' feet to the fire," as it often says, to force technology. Yet, time and again, manufacturers are unable to meet such unreasonable requirements (which they have clearly stated to ARB at the outset, to no avail), requiring the "relaxation" to which Staff refers.

ARB's approach to rulemaking causes an undue burden and unjustified expense for manufacturers, who have invested their limited resources in trying to meet ARB's regulatory requirements only to find out, at the very last minute, that those requirements have changed or that new requirements have been added on. This is inherently unreasonable.

Manufacturers need certainty so they may use their limited resources most effectively – certainty in knowing what standards they must meet and the time frame in which to meet them. ARB's rulemaking process has failed to provide such certainty. ARB must provide the certainty that manufacturers need by assuring that it upholds the leadtime, stability, notice and process requirements of federal and California law. ARB must revise its rulemaking process, must adopt feasible standards and requirements, and must provide sufficient time for meeting those requirements.

C. The Many Challenges Manufacturers Face In Meeting Emission Standards And OBD Requirements

Engine manufacturers were engaged in a multiple-year effort to meet stringent new federal and California emissions standards that began in 2007 for on-highway engines used in vehicles over 8,500 lbs. GVWR. The new emission standards reduced

engine emissions by an additional 90% over the previous standards and have resulted in diesel technology – long known for being the most durable and energy-efficient – having the right to also be called ultra-clean. Engine manufacturers continue to devote thousands of hours of engineering time and expertise in the emissions test cell to refine their clean diesel technologies. Meanwhile, they also must address the challenges of the new manufacturer-run heavy-duty in-use test program applicable to those engines federally and in California.

On top of those underlying emission standards, and the in-use compliance program, the OBD rules further require manufacturers to certify engines and vehicles to new, stringent OBD requirements. OBD is technically complex, and requires the development and commercialization of sophisticated new systems installed in engines and vehicles. Software that can diagnose emission component problems to the stringent levels required in the rule must be developed, tested and verified. The level of coding necessary to achieve such diagnostics is extremely complicated, and must account for the inter-connectedness of numerous systems, sub-systems and components. Base software must be developed and then further developed for each engine model and rating. Regulating how manufacturers use OBD and monitor their engine emission control adds more complexities and new challenges to produce engines that are compliant with 2013 and later emission standards and OBD requirements. ARB staff will confirm the fact that manufacturers are doing all that they can to meet the OBD requirements that have been established.

Further complicating manufacturers' efforts to comply with OBD is that what has worked for light- and medium-duty OBD will not necessarily work for heavy-duty engines. The two industries are very different. As noted, the heavy-duty industry is generally a non-integrated industry, meaning that engine manufacturers sell their products – engines – to customers who take those engines and incorporate them into many different types of vehicles, with many different types of transmissions, customer specifications and performance requirements. Engine manufacturers simply cannot predict all the possible variations in which their engines will be used and they do not have control over vehicles. In the non-integrated heavy-duty engine and vehicle industry, there is an extreme burden associated with calibrating OBD monitors for use in a myriad of different vehicle configurations. Further changes must be made to the OBD rule to limit engine manufacturers' responsibility for vehicle-related requirements outside their control.

Finally, additional OBD development challenges uniquely apply to the heavy-duty sector. A particularly challenging aspect is the need to accumulate sufficient test mileage with multiple chassis over a broad range of applications to ensure adequate monitor safety margins against false codes, while at the same time meeting increasingly stringent threshold requirements. Compared to passenger car applications, the integrity of monitors must be maintained over triple the target mileage. Costs for development and validation not only increase respective to mileage goals, but also are driven higher by material costs of the vehicles themselves and the operation costs per mile. As monitoring requirements become more stringent, design iterations must increase and, consequently, more time is consumed. Manufacturers simply must be allowed sufficient time to develop

products that are both capable of meeting more demanding OBD requirements and robust enough for commercial consumers who, aside from fuel economy, hold "up-time" of their equipment as the most important characteristic.

In sum, in light of the legal framework underlying the OBD standards, the impact on manufacturers of ARB's rulemaking process, and the many challenges manufacturers face, all described in detail below, ARB must make changes to the proposed HD OBD amendments.

II. **Discussion**

In the following discussion, EMA details its significant concerns with the proposed amendments, including how ARB's proposal fails to provide the necessary leadtime and stability, and also fails to establish that the proposed amendments to ARB's OBD standards are technologically feasible and cost-effective. While EMA's comments are focused primarily on heavy-duty engine diagnostics under the HD OBD rule (section 1971.1), the same issues also apply to medium-duty diesel engines regulated under the OBD II rule (section 1968.2), requiring similar changes as those EMA recommends for heavy-duty.

Before elucidating those technical points, however, a more fundamental defect in ARB's HD OBD program needs to be addressed. In addition to its inherent lack of leadtime and demonstrated feasibility, ARB's HD OBD program contains two fundamentally unlawful and invalid components: (i) a manufacturer-run in-use testing program (codified at CCR, title 13, §§ 1971.1(l)(4) and 1971.5(c)); and (ii) an engine recall program premised on exceedances of OBD malfunction criteria (codified at CCR, title 13, §§ 1971.5(d)(1) – (4) and (6) – (7), 1971.5(e) and 1971.5(f)). EMA has challenged both of those unlawful components in the Superior Court of California for Sacramento County (See EMA v. CARB, Case No. 34-2010-00082774), and recently obtained the following judicial declaration (finalized on July 18, 2012):

> IT IS HEREBY ADJUDGED AND DECREED that, for the reasons set forth in the Court's Final Order in this matter, which is being entered concurrently with this judgment, the Defendant California Air Resources Board's ("CARB") Amended Regulations at issue pertaining to Heavy-Duty On-board Diagnostic systems, specifically, California Code of Regulations, title 13, sections 1971.1(l)(4), 1971.5(c), 1971.5(d)(1)-(4) and (6)-(7), 1971.5(e) and 1971.5(f), are hereby declared to be invalid because they were not within the scope of authority conferred to CARB, nor were they reasonably necessary to effectuate the purpose of Sections 43104 and 43105.

Copies of the Superior Court's Final Order and Judgment are attached to these comments as Exhibit 1.

In light of the Superior Court's ruling, ARB must recognize the invalidation of the manufacturer-run in-use testing and recall components of its HD OBD program before

attempting any further amendments to the program. Indeed, as detailed below, ARB is seeking to amend recall provisions that have been expressly ruled to be invalid and of no effect. Any such attempted amendment is necessarily invalid and of no effect as well. Accordingly, before proceeding further with any of the proposed amendments at issue in this iteration of rulemaking, ARB needs to take specific account of all of the prior amendments that have been determined to be unlawful and invalid. Not doing so will only spawn additional litigation, judicial mandates and sanctions that should otherwise be unnecessary if ARB simply abides by the pending order of the Superior Court.

A. ARB's New Definition Of "Emission Standard" Is Invalid And Must Be Deleted From The Rules

One of the series of revisions that ARB staff have proposed to the HD OBD rule and to the OBD II rule is the addition of a newly-minted definition of the term "emission standard." ARB Staff have proposed to add this definition to the regulations presumably so that ARB can try to bolster its claim (i) that the OBD malfunction criteria are emission standards, and (ii) that failures to satisfy the OBD malfunction criteria amount to violations of emission standards, which in turn can lawfully allow ARB to insist on an engine recall under HSC §43105.

As an initial matter, it seems apparent that ARB staff formulated and inserted their proposed definition prior to the issuance of the final judgment by the California Superior Court on July 18, 2012, in EMA v. ARB (Case No. 34-2010-00082774-CU-MC-GDS; Sacramento County). In that case, as noted above, the Superior Court ruled that the manufacturer-run in-use testing provisions of the HD OBD regulations, as well as the mandatory recall provisions (see CCR, title 13, sections 1971.1(l)(4), 1971.5(c), 1971.5(d)(l)-(4) and (6)-(7), 1971.5(e) and 1971.5(f)), are not within the scope of ARB's authority and so are invalid. Thus, the proposed regulatory revisions at issue have, in effect, been superseded and mooted by the recent decision of the California Superior Court.[1] The OBD-related in-use testing and recall provisions that ARB seeks to amend have been judicially determined to be in excess of ARB's statutory authority and, therefore, invalid. Simply stated, ARB is seeking to amend an in-use testing and recall program that is invalid and of no effect. As a consequence, the amendments at issue are inherently invalid as well. ARB cannot revise or amend regulations that have been struck down.

Even if the proposed revisions were not mooted by the Superior Court's recent decision, it is clear that OBD malfunction criteria are not emission standards, under either federal law or California law. Thus, as explained below, the recent determination of the California Superior Court -- that "a malfunction criterion is not an emission standard" -- remains the binding and correct conclusion.

ARB asserts that it is entitled to change the operative definition of "emission standard" pursuant to Health and Safety Code section 39601(b). (See ISOR, p.61.) That

[1] It should be noted that the same provisions appear in the OBD II rule, section 1968.5, so those provisions must be deemed invalid as well.

section, in relevant part, authorizes ARB to revise certain definitions of terms "in order to conform those definitions to federal laws and rules and regulations." But ARB's new definition of "emission standard" does not conform to the federal definition of "emission standard." Rather, it amounts to a transparent and invalid effort to end-run the Superior Court's recent decision.

The federal definition of "emission standard" is found at section 302(k) of the Clean Air Act ("CAA"). That provision of federal law states in relevant part that,

> The terms "emission limitations" and "emission standard" mean a requirement established by the State [of California] or the Administrator [of EPA] which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis… (42 U.S.C. §7602(k).)

Plainly, ARB's proposed amended definition of "emission standard" does not at all conform to CAA section 302(k) and so is not authorized under Health and Safety Code section 39601(b). As a result, the Board is not authorized to approve the proposed amended definition of "emission standard."

In an implicit concession that its definitional gamesmanship does not conform with CAA section 302(k), ARB does not even mention the controlling federal definition of "emission standard," but instead asserts that its proposed redefinition of the term is consistent with the Supreme Court's ruling in EMA v. SCAQMD, 541 U.S. 246 (2004). In that case, however, the Court was called upon to interpret the scope of federal preemption under CAA section 209(a), not the definition of "emission standard" under CAA section 302(k). The scope of federal preemption encompasses "any standard relating to the control of emissions." See 42 U.S.C. §7543(a). It is, therefore, broader in scope than the specific statutory definition of the term "emission standard." More fundamentally, the Supreme Court's elucidation of the scope of federal preemption cannot form the basis for ARB's attempt to redefine the term "emission standard." That redefinition, if it is to be valid under Health and Safety Code section 39601(b), must be premised on CAA section 302(k), not case law interpreting other provisions of the Clean Air Act. Thus, ARB's purported reliance on the Supreme Court's 2004 preemption decision is entirely misplaced and unavailing.

With reference to the actually relevant terms of CAA Section 302(k), an OBD malfunction criterion or threshold is not a numerical tailpipe limit on the "quantity, rate or concentration of emissions of air pollutants" with which an engine or vehicle must comply. Rather, it is a durability or reliability standard that an OBD system component must meet so that it consistently activates a MIL when warranted. Consequently, it is clear that the federal definition of the term "emission standard" does not encompass an OBD malfunction criterion. As a result, ARB's latest attempt to disguise OBD malfunction criteria as "emission standards" (as opposed to performance specifications for OBD components) remains violative of state and federal law.

The other definitions contained in the current version of the HD OBD regulations confirm this as well. Specifically, ARB still defines a "non-conforming OBD system" to

mean an OBD system that has been determined not to comply with the malfunction criteria (set forth in 1971.1(e) through (g) and corresponding provisions of 1968.2) "irrespective of whether engines in the engine class, on average, meet applicable tailpipe or evaporative emission standards." As the Superior Court recently ruled, "by this definition, a malfunction criterion is not an emission standard."

ARB tries to get around this necessary conclusion by splitting hairs – in this case by devising and proposing a broader definition of "emission standard," and then adding two other sub-definitions, one for "evaporative emission standards" and one for "tailpipe emission standards." This hair-splitting presumably is intended by ARB staff to clear a path for ARB to argue that even though a "nonconforming OBD system" is not dependent on "evaporative emission standards" or "tailpipe emission standards," it is nonetheless tied to an "emission standard" as more broadly defined, and so can serve as a proper trigger for an engine recall.

Once again, however, that tortured word-play does not change the ultimate conclusion. Simply stated, ARB's proferred definition does not conform with CAA section 302(k) and so is invalid under Health and Safety Code section 39601(b). An OBD malfunction criterion -- a threshold above which a MIL must activate or else be deemed nonconforming -- is not a limit on the quantity, rate or concentration of emissions of air pollutants, and so is not an emission standard. As already stated, it is simply a performance specification for an OBD system or component. ARB's definitional contortions cannot change this fundamental legal conclusion.

ARB's attempts to establish recall authority where it has none is perhaps best revealed by its final rationale for its added definitions. ARB states that its OBD malfunction criteria amount to "emission standards *for OBD systems*." (Notice of Public Hearing, p. 3; ISOR, p. 7; emphasis added.) But there is no such thing. Emission standards necessarily pertain to the emissions of air pollutants from *a motor vehicle or engine*, not to an OBD system. OBD systems do not generate emissions. It is, therefore, a complete *non sequitur* for ARB to assert that it has adopted emission standards for OBD systems. Accordingly, just as it makes no sense to say that there are separate "emission standards" for ABS systems or airbags, so, too, is it an inherent malaprop to refer to OBD malfunction thresholds as "emission standards" for OBD systems. No matter how many times ARB refers to an OBD malfunction criterion as a standard, it is still just a performance/durability requirement for a sensor and a MIL.

As noted above, it appears that ARB devised its definitional scheme prior to the issuance of the Superior Court's final ruling on July 18, 2012, which has invalidated the manufacturer-run in-use testing and mandatory recall provisions of the HD OBD regulations (specifically, CCR, title 13, §§ 1971.1(l)(4), 1971.5(c), 1971.5(d)(1)-(4) and (6)-(7), 1971.5(e), and 1971.5(f)). Consequently, not only are the regulatory revisions at issue invalid in their own right, they have been superceded and, in effect, mooted by the Superior Court's invalidation of the underlying OBD-related in-use testing and recall regulations that ARB purports to be able to amend. Since the underlying regulations have been invalidated, the proposed revisions thereto are necessarily and inherently invalid as well.

Consequently, the Board must direct Staff to publish modified regulatory language deleting the proposed definitions of "emission standard," "evaporative emission standards," and "exhaust emission standards or tailpipe emission standards" from the HD OBD rule and from the OBD II rule. Similarly, as detailed below, the Board must direct staff to delete the other sections of the HD OBD rule that have been invalidated by the Superior Court of California.

B. ARB Must Amend The Enforcement Regulations To Remove Provisions Deemed Unlawful By Court Order

As discussed above, the Superior Court in EMA v. ARB confirmed that the provisions of sections 1971.1(l)(4); 1971.5(c); 1971.5(d) (1)-(4), (6), (7); 1971.5(e); and 1971.5(f) are beyond the limits of ARB's statutory authority and, as a result, are unlawful. As a result, the Board now must direct Staff to publish modified language deleting the unlawful sections of the HD OBD regulations and of the parallel OBD II regulations.

1. 1971.1(l)(4) and 1971.5(c) Manufacturer Self-Testing Provisions

Section 1971.1(l)(4) (Verification of In-Use Compliance) and section 1971.5(c) (Manufacturer Self-Testing) must be deleted in their entirety. Section 1971.1(l)(4) is language used to purportedly require manufacturer in-use self-testing under 1971.5(c) as a condition of OBD certification under 1971.1. The Superior Court held those provisions of the existing regulations exceed ARB's limited delegated statutory authority because they unlawfully impose in-use emissions testing obligations on engine manufacturers with respect to non-new engines that have been sold into commerce and are beyond manufacturers' custody and control, and were not reasonably necessary to effectuate the purpose of HSC §§43104 and 43105 authorizing ARB to regulate new motor vehicle emissions.

As a result, the Board must direct Staff to publish modified regulatory language deleting sections 1971.1(l)(4) and 1971.5(c) in their entirety.

2. 1971.5(d) (1)-(4), (6), (7), 1971.5(e) and 1971.5(f) Remedial Actions (Recall) and Penalties

Sections 1971.5(d) (1)-(4), (6), (7); 1971.5(e); and 1971.5(f) and the parallel provisions of the OBD II rule appearing in 1968.5 must be deleted in their entirety. The Court held those provisions of the existing HD OBD regulations exceed ARB's limited delegated statutory authority because they unlawfully impose mandatory engine recall obligations without first requiring proof that the manufacturer has violated emission standards or test procedures, and were not reasonably necessary to effectuate the purpose of HSC §§43104 and 43105. Those same principles of invalidity are applicable to the OBD II enforcement regulations as well.

As a result, the Board must direct Staff to publish modified regulatory language deleting sections 1971.5(d) (1)-(4), (6), (7); 1971.5(e); and 1971.5(f) – and sections 1968.5 (c)(1)-(4), (6), (7), (d) and (e) – in their entirety.

C. ARB Must Revise Heavy-Duty OBD and Medium-Duty Thresholds And Requirements (1971.1 and 1968.2)

Manufacturers support many of the changes that ARB has proposed to make to the requirements for 2013 and later HD OBD monitoring requirements. Even though some relief has been provided, however, and while manufacturers continue to work with Staff on other necessary changes, many other requirements that ARB adopted in 2005 and subsequently amended, in part, in 2009 continue to be technologically infeasible. Thus, further changes to the existing thresholds are absolutely necessary.

1. Diesel Misfire Monitoring 1971.1 (e)(2) and 1968.2 (f)(3)

ARB is proposing to amend the rule to require continuous monitoring for misfire beginning with MY2016. These new requirements are being proposed without the leadtime required by law. As discussed elsewhere in these comments, MY 2013 is already underway (it began January 2, 2012). Because four full years' leadtime is required, the earliest the new requirements could be in place is January 2, 2017, *if* the proposed amendments are final and approved by December 31, 2012. If final OAL approval is not completed until January 2, 2013, or later, then the earliest such new requirements could be implemented is January 2, 2018. In either event, ARB has failed to propose sufficient leadtime.

ARB further is proposing to phase in the continuous monitoring requirements for misfire beginning in 2016 for a three-year period, using a fixed percentage of 5 percent as the malfunction criterion for both heavy-duty engines and medium-duty vehicles and limiting monitoring to up to 75% of maximum-rated engine speed and load. Notwithstanding EMA's position that the 2016 start date is too early to provide sufficient leadtime, EMA supports such a phase-in as it is essential to addressing manufacturers' concerns regarding their ability to achieve repeatable and representative misfire detection.

In addition to such a phase-in (beginning in 2017 or 2018, depending on finalization of the amendments), EMA seeks additional changes that are necessary to address the numerous challenges associated with achieving robust misfire detection in diesel engines and vehicles. Specifically, EMA proposes the addition of a minimum load range at which misfire would be required to be continuously detected.

Under the current proposal, detection at engine load 5% above the positive torque line is too light a load for robust misfire detection and creates a substantial risk of false failures (MIL indicates failure when no fault or exceedance of the OBD malfunction criterion exists). ARB and manufacturers both are sensitive to the risk of false failures and should take all reasonable steps to minimize their risk.

Crank sensor-based misfire detection is more difficult in heavy-duty diesel engines than for light-duty vehicles. Such increased challenges are due to increased crank-twist and the wide variety of torque noise factors from multiple OEM driveline designs and intermittent high accessory loads. Light-duty OEMs typically need to

calibrate misfire algorithms for one automatic and, on rare occasions, one manual transmission used across a large percentage of vehicles from a single OEM, and with similar and well-defined accessory packages.

In contrast, on-highway heavy-duty engine manufacturers face a wide variety of transmission/final drive/chassis combinations from vehicle OEMs' multiple chassis types going into widely varying and specialized vehicle applications. This wide variation significantly increases the possibility of false MILs, unless a reasonable minimum peak torque limitation can be established.

Manufacturers are proposing a minimum peak torque requirement of 20%. Such a limit is reasonable for several reasons. Detection at idle will continue to be required by (e)(2.3.1). This slight extra carveout will not impede misfire detection appreciably, as heavy-duty diesel engines spend much of their running time within the proposed monitoring torque range, and generally only pass through the light load region of the map under short load transitions. EMA also recommends that percent of engine load be changed to percent of peak torque to simplify the detection region. Load at given operating points can vary widely due to multiple factors and different calculation methods. Peak torque is a known point and is less ambiguous.

In summary, EMA recommends that the language be modified to require misfire detection above 20% peak torque up to 75% peak torque and between low idle and 75% max-rated engine speed. (See Appendix A for proposed regulatory language changes.) Similar changes should be made to both the heavy-duty and medium-duty regulations (1971.1(e)(2.3.3)(A)(i) and Section 1968.2 (f)(3)).

Further modifications to the regulation also should be made to address special operating conditions. In addition to difficulties at low load in separating indications of misfire faults from normal signal variation, other operating conditions exist where identification of a fault is difficult. Diesel particulate filter (DPF)-equipped heavy-duty diesels typically require active regeneration. Strategies for regeneration may include unique modulation of injection events so as to enhance DPF regeneration. Such strategies alter dynamic characteristics causing variability which may inhibit the ability of misfire monitors to detect a fault. As manufacturers continue to develop technology resulting in reduction of fuel consumption and greenhouse gas emissions, DPF regeneration frequency has continued to decrease. Consequently, the already-small fraction of time associated with this requested exemption is likely to diminish over time. Misfire detection during DPF regeneration, therefore, should be exempted. Additional conditions have been recognized and accommodated in the 1968.2 OBDII misfire requirements for medium-duty vehicles and also should be recognized in the 1971.1 heavy-duty rule. These include operation during fuel cutoff modes, heavy transient conditions, rough road operation, gear changes, intrusive tests, and traction control. EMA's specific proposed language changes are set forth in Appendix A, section 1971.1(e)(2.3.3)(B).

EMA urges the Board to direct Staff to incorporate these necessary changes into the proposed amendments.

2. NMHC-Converting Catalyst Monitoring (e)(5)

Despite manufacturers' concerns that the 2013 MY NMHC emissions thresholds are too low and will be exceeded when total failure of the diesel oxidation catalyst's NMHC conversion efficiency occurs, ARB is proposing no changes to the NMHC emissions threshold of 2.0 times the applicable standard. This approach appears to be based on strategies that Staff believes can be successful in measuring catalyst deterioration prior to total failure, including the fact that one manufacturer apparently has been able to demonstrate the ability to detect a degraded catalyst prior to exceedance of the threshold (ISOR, p. 27). However, the purported success of one manufacturer does not demonstrate a technologically feasible standard.

Detailed comments outlining EMA's concerns and the technical challenges associated with detecting NMHC emissions on catalyst degradation are set forth in Appendix B. Notwithstanding Staff's belief that "virtually all manufacturers" have continued to make improvements to regeneration emissions allowing them to meet the emissions threshold of 2.0x NMHC standard, EMA remains concerned that the requirements are not technologically reasonable and feasible. ARB should increase the emissions-based malfunction threshold for NMHC converting catalysts to a high-enough level to ensure that 2013 MY engines will only have to meet functional monitoring requirements. EMA believes a threshold of 4 times the NMHC standard would ensure functional monitoring on most engine applications.

In summary, the proposed threshold monitoring requirement for the diesel oxidation catalyst cannot be met by all manufacturers for the 2013 MY. EMA continues to maintain that the proposed threshold-monitoring requirement in the HD OBD regulation for diesel oxidation catalysts is not feasible and must be revised.

3. NOx Converting Catalyst (e)(6) and NOx Sensor Monitoring (e)(9)

ARB is proposing a phase-in of the NOx converting catalyst and NOx sensor thresholds to address the significant technological challenges that face manufacturers in meeting the NOx thresholds originally established for 2013 and later. EMA supports the phase-in outlined in the proposed regulatory language because it is directionally helpful for manufacturers in meeting the requirements. Nevertheless, the provisions do not go far enough in accounting for the realities of the technologies required to meet such stringent requirements.

Detailed comments outlining EMA's concerns and the technical challenges associated with meeting the NOx catalyst and NOx sensor thresholds are set forth in Appendix B. As stated therein, while NOx sensor technology has continued to develop since the OBD requirements were first adopted, the accuracy, reliability, and durability of NOx sensors has not kept up to a sufficient degree with the extremely stringent NOx thresholds that have been implemented over time.

In 2009, EMA urged ARB to reduce the stringency of the 2010 emission thresholds for NOx aftertreatment until such time as durable, reliable, and effective

sensing technology was developed. At that time, NOx sensors with the accuracy necessary to meet the stringent OBD requirements were not available. Even now, NOx sensor suppliers have indicated that it is unlikely that additional improvements in measurement accuracy of such sensors will be achievable. With that in mind, changes to the OBD regulations must be made to ensure that manufacturers can meet the applicable OBD malfunction criteria.

At a minimum, EMA proposes that the phase-in of the requirements be modified to require manufacturers to meet 10% of the manufacturer's projected sales volume at +0.3 in 2014 and 20% of volume at +0.3 in 2015, in addition to the proposed phase-in extension to +0.2 in 2017 for those engines meeting the +0.3 threshold in 2014 and 2015.

4. PM Filter Monitoring (e)(8)

ARB is proposing changes to address technological challenges faced by manufacturers in attempting to meet the stringent PM filter monitoring requirements that have been established in the HD OBD rule. In lieu of changing the threshold levels, however, as manufacturers had requested, ARB is proposing a phase-in of the more stringent PM threshold levels as well as a "phase-out" of the existing exclusion for certain failure modes. EMA supports the proposed phase-in as directionally correct, but, once again, additional changes should be made to address the significant challenges with the use of PM sensors for PM filter monitoring at the extremely stringent thresholds set forth in the rule and without the availability of the failure mode exemption.

As EMA predicted in our previous written comments during the 2009 biennial review, the requirements that ARB established for 2013 caused manufacturers to expend significant time and resources in attempting to meet the rule, but without sufficient technological success. As Staff noted in the ISOR, only one *light-duty* manufacturer is able to implement a PM sensor in the 2013 MY, and only a few heavy-duty manufacturers were making progress toward that goal until recently, when such efforts were abandoned. Indeed, ARB Staff "generally agrees that PM sensors are not ready for full scale implementation in the 2013 model year" and sensor suppliers have confirmed that fact as well (ISOR, p. 32).

Detailed comments outlining EMA's concerns and the technical challenges associated with meeting the 2013 PM filter threshold, elimination of the exemption for certain failure modes, and use of the PM sensor are set forth in Appendix B. As described more fully there, available PM sensors are still not mature enough to be placed into widespread serial production. Moreover, analysis of recent data indicates that PM sensors will not be capable of meeting the 0.03 g/bhp-hr PM filter monitoring threshold without significant risk of false MILs, simply because the PM sensor cannot distinguish between a good filter and a failed filter at the levels in the regulation.

EMA appreciates the effort that ARB has made to evaluate the state of readiness of PM sensor technology and its willingness to appropriately adjust requirements. But while ARB's phase-in proposal provides partial relief, it does not go far enough. As a

result, engine manufacturers are proposing further phase-in relief and a means whereby failures can be detected without substantial risk of false failures.

Specifically, EMA recommends that the phase-in of the requirements be modified to require manufacturers to meet 10% of the manufacturer's projected sales volume at 0.05 without the failure mode exemption in 2014-2015 or 25% of volume at 0.03 without the failure mode exemption in 2015, in addition to the proposed phase-in extension through 2016 for those engines. In addition, EMA recommends that phased-in engines not be required to illuminate a MIL or store fault codes during the 2014-2015 phase-in years. Rather, manufacturers would meet the percentages established and gather data in "silent mode" to be used for further development of robust monitoring technologies capable of meeting requirements in 2016.

Such an approach provides a logical allocation of the phase-in to the product mix in the early years of the increasingly stringent requirements (a reduced number of OEMs with a reduced number of models). It also serves to limit liability for sensor suppliers in the phase-in years (other new technology sensors are having issues in real-world testing; sensor drifts, offsets, and high failure rates, etc.) and for end users, ARB as a regulatory agency interested in acceptance of the diagnostic technology, and engine and vehicle manufacturers. False faults are everyone's concern, and this approach is designed to minimize their impact.

Even with the modifications that EMA has proposed, manufacturers' rationality diagnostic approach and prove-out will be difficult and problematic. Moreover, manufacturers will face significant challenges in attempting to integrate PM sensors with delta-pressure sensing technology to achieve compliance across product offerings. The use of PM sensors and delta-P technology to improve in-use monitor ratios also needs development time.

Finally, the PM sensor itself may be an integrated assembly of an exhaust stream sensor probe and the interface module. Those two components may come from separate suppliers, and must be integrated into the aftertreatment system. Both parts of the assembly have development challenges. In-stream probes are historically challenging, and there are known issues such as probe-clogging concerns. The interface module may require voltage control enhancements to more reliably clean the sensor element and detect a failed filter in a timely manner.

For all the above reasons, the Board should direct Staff to incorporate the changes proposed by EMA for a modified phase-in and "silent mode" monitoring in 2014-2015.

5. EGR System Monitoring (e)(3)

ARB has proposed to add provisions in (e)(3.2.6) allowing an exemption from monitoring the catalyst if there is no measurable impact on criteria pollutant emissions. EMA supports this provision. Such a "test-out" option also should be made available in 1968.2 for EGR catalyst system monitoring for medium-duty engines/vehicles.

6. Deficiencies

a. Carryover of Deficiencies (k)

In the ISOR, Staff has referred to an issue about which manufacturers have sought clarification: specifically, the need for the "clock" on deficiencies to be "re-set" each time manufacturers are required to certify engines to a new OBD emissions threshold. Under the regulation, manufacturers are allowed to "carry over" deficiencies from one year to the next for up to two to three years. In cases where manufacturers have attempted to meet an interim threshold on a particular monitor and did so with a deficiency, if manufacturers then meet a final threshold for the same monitor, the time during which deficiencies were granted for the interim threshold should not count toward deficiencies that may be necessary meet the final threshold for the same monitor.

Given the challenges manufacturers face in meeting the thresholds, as well as the existing ARB regulatory requirements that, in order to receive deficiencies, manufacturers must make a good faith effort to comply in full as quickly as possible, Staff has indicated its general policy that a change in the monitoring threshold "resets the clock" for a deficiency (ISOR, p. 46). Manufacturers support this interpretation of the regulations and anticipate relying on it where necessary.

In a slightly different issue also related to carryover of deficiencies, however, manufacturers are seeking a specific regulatory language change. Section (k)(4) currently allows deficiencies to be carried over for two years, with the option of one additional year if it can be demonstrated that substantial hardware changes would be needed to correct the deficiency.

EMA is proposing that deficiencies identified in 2010 (or later) be allowed to carry over for three years without additional EO approval, with the option of one additional year if it can be demonstrated that substantial hardware changes would be needed to correct the deficiency. This allowance would extend into the 2013 and 2014 model years only. See Appendix A for proposed regulatory language changes.

The additional time being sought under this regulatory language change is different from the regulatory interpretation policy discussed above, which applies when there is a change in the standard – where manufacturers used deficiencies to meet an interim standard, and now have to start again (potentially using new deficiencies) to meet the final (stepped-down) standard. The issue that EMA is proposing to address with the regulatory language change is that of deficiencies that have existed on a particular technology and further refinement is needed in order to make the technology fully compliant. In such a case, another year of carryover without the need to demonstrate a hardware change would allow the manufacturer to achieve compliance without having the "hard stop" of having to pull product out of production. The threshold has not changed, but additional time is allowed to bring the product into full compliance.

EPA has discussed the need for this change with ARB Staff and Staff recognizes the concerns. We are working together on regulatory language changes to address this issue, although EMA has proposed language in Appendix A to these comments.

b. Production Testing Timing (1971.1(l)(2) and 1968.2(j)(2))

Recognizing some of the challenges that manufacturers face in the timing of conducting production engine and vehicle evaluation testing, ARB has proposed to extend the time to six months (from three) for conducting such testing on vehicles and for obtaining retroactive deficiencies should such testing uncover problems that would be considered deficiencies.

EMA supports the extension of the time in which to conduct testing and obtain retroactive deficiencies; however, the timing that ARB has proposed does not go far enough to address manufacturers' real concerns and challenges in getting such testing completed.

Specifically, EMA proposes that ARB extend the time to complete production engine and vehicle evaluation testing from six to nine months for diesel medium-duty vehicles and heavy-duty engines. In addition, EMA proposes that ARB extend the retroactive deficiency allowance from six to nine months after the start of production for diesel medium-duty vehicles and heavy-duty engines. See Appendix A for proposed regulatory language changes.

Such changes are necessary because of the unique nature of diesel engine and vehicle systems. Diesel OBD systems often have twice as many MIL-illuminating diagnostic trouble codes to demonstrate (up to 500+ DTCs) compared with gasoline engines. Moreover, many diesel monitors require extended vehicle operation and/or extended soak periods in order to detect faults.

Engine manufacturers typically have been unable to complete this testing within the first six months after the start of production as a result. Staff have often had to extend testing periods beyond the strict six-month limit. It is important for manufacturers that issues identified through this testing beyond six months be allowed to be considered for retroactive deficiencies.

EMA recommends appropriate regulatory changes be made to extend the time for production evaluation testing and retroactive deficiencies to nine months after start of engine or vehicle production.

7. NMHC Conversion Efficiency of Catalyzed PM Filters (e)(8.2.4)(A)

ARB is proposing to delay the monitoring requirements of the catalyst function of catalyzed PM filters until the 2015 model year. EMA supports the delay in imposing monitoring requirements as necessary due to the lack of cost-effective monitoring strategies capable of robustly detecting deterioration of the NMHC conversion capability for a catalyzed DPF.

In fact, EMA believes the requirement should be delayed until 2016 because of the significant technological concerns. A delay would provide engine manufacturers with time to investigate and develop a robust, cost-effective monitoring strategy. And considering the minimal NMHC emissions impact of the catalyzed DPF, EMA further recommends that ARB review manufacturers progress in meeting this requirement by the 2016 MY, and eliminate the monitoring requirement if manufacturers determine there is no cost-effective monitoring strategy that can meet it. See Appendix B for further detailed comments supporting the delay to 2016.

ARB also is proposing to add "test-out" criteria allowing manufacturers to be exempt from monitoring if complete failure of the component results in a less than 15 percent of the standard (or FEL) increase over the applicable test cycle as long as emissions are below the standard. EMA supports this additional test-out criteria as an important tool to minimize costs where additional testing and proof of compliance is unnecessary. For consistency in language throughout the regulation, however, EMA recommends that the phrase "full useful life" be deleted from the applicable provision, as it is inapplicable to the heavy-duty regulatory language.

8. DOC Feedgas Constituency Conversion Capability (e)(5.2.3)(B)

ARB is proposing to delay the requirements for monitoring the ability of the DOC to generate a desired feedgas constituency until the 2015 model year. EMA supports the delay in imposing monitoring requirements as necessary due to the lack of monitoring strategies capable of meeting this requirement.

In fact, EMA believes the requirement should be delayed until 2016 because of the significant technological concerns. See Appendix B for further detailed comments supporting the delay to 2016.

ARB also is proposing to add "test-out" criteria allowing manufacturers to be exempt from monitoring if complete failure of the component results in a less than 15 percent of the standard (or FEL) increase over the applicable test cycle as long as emissions are below the standard. EMA supports this additional test-out criteria as an important tool to minimize costs where additional testing and proof of compliance is unnecessary. For consistency in language throughout the regulation, however, EMA recommends that the phrase "full useful life" be deleted from the applicable provision, as it is inapplicable to the heavy-duty regulatory language.

9. Fuel Injector Tolerance Compensation Factor (g)(3.2.2)(F)

ARB is proposing to delay the requirements for monitoring fuel control system components that have tolerance compensation features until the 2015 model year. EMA supports the delay in imposing monitoring requirements as necessary due to the technological challenges in meeting this requirement.

In fact, EMA believes the requirement should be delayed until 2016 because of the significant technological concerns. See Appendix B for further detailed comments supporting the delay to 2016.

ARB also is proposing to add "test-out" criteria allowing manufacturers to be exempt from monitoring if complete failure of the component results in a less than 15 percent of the standard (or FEL) increase over the applicable test cycle as long as emissions are below the standard. EMA supports this additional test-out criteria as an important tool to minimize costs where additional testing and proof of compliance is unnecessary. For consistency in language throughout the regulation, however, EMA recommends that the phrase "full useful life" be deleted from the applicable provision, as it is inapplicable to the heavy-duty regulatory language.

10. Chassis-Certified MDVs

ARB is proposing to require diesel medium-duty vehicles (MDVs) certified on the chassis dynamometer to meet the monitoring requirements and malfunction criteria applicable to passenger cars, light-duty trucks and medium-duty passenger vehicles (MDPVs) certified on the chassis dynamometer. ARB is proposing to require this by the 2016 MY. Despite the exceptions provided for the NMHC catalyst monitor and misfire monitor, EMA is concerned that this proposed change overall to MDV monitoring requirements and malfunction criteria will not be feasible for some monitors due to the significant increase in the stringency of the requirement, particularly for monitoring of aftertreatment systems.

Chassis dyno-certified diesel MDVs use similar emissions control technology as those certified on the engine dynamometer for both medium and heavy-duty vehicles. In fact, the diesel engines used in MDVs are most often used in engine-certified MDV applications as well as heavy-duty truck applications. As such, chassis-certified MDVs will be faced with the same monitoring feasibility issues as their engine-certified counterparts. There is no reason for ARB to impose more stringent malfunction criteria for chassis-certified MDVs than for engine-dynamometer certified MDVs.

There also are advantages to ARB when manufacturers certify MDVs on the chassis dynamometer. Chassis certification allows ARB to more readily conduct confirmatory testing of manufacturers' compliance with OBD requirements on these trucks. The proposed requirement, however, would present a deterrent for manufacturers to certify MDVs on the chassis dynamometer in the future.

For all these reasons, EMA recommends that ARB not require MDVs to meet light-duty malfunction criteria by the 2016 MY. Rather, ARB should require that MDVs certified on the chassis-dynamometer meet the same requirements as medium-duty engines certified on the engine-dynamometer.

11. I&M Readiness

Manufacturers are seeking a specific regulatory change to address an issue with inspection and maintenance (I/M) requirements and "readiness groups." The issue has become of greater concern with infrequent regeneration monitors that run only once every 300-500 (or more) miles. With increasing regularity, because of infrequent regeneration monitors, properly functioning vehicles are appearing to be "not ready" for

I/M testing, which is causing problems for inspection facilities, end users and manufacturers.

Various monitors depend on PM filter regeneration events to complete (a monitor "completes" after it has been enabled, runs, and finishes all aspects of its monitoring operation). Since PM filter regeneration events are infrequent (occurring at intervals of hundreds or thousands of miles, or tens to hundreds of hours), the monitors that depend on such events take similarly long to complete. In addition, infrequent monitors are spread among several "readiness groups." As a result, it may take a relatively long time for all (or all but one) readiness groups to complete after code clearing events. Code clearing events occur when an electronic control module is reprogrammed or after a vehicle is serviced by a repair facility, both of which may occur just prior to an inspection.

Jurisdictions with I/M programs that currently inspect medium-duty diesel vehicles typically have adopted the gasoline vehicle practice of allowing zero or one "not ready" monitor readiness group to pass. As a result, in California, diesel vehicles that *are functioning properly* are at risk of *failing inspections*. This is particularly true after codes have been recently cleared. If a vehicle fails I/M, the customer may be inconvenienced and frustrated by a such a failure and by the steps necessary to address the "failure" and prepare the vehicle to pass inspection, including unnecessary time and expense devoted to "solving" the problem.

For example, the customer may have just completed an OBD repair, only to be told that the customer's vehicle has "failed" inspection. Further, to solve the problem, the customer may be sent away from the I/M facility and told to drive for a certain number of miles or hours before returning. That may be repeated if insufficient miles or hours have accumulated for all the monitors to pass "readiness."

To address this issue, EMA recommends that ARB revise the regulatory language as follows: (1) remove infrequent regeneration-based monitors from readiness groups, or (2) create a new readiness group to capture all infrequent regeneration-based monitors. By adopting one of those recommendations, ARB can greatly increase the chances that diesel vehicles will have zero or only one monitor groups "not ready" even relatively soon after code clearing events. Such a change would alleviate the vast majority of I/M failures associated with monitors being "not ready" on properly functioning vehicles. Such changes should be incorporated into both OBD II and HD OBD requirements, as heavy-duty vehicles may be subjected to similar I/M processes in the future.

12. <u>Hybrid Component Monitoring Requirements (g)(3.1.5) and (d)(7.6)</u>

ARB is proposing what it calls an "integrated approach" requiring a single entity – whether hybrid system manufacturer or engine manufacturer – to take certification responsibility for an integrated system, beginning in 2014. In the meantime, for 2013, a hybrid vehicle may use a California-certified 2013 MY engine with modifications made solely for the purpose of preventing false failures. At the same time, for MY2013, the

manufacturer of the engine used in such hybrid system would be exempt from enforcement or liability for noncompliance caused by addition of the hybrid system to the certified engine.

Both hybrid system and engine manufacturers have provided information to ARB Staff regarding the significant challenges associated with integration of heavy-duty engines into hybrid systems. EMA is concerned that ARB's proposed approach will result in little or no use of hybrid applications in California, depriving the state of the fuel efficiency and other benefits that hybrid technology has to offer.

To that end, EMA recommends that additional time be offered to hybrids to allow development of hybrid system and engine technology and associated diagnostic strategies that can comply with the monitoring requirements of the ARB rule.

Specifically, from now through 2015 (through 2016 for hybrids being produced prior to MY 2013), engine manufacturers propose to maintain existing OBD capability and calibrations for diesel engine systems used in hybrid applications, except that there should be no liability for failure to meet diagnostic performance requirements (detection thresholds, in-use performance ratios, etc.) with certified engine systems used in hybrid applications. Rather, manufacturers would accept responsibility to meet EMD/EMD+ system monitoring requirements for NOx aftertreatment, DPF, fuel system, and EGR systems for their engines used in hybrid applications.

In addition, there should be no requirement to demonstrate that monitors complete on the applicable FTP/SET for engine/hybrid system operation. Engine manufacturers also should be allowed to seek Agency approval to re-calibrate monitoring strategies if evidence shows false failures occurring with existing engine OBD systems. The rule also should allow flexibility for manufacturers to seek Agency approval of (different) diagnostics for unique engine calibrations that may be developed for hybrid use.

During the same time frame, diagnostics for the hybrid components or systems themselves should be based on (i) what hybrid manufacturers believe necessary to provide service and (ii) monitoring of other gross systems that manufacturers already are monitoring and that are necessary to meet performance and other needs.

The use of hybrid technology in heavy-duty applications is an emerging industry, and the market is very small relative to heavy-duty overall and to light-duty hybrid. There are multiple heavy-duty applications in which hybrids are used. Adequate time is needed for development of proper diagnostics on hybrid components.

Given the broad nature of the concerns, engine manufacturers should not be required to certify diagnostics on the emissions created by a hybrid drive system until the nature of such emissions are better understood and there is data to direct appropriate policy on the diagnostics desired. Creating requirements in an HD OBD regulation for hybrid drive systems, without addressing certification and other issues, is premature.

As the proposed regulation stands, huge disincentives are created for any hybrid drive technology to reach the California marketplace. ARB should make changes to the

OBD monitoring requirements to ensure the successful introduction of hybrid system technology in California.

13. Definition of "Diagnostic or Emission Critical" Electronic Control Unit (a)

ARB has proposed a revised definition of "diagnostic or emission critical" in 1971.1 and 1968.2. The proposed definition appears to include all or most sensors and other potential devices used in connection with the engine, and potentially will require a proliferation of calibration identifiers (CAL IDs) and calibration verification numbers (CVNs).

The definition should be revised to minimize the number of controllers required to report CAL IDs and CVNs. The ISOR appears to reflect an intent to minimize the number of control units subject to the reporting requirement. Nevertheless, the current language is ambiguous and raises concerns that more, rather than fewer, CAL IDs and CVNs may be required. The definition should be revised to state not only what is "diagnostic or emission critical" but also what is not. This may require specific exceptions to be written into the regulatory language in order to effectuate ARB's intent.

14. Diagnostic Connectors – J1939 Test Results 1971.1(h)(4); 1968.2(g)(4)

Sections 1971.1(h)(4.5.5) and 1968.2(g)(4.5.4)(D) address reporting of J1939 test results. The existing regulatory text in both sections should be modified, as it is inconsistent with the J1939-73 standard language that has existed since the late 1990s. See Appendix A for proposed modified regulatory text.

15. Service Information Requirements (h)(6)

The adoption by ARB in 2006 of 13 CCR 1969 amendments incorporating heavy-duty engine requirements into the existing light/medium-duty service information rule – one year after adoption of the original heavy-duty OBD requirements (1971.1) – supersedes the requirements in 1971.1(h)(6). As (h)(6) has been superseded by a previously-adopted rule, it should be deleted from 13 CCR 1971.1. It is, at best, inappropriate for two separate ARB staff sections to separately promulgate rules and separately administer them on the same topic. ARB Staff concerns, if any, with the content of this rule should be addressed within ARB and not within separate rules.

As service information requirements are fully covered and implemented under a separate rule, section (h)(6) should be deleted from section 1971.1.

16. Medium-Duty Enforcement Regulations (1968.5(b))

Medium-duty OBD II NOx enforcement thresholds are significantly tighter than HD OBD for the same malfunction threshold. HD OBD applies a 2X multiplier to the malfunction threshold in 1971.5 (b)(6)(A)(ii)(a), whereas OBD II uses a +0.2 additive number to the malfunction threshold in 1968.5 (b)(6)(A)(ii)(d).

By way of illustration, a 0.2 standard has an OBD threshold of 0.5 (standard of 0.2+0.3). Adding +0.2 results in a non-conformance threshold of 0.7 under the medium-duty OBD II requirements. By way of comparison, the non-conformance threshold for the same HD OBD standard (0.2 std) results in a non-conformance threshold of 1.0 (standard of 0.2 + 0.3 = OBD threshold of 0.5; 0.5*x2* equals 1.0 non-conformance threshold).

EMA recommends that the additive number in 1968.5 for medium-duty NOx be changed to +0.4 above the malfunction threshold. This will still lead to a tighter medium-duty OBD II non-conformance threshold than for HD OBD, but will allow more in-use separation and better measure of a non-conforming system. See Appendix A for proposed regulatory language.

D. The Proposed Amendments Must Be Feasible, Be Cost-Effective, And Provide Sufficient Leadtime and Stability

As noted at the outset of these comments, many of the proposed HD OBD amendments under consideration constitute new or changed requirements that engine manufacturers must meet before introducing their products for sale into commerce. Because the Board is adopting new requirements, it is subject to clear mandates both by the U.S. Congress in the federal Clean Air Act and by the California legislature in state law. Any mobile source emission standards adopted by the ARB for on-highway engines and vehicles from over 8,500 lbs. GVWR require a waiver of federal preemption from EPA and must be technologically feasible, must be cost-effective, and may be implemented only if the requisite leadtime and period of stability are provided to manufacturers.

1. ARB Must Adopt HD OBD Requirements That Are Technologically Feasible

Under CAA Section 209(b), which authorizes California to adopt emissions standards for mobile sources only if certain conditions are met, California's emission standards must be consistent with CAA Section 202(a). Section 202(a) requires, among other things, that emission standards for heavy-duty engines must be technologically feasible:

> [S]tandards must reflect the greatest degree of emission reduction achievable through the application of technology … determine[d to] be available for the model year to which such standards apply, giving appropriate consideration to cost, energy, and safety factors associated with the application of such technology.

CAA Section 202(a)(3); 42 U.S.C. §7521. *See Motor & Equip. Mfrs. Ass'n v. Nichols*, 142 F.3d 449, 463 (D.C. Cir. 1998) ("In the waiver context, section 202(a) 'relates in relevant part to technological feasibility and to federal certification requirements.'") (citing *Ford Motor Co. v. EPA*, 606 F.2d 1293, 1296 n. 17 (D.C. Cir. 1979)); *see also*

Motor & Equip. Mfrs. Ass'n v. EPA, 627 F.2d 1095, 1111 (D.C. Cir. 1979) (consistency with the CAA requires standards to be " technologically feasible").

California law also requires that emission standards be justified and technologically feasible. Under the California Health & Safety Code, ARB "may adopt and implement motor vehicle emission standards … which [ARB] has found to be necessary, cost-effective, and technologically feasible." Cal. Health & Safety Code, §43013. Staff has failed to justify the technological feasibility of many of the proposed amendments.

2. ARB Must Demonstrate That The Proposed Amendments Are Cost-Effective

ARB must demonstrate that its proposed control measures are cost-effective under both federal and state law. Section 202(a) of the CAA requires the Board to consider cost and other related factors in setting new heavy-duty engine and vehicle emission standards. The California Health & Safety Code establishes a similar mandate for ARB, requiring the Board to adopt emissions standards which will result in the most cost-effective combination of control measures on motor vehicles and fuel. And the California Government Code requires the Board to assess the proposal's economic impacts (Section 11346.3 and 11346.5).

Staff has not met the burden of showing the proposed amendments are cost-effective. Staff has both underestimated the costs to engine manufacturers and vehicle owners and has not fully analyzed the cost-effectiveness (the costs v. the emission benefits).

ARB's cost-effectiveness and emissions benefit discussion in the ISOR for the proposed amendments is faulty in two obvious ways. ARB's first obvious miscalculation is to base its cost estimates on manufacturers' nationwide sales of engines and vehicles. This is a California rule, and using nationwide data to justify the benefits in California is misleading and improper. Moreover, the ISOR points to ARB's previous analysis of cost-effectiveness from the 2009 amendments to the OBD rule, which cost estimates were based on and pointed to the *2005 adoption* of the OBD rule. ARB relies on past analysis of data *nearly a decade old* for its current rulemaking. It is not realistic to assume that heavy-duty manufacturers will meet the extremely complex, ever-more-stringent OBD requirements and increase engine durability while holding down the cost of new products as ARB estimates. Decade-old assumptions are inherently unreasonable.

ARB has failed to appropriately assess the cost impact and anticipated benefits of the 2012 requirements to the OBD rule. Indeed, EMA questions whether ARB could justify any of those requirements if it were to properly analyze and assess the OBD rule and its costs against the emissions benefits anticipated from it. ARB must conduct a thorough, updated and focused analysis on the proposed amendments to determine their true costs for manufacturers and for consumers, as well as their true benefit to air quality.

3. ARB Must Provide Sufficient Leadtime And Period Of Stability

As detailed above, engine manufacturers need sufficient time to develop OBD technology that is feasible and practical. California law requires that standards must be adopted within reasonable time frames (Cal. Health & Safety Code, Section 43013). Section 202(a) of the CAA also requires the ARB to assure that it provides sufficient leadtime and period of stability for any new heavy-duty engine or vehicle standard:

> Any standard promulgated or revised under this paragraph and applicable to classes or categories of heavy-duty vehicles or engines shall apply for a period of no less than 3 model years beginning no earlier than the model year commencing 4 years after such revised standard is promulgated.

In other words, any new emission standards may go into effect only four or more full model years after the year in which they were promulgated. And those new standards must stay in effect for at least three full model years before ARB may establish another standard. Unless California meets those requirements, it has no authority to adopt emissions standards for on-highway heavy-duty engines.

Section 209(b) of the CAA requires that ARB's emission standards must be consistent with Section 202(a) for EPA to waive federal preemption and allow California to enforce its own emission standards. Unless ARB demonstrates that the standards are technologically feasible and cost-effective, and provides sufficient leadtime and stability to engine manufacturers, California cannot obtain the necessary preemption waiver from EPA.

E. **ARB Must Undertake A Timely And Thorough Biennial Review**

California law requires that ARB conduct biennial rulemaking reviews to evaluate manufacturers' progress toward meeting the standards established by ARB. It is crucial that such biennial reviews be conducted in a timely manner in order to provide manufacturers some degree of certainty with respect to the standards they are being asked to meet. As manufacturers work toward achieving the aggressive OBD threshold requirements that ARB has proposed, they will learn more and become smarter about just what is possible and technologically feasible.

However, ARB's review of technology and changes to requirements during a biennial review cannot wait – as is happening right now – until after the model year for new requirements already has started, and when manufacturers already have invested their limited resources in meeting regulatory requirements and are under time constraints to certify their products. As discussed above, manufacturers need certainty so they may use their limited resources most effectively – certainty in knowing what standards and requirements they must meet and the time frame in which to meet them.

It also is crucial that biennial reviews be a true review of the current and expected technological capability and progress of manufacturers toward meeting the regulations previously established, including an updated assessment of the expected costs associated

with the requirements. A biennial review is not meant to be – nor should it be – ARB's opportunity to increase the stringency of the regulations to make them more difficult to meet. In many cases, as time progresses, the technology development needed to meet the new requirements may not have progressed as expected, resulting in higher costs, increased uncertainty, and potentially less capable systems than ARB assumed during the previous rulemaking. Timely and thorough biennial reviews are essential.

III. Conclusion and Recommendations

OBD regulations are complex, far-reaching, and highly technical. Many of the proposed amendments would establish extremely technology-forcing thresholds that manufacturers do not know how they will meet. A number of changes are necessary to the proposed amendments to make them technologically feasible, cost-effective, and in line with leadtime and stability requirements. EMA urges the Board to direct Staff to work further with engine manufacturers to make the necessary changes to address the issues raised in these comments and in our ongoing discussions with Staff. Specifically, ARB must:

- Delete the definition of "emission standard" from the proposed HD OBD and OBD II rules.
- Delete the invalidated and unlawful manufacturer-run in-use testing and recall enforcement provisions from the HD OBD and OBD II rules.
- Delay the misfire continuous monitoring requirements and incorporate additional limitations for the conditions under which continuous misfire monitoring must be conducted.
- Revise the NMHC converting catalyst monitor threshold to 4x the NMHC std.
- Modify the phase-in for the NOx catalyst and NOx sensor thresholds.
- Modify the phase-in for the PM filter threshold and elimination of the failure mode exemption, and allow "silent mode" monitoring for 2014-2015.
- Allow EGR system monitoring "test-out" option for medium-duty.
- Allow an additional year to existing deficiency carryover provisions, applicable to 2013 and 2014 model years.
- Extend time for (l)(2) and (j)(2) production testing and retroactive deficiencies to nine months after the start of engine or vehicle production for heavy-duty and medium-duty engines and vehicles.
- Eliminate, or delay at least until 2016, any requirement compelling manufacturers to monitor NMHC conversion capability of a catalyzed PM filter, DOC feedgas constituency generation, and fuel control system components that have tolerance compensation features.

- Apply the same monitoring requirements and malfunction criteria to chassis-certified medium-duty vehicles as apply to medium-duty engine-dynamometer-certified engines.
- Revise the regulatory language to remove infrequent regeneration-based monitors from readiness groups or create a new readiness group to capture all infrequent regeneration-based monitors.
- Delay full hybrid component monitoring requirements until 2016/2017.
- Revise the definition of "diagnostic or emission critical" electronic control unit
- Delete service information requirements from the OBD provisions.
- Revise the medium-duty OBD regulations (1968.2) to assure consistency with the heavy-duty OBD rule.
- Assure cost-effectiveness and sufficient leadtime and period of stability for all the OBD requirements.

The Board also must direct Staff to conduct timely and meaningful future biennial reviews to evaluate whether technology is progressing as ARB predicted and whether manufacturers can meet the requirements of the heavy-duty and medium-duty OBD rules. Engine manufacturers need certainty and stability – they need to know the requirements well in advance and know they are not changing – so that they can work productively and cost-effectively toward the goals that are set. Manufacturers should not be required to expend time and effort on attempting to develop costly monitoring strategies that are not feasible. Without certain changes in this rule, that is exactly what will happen. ARB must make the recommended changes and support engine manufacturers in their efforts and take all steps possible to ensure a timely, cost-effective, and feasible rule.

Respectfully submitted,

TRUCK & ENGINE MANUFACTURERS ASSOCIATION

Appendix A – Proposed Regulatory Text Changes

1. Diesel Misfire Monitoring

Section (e)(2.2-2.3) 45-Day Notice language (July 5, 2012), including underlines and strikeouts from current in-force regulation, is in black. Section 1971.1 text is proposed, but same changes to apply to Section 1968.2 (f)(3). Proposed underlined additions and strikeouts are in red:

CCR 1971.1 (e)(2.2) Malfunction Criteria:

(2.2.1) The OBD system shall detect a misfire malfunction when one or more cylinders are continuously misfiring.

(2.2.2) Additionally, for 2013 ~~and subsequent~~through 2015 model year engines equipped with sensors that can detect combustion or combustion quality (e.g., for use in homogeneous charge compression ignition (HCCI) control systems) and for 20 percent of 2016 model year diesel engines, 50 percent of 2017 model year diesel engines, and 100 percent of 2018 model year diesel engines (percentage based on the manufacturer's projected California sales volume of all diesel engines subject to this regulation), the OBD system shall detect a misfire malfunction when the percentage of misfire is equal to or exceeds five percent ~~causing the engine's NMHC, CO, or NOx emissions to exceed 2.0 times the applicable standards or the engine's PM emissions to exceed the applicable standard plus 0.02 g/bhp-hr~~.

(A) Manufacturers shall ~~determine~~ evaluate the percentage of misfire ~~evaluated~~ in 1000 revolution increments ~~that would cause NMHC, CO, or NOx emissions from an emission durability demonstration engine to exceed 2.0 times any of the applicable standards or PM emissions to exceed the applicable standard plus 0.02 g/bhp-hr if the percentage of misfire were present from the beginning of the test. To establish this percentage of misfire, the manufacturer shall utilize misfire events occurring at equally spaced, complete engine cycle intervals, across randomly selected cylinders throughout each 1000 revolution increment. If this percentage of misfire is determined to be lower than one percent, the manufacturer may set the malfunction criteria at one percent~~.

(B) Subject to Executive Officer approval, a manufacturer may employ other revolution increments. The Executive Officer shall grant approval upon determining that the manufacturer has demonstrated that the strategy would be equally effective and timely in detecting misfire.

(2.2.3) A malfunction shall be detected if the percentage of misfire ~~established~~ specified in section (e)(2.2.2)~~(A)~~ is exceeded regardless of the pattern of misfire events (e.g., random, equally spaced, continuous).

(2.2.4) For multiple cylinder misfire situations that result in a misfire rate greater than or equal to 50 percent of all engine firings, the OBD system shall only be required to detect a misfire malfunction for situations that are caused by a single component failure.

(2.2.5) Upon request by the manufacturer and upon determining that the manufacturer has submitted data and/or engineering evaluation that support the request, the Executive Officer shall revise the percentage of misfire malfunction criteria in section

(e)(2.2.2) upward to exclude detection of misfire that cannot cause the engine's NMHC, CO, and NOx emissions to exceed 2.0 times the applicable standards and the engine's PM emissions to exceed the applicable standard plus 0.02 g/bhp-hr.

(2.3) Monitoring Conditions:

(2.3.1) Except as provided in section (e)(2.3.2), ~~T~~the OBD system shall monitor for misfires identified in section (e)(2.2.1) during engine idle conditions at least once per driving cycle in which the monitoring conditions for misfire are met. A manufacturer shall submit monitoring conditions to the Executive Officer for approval. The Executive Officer shall approve manufacturer-defined monitoring conditions that are determined (based on manufacturer-submitted data and/or other engineering documentation) to: (i) be technically necessary to ensure robust detection of malfunctions (e.g., avoid false passes and false detection of malfunctions), (ii) require no more than 1000 cumulative engine revolutions, and (iii) do not require any single continuous idle operation of more than 15 seconds to make a determination that a malfunction is present (e.g., a decision can be made with data gathered during several idle operations of 15 seconds or less); or satisfy the requirements of (d)(3.1) with alternative engine operating conditions.

(2.3.2) Manufacturers may request Executive Officer approval to use alternate monitoring conditions (e.g., off-idle) in lieu of the monitoring conditions specified in section (e)(2.3.1). The Executive Officer shall approve alternate monitoring conditions that are determined (based on manufacturer-submitted data and/or other engineering documentation) to ensure equivalent robust detection of malfunctions and equivalent

timeliness in detection of malfunctions.

(2.3.3) ~~Additionally, f~~For misfires identified in section (e)(2.2.2) ~~2013 and subsequent model year engines equipped with sensors that can detect combustion or combustion quality~~:

(A) The OBD system shall continuously monitor for misfire under the following conditions:

(i) For 2013 through 2018 model year engines and 2019 and subsequent model year engines that are not included in the phase-in specified in section (e)(2.3.3)(A)(ii), ~~all~~ between 20 percent and 75 percent peak torque ~~under positive torque conditions~~ with engine speed~~s~~ up to 75 percent of the maximum-rated engine speed ~~and engine load up to 75 percent maximum-rated~~ and ~~load conditions except within the following range~~.: ~~the engine operating region bound by the positive torque line (i.e., engine load with transmission in neutral) and the two following engine-operating points: engine speed of 50 percent of maximum-rated engine speed with the engine load at the positive torque line, and 75 percent of the maximum-rated engine speed with the engine load 5 percent above the positive torque line~~.

(ii) For 20 percent of 2019 model year diesel engines, 50 percent of 2020 model year diesel engines, and 100 percent of 2021 model year diesel engines (percentage based on the manufacturer's projected California sales volume of all diesel engines subject to this regulation), under all positive torque engine speed and load conditions.

(B) If a monitoring system cannot detect all misfire patterns under all required

engine speed and load conditions as required in section (e)(2.3.3)(A), the manufacturer may request Executive Officer approval to accept the monitoring system. In evaluating the manufacturer's request, the Executive Officer shall consider the following factors: the magnitude of the region(s) in which misfire detection is limited, the degree to which misfire detection is limited in the region(s) (i.e., the probability of detection of misfire events), the frequency with which said region(s) are expected to be encountered in-use, the type of misfire patterns for which misfire detection is troublesome, and demonstration that the monitoring technology employed is not inherently incapable of detecting misfire under required
conditions (i.e., compliance can be achieved on other engines), and the extent to which the most reliable monitoring method developed is unable to ensure robust detection of misfire in the region(s). The Executive Officer shall approve disablement under the following conditions: Diesel particulate filter (DPF) regeneration, fuel cutoff modes, heavy transient conditions, rough road operation, gear changes, intrusive tests, and traction control. The evaluation shall be based on the following misfire patterns: equally spaced misfire occurring on randomly selected cylinders, single cylinder continuous misfire, and paired cylinder (cylinders firing at the same crank angle) continuous misfire.

2. PM Filter Monitoring

Proposed Language- Proposed additions/deletions to 45-Day Notice language are in red:

CCR 1971.1 (e)(8.2.1) Filtering Performance:
* * *
(C) For 2014 through 2015 model year engines, the manufacturer shall meet one of the following two options below:

(i) For at least ~~2~~10 percent of 2014 model year diesel engines and at least ~~2~~10 percent of 2015 model year diesel engines (percentage based on the manufacturer's projected California sales volume of all diesel engines subject to this regulation), the OBD system shall use the malfunction criteria of section (e)(8.2.1)(B) without using the provisions of section (g)(5.1) to exclude specific failure modes.

(ii) For at least 25~~0~~ percent of 2015 model year diesel engines (percentage based on the manufacturer's projected California sales volume of all diesel engines subject to this regulation),…

* * *

(G) For 2014 through 2015 model year engines, manufacturers are exempt from requirements in section (e)(8.4).

3. Deficiency Carryover

(k) (4)

Manufacturers must re-apply for Executive Officer approval of a deficiency each model year. In considering the request to carry-over a deficiency, the Executive Officer shall consider the factors identified in section (k)(1) including the manufacturer's progress towards correcting the deficiency. For model year 2015 and beyond, the Executive Officer may not allow manufacturers to carry over monitoring system deficiencies for more than two model years unless it can be demonstrated that substantial engine hardware modifications and additional lead time beyond two years would be necessary to correct the deficiency, in which case the Executive Officer shall allow the deficiency to be carried over for three model years. For the 2013 and 2014 model years the Executive Officer may allow manufacturers to carry over deficiencies for three model years unless it can be demonstrated that substantial engine hardware modifications and additional lead time beyond three years would be necessary to correct the deficiency, in which case the Executive Officer shall allow the deficiency to be carried over for four model years.

For illustration purposes only:

Model Yr	2010	2011	2012	2013	2014	2015	2016
Current Rule	Deficiency Identified	Carry over year 1	Carry over year 2	Special Carry over year 3			
Proposed Change	Deficiency Identified	Carry over year 1	Carry over year 2	Carry over year 3	Special Carry over year 4		

4. Production Engine Evaluation Testing

Proposed changes to 1971.1 (heavy-duty):

(l)(2) Verification of Monitoring Requirements.
(2.1) No later than either ~~six~~ nine months after the start of engine production or ~~six~~ nine months after the start of vehicle production (six months after the start of vehicle or engine production for spark-ignited engines), whichever is later, manufacturers shall conduct a complete evaluation of the OBD system of one or more production vehicles (test vehicles) and submit the results of the evaluation to the Executive Officer.

(k)(6) Request for retroactive deficiencies
(6.1) During either the first ~~6~~ 9 months after commencement of the start of engine production or the first ~~3~~ 9 months after commencement of the start of vehicle production(6 months after the start of vehicle or engine production for spark-ignited engines), whichever is later, manufacturers may request that the Executive Officer grant a deficiency and amend an engine's certification to conform to the granting of the deficiencies for each aspect of the monitoring system: (a)

identified by the manufacturer (during testing required by section (l)(2) or any other testing) to be functioning different than the certified system or otherwise not meeting the requirements of any aspect of section 1971.1; and (b) reported to the Executive Officer. If the Executive Officer grants the deficiency(ies) and amends the certification, the approval would be retroactive to all affected engines within the engine family.

Proposed changes to 1968.2 (medium-duty):

(j)(2) *Verification of Monitoring Requirements*.
(2.1) For 2004 and subsequent model year vehicles, within the first six months after normal production begins (within the first nine months for medium-duty diesel vehicles), manufacturers shall conduct a complete evaluation of the OBD II system of one or more production vehicles (test vehicles) and submit the results of the evaluation to the Executive Officer.

(k)(6) Request for retroactive deficiencies
(6.1) Manufacturers may request that the Executive Officer grant a deficiency and amend a vehicle's certification to conform to the granting of the deficiencies during the first 6 months after commencement of normal production for each aspect of the monitoring system (during the first 9 months for medium-duty diesel vehicles): (a) identified by the manufacturer (during testing required by section (j)(2) or any other testing) to be functioning different than the certified system or otherwise not meeting the requirements of any aspect of section 1968.2; and (b) reported to the Executive Officer. If the Executive Officer grants the deficiencies and amended certification, their approval would be retroactive to the start of production.

5. J1939 Test Results Reporting

Proposed changes to 1971.1 (h)(4.5.5):

If the OBD system fault memory is cleared in a J1979 system, all test results shall report values of zero for the test result and test limits. If the OBD system fault memory is cleared in a J1939 system, all test results shall report values of either, 1) zero for the test result and test limits, or 2) "test not complete" . The test results shall be updated once the applicable monitor has run and has valid test results and limits to report.

In 2016 if the OBD system fault memory is cleared in a J1939 system, all test results shall report the value of "test not complete." The test results shall be updated once the applicable monitor has run and has valid test results and limits to report.

6. Medium-duty Enforcement – NOx Non-Conformance Threshold

1968.5 (b)(6)(A)(ii) d. For 2013 through 2015 model year medium-duty vehicles, with respect to the NOx malfunction criteria for the NOx converting catalyst
conversion efficiency monitor (title 13, CCR section 1968.2(f)(2.2.2)),
reductant delivery performance monitor (title 13, CCR section
1968.2(f)(2.2.3)(A)), and NOx sensor monitor (title 13, CCR section

1968.2(f)(5.2.2)(A)), the Executive Officer shall make a finding of nonconformance of the OBD II system if the results of the OBD II emission tests indicate that 50 percent or more of the vehicles in the test sample do not properly illuminate the MIL when emissions exceed an additional ~~0.2~~ 0.4 g/bhp-hr above the NOx malfunction criteria defined in title 13, CCR section 1968.2(f)(2.2.2)(A)(ii)c. or 1968.2(f)(5.2.2)(A)(ii)c.

Appendix B – Detailed Technical Discussion/Support

(Note: The below information also was provided to Staff during discussions on the rulemaking.)

1. PM Filter Threshold (e)(8)

Issue
The PM threshold monitor for 2010MY is at a level of seven times the standard emissions and the 2013MY requirements are even more challenging. No mature technology is today available to secure a robust monitor for the 2013MY DPF PM threshold requirement.

EMA´s position
In order to get enough time to evaluate and test new technology, ARB should adjust the threshold for 2013MY to remain at seven times the standard and push back the 2013MY threshold requirement to 2016MY. The necessary sensor technology is not available to meet 2013MY requirements.

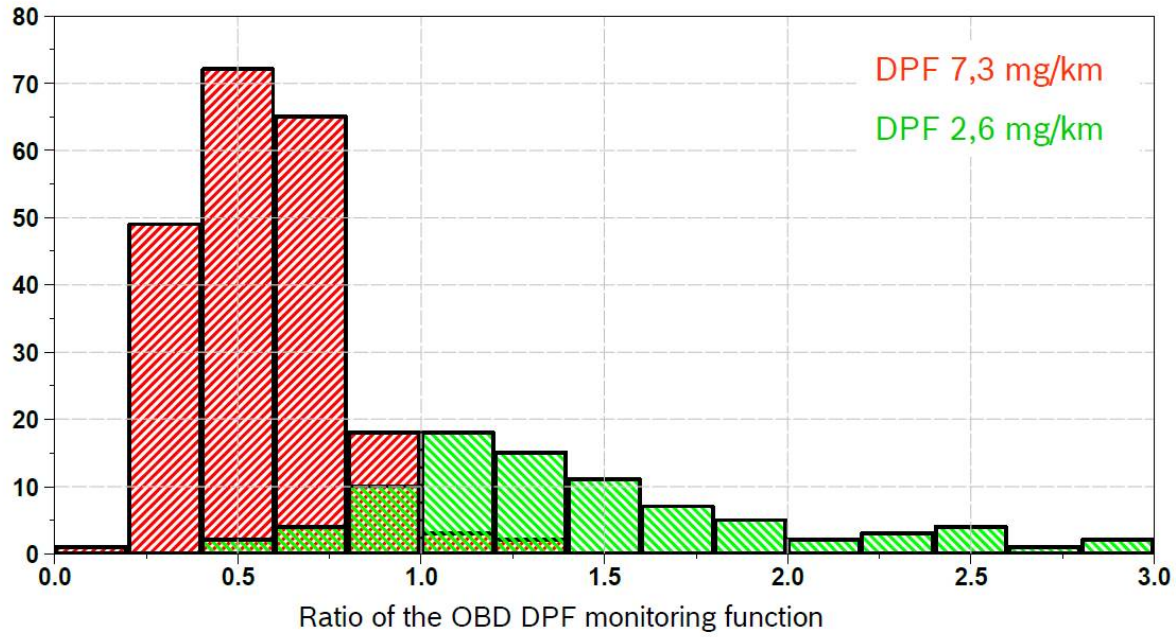
Rationale
The common way to monitor the filter performance today is by using a delta pressure sensor measuring the pressure difference over the filter. At some point it will be hard to distinguish between a malfunctioning filter and a fault free filter due to part tolerances, sensor tolerances, aging, driving conditions and different application installations.

There are today sensor suppliers developing sensors for PM measurements in HD vehicles but the technology is new and the sensors are at a prototype stage (see below discussion on PM sensor considerations). It is important for the engine manufacturers to continue evaluating available technology. The current technology has sensor-to-sensor variability as well as run-to-run variability that is too high for a robust filter performance monitor.

Introducing new sensors requires robust technology developed for usage in different driving conditions as well as in different vehicle applications. Prototype sensors are now available and the accuracy of the measurements as well as the evaluations is expected to improve. However, the sensors available are still not mature enough to put into serial production.

Analysis of recent data indicates that PM sensors will not be capable of meeting the 3 times monitoring threshold without significant risk of false MILs. One PM sensor supplier has said they can meet a 1.75x DPF monitoring threshold for a light-duty application (currently required in 2013) only if the manufacturer defines a "good" DPF to be well below the tailpipe PM standard (3 mg/mi vs. the 10 mg/mi standard). This means that good DPFs delivering 4 mg/mi, or less than half the standard, would be at risk of illuminating the MIL. So the minimum detection capability of the PM sensor would be to distinguish a 3 mg/m DPF from an 18 mg/mi (1.75x) DPF. The resultant threshold multiplier capability is actually closer to 6x the standard (18/3).
To support this claim, and justify the need for a higher threshold multiplier in 2013, one engine manufacturer conducted DPF monitor testing using a PM sensor on a European light-duty application intended to meet a 4.5 mg/km PM standard. PM sensor data on DPFs with 2.6

mg/km ("good') and 7.3 mg/km ("threshold", at 3x separation in tailpipe PM from the "good" DPF) showed significant overlap during real world driving:



Note that the "Ratio of the OBD DPF monitor function" is defined as:

Time between sensor regeneration events/
Nominal time between regeneration events for a good DPF near the PM standard

A lower ratio indicates a bad DPF, and a higher ratio indicates a good DPF. In the above data, in order to detect the 7.3 mg/km "bad" DPF, the threshold would have to be set at a ratio of 1.5, resulting in the 2.6 kg/km "good" DPF to be detected as bad on a number of driving events. Since this data was collected on only one vehicle, vehicle-to-vehicle and sensor-to-sensor variability has not been taken into account, and would further increase the occurrence of false MILs for this sensor capability.

In conclusion, PM sensor technology at this point can only distinguish a good DPF from a bad DPF when the tailpipe PM level of the bad DPF is seven times that of the good DPF. This justifies the need for a DPF monitor threshold of seven times the PM standard even when PM sensors are implemented into production.

PM Threshold and PM Sensor Considerations

During the 2011 Society of Automobile Engineers hosted OBD Symposium, participating manufacturers noted ARB comments regarding industry readiness for meeting more stringent model year 2013 DPF efficiency monitoring requirements, among others. Manufacturers heard ARB's accurate assessment that technology, namely, the essential PM sensor technology, would not likely be ready to support industry's needs on a broad basis for model year 2013 products for which 1968.2 or 1971.1 rules apply. Significant barriers preventing broad scale availability of sensors include, as observed by ARB, limitations of sensor suppliers precluding support of

development programs for all affected manufacturers. As described above, and as manufacturers have previously noted to ARB, the current maturity of PM sensor technology and the necessary algorithms necessary for effective monitoring using the sensors are such that model year 2013 introduction carries significant risk of deficiencies relating to compliance with DPF efficiency monitor requirements (as described above) and to monitoring requirements for the sensor itself.

EMA members support implementation of changes to these requirements in 1971.1 regulations with corresponding effective dates appropriate for the 1971.1 timetable and considering the much longer development time necessary to validate features for longer mileage heavy-duty diesel applications. Namely, commensurate with delay of more stringent DPF efficiency monitoring to model year 2015 and later, it is appropriate for heavy-duty applications to delay increased monitor stringency (for all engines affected by 1971.1) to model year 2016 and later. In concert with delay of more stringent DPF monitoring thresholds until the 2016 model year, provisions to exclude requirements to detect certain failure modes (e.g., partially melted or partially cracked filters) should be effective in model years prior to 2016.

As an incentive to manufacturers who are considering early introduction of PM sensors to gain field experience, ARB should propose measures that ease monitoring requirements. Such measures can be helpful to early introduction of PM sensors. To improve upon the likely effectiveness of the incentives, EMA encourages ARB to consider a form of deficiency credits for manufacturers introducing PM sensor technology early. For example, allowance of an additional "free deficiency" for a major monitor could be appropriate, i.e., increasing free deficiencies from two to three.

EMA appreciates the effort that ARB has made to evaluate the state of readiness of PM sensor technology and its willingness to appropriately adjust requirements.

2. SCR Efficiency (e)(6)

Issue

On-Board Diagnostic Regulations published by the Air Resource Board of California require manufacturers utilizing Selective Catalytic Reduction (SCR) catalysts to monitor for proper conversion capability. More specifically, “the OBD system must detect a catalyst malfunction when the conversion capability decreases” to the point before tailpipe out NOx emissions exceed a threshold. The applicable thresholds for 2013 are as follows:

• For passenger cars, light-duty trucks, and MDPVs certified to a chassis dynamometer tailpipe emission standard: 1.75 times the applicable standard.
• For medium-duty vehicles (including MDPVs) certified to an engine dynamometer tailpipe emission standard:0.2 g/bhp-hr above the applicable standard.
• For heavy-duty vehicles certified to an engine dynamometer tailpipe emission standard: 0.2 g/bhp-hr above the applicable standard.

The dynamics of the SCR system and its control present significant challenges when attempting to detect a malfunction of the SCR system at these thresholds. Outlined below are several of the

challenges that prevent reliable diagnosis of the SCR conversion capability and suggested changes in the regulation that would allow reliable diagnosis of SCR conversion capability.

General Function and Technology of SCR Systems

While specific details of the SCR system may vary between manufacturers, there are several common elements which nearly all SCR systems include. The following is a list of these common elements with points of variation identified for each element:

• SCR Catalyst - Variation includes substrate material, catalyst coating content, and physical dimensions.
• SCR In NOx Sensor - Variation includes sensor manufacturer, and installation.
• SCR Out NOx Sensor - Variation includes sensor manufacturer, and installation.
• DEF Dosing System - Variation includes doser manufacturer, and installation.

EMA Position

Due to the significant technical constraints that manufacturers face in adequately measuring and modeling the overall health of the SCR efficiency, ARB should revise the current thresholds for SCR Conversion Efficiency diagnostics to make them equivalent to the 2010 thresholds. Included below are several reasons that technically justify the need for this allowance.

Rationale

SCR Catalyst Challenges

SCR systems are very dynamic in nature and successfully diagnosing them presents many challenges. While the specifics of the diagnostic challenge may differ among manufacturers, the same challenges generally apply across all manufacturers regardless of catalyst substrate, precious metal coating, control system design, and other factors. Two specific principles of the SCR System that impact diagnostic design for SCR catalyst systems are SCR Conversion Efficiency and NH3 Storage Dynamics.

SCR Conversion Efficiency

Modern SCR systems are capable of optimal conversion efficiency in excess of 90%, meaning that Outlet NOx is less than 10% of Intake NOx. Given this high degree of conversion efficiency, a system that has degraded to the level required to be detected under the OBD requirements is still a highly functioning SCR system. Compounding this problem, the instantaneous conversion efficiency of a good catalyst can change dramatically given its operating conditions (temperature, volumetric flow rate, etc.) to the point where it can resemble a bad catalyst. Likewise, a catalyst that could potentially be classified as bad can resemble a properly functioning catalyst under alternate operating conditions. The confoundedness of these two systems is often difficult to separate on the FTP cycle for some engine power ratings and can be nearly impossible under worst case vehicle duty cycles such as that of a delivery vehicle which makes frequent changes in load and exhibits several ignition cycles in short periods of time.

NH3 Storage Dynamics

NH3 Storage or the measure of the capability of the SCR Catalyst to adsorb NH3 is a highly dynamic property of SCR catalysts. It is a significant contributor to the change in conversion efficiency of an SCR Catalyst that can be exhibited on both good and bad systems. While NH3

Storage is a known property of the SCR Catalyst it has proven very difficult if not impossible to model accurately due to the fact that the NH3 is often distributed non-uniformly along the catalyst and the distribution itself is related to prior operating conditions. Additionally, the NH3 Storage capacity of the SCR Catalyst exhibits highly dynamic properties based on operating conditions including exhaust gas temperature and volumetric flow rate. When the NH3 Storage capacity decreases below where the SCR Catalyst can contain its current level of stored NH3, it can cause what is referred to as a NH3 slip event as a result of the desorption of the excess stored NH3. These NH3 slip events can be difficult to predict in advance and modeling the magnitude and rate of desorption of stored NH3 has proven equally challenging. In scientific experiments NH3 slip events have been shown to take in excess of 60 seconds to fully propagate through the SCR Catalyst to where they can be detected by instrumentation. The occurrence of NH3 slip events are prevalent in vehicles which exhibit highly transient duty cycles due to the rapid and constant change of NH3 storage capacity.

In the HDOBD Initial Statement of Reasons dated May 29, 2009, ARB has commented that active/intrusive methods may be possible for evaluating SCR efficiency with little impact to emissions. The conclusions of recent experiments conducted by an independent laboratory have confirmed that this is not possible for current SCR catalyst technologies. These experiments demonstrated the stochastic nature of NH3 storage and highlighted that the time to sufficiently adsorb and desorb sufficient NH3 to generate a reliable diagnostic signature would be on the order of multiple minutes which would not be feasible in a vehicle without constant operating conditions.

SCR Sensing System Challenges

While specific manufacturers may pursue additional sensing capabilities within the SCR system, most manufacturers have chosen to position NOx Sensors before and after the SCR Catalyst to provide real-time feedback on the conversion of NOx within the SCR Catalyst. While manufacturers may differ slightly on packaging and installation of NOx sensors, all suffer from the same challenges. The most significant factors facing the SCR sensing system are sensor accuracy and sensor cross-sensitivity to NH3.

NOx Sensor Accuracy

NOx sensors have a variable accuracy capability with a higher degree of fidelity (often stated in ±ppm) in lower ppm ranges of NOx and a lesser degree of fidelity (often stated in ±% of measured ppm) in higher ppm ranges. Most current production NOx sensors have a manufacturer specified tolerance of ±15 ppm from 0-100ppm and ±15% from 100-1500ppm. It is believed that next generation NOx sensors (available for 2013 production) will have an accuracy of roughly ±10ppm from 0-100ppm and ±10% from 100-1500ppm.

The accuracy of the NOx sensors has a significant impact on the ability to accurately measure conversion efficiency of the SCR Catalyst. Experiments have been run to measure the probabilities that NOx sensors with varying degrees of accuracies would lead to both the correct determination of a healthy system and the correct determination of a failed system. Figure 1 demonstrates the probability that the proper decision regarding conversion efficiency is made given the proposed 2013 HD OBD Threshold of +0.2 g/bhp-hr

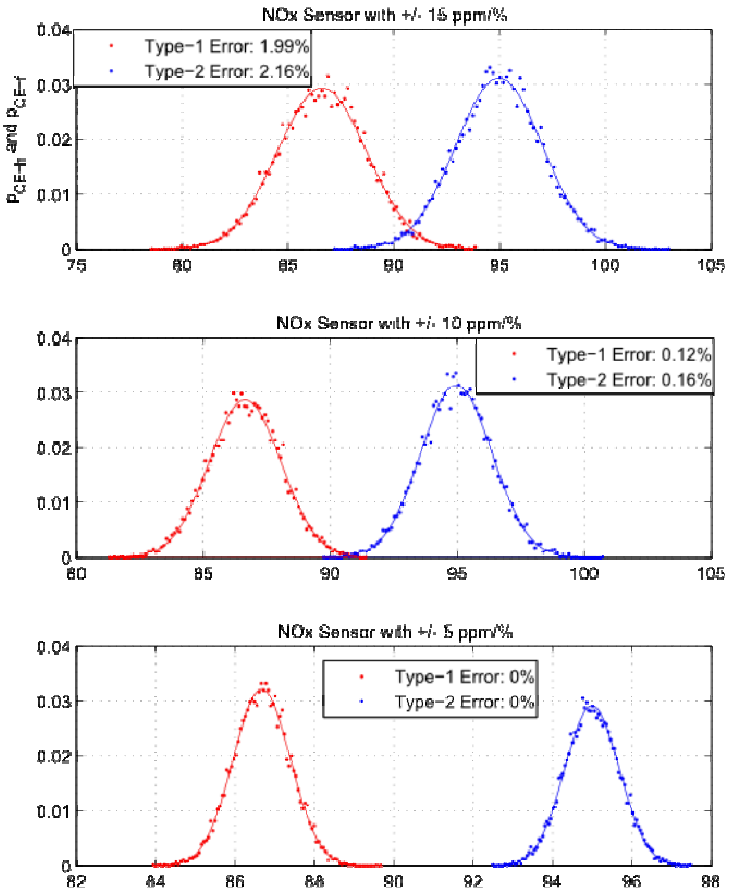


Figure 1: Effect of NOx Sensor accuracy on conversion efficiency determination at 2013 threshold of +0.2 g/bhp-hr.

In the graphs, a Type-1 error is an error associated with improperly classifying a healthy part as being failed, and a Type-2 error is an error associated with improperly classifying a failed part as healthy. The top plot of Figure 1 shows that with NOx sensors with a manufacturer specified tolerance of ±15ppm from 0-100ppm and ±15% from 100-1500ppm, the resulting NOx conversion efficiencies of healthy- and failed-systems lead to error rates of 1.99% for Type-1 errors and 2.16 % for Type-2 errors. The center plot of Figure 1 demonstrates that sensors with an accuracy of roughly ±10ppm from 0-100ppm and ±10% from 100-1500ppm improves separation but it still yields to error rates of 0.12% for Type-1 errors and 0.16% for Type-2 errors. Only when the NOx sensor technology can yield to the accuracy levels of ±5ppm from 0-100ppm and ±5% from 100-1500ppm, can separation be achieved with 0.00% for Type-1 errors and 0.00 % for Type-2 errors when only considering the error of the sensor.

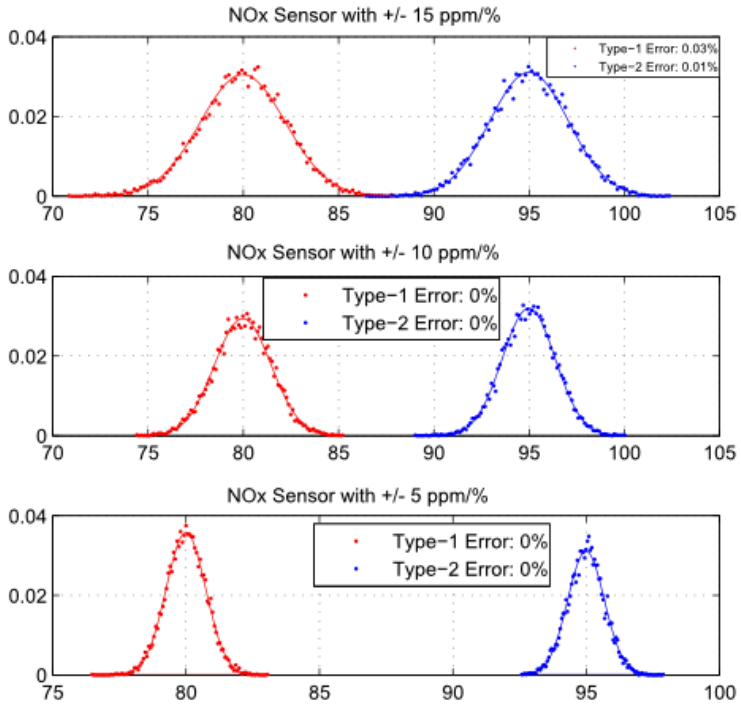


Figure 2: Effect of NOx Sensor accuracy on conversion efficiency determination at 2013 threshold of +0.4 g/bhp-hr.

Figure 2 demonstrates the impact of NOx sensor accuracies on conversion efficiency determination when a threshold of +0.4 g/bhp-hr is considered.. At this threshold it can be seen in the middle graph that the sensor error is not significant enough to cause a misclassification of the part based on a conversion efficiency calculation.

NOx Sensor Cross-sensitivity to NH3

NOx sensors are cross-sensitive to other gas species including NH3. The range of NOx sensor sensitivity to NH3 varies from 70% to 250% when it is new up to from 60% to 200% when it is aged. The presence of 100 ppm of NH3 at the downstream exhaust, for instance, will be reported by a NOx sensor with 95% NH3 cross-sensitivity as an additional 95 ppm to the reported downstream NOx sensor measurement. The presence of NH3 at the exhaust system outlet is due to several reasons. Released ammonia from the SCR catalysts due to temperature rises, a very aggressive urea injection to SCR catalyst strategy, and reduced SCR catalyst NH3 storage capability constitute some causes of downstream SCR slipping NH3. As an example, consider a case where the NOx sensor is cross-sensitive to NH3 at the level of 90%. As a result, an increase of 10 ppm of NH3 at the tail-pipe due to aggressive urea dosing on a healthy system will increase the width of the distribution shown in Fig. 3 by ±5%. Such a variance width increase degrades the capability of NOx sensor-based NOx conversion efficiency evaluation as the error rates grow to 2.33% miss-detection and 2.54 % false-detection from 1.99% miss-detection and 2.16 % false-detection for the case of using NOx sensors with accuracy of ±15ppm from 0-100ppm and ±15% from 100-1500ppm.

3. NOx sensor threshold (e)(9)

Issue

The 2010MY threshold is at +0.4g/bhp-hr above the emission standard and the requirement for 2013MY is at +0.2g/bhp-hr above the emission standard. The available NOx sensors for 2013MY are only marginally better than the 2010MY sensors, and they are not sufficiently accurate and reliable to meet the 2013MY threshold limit.

EMA´s position

The intent of the NOx sensor threshold monitor should be to identify NOx emissions exceeding a certain level as accurately as possible. Because of only small differences between the NOx sensor (typically referred to as "generation 2.0") available for 2010MY and the NOx sensor "generation 2.5" for 2013MY, and the current 2013MY threshold level, too many false detections are likely to result. False MILs will lead to unnecessary and unjustified "repairs" and costs, including warranty costs. ARB should revise the 2013 MY threshold requirement to maintain the existing 2010MY threshold for 2013MY.

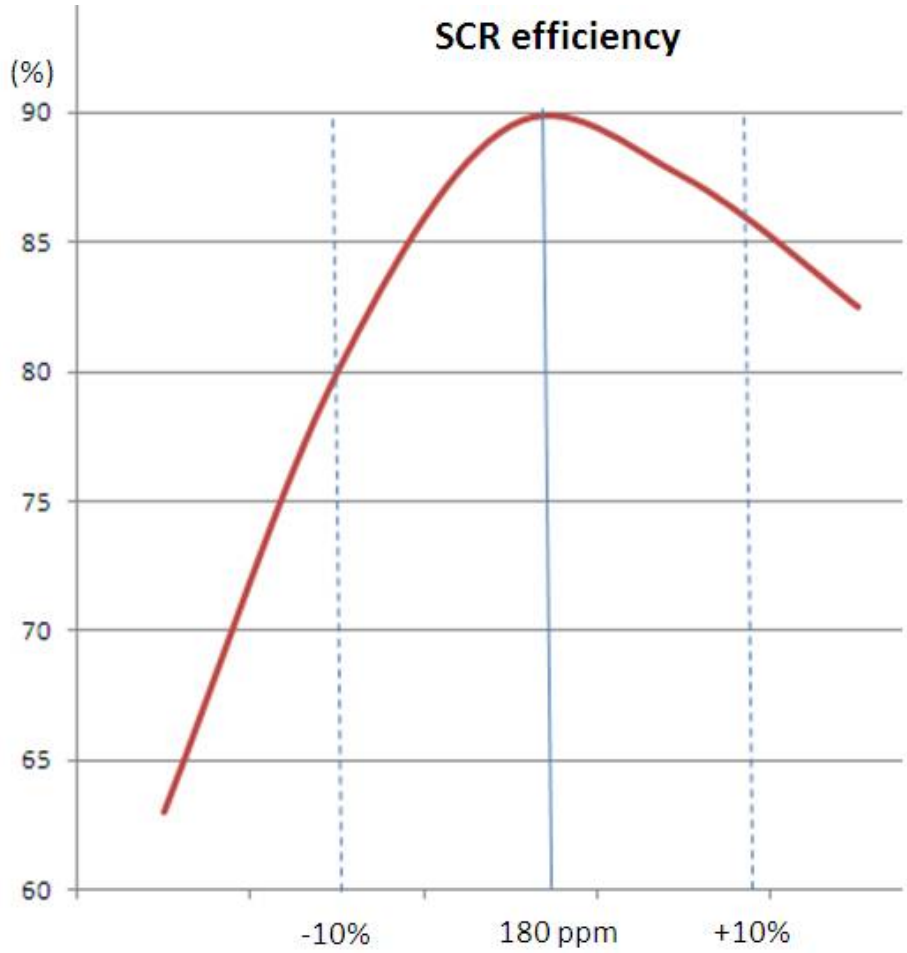
Rationale

The NOx sensor was introduced for HD vehicles some years ago. While the sensor technology has matured and the reliability of the sensors has increased, the already challenging 2010MY requirements are today hard to manage with the existing NOx sensor. The next generation sensor (generation 2.5) is only marginally better for 2013MY.

The sensor specified tolerances for the generation 2.0 NOx sensor is ±15ppm in the range 0-100 ppm and ±15% above 100ppm. The new generation 2.5 NOx sensors will have an adjusted specified tolerance with ±10ppm in the range 0-100 ppm and ±10% above 100ppm. A calibrated threshold monitor must account for the sensor tolerances. With the 2013MY threshold and the generation 2.5 sensor, too little separation will exist between a fault free and a malfunctioning condition to assure a robust monitoring strategy.

To make a proper evaluation of the NOx sensor there are many important inputs to consider. The NOx sensor values are compared to a modeled NOx level and with a perfectly tuned model considering humidity, ammonia slip, etc., the sensor tolerance will be the only noise factor to take into account. The information from the NOx sensors can be used to both control the target SCR efficiency and to monitor the catalyst efficiency. Since two NOx sensors are the common setup, the SCR efficiency is important for the evaluation and stable conditions are required to get good evaluation conditions.

The monitor for the NOx sensors is performed in the range of 150 to 190 ppm NOx during stable conditions. When performing tests with sensors within the tolerances the following figure represents the deviation in evaluation.



If the NOx level is 180ppm as an average during the evaluation for a good performing system, with SCR efficiency of 90% the sensor tolerances will impact the monitors and especially the minimum level of the sensor. A NOx sensor with a tolerance of 10% below nominal will present an actual conversion efficiency of 80% when targeting 90%. The OBD threshold at two times the emission standard will be reached when the conversion efficiency decreases to ~84% and the NOx sensor monitor will then not be able to separate a fault free system from a faulty system.

Engine manufacturers are today using one or more NOx sensors for monitoring the aftertreatment system. In order to assure reliable products, the monitor must be robust and too low a threshold will have a negative impact on the product and on customers.

4. NMHC DOC conversion efficiency threshold monitor (e)(5)

Issue

The 2013 MY NMHC emissions threshold in the regulation is too low and can be exceeded on engines if total failure of the DOC occurs. This will require manufacturers to implement an emissions threshold-based monitor rather than revert to functional-only monitors. And there is no monitoring technology available that can robustly monitor NMHC converting capability at 2

times the NMHC standard with IRAF correction factor applied without a significant risk of false MILs.

EMA Position

Increase the emissions-based malfunction threshold for NMHC converting catalysts to a high-enough level to ensure that engines will only have to meet functional monitoring requirements. EMA believes a threshold of 4 times the NMHC standard would ensure functional monitoring on most engine applications.

Rationale

There is a significant risk that manufacturers will be required to meet this infeasible emissions threshold-based monitoring requirement for the DOC. The reasons for this are as follows:

- There is a clear tradeoff between engine out NMHC and NOx emissions, which will result in higher NMHC levels in order to meet the 0.2g/bhp-hr NOx standard.

- As a result of higher engine-out NMHC levels, oxidation catalysts operate at a higher efficiency in order to meet the 0.14g/bhp-hr NMHC standard.

If an emissions threshold monitor is required, there is no monitoring technology available to meet ARB's monitoring requirement. SAE Technical Paper 2005-01-3602, "Diagnostics for Diesel Oxidation Catalysts," evaluated the feasibility of monitoring DOC/DPFs to specific emissions threshold levels. This paper evaluated the feasibility of both the exhaust oxygen sensor and catalyst temperature monitoring approaches. Some of the major findings and conclusions from this paper were as follows:

- The paper showed that diesel oxidation catalysts age by shifting the light-off to higher temperatures, and that exotherm from higher temperature-aged and fresh catalysts were indistinguishable at the higher catalyst temperatures. As a result, the exotherm monitor must be operated in a fairly narrow temperature window around catalyst light-off (200 to 400 degrees C).

- The HC levels occurring in diesel exhaust during normal operation are too low to generate any appreciable exotherm to monitor at the required threshold levels. And the DPF regeneration event does not provide optimal conditions for monitoring since temperatures are above the light-off temperature of the catalyst.

- The error stack-up of RTD temperature sensors create significant uncertainty for monitoring the DOC/DPF. The paper evaluated the uncertainties due to sensor variability, sensor aging, measuring circuit, sensor length and mounting orientation, and A/D processing, and related the cumulative error for these uncertainties to a 3 sigma error bound that manufacturers must account for in determining threshold monitoring capability.

- A monitoring approach using oxygen sensors to infer HC conversion efficiency by determining the difference in oxygen concentration before and after the catalyst was evaluated and found to be less accurate than the exotherm monitoring approach for diesels. This was because the accuracy of lambda sensors deteriorated rapidly for lean air/fuel ratios. This paper presented data that shows this effect, and provided analysis that showed the uncertainty of HC conversion measurement to be between 2000 to 3000 ppm during typical diesel lambda values of 1.5 to 2, compared to the exotherm measurement uncertainty of 1000 to 1500 ppm HC found in the catalyst light-off temperature range.

- When all the noise factors for a normalized exotherm metric were added together, the paper found that the separation between a marginal and threshold catalyst was very poor, and would result in both false MILs and undetectable failures.

As a result, the paper concluded that *emissions threshold-based monitoring* of the HC conversion capability of the DOC was not feasible. On the other hand, manufacturers have found the exotherm monitoring approach to be feasible for *functional monitoring* of the DOC.

Additionally, ARB discussed some monitoring approaches in the September 11, 2008 Workshop Report which they believed help justify the current NMHC catalyst monitoring threshold requirement. EMA's response to each one of ARB's monitoring concepts and enhancements are discussed as follows:

- On Page 12 of the Workshop Report, ARB stated that intermediate levels of catalyst deterioration that cause increases in light-off temperature and lower conversion efficiencies can be detected. By looking at the catalyst behavior during active regeneration (e.g., by investigating how much time and/or fuel is needed to generate an exotherm, tracking the actual temperature rise from the exotherm versus the expected, and using better temperature sensors), they believe that manufacturers will be able to better determine the characteristics exhibited as an NMHC catalyst degrades (even if it is still capable of eventually getting to a high enough exotherm to achieve regeneration of the PM filter). Although EMA believes there is some validity to monitoring catalyst light-off, we also believe there are significant limitations. For example, manufacturers must warm-up the catalyst as quickly as possible after a cold start in order to minimize HC slip. As a result, and as stated in the SAE paper referenced above, the exotherm monitor must be run in a fairly narrow temperature and time window around catalyst light-off, making it very difficult to complete the monitor and detect a partially deteriorated catalyst, especially when you take into account other noise factors that affect catalyst light-off.

- Additionally on Page 12, ARB also offered the following monitoring approach: "As an alternate approach, there are at least two light-duty manufacturers that are planning on monitoring the catalyst during a cold start. Often combined with an accelerated catalyst light-off strategy similar in concept to what many gasoline manufacturers use, this monitoring approach tracks the light-off and/or temperature rise characteristics to evaluate the catalyst during intrusive actions intended to bring the catalyst up to the desired temperature quickly after a cold start." But this approach has limitations as well,

as there are many factors that can affect catalyst warm-up, with the condition of the DOC being only one of them. It should be noted that the intrusive actions involved in diesel lightoff strategies encompass a multitude of actuators, and as such the DOC is only one component that generated increased heat to the exhaust. Most manufacturers find that the cold start component monitor for the DOC can only detect a completely failed DOC, and hence constitutes a functional monitor, not a threshold monitor.

- On Page 13, ARB stated that manufacturers simply work on reducing engine-out NMHC levels such that degraded catalysts will have less of an emissions effect. However, as we have stated above, measures taken to lower engine out NMHC will result in higher engine-out NOx levels. This would jeopardize both the ability to comply with the NOx emissions standard as well as making it more difficult to meet NOx catalyst monitoring requirements due to the resulting higher NOx conversion efficiency that would be needed. Manufacturers must strike a fine balance for engine-out NMHC and NOx levels to ensure that both requirements are met, and cannot simply jeopardize one to meet the other.

In conclusion, the proposed threshold monitoring requirement for the DOC cannot be met by the 2013 MY. EMA continues to maintain our position that the proposed threshold-monitoring requirement in the HDOBD regulation for diesel oxidation catalysts is not feasible.

5. NMHC DPF conversion efficiency threshold monitor

Issue

EMA remains concerned that there are no cost-effective monitoring strategies that are capable of robustly detecting deterioration of the NMHC conversion capability for a catalyzed DPF. This monitor is currently required in the HDOBD regulation for the 2013 MY, with an emissions-based detection threshold of 2 times the NMHC standard.

EMA's Position

ARB must delay implementation of this monitoring requirement until the 2016 MY. A delay would provide engine manufacturers with time to investigate and develop a robust, cost effective monitoring strategy. And considering the minimal NMHC emissions impact of the catalyzed DPF, EMA further recommends that ARB review manufacturers progress in meeting this requirement by the 2016 MY, and eliminate the monitoring requirement if manufacturers determine there is no cost-effective monitoring strategy that can meet it.

Rationale

The reason a catalyzed coating is used on a DPF is to prevent damage to the DPF as a result of non-homogeneous soot-burning under certain conditions. The NMHC conversion resulting from this catalyzed coating is a beneficial side effect, but is not needed to meet the emission standards. Monitoring approaches, such as the use of HC sensors, are being looked at, but there currently are no suitable, cost-effective monitoring approaches that are feasible at this time.

Since the catalyzed coating is used to prevent DPF damaged and is not intended to reduced NMHC emissions, EMA believes that engine manufacturers should not be required to implement a costly monitoring approach due to its minimal NMHC emissions benefit. Also, if the NMHC coating deteriorates, and this results in damage to the DPF, the DPF leakage monitor will be able to detect the DPF failure if PM emissions exceed the emissions threshold.

6. NMHC (DOC) Catalyst Threshold Monitor – Feedgas Monitoring

Issue

Currently 1971.1 (e)(5.2.3)(B) requires for 2013 and subsequent model year engines, that for catalysts used to generate a feedgas constituency to assist SCR systems (e.g., to increase NO2 concentration upstream of an SCR system), the OBD system shall detect a malfunction when the catalyst is unable to generate the necessary feedgas constituents for proper SCR system operation. Neither directly measuring sensors nor monitoring strategies are known that are capable of meeting this requirement.

EMA Position

At a minimum, EMA recommends postponement of 1971.1 (e)(5.2.3)(B) to the 2016 model year. In the alternative, ARB should accept that the SCR efficiency monitor sufficiently detects degradation of critical feedgas constituents and that feedgas monitoring is not necessary to comply with emission standards and has no emission benefits, as it is a secondary function of the NMHC catalyst.

Rationale

Per ARB's 1971.1 Initial Statement of Reasons (ISOR), ARB had recognized that this requirement was premature for the 2010 model year (MY) and subsequently postponed it until the 2013 MY. More recently ARB postponed the same requirement for light and medium-duty applications from the 2012 MY to the 2015 MY. EMA believes that for the same reasons supportive of delaying the requirement for light and medium-duty applications it is appropriate for ARB to similarly delay this requirement for heavy-duty.

In the previous ISOR, ARB recognized that successful development of strategies that it had suggested (detection via DPF loading/regeneration characteristics, or evaluation of SCR conversion efficiency under specific operating conditions) depends on individual manufacturers technology paths. ARB also recognized that OBD monitor development is only possible after the basic engine and aftertreatment design and control reach a certain level of stability. Time for monitor development was not available for 2010 given the extensive development demands for 2010 MY introduction of heavy-duty SCR technology.

The technology development environment that led ARB to conclude that delay of (e)(5.2.3)(B) was appropriate is largely unchanged. The development of next iteration SCR aftertreatment designs, DPF regeneration strategies and engine NOx control strategies has been intense as

necessitated by fuel economy demands of the customer that are in turn driven by high fuel prices. Rather than a period of technology stability that ARB may have anticipated, a period of rapid design change has ensued. Since engine out NOx strategies, DPF regeneration strategies, and SCR NOx reductions strategies are so intertwined (as the ISOR appeared to recognize) and changing, and since these strategies directly affect feedgas monitoring strategies, there is insufficient time for 2013 MY introduction.

Moreover, because the proposed delay would affect what is a secondary function of the NMHC catalyst, as ARB recognizes in the new ISOR on the current OBDII rule changes, such a delay would not result in any lost emission benefits.

7. FIE tolerance compensation feature

Issue

Some fuel injection systems have logic for a tolerance compensation feature in order to reduce the engine-to-engine variations and to maintain advertised performance specification. Section (g)(3.2.2)(F) of the ARB regulation requires the following:

> The components shall be monitored to ensure the proper compensation is being used. If a manufacturer demonstrates that a single component using the wrong compensation cannot cause a measurable increase in emission during any reasonable driving condition, the manufacturer shall detect a malfunction for the minimum number of components using the wrong compensation needed to cause an emission increase.

EMA´s position

The 2013 FIE OBD requirements include monitors for malfunctions related to pressure, timing and quantity. They will all cover emission related malfunctions that are associated with the FIE system. The magnitude of the malfunction criteria in (e)(1.2) compared to the tolerance compensation is very different. EMA requests ARB extend the implementation date for FIE tolerance compensation feature to the 2016MY based on the rationale below.

Rationale

The FIE tolerance compensation is made in the engine production assembly process and parameter values are updated for each fuel injector. The major purpose of the adjustment is to be able to achieve a smooth engine speed at idle and to get the correct performance at high engine load. The tolerance compensation can cover one or more compensation parameters for quantity and/or timing and the compensation can cover both electrical and hydraulic adjustments to get the correct fuel flow characteristics.

The parameter values used for compensation of the individual injectors adjusts the time for the valves and the quantity (compensation often in microseconds).

There are two different options using compensation for the FIE system: the compensation can either be fixed values or be based on adaptive calculation during engine operation.

For the fixed value compensation the parameters will only be able to update with an off board workshop tool when replacing one or more injectors. The fixed value compensation is based on the fuel injector flow characteristics delivered from the injector.

The adaptive algorithm calculates the compensation needed for keeping the nominal injector characteristics and when replacing one or more injectors the new compensation parameters will be updated using an Off board workshop tool.

For a six-cylinder diesel engine each cylinder represents 120° of the flywheel during two revolutions. Compensations made in microseconds for one injector will then result in an increase or decrease of the FIE-related parameters such as timing. The graph below shows how a certain number of microseconds will impact the timing for compensations made with 150, 100 and 50 micro seconds.

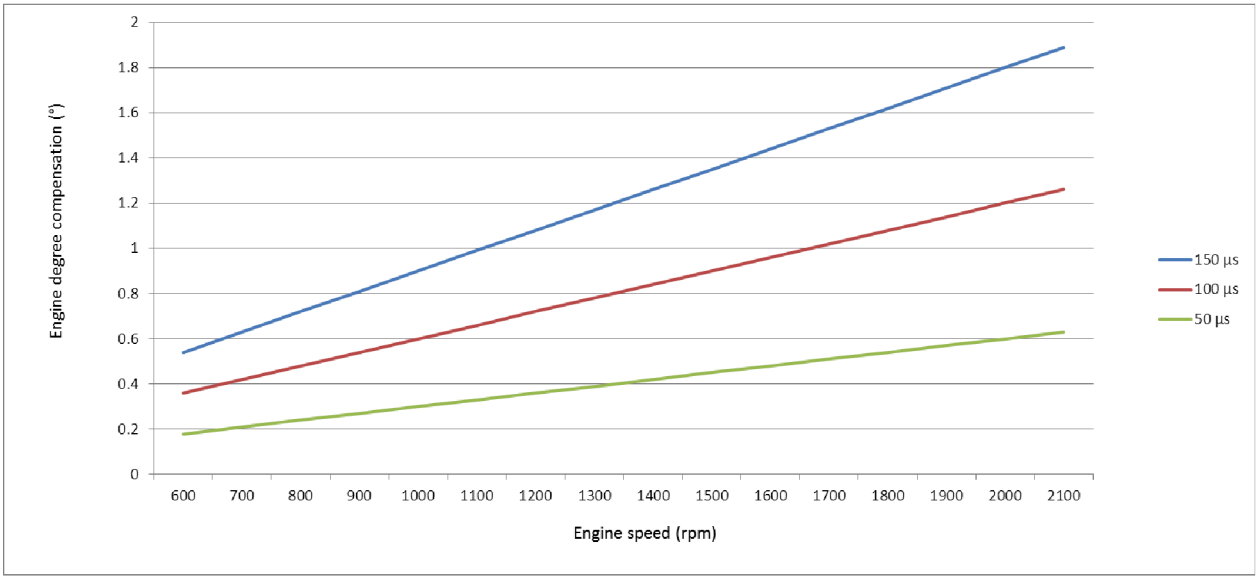


Figure 1 - Tolerance compensation feature

The x axis presents the engine speed and the y axis presents the crank angle compensation made for the tolerance compensation.

A normal distribution of the injectors used in production in 99% of the cases is less than 60% of the total possible amount of the compensation. Taking that as well as the normal operation window into account results in the figure below. The compensation will then be close to or less than one crank angle degree for one injector. This is a significant low adjustment compared to the monitoring levels for detecting pressure, timing and quantity related faults.

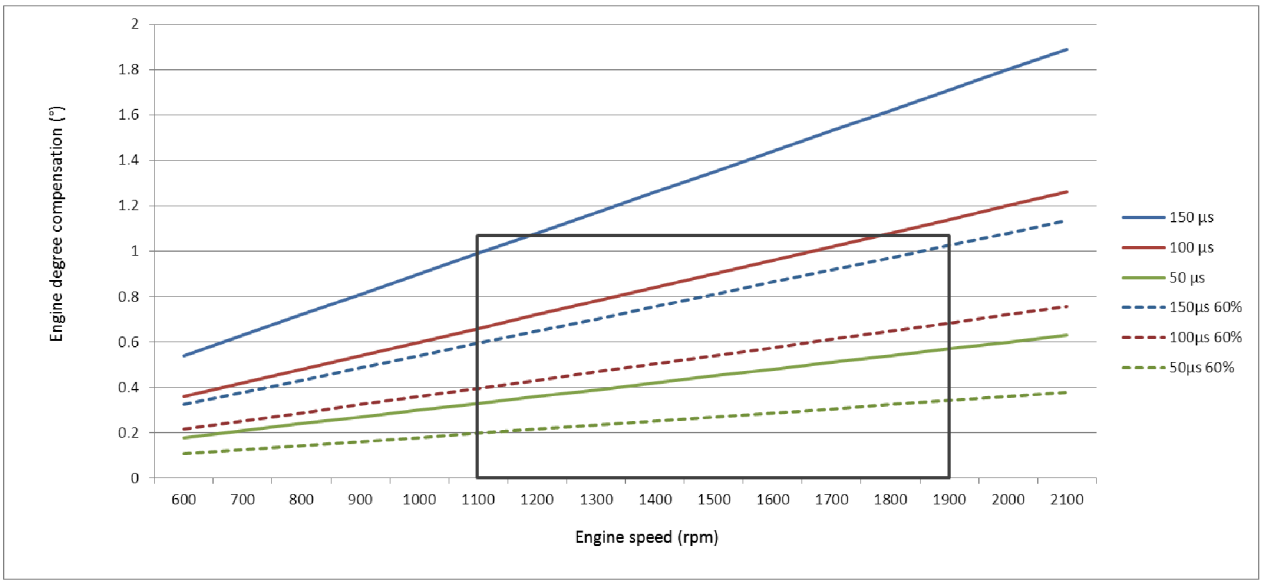


Figure 2 - Normal injector distribution

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54

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SACRAMENTO

ENGINE MANUFACTURERS ASSOCIATION,

Plaintiff,

vs.

CALIFORNIA AIR RESOURCES BOARD,

Defendant.

Case No. 2010-00082774-CU-MC

[~~PROPOSED~~] ORDER GRANTING MOTION FOR JUDGMENT ON THE PLEADINGS

Plaintiff Engine Manufacturers Association's Motion for Judgment on the Pleadings (the "Motion") came before this Court on May 4, 2012, in Department 54, the Honorable Shelleyanne W.L. Chang presiding. Timothy A. French, admitted pro hac vice, and Nancy J. Doig appeared as attorneys for the Plaintiff. Deputy Attorney General Nicholas Stern appeared as attorney on behalf of the Defendant California Air Resources Board.

The Court having received and considered the pleadings and briefs submitted in this matter, and having heard the parties' oral arguments, hereby adopts the Minute Order it issued on June 11,

2012 as its final order on the Motion. A copy of the June 11, 2012 Minute Order is attached as Exhibit A and incorporated by reference.

IT IS SO ORDERED.

DATED: July 18, 2012

Honorable Shelleyanne W.L. Chang
Judge of the Superior Court of the State of California

DECLARATION OF SERVICE

I am a citizen of the United States, over the age of 18 years, and not a party to or interested in this action. I am an employee of Greenberg Traurig LLP, and my business address is 1201 K Street, Suite 1100, Sacramento, CA 95814. On this day I caused to be served the following document(s):

[PROPOSED] ORDER GRANTING MOTION FOR JUDGMENT ON THE PLEADINGS

☒ by placing ☐ the original ☒ a true copy into sealed envelopes addressed and served as follows:

Kamala D. Harris Sara J. Russell Nicholas Stern Attorney General of California 1300 I STREET P.O. Box 944255 SACRAMENTO, CA 94244-2550 916.323.3840 916.327.2319 (fax) Nicholas.Stern@doj.ca.gov	Attorneys for Defendant, California Air Resources Board
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☒ **BY MAIL**: I am familiar with this firm's practice whereby the mail, after being placed in a designated area, is given fully prepaid postage and is then deposited with the U.S. Postal Service at Sacramento, California, after the close of the day's business.

☐ **BY FACSIMILE**: I caused such document(s) to be transmitted by facsimile transmission from (916) 448-1709 to the person(s) and facsimile transmission number(s) shown above. The facsimile transmission was reported as complete without error and a transmission report was properly issued by the transmitting facsimile machine. A true and correct copy of the transmission report will be attached to this proof of service after facsimile service is completed.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on July 13, 2012, at Sacramento, California.

SELENA PARADEE

SAC 442,215,970 v1

EXHIBIT A

SUPERIOR COURT OF CALIFORNIA,
COUNTY OF SACRAMENTO
GORDON D SCHABER COURTHOUSE

MINUTE ORDER

DATE: 06/11/2012 TIME: 02:30:00 PM DEPT: 54

JUDICIAL OFFICER PRESIDING: Shelleyanne W L Chang
CLERK: E. Higginbotham
REPORTER/ERM:
BAILIFF/COURT ATTENDANT:

CASE NO: **34-2010-00082774-CU-MC-GDS** CASE INIT.DATE: 07/16/2010
CASE TITLE: **Engine Manufacturers Association vs. California Air Resources Board**
CASE CATEGORY: Civil - Unlimited

EVENT TYPE: Motion for Judgment on the Pleadings - Civil Law and Motion - Demurrer/JOP

APPEARANCES

Nature of Proceeding: Motion for Judgment on the Pleadings (Taken Under Submission 5/4/12)

TENTATIVE RULING

Plaintiff Engine Manufacturers Association ("EMA") Motion for Judgment on the Pleadings is GRANTED.

EMA's Request for Judicial Notice is GRANTED with the exception of Exhibits B (unpublished superior court ruling) and C (settlement agreement). EMA's Supplemental Request for Judicial Notice is GRANTED.

Defendant California State Air Resource Board's ("CARB") Request for Judicial Notice is GRANTED. CARB's Request for Judicial Notice in Support of Supplemental Brief is likewise GRANTED.

In taking judicial notice of these documents, however, the court does not accept the truth of the factual assertions therein. (*Herrera v. Deutsche Bank Nat'l Trust Co.* (2011) 196 Cal.App.4th 1366, 1375.)

EMA's First Amended Complaint seeks declaratory relief pursuant to CCP § 1060 and Gov't Code § 11350. EMA contends that in adopting certain regulatory amendments regarding on-board diagnostic ("OBD"') system requirements applicable to heavy-duty ("HD") diesel engines, CARB exceeded its statutory authority under the Health and Safety Code, and as, a result, the amendments are invalid.

"OBD systems are comprised mainly of software that is programmed into a [sic] HD vehicle's on-board computer to detect emission control system malfunctions as they occur by monitoring virtually every engine component and system that could cause an increase in engine emissions. When the OBD system detects a potential malfunction of a covered engine component, and when other sensors determine that the emission-related threshold for that component is being exceeded, the OBD system alerts the vehicle operator by illuminating a malfunction indicator light ("MIL"), and also stores information relating to the potentially faulty component. The purpose of the OBD system is to promote and facilitate prompt inspection and, where warranted, repairs of emissions-related components." (FAC, ¶ 5, Answer, ¶ 2.)

The regulations at issue here are 13 CCR 1971.1(l)(4) and 1971.5(c) which require that as a condition of certification, HD diesel engine manufacturers are to procure HD engines that have been in use for some time and test their OBD systems to ensure functionality. EMA also challenges 13 CCR 1971.5(d)(1)-(4) and (6)-(7), (e) and (f) which authorize CARB to order a recall of HD engine classes whose OBD systems fail in-use testing. The questioned amendments will be collectively referred to as the "HD OBD Amendments."

CARB asserts four affirmative defenses to EMA's FAC: (1) failure to exhaust administrative remedies, (2) failure to present an actual controversy or judiciable question, (3) failure to allege facts sufficient to constitute a cause of action, and (4) each cause of action is uncertain. CARB denies most of the allegations in the FAC and admits ¶¶ 2 (in part) 3, 4, 5, 9, 11 (in part), 12 (in part), 16 (in part), and 18 (in part).

A motion for judgment on the pleadings is an appropriate means of obtaining an adjudication of the rights of the parties in a declaratory relief action if those rights can be determined as a matter of law from the face of the pleading attacked, together with those matters of which the court may properly take judicial notice. (*Allstate Ins. Co. v. Kim W.* (1984) 160 Cal.App.3d 326, 330.) Plaintiff is entitled to judgment on the pleadings if it can show "that the complaint states facts sufficient to constitute a cause or causes of action against the defendant and the answer does not state facts sufficient to constitute a defense to the complaint." (Cal. Code Civ. Proc. § 438(c)(1)(A).) In ruling on a plaintiff's motion for judgment on the pleadings, "the court will assume the truth of all facts properly pleaded in the answer and will disregard the controverted allegations of the complaint." (*Sebago, Inc. v. City of Alameda* (1989) 211 Cal. App. 3d 1372, 1380.) The standards governing a motion for judgment on the pleadings are essentially those governing demurrers. (*See Gerawan Farming, Inc. v. Kawamura* (2004) 33 Cal.4th 1, 32.)

The Court finds that FAC states facts sufficient to constitute a cause for Declaratory Relief. Further, based on the briefs the parties do not dispute that an actual controversy exists between EMA and CARB concerning their respective rights and duties. CARB's Answer does not state additional facts and simply contains denials or admissions.

The Court now turns to the parties' request for a declaration whether CARB exceeded its statutory authority in promulgating the HD OBD Amendments.

Statutory Authority for HD OBD Amendments

EMA's Contentions

EMA contends that CARB's statutory authority to compel motor vehicle manufacturers to conduct emissions certification testing is limited solely to the certification, manufacture and assembly of "new" motor vehicles. To support its position, EMA points to Health and Safety Code § 43104 ("Section 43104") which provides:

"for the certification of new motor vehicles or new motor vehicle engines, the state board shall adopt by regulation, test procedures and other procedures necessary to determine whether the vehicle engines are in compliance with the emissions standards established pursuant to Section 43101."

EMA further points to Health and Safety Code § 43105 ("Section 43105") which provides:

"No new motor vehicle, new motor vehicle engine, or motor vehicle with a new motor vehicle engine required pursuant to this part to meet the emissions standards established pursuant to Section 43101 shall be sold to the ultimate purchaser, offered or delivered for sale to the ultimate purchaser, or

registered in this state if the manufacturer has violated emission standards or test procedures and has failed to take corrective action, which may include recall of vehicles or engines, specified by the state board in accordance with regulations of the state board."

EMA argues that because the HD OBD Amendments require engine manufacturers to conduct in-use testing (i.e. testing of non-new cars); the amendments exceed CARB's statutory authority pursuant to Sections 43104 and 43105. EMA additionally argues that CARB impermissibly "bootstraps" the testing of non-new engines with the initial certification of new engines for sale because the in-use testing mandates: (1) do not apply to "new motor vehicle engines, (2) are not applicable to or a condition precedent to the initial certification of new engines, (3) are tests to check whether the MILS illuminate when OBD "malfunction criteria" are exceeded, and (4) is not based on federal test procedures or on typical urban driving patterns in California. (Reply, 4:8-18.) Further, CARB has promulgated "in-use vehicle enforcement test procedures" whereby CARB procures and tests in-use vehicles for compliance with emissions standards. (Reply, 7:14-8)(citing 13 CCR 2137(a).) CARB has also promulgated regulations for passenger cars whereby CARB procures and tests the OBD systems to ensure that they function properly. (Reply, 8:1-7)(citing 13 CCR § 1968.5(b).)

CARB's Contentions

CARB contends that the Legislature's delegation to CARB of authority to control motor vehicle emissions "impliedly includes the authority to adopt" the HD OBD Amendments. (Opposition, 6:16-18)(citing H&S Code §39000 *et seq.*) According CARB, the Legislature specifically found that "attaining state air quality standards will require improvements in the durability of emission control systems and in the in-use performance of vehicles, including heavy duty vehicles." (Opposition, 7:5-7)(citing H&S Code §43000.5)(emphasis added.) CARB is the state agency charged with regulating major sources of air pollution such as new and used motor vehicles. (Opposition, 7:2-4)(citing H&S Code §§ 39003, 39500, 4300, 43013 subds. (a),(b), (h), 43018(a).) Further, CARB is required to "adopt regulations that reduce in-use emissions by improving emission system durability and performance." (Opposition, 7:13-14)(citing H&S Code §43018(c)(2)(emphasis added.) CARB claims that the OBD systems on HD engines result in significantly lower exhaust emissions. (Opposition, 8:4-5.) Thus, according to CARB, the in-use testing of the OBD systems and recalls of defective systems ensure that the systems function properly and achieve lower exhaust emissions. (*Id.*, 8:5-7.)

CARB also contends that it has express authority to require manufacturers to do in-use testing and order recalls pursuant to Sections 43104 and 43105 because it has done so in the past. For example, manufacturers of medium duty vehicles that choose to certify their vehicles on engine dynamometers rather than chassis dynamometers must procure and test in-use vehicles on engine dynamometers. (Opposition, 12:14-17)(citing 13 CCR 2139(c)(1).) Additionally, federal law requires manufacturers of light duty vehicles, light duty trucks, and complete heavy duty vehicles to procure in-use vehicles and conduct emissions testing as a condition of certification. (Opposition, 13:7-11)(citing 40 C.F.R. §86.1845-01.)

Recall Authority

EMA's Contentions

The HD OBD Amendments authorize CARB to order a recall when 50 percent or more of the tested HD diesel engines have OBD components that fail to illuminate a MIL prior to the engine emissions exceeding two times or three times the "applicable major monitor malfunction criteria." (13 CCR §1971.5(d)(3).)

EMA contends that the OBD HD Amendments are contrary to Section 43105 because the regulations

allow the recall without first demonstrating that "the manufacturer has violated emission standards or test procedures." In support of its position, EMA argues that a "malfunction criteria" is neither an emission standard nor test procedure.

Emission Standards

Emission standards are "the specified limitation on discharge of air contaminant into the atmosphere." (*See* Health and Safety Code § 39027.) In the case of HD diesel engines, CARB has established tailpipe emission standards for particulate matter, hydrocarbons, oxides of nitrogen and carbon monoxide. According to EMA, a "malfunction criteria" is not an emission standard because while a "malfunction criteria" may be calculated by reference to an applicable emission standard, it is set at 2-3 times the applicable emission standard. EMA additionally points to the definition of "Nonconforming OBD System" which states that ". . .For purposes of section 1971.5, an engine class shall be considered nonconforming irrespective of whether engines in the engine class, on average, meet applicable tailpipe or evaporative emission standards." (13 CCR 1971.5(a)(3).) According to EMA, CARB's own regulations "make clear that whether an engine is in compliance with the applicable emission standards is irrelevant to the question of whether there is a malfunctioning OBD component." (Motion, 14:3-5.)

Test Procedures

According to EMA, "malfunction criteria" are "performance specifications and malfunction thresholds for specific OBD-related components." (Motion, 14:11-12.) A test procedure, however, is used to "determine whether the [new motor] vehicle engines are in compliance with the emissions standards established pursuant to Section 43101." (Health and Safety Code § 43104.) Thus, EMA contends that a "malfunction criteria" is not a test procedure.

EMA further notes that a test procedure is not violated when the tests show that the OBD-related MILs do not illuminate when they should. (Reply, 9:10-12.) Instead, there is a violation of the OBD malfunction criteria. (*Id.*)

CARB's Contentions

Emission Standards

CARB claims that "malfunction criteria" are a type of emission standard because they "set limits on discharge of air pollution into the atmosphere, just like tailpipe emissions standards." (Opposition, 10:5-11.) Further, "emissions above the malfunction criteria limits are deemed emission control malfunctions." (*Id.*) According to CARB, because the purpose of the OBD HD Amendments and the malfunction criteria are to "assure continuous emissions reductions, the malfunction criteria are a type of emission standard." (*Id.* at 10:25-11:2.)

In support of its position, CARB cites to a 1996 U.S. EPA decision document in which CARB claims the U.S. EPA found that "the malfunction criteria were emission standards." CARB also cites to the federal Clean Air Act's definition of emission standard "The terms "emission limitation" and "emission standard" mean a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under this Act." (42 U.S.C. §7602(k).)

Test Procedures

CARB contends that since malfunction criteria are emission standards, it can require manufacturers to

test their engines for compliance with the emission standards as a condition for certification. (Opposition, 11:15-17.) CARB claims that it is required to adopt "test procedures and any other procedures" necessary to determine whether the engines comply with emission standards" and that such test procedures are outlined in the HD OBD Amendments. (*Id.* at 11:25-28.)

CARB also states that the test procedure is violated if the in-use testing indicates that half or more of an engine family's OBD system fails to detect emissions that exceed the level of the malfunction criteria. (Opposition, 14: 13-16.)

Standard of Review

"[Q]uasi-legislative regulations adopted by an agency to which the Legislature has confided the power to "make law," and which, if authorized by the enabling legislation, bind this and other courts as firmly as statutes themselves." (*Yamaha Corp. of America v. State Bd. of Equalization* (1998) 19 Cal. 4th 1, 7.) "[I]n reviewing the legality of a regulation adopted pursuant to a delegation of legislative power, the judicial function is limited to determining whether the regulation (1) is 'within the scope of the authority conferred' and (2) is 'reasonably necessary to effectuate the purpose of the statute.' 'These issues do not present a matter for the independent judgment of an appellate tribunal; rather, both come to this court freighted with [a] strong presumption of regularity . . . .' Our inquiry necessarily is confined to the question whether the classification is 'arbitrary, capricious or [without] reasonable or rational basis." (*Id.* at 7.)

Even in those cases involving the court's review of quasi-legislative regulations, the court, not the agency, has "final responsibility for the interpretation of the law" under which the regulation was issued. (*Yamaha, supra*, at p.11 fn.4.) If the court determines that a challenged administrative regulation was not authorized by, or is inconsistent with, acts of the Legislature, that administrative action is void. (*Cal. Assn. of Psychology Providers, supra*, at p.11; see also Gov. Code §§ 11350, 11342.1, 11342.2.) Therefore, a court does not completely defer to an agency's view when deciding whether a regulation lies within the scope of the authority delegated by the Legislature. (*Yamaha, supra*, at p.11 fn.4.) The California Supreme Court has referred to the standard of review for challenges to the fundamental legitimacy of a quasi-legislative regulation as being one of "respectful nondeference." (*Id.*)

Because the court concludes the HD OBD Amendments are quasi-legislative regulations, its standard of review is governed accordingly.

Analysis

The Court first determines whether CARB had broad or implied authority to promulgate the HD OBD Amendments. The Legislature specifically found that "attaining state air quality standards will require improvements in the durability of emission control systems and in the in-use performance of vehicles, including heavy duty vehicles." (H&S Code §43000.5)(emphasis added.) The Legislature has also required CARB to "adopt regulations that reduce in-use emissions by improving emission system durability and performance." (H&S Code §43018(c)(2)(emphasis added.) These statutes provide CARB with broad authority to adopt regulations that reduce air pollution resulting from in-use emissions. (*See Western Oil and Gas Assn. v. Orange County Air Pollution Control Dist.* (1975)14 Cal.3d 411, 414.)

The Court now turns to the question of whether the HD OBD Amendments fall within the broad authority of H&S Code §43018(c)(2) (i.e. whether the HD OBD Amendments will reduce in-use emissions.) CARB states that the on-board diagnostic systems on heavy duty engines result in significantly lower exhaust emissions. (Opposition, 8:4-5.) Although CARB cites to Ex. E of EMA's Request for Judicial Notice to support this position, the Court does not accept the truth of the factual assertions therein. (*Herrera v. Deutsche Bank Nat'l Trust Co.* (2011) 196 Cal.App.4th 1366, 1375.) CARB further states that "in-use

testing of diagnostic systems and recalls of defective systems ensure that the systems function properly and achieve this result." (*Id.* 8:5-6.) This general statement, however, is not supported by the language of the HD OBD Amendments.

The definition of "Nonconforming OBD System" states that "...For purposes of section 1971.5, an engine class shall be considered nonconforming *irrespective of whether engines in the engine class, on average, meet applicable tailpipe or evaporative emission standards.* CARB may order recall of engines in an engine class that have been equipped with nonconforming OBD Systems." (13 CCR 1971.5(3)(A).[Emphasis added.]) Based on the explicit language of the regulation a "nonconforming OBD system" is not related to emission standards, the testing could result in the recall of engines even if, on average, they meet emission standards. Thus, the testing may not assist in the attainment of air quality standards. Accordingly, the HD OBD Amendments do not fall within CARB's broad authority to regulate pollution from in-use emissions.

The Court next turns to the question of whether Sections 43104 and 43105 provide authority for the HD OBD Amendments which expressly refer to "new motor vehicles" or "new motor vehicle engines."

In any case of statutory interpretation, the Court's "task is to determine afresh the intent of the Legislature by construing in context the language of the statute. In determining such intent, we begin with the language of the statute itself. That is, we look first to the words the Legislature used, giving them their usual and ordinary meaning. If there is no ambiguity in the language of the statute, then the Legislature is presumed to have meant what it said, and the plain meaning of the language governs. But when the statutory language is ambiguous, 'the court may examine the context in which the language appears, adopting the construction that best harmonizes the statute internally and with related statutes." (*People v.*
Superior Court (Zamudio) (2000) 23 Cal. 4th 183, 192-193.) (Internal citations omitted.)

Here, the Court finds that the statutory language is not ambiguous. Sections 43104 and 43105 expressly refer to "new motor vehicles" or "new motor vehicle engines." The fact that CARB has previously required manufacturers of medium duty vehicles to procure and test in-use vehicles as a condition of certification does not alter the Court's view because the above statutes explicitly refer only to "new" vehicles or engines, thereby expressly defining CARB's authority. The in-use testing requirements for the medium duty vehicle manufacturers are optional, not mandatory as here. (13 CCR 2139(c)(1).) Further, there is no indication whether CARB's authority to promulgate the in-use testing requirements for medium duty vehicle manufacturers was challenged. Moreover, although CARB mentions the federal regulation requiring some manufacturers to do in-use testing as a condition of certification of new vehicles (40 C.F.R. § 86.1848-02(c)(5)), it does not explain how EPA's regulations effect CARB's interpretation of a California statute.

Even if Sections 43104 and 43105 applied to in-use vehicles, the HD OBD Amendments conflict with Section 43105 because the regulations allow the recall without first demonstrating that "the manufacturer has violated emission standards or test procedures."

The HD OBD Amendments require manufacturer in-use testing to determine whether the diagnostic systems detect emissions in excess of the malfunction criteria. When the OBD System has been determined not to comply with 13 CCR 1971.1, it is considered "nonconforming." CARB may order recall of engines in an engine class that have been equipped with nonconforming OBD Systems. (13 CCR 1971.5(3)(A).) As stated above, an OBD System is considered nonconforming "irrespective of whether engines in the engine class, on average, meet applicable tailpipe or evaporative emission standards." (13 CCR 1971.5.) Thus, by this definition, a malfunction criterion is not an emission standard.

Further, the test procedures are not violated when the engine family's diagnostic system fails to detect emissions that exceed the level of malfunction criteria, as CARB suggests. Rather, if the testing indicates that the system fails to detect emissions that exceed the level of the malfunction criteria, the testing was performed properly (i.e. the manufacturer has not violated the test procedures.)

Accordingly, the Court declares that the HD OBD Amendments that require, as a condition of certification, HD diesel engine manufacturers to procure HD engines that have been in use for some time and test their OBD systems to ensure functionality and authorizing CARB to order a recall of HD engine classes whose OBD systems fail in-use testing were not within the scope of authority conferred to CARB, nor were they reasonably necessary to effectuate the purpose of Sections 43104 and 43105 authorizing CARB to regulate new motor vehicle emissions and plaintiff's motion for judgment on the pleadings is granted.

EMA shall submit a formal order and judgment for the court's signature pursuant to CRC 3.1312.

COURT RULING

The matter was argued and submitted. The matter was taken under submission.

SUBMITTED MATTER RULING

Having taken the matter under submission on 05/04/2012, the Court now rules as follows:

Having taken the matter under submission, the Court affirms the tentative ruling with the following additional comments.

At oral argument, CARB argued that the motion should be denied because at trial, it would be able to prove that the HD OBD Amendments substantially reduce emissions based upon its findings in the administrative record. However, EMA conceded in its moving papers that "the only legal issue in this case is whether the underlying statutes authorize the challenged regulatory provisions . . . and an issue that requires no further factual development to resolve." (Motion, 7:20-8:1.) CARB did not dispute this representation or argue that the motion should somehow be denied because the Court needed to consider evidence to render a judgment. CARB even stated that "EMA's limited challenge is consistent with the limited scope of a plaintiff's motion for judgment on the pleadings." (Opposition, 5:22-24.) CARB thus conceded that the issue was purely a question of law, that the court did not need to resolve any factual dispute and the Court ruled on the motion as such.

"A plaintiff may recover judgment on a motion for judgment on the pleadings only if his complaint states facts sufficient to constitute a cause of action and the answer neither raises a material issue nor states a defense." (*Barasch v. Epstein* (1957) 147 Cal.App.2d 439, 440.) In ruling on a plaintiff's motion for judgment on the pleadings, "the court will assume the truth of all facts properly pleaded in the answer and will disregard the controverted allegations of the complaint." (*Sebago, Inc. v. City of Alameda* (1989) 211 Cal. App. 3d 1372, 1380.) Although CARB asserted four affirmative defenses to EMA's FAC, its Answer did not state facts to support its affirmative defenses and simply contained denials or admissions. In its Answer, CARB admits that it adopted the HD OBD Amendments which became effective in June 2010 and that CARB and its agents are responsible for implementing and administering the HD OBD Amendments. (Answer, ¶¶ 2, 6(a).) Although the Answer denies the allegations contained in EMA's Declaratory Relief cause of action and that an actual controversy exists between EMA and CARB concerning their respective rights and duties, the parties' briefings show otherwise. If there was no dispute as to CARB's authority to promulgate the HD OB Amendments, CARB would not have opposed the motion. Thus, the Court determined whether CARB exceeded its statutory authority in promulgating the HD OBD Amendments and whether EMA was entitled to judgment as a matter of law.

Notably, at oral argument, CARB did not dispute the Court's finding that EMA's FAC stated facts sufficient to constitute a cause of action for Declaratory Relief against CARB and CARB's Answer did not state facts sufficient to constitute a defense to the FAC. (Cal. Code Civ. Proc. § 438(c)(1)(A).)

Finally, at oral argument CARB contended that *Western Oil & Gas Assn. v. Orange County Air Pollution Control Dist.* (1975) 14 Cal.3d 411 gave it broad authority to control motor vehicle emissions and that the Court, consistent with *Western Oil*, should not imply restrictions on it. CARB suggests that its authority to adopt the HD OBD Amendments can be implied for the same reasons as *Western Oil*. EMA interprets *Western Oil* to be much narrower and that the holding of *Western Oil* is that CARB may implement emission standards through direct or indirect means. EMA further contends that the HD OBD Amendments do not regulate emission standards because a malfunction criteria is not an emission standard, thus, CARB did not have the authority to promulgate the HD OBD Amendments.

In *Western Oil*, the court stated that the crucial question was "whether the Legislature intended to confine the board's power to control emissions to the mechanical devise method" (i.e. regulation of emissions by mechanical means which control the pollutants released by an engine or by specifying the ingredients of the gasoline used in the engine.) The court found that there was "no express restriction in the statutes" as to the manner in which CARB could implement motor vehicle emission standards and that it "would be unjustified in implying a restriction to mechanical means." The court reasoned that it was "at the very least highly debatable" whether mechanical devices existed to reduce lead emission. The court then stated "[i]f we were to hold that the ARB has no power to regulate fuel content, we would be attributing to the Legislature an intention to deprive the agency of the *only realistic means at its disposal* to achieve the purposes of the act" and that the "Legislature did not intend to deprive the ARB of the *only feasible means* to achieve the Legislature's previously stated goal." (*Western Oil and Gas Assn' v. Orange County Air Pollution Control District* (1975) 14 Cal.3d 411, 420)(emphasis added.)

While CARB has broad authority to adopt regulations that reduce air pollution resulting from in-use emissions, the broad authority referenced in *Western Oil* does not reach as far as CARB suggests. Requiring HD engine manufacturers to procure and test HD engines is not the only "realistic or feasible" means for CARB to achieve the purposes of the Act. As EMA pointed out, CARB can procure the engines and perform the testing itself. Moreover, CARB has adopted regulations where it conducts in-use testing of HD engines, including checking the OBD system for proper operation. (*See* 13 CCR 2136 - 2140.) Further, to the extent CARB argues that it will be too expensive for it to procure the engines and conduct the testing, CARB has not presented admissible evidence that the Court can consider. Although CARB cites to Exhibit E of EMA's Request for Judicial Notice to support this position, the Court does not accept the truth of the factual assertions therein. (*Herrera v. Deutsche Bank Nat'l Trust Co.* (2011) 196 Cal.App.4th 1366, 1375.) Thus, *Western Oil* is inapposite and does not provide the authority to CARB to promulgate the regulations in question.

Accordingly, the Court affirms the tentative ruling.

SUPERIOR COURT OF CALIFORNIA, COUNTY OF SACRAMENTO

Gordon D Schaber Courthouse
720 Ninth STREET
Sacramento, CA 95814-1311

SHORT TITLE: Engine Manufacturers Association vs. California Air Resources Board

CLERK'S CERTIFICATE OF SERVICE BY MAIL (Minute Order)	CASE NUMBER: **34-2010-00082774-CU-MC-GDS**

I certify that I am not a party to this cause. I certify that a true copy of the Minute Order was mailed following standard court practices in a sealed envelope with postage fully prepaid, addressed as indicated below. The mailing and this certification occurred at Sacramento, California, on 06/12/2012.

Clerk of the Court, by: */s/ E. Higginbotham* , Deputy

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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SACRAMENTO

ENGINE MANUFACTURERS ASSOCIATION, Plaintiff, vs. CALIFORNIA AIR RESOURCES BOARD, Defendant.	Case No. 2010-00082774-CU-MC ~~[PROPOSED]~~ **FINAL JUDGMENT**

IT IS HEREBY ADJUDGED AND DECREED that, for the reasons set forth in the Court's Final Order in this matter, which is being entered concurrently with this judgment, the Defendant California Air Resources Board's ("CARB") Amended Regulations at issue pertaining to Heavy-Duty On-board Diagnostic systems, specifically, California Code of Regulations, title 13, sections 1971.1(l)(4), 1971.5(c), 1971.5(d)(1)-(4) and (6)-(7), 1971.5(e) and 1971.5(f), are hereby declared to be invalid because they were not within the scope of authority conferred to CARB, nor were they reasonably necessary to effectuate the purpose of Sections 43104 and 43105.

IT IS FURTHER ADJUDGED AND DECREED that judgment is granted in favor of Engine Manufacturers Association ("EMA") and against CARB on EMA's First Amended Complaint for Declaratory Relief.

DATED: July 18, 2012

Honorable Shelleyanne W.L. Chang
Judge of the Superior Court of the State of California

DECLARATION OF SERVICE

I am a citizen of the United States, over the age of 18 years, and not a party to or interested in this action. I am an employee of Greenberg Traurig LLP, and my business address is 1201 K Street, Suite 1100, Sacramento, CA 95814. On this day I caused to be served the following document(s):

[PROPOSED] FINAL JUDGMENT

☒ by placing ☐ the original ☒ a true copy into sealed envelopes addressed and served as follows:

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☒ **BY MAIL**: I am familiar with this firm's practice whereby the mail, after being placed in a designated area, is given fully prepaid postage and is then deposited with the U.S. Postal Service at Sacramento, California, after the close of the day's business.

☐ **BY FACSIMILE**: I caused such document(s) to be transmitted by facsimile transmission from (916) 448-1709 to the person(s) and facsimile transmission number(s) shown above. The facsimile transmission was reported as complete without error and a transmission report was properly issued by the transmitting facsimile machine. A true and correct copy of the transmission report will be attached to this proof of service after facsimile service is completed.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on July 13, 2012, at Sacramento, California.

SELENA PARADEE

SAC 442,215,969 v1