

**Written Comments of the Manufacturers of Emission Controls Association on the
Colorado Air Quality Control Commission's Proposed Regulation Number 20:
Colorado Low Emission Vehicle Program**

October 30, 2018

The Manufacturers of Emission Controls Association (MECA) is pleased to provide comments in support of the Colorado Air Quality Control Commission's proposed Regulation Number 20, which would adopt California Low Emission Vehicle (LEV) standards for new light-duty motor vehicles sold in Colorado beginning in the 2022 model year, as well as require aftermarket catalytic converters to meet California's standards.

MECA is a non-profit association of the world's leading manufacturers of emission control, combustion efficiency, and greenhouse gas (GHG) reduction technologies for mobile sources. Our member companies have over 45 years of experience and a proven track record in developing and manufacturing clean vehicle technologies, and they represent the majority of aftermarket converter manufacturers who have been supplying converters under the California and the U.S. EPA aftermarket programs since the late 1980s. Our industry has played an important role in the air quality success story associated with light-duty vehicles in North America, and we have continually supported efforts to develop innovative, technology-neutral, emission control programs to mitigate air pollution problems and minimize the impacts of climate change.

MECA has supported the California ARB's LEV program since it was first introduced in 1990. Most recently, MECA provided detailed written comments in support of the LEV program when it was amended by the CARB Board in January 2012 and in October 2014 (see: http://www.meca.org/attachments/2120/MECA_comments_on_ARB_LEV_III_post-2016_GHG_012512.pdf and http://www.meca.org/attachments/2476/MECA_written_comments_on_ARB_Tier_3_proposed_amendments_102314.pdf, respectively). In these comments, MECA agreed with CARB staff's assessment that achieving the LEV III exhaust and evaporative emission standards and associated emission reductions are both technically feasible and cost-effective. This fact is clearly demonstrated by the millions of SULEV- and PZEV-compliant light-duty vehicles that have been sold in California and the rest of the U.S. since these near-zero emission, gasoline vehicles were first introduced more than 15 years ago. The technology base of advanced three-way catalysts, high cell density substrates, emission system thermal management strategies, secondary air injection systems, advanced carbon canisters, advanced low fuel permeation materials, and air intake hydrocarbon adsorber materials that have already been commercialized for a variety of PZEV gasoline vehicle applications can be extended and further optimized to allow all light-duty and medium-duty gasoline vehicles to achieve the exhaust and evaporative emission reductions needed to comply with the LEV III emission limits. In addition, advanced diesel emission control technologies, including diesel particulate filters, lean NOx adsorber catalysts, and selective catalytic reduction catalysts, can be combined with advanced diesel engines to allow light-duty diesel vehicles to achieve the LEV III emission limits.

Implicit in federal and state GHG emission analyses is the ability of advanced light-duty powertrain options to meet the applicable criteria pollutant emission standards while at the same time reducing GHG emissions and improving fuel economy. A range of powertrain technologies, including engine turbochargers, exhaust gas recirculation systems, advanced fuel injection systems, variable valve actuation technology, advanced transmissions, electrified powertrain components, and powertrain control modules, that can be applied to both light-duty gasoline and diesel powertrains to help improve overall vehicle efficiencies, also help reduce fuel consumption, both of which can result in lower carbon dioxide (CO₂) exhaust emissions. In many cases, the application and optimization of advanced emission control technologies on advanced powertrains can be achieved with minimal impacts on overall fuel consumption.

MECA commends the AQCC for recognizing the opportunity to reduce emissions from Colorado's existing fleet of light-duty passenger cars and trucks by proposing to adopt CARB's aftermarket converter requirements. MECA has supported CARB's aftermarket converter regulations for 30 years, dating back to their original regulations for replacement converter certification in 1988. MECA and our member companies actively participated in the regulatory process leading up to implementation of California's current amendments to their aftermarket converter standards in 2009, including providing staff with information regarding the performance capabilities of advanced aftermarket converter technologies.

Significant emission reductions in oxides of nitrogen (NO_x), hydrocarbons (HCs), and carbon monoxide (CO) are achievable from in-use light-duty vehicles through implementation of a comprehensive aftermarket converter program such as California's. To meet the durability requirements for new aftermarket converter catalysts of 50,000 miles, catalyst manufacturers have developed technologies based on more thermally durable materials. To ensure that catalysts are compatible with the OBD II system and do not cause the vehicle's MIL to illuminate when the catalyst is functioning properly, manufacturers have developed advanced catalyst coating practices and implemented tight quality control procedures in their processes. These advances result in catalysts that can survive high temperature exposure and deliver the required performance over a longer useful life. MECA member companies have certified and continue to obtain CARB approval for new technologies to broaden the availability of aftermarket converters that comply with the latest requirements.

The benefits of applying the most advanced aftermarket converters on non-OBD vehicles was demonstrated by CARB staff through vehicle tests and presented in the staff report supporting their 2009 amendments (see: <https://ww3.arb.ca.gov/regact/2007/amcat07/isor.pdf>). After approximately 8,000 miles of mileage accumulation, the advanced catalysts resulted in 50-75% lower emissions of all three criteria pollutants compared to the aftermarket catalyst technology sold previously in California. Furthermore, the advanced catalysts demonstrated far better durability, resulting in 60% less deterioration in HC emissions and 75% less deterioration in NO_x emissions after mileage accumulation relative to today's aftermarket converters sold for pre-OBD vehicles outside of California.

In addition, MECA member companies conducted a test program in 2012 that compared the emission reduction benefits of California aftermarket converters to federal aftermarket converters. After only 25,000 miles of equivalent aging, the CARB converters emitted 77% less

NO_x, 60% less HCs, and 63% less CO than the equivalently aged EPA converters. The emission benefits of the CARB aftermarket converters were even more dramatic after 50,000 miles of aging. (A summary of this test program was published as an SAE paper in April 2013; see: papers.sae.org/2013-01-1298/.)

MECA believes that the most effective approach for cleaning up the in-use light-duty fleet in the U.S. is through a more stringent federal aftermarket converter program that harmonizes performance and durability requirements for aftermarket converters with the CARB program. MECA staff and member companies have engaged in direct discussions with the U.S. EPA since 2009 to try to revise the current federal aftermarket converter program (adopted back in 1986) to be more in line with California's program. A revised federal program would eliminate the complexity of enforcing on out-of-state vehicles or illegal converters installed in neighboring states that may have different requirements. In addition, a revised federal program would make available the most advanced aftermarket technology for federally certified vehicles that are not covered by existing CARB Executive Orders.

MECA recognizes that, until EPA decides to act, states that are in nonattainment for ozone might consider implementing California's aftermarket converter requirements as a means to help clean up their existing light-duty vehicle fleet. MECA staff and member companies have pledged to work with states that choose to adopt California's aftermarket converter requirements to help them implement an effective aftermarket converter program.

Based on the experience gained through working with states that have already adopted CARB's aftermarket converter requirements (New York and Maine), as well as with the Ozone Transport Commission on their aftermarket catalytic converter model rule, MECA has identified a number of issues with implementing a CARB aftermarket converter regulation in the absence of resources that California has committed to their program. Just as with new vehicle regulations, in order to facilitate a smooth transition, aftermarket converter manufacturers require sufficient lead-time to comply with new requirements to ensure that new parts are available and parts in distribution are phased out of the market. Furthermore, we have found that sufficient time is allowed for outreach to consumers, distributors, and installers to educate the market about the new requirements. MECA recommends that the AQCC consider the following issues when finalizing the date for implementing California's aftermarket converter requirements and prioritize the necessary outreach and other associated issues.

Prior to the effective implementation date for new aftermarket converter requirements, manufacturers will need to:

- Quantify and analyze the vehicle fleet population and engine families in the state.
- Consider the practices of the vehicle repair industry in the state to ensure the right mix of universal fit converters or direct fit exhaust assemblies are available in distributors' warehouses prior to the implementation date.
- Manufacture additional product inventory appropriate for the region.
- Prepare for the smooth exchange of inventory once the regulation goes into effect.
- Develop specific aftermarket converter information tailored to the vehicle mix and model years covered by California regulation.

- Communicate the regulatory changes throughout the distribution and installation network and educate the supply chain on the new requirements.

In addition, MECA would welcome working with the AQCC on the following areas to ensure the long-term success of the new aftermarket converter program:

- Enforcement of the new regulation to maintain a level playing field in the market.
- Prepare a regulatory summary to clearly describe the key aspects of the regulation. This information should be distributed to the registered converter installers, distributors, retailers, and vehicle owners in the state or region.
- Conduct workshops to address questions about the regulation and address implementation issues in preparation for a smooth transition.

MECA believes that a state's successful transition to a new aftermarket converter program requires thoughtful planning and execution in order to minimize confusion and frustration by consumers and installers with the regulatory changes. Furthermore, once implemented, enforcement of the regulation is essential to achieve the full emission benefits of the program. To facilitate enforcement, we urge the AQCC to incorporate a visual inspection requirement under the state's light-duty vehicle inspection and maintenance program, as is being done by California's Smog Check program, to confirm that the proper converter is installed on each vehicle.

MECA commends the Colorado AQCC for taking important steps through this proposed rulemaking to reduce criteria pollutant and greenhouse gas emissions from light-duty vehicles in the state. Furthermore, we applaud the agency for their leadership in taking the additional steps to apply the best aftermarket converter technology to the state's existing light-duty vehicle fleet to accelerate the process towards improving the air quality for the citizens of Colorado. Together, these new standards will provide consumers with light-duty vehicles designed to reduce multiple pollutants while preserving vehicle choice and saving money on fuel. Our industry looks forward to supporting the AQCC in the transition to the cleanest aftermarket converter technology.

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