

## UPDATED INFORMATIVE DIGEST

### PROPOSED AMENDMENTS TO CALIFORNIA SPECIFICATIONS FOR FILL PIPES AND OPENINGS OF MOTOR VEHICLE FUEL TANKS

**Sections Affected:** This action amends *Specifications for Fill Pipes and Openings of 2015 and Subsequent Model Motor Vehicle Fuel Tanks*, last amended: March 22, 2012, which is incorporated by reference in the California Code of Regulations, title 13, section 2235.

#### **Background and Effect of the Regulatory Action:**

Amendments to the California Air Resources Board's (CARB or Board) fill pipes specifications were adopted at the Board's October 25, 2018, public hearing to help ensure new motor vehicle fill pipes continue to be compatible and form a good seal with Phase II recovery nozzles that are certified for use at California gasoline stations, therefore reducing overpressure. The original fill pipe specifications were adopted in 1976, which primarily defined acceptable dimensions for interfacing with vapor recovery nozzles. Subsequent changes were made to introduce performance specifications to better ensure problem-free refueling. The new amendments include a new performance leak standard and a bench test procedure. Minimizing leaks between the motor vehicle fill pipe and nozzle helps ensure On-board Refueling Vapor Recovery (ORVR) equipped vehicles are identified during refueling. This identification is necessary to reduce air ingestion at the nozzle, which helps reduce pressure-driven emissions caused by evaporation of gasoline within the gasoline storage tank during winter months.

Since the fill pipe specifications were first adopted, there have been changes to both vehicles and the nozzles over time. Newer vehicles capture vapor from refueling by having an ORVR system. This was phased in for new light-duty vehicles between 1998 and 2006. In addition, CARB implemented Phase II Enhanced Vapor Recovery (EVR) systems at gasoline stations starting in 2001 for underground storage tanks (UST), and 2009 for above-ground storage tanks (AST). These actions, done separately by the Board, reduce emissions from the vehicle side by adopting ORVR systems, and for those vehicles without ORVR, Phase II systems would capture and contain gasoline emissions. The Phase II EVR systems are certified to capture and contain at least 95 percent of available vapor generated during refueling.

The performance leak standard quantifies an allowable leak rate between the fill pipe face and the nozzle boot. This is necessary as new capless fill pipe designs continue to be introduced by multiple manufacturers in California. Though a zero leak rate would be ideal, it would be hard to achieve with some of the designs available on the market today. A performance leak standard gives manufacturers flexibility in the design they choose to meet the standard. This new leak standard phases in starting in the 2022

model year and will be fully phased in the 2024 model year. Manufacturers will measure their leak rate via a bench test. Staff developed the bench test procedure by working with the vehicle and nozzle manufacturers.

In addition, to prevent future increases in overpressure at California gasoline stations, existing fill pipe dimensional requirements have been modified. These design changes only apply when an auto manufacturer is changing the fill pipe head design on new model year 2024 and subsequent vehicles. From talks with manufacturers, staff understands that the fill pipe heads designs do not change often. Some designs have been around for decades. This provides flexibility, since the cost of redesigning and testing the fill pipe would already be incurred by the manufacturer during a planned redesign.

### **Objectives and Benefits of the Regulatory Action:**

The amendments include a new performance leak standard for fill pipes in new vehicles. These amendments are needed to improve motor vehicle fill pipe compatibility with nozzles. This compatibility is necessary to reduce air ingestion at the nozzle, which will help reduce pressure-driven emissions (overpressure emissions) caused by evaporation of gasoline within the gasoline dispensing facility (GDF) storage tank headspace. Unexpected pressure driven emissions cause GDF vapor recovery systems to not achieve the performance standards and emission reductions anticipated when EVR regulations were adopted.

The fill pipe amendments will reduce misidentification rates with ORVR vehicles when refueled with vacuum assist nozzle spouts, and ensure compatibility with newer EVR and Enhanced Conventional (ECO) nozzle spouts. Emission reductions will result from minimizing air ingestion by vented fill pipe designs by enabling a better seal between the fill pipe of a vehicle with an ORVR system and the nozzle's vapor collection bellows. Approximately 52 percent of California GDFs are equipped with vacuum assist nozzles.

CARB staff estimates that compliance with the amendments will improve air quality by reducing gasoline vapor (aka reactive organic gases, or ROG) emissions, which also contain benzene, by about 0.63 tons per day during winter months (typically November through February) on a day with average vapor concentration. The fill pipe amendments and the nozzle amendments are expected to yield emission reductions up to 2.2 tons per day (TPD) in 2030 on a day with maximum vapor concentration. The amendments are projected to reach the maximum potential emissions reductions that can result from improving the fill pipe and nozzle interface due to the mechanics of gas station overpressure emissions. Therefore, further fill pipe improvements are not expected to yield additional reductions in emissions.

Reducing ROG emissions is an integral part of California reaching its goal of attaining federal ozone standards. Reducing benzene emissions is critical for protecting the

health of people who live and work near gasoline dispensing facilities and people who own and fuel ORVR-equipped vehicles with fill pipes that do not form a good seal with the nozzle. Fill pipes that meet the performance leak standard and future dimensional requirements will also enable the automotive industry to more effectively design compatible fill pipes for future vehicle models. In addition, reducing overpressure conditions will reduce the frequency of GDF In-Station Diagnostic (ISD) system overpressure alarms, which will reduce the frequency and cost of service calls for many GDFs with vacuum-assist vapor recovery systems.

CARB's amendments to the fill pipe specifications were developed in conjunction with an extensive public process. Staff informed, involved, and updated public stakeholders on staff's progress developing the amendments. Staff held public workshops and had other meetings with interested persons during the development of the regulatory amendments. These informal pre-rulemaking discussions provided staff with useful information that they considered during development of the regulatory amendments. Between 2012 and 2017, CARB staff held eleven public workshops in northern and southern California about GDF storage tank overpressure problems, study designs and results, and potential solutions. These workshops engaged representatives from nozzle, fill pipe, and automotive manufacturers; GDF owners and operators; service contractors and consultants; petroleum refineries and distributors; air districts; Tribes; environmental consultants; farm bureaus; and air quality agencies from outside of California. In addition, staff created a public webpage where related workshop materials and technical support documents were posted to keep stakeholders up to date on the latest developments in the pre-rulemaking process and distributed announcements and workshop materials through the CARB list serves that, based on individual subscribers to the list serves, reach more than 4,000 individuals. Staff sent out multiple emails providing announcements to upcoming workshops, a description of the proposed amendments, and contact information for relevant staff for both the fill pipe and nozzle proposed amendments.

Further, over the last two years, CARB staff participated in over a dozen meetings with the Society of Automotive Engineers (SAE) Fuel Systems J285/J1140 Task Force (SAE Task Force), which is comprised of nozzle, vehicle, and fill pipe manufacturers. The SAE Task Force is charged with developing and testing new dimension specifications to standardize the vapor recovery nozzle and fill-pipe interface to improve compatibility. The amendments to CARB's fill pipe specification are the result of extensive deliberations of nozzle, vehicle, and fill pipe manufacturers who participated in the SAE Task Force.

### **Activity Since the Board Hearing:**

After the Board hearing, CARB staff made various non-substantial changes to the regulations. These changes include clarifying the new bench test procedure and

clarifying the fill pipe dimensional specifications. The Final Statement of Reasons includes a description of these changes.

**Comparable Federal Regulations:**

There are no federal regulations or programs directly comparable to California Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks. California's existing Fill Pipe Specifications already exceed federal requirements.

**An Evaluation of Inconsistency or Incompatibility with Existing State Regulations (Gov. Code § 11346.5, subd. (a)(3)(D)):**

During the process of developing the regulatory action, CARB conducted a search of any similar regulations on this topic and concluded these regulations are neither inconsistent nor incompatible with existing state regulations.