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The Debate Continues

Why ORVR Cars Will Get the Job Done

In *PE&T's* Sept./Oct. issue, I explained how a combination of existing Stage II vapor recovery and newly mandated vehicle on-board refueling vapor recovery (ORVR) systems together may be worse than each by itself. In the May/June issue, columnist Ed Hasselmann described ongoing compatibility testing between Stage II and ORVR systems at the California Air Resources Board (CARB) and projected that on-board carbon canisters will have significant technical and durability problems ("Will ORVR Systems Make Pollution Worse?" pg. 24). I also would like to revisit the issue of ORVR reliability.

Terminal improvements—True, early Stage II systems using carbon canisters had mechanical difficulties. However, their demise was not caused by those problems, but by the oil industry's decision to work with less costly balance systems that, at the time, were less developed than the early assist vapor recovery systems. Carbon adsorption of gasoline vapors at the service station had been developed by adapting similar systems used in distribution terminals. Through continued improvements, terminal units today approach carbon bed life spans of 10 years. Obviously, the know-how and carbon technology improvements are transferable to ORVR systems.

It is important to remember that ORVR systems are part of the automotive evaporative control system and are covered by a mandated 10 year/100,000 mile warranty. In addition, EPA conducts ongoing in-use testing and audits the performance of environmental systems. Should premature failure occur, the agency can mandate recalls. ORVR is mandated by the 1990 Clean Air Act Amendments; short of changing the mandate, the auto makers must comply, and provide durable systems that meet the mandated performance standards.

Compatibility testing—In January, CARB began an ambitious test program to determine compatibility of ORVR systems with existing Stage II equipment. CARB tested 17 ORVR systems and 20 vapor recovery nozzles (with 15 assist and 5 balance system nozzles). More than 1,200 tests were performed, testing 297 equipment combinations. Results show only 21 refueling difficulties, most of which occurred when vapor recovery sleeves on assist system nozzles sealed at the fill pipe. Those problems have been resolved by CARB authorizing the respective nozzle manufacturers to introduce holes in the sleeves to prevent sealing. In response to a request from EPA, CARB also tested 12 conventional nozzles for compatibility and observed no problems during normal operation. Topping off at high fueling rates (10 gpm) resulted in significant spitback.

CARB now has two remaining issues to resolve: (1) the potential safety problem resulting from low hydrocarbon concentrations in the fill pipe, the dispenser and underground piping; and (2) the broader problem of potential fugitive emissions from overpressurizing the underground system. The first issue is being addressed by the California Fire Marshal's office and should be settled by year-end. The fugitive emission issue is being studied by a third party laboratory. I do not expect CARB to issue a guidance document until well into next year or possibly 1998.

In the interim, CARB has performed limited additional testing on assist systems during the week of June 23, determining hydrocarbon concentrations at the fill pipe interface and in the dispenser during refueling of ORVR cars. This data will help in assessing potential safety problems.

Task force topics—Last year, the Society of Automotive Engineers formed a Task Force to address ORVR issues. Members include service station equipment suppliers, car manufacturers, EPA, API and various other interested parties. The Task Force has reviewed the equipment compatibility issues and will draft a standard to ensure future compatibility.

Recently the group has discussed "smart interfaces" between the nozzle and vehicle. They are studying a proposal for a radio frequency identification device in the vehicle, which would transmit the presence of an ORVR car to the dispenser and disable the dispenser vapor recovery system. A number of other options are also being studied and prioritized.

In conclusion—Since my initial column on the ORVR issue last year, significant additional effort has gone into the various studies on potential problems. As I pointed out then, this effort has not and will not improve air quality; it will only fix problems caused by mandating two systems to recover the same refueling emissions. Each system works well by itself. Together, the net effect would have been more fugitive emissions, had it not been for the efforts of a number of dedicated folks in industry and in the regulatory agencies.

While there may certainly be some technical problems with ORVR equipped cars, I project that the auto industry will solve them quickly to avoid future large-scale recalls. However, public reaction to ORVR cars may initially be negative, since they do require lower flow rates at the dispenser and may cause spitback at the mandated upper flow rate limit of 10 gpm during topping off.

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