

## Response to Media Allegations Concerning Cleaner-Burning Gasoline

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As part of the cleaner-burning gasoline program, the Air Resources Board (ARB) staff worked with a broad range of experts throughout industry on the comprehensive testing program. The testing effort was designed, implemented, evaluated and results published by a Performance Subcommittee consisting of approximately 50 engineers and scientists representing the automotive industry, oil industry, and others (list of participants enclosed).

The Performance Subcommittee was formed specifically to ensure that the test program would benefit from the expertise of these organizations. Approximately 20 highly technical members of the Performance Subcommittee formed a Technical Review Panel which worked extensively on the implementation and interpretation of the testing program for a period of several months. It is important to emphasize that the test program was not an internal ARB effort, but was the combined product of a much larger group which conducted all of its work in public.

### **1. A test conducted by the media shows that the fuel-mileage loss from cleaner- burning gas is 6 percent or greater, and the emissions benefits are questionable.**

**Response:** This test is inconclusive because it was performed on only one vehicle, and two fuels (two gallons of cleaner-burning gasoline and two gallons of conventional gasoline purchased in Nevada). This single test in no way refutes the results of the extensive testing conducted by the Performance Subcommittee as well as tests conducted by other independent organizations which consistently support the ARB's estimate. Specifically, they show that the average reduction in fuel economy associated with cleaner-burning gasoline when compared to conventional gasoline (non-oxygenated) is about 3 percent and about 1 percent when compared to oxygenated gasoline.

These results are further corroborated by studies which have analyzed the energy content of gasolines. This is important because there is a clear and proven relationship between fuel economy and the energy content of gasoline. Based on our analysis of current and historical gasolines, the average energy content of cleaner-burning gasoline is 3.3 percent (average of winter and summer) lower than conventional non-oxygenated gasoline. Because cleaner-burning gasoline is specifically formulated to burn more efficiently, the fuel economy loss will be somewhat less than the loss in energy density. Therefore, the reduced energy content of cleaner-burning gasoline will produce average reductions in fuel economy of three percent or less.

It is also important to point out that there are a number of factors which can have a more significant impact on fuel economy than the gasoline used. These factors include the rate of speed driven, use of air conditioning, tire pressure, vehicle maintenance, weather conditions, and fueling practices. For example, under filling a ten-gallon tank by one-half gallon will increase the calculated fuel economy by five percent. It is also important to note that fuel economy results can vary significantly among vehicles and that it is necessary to test numerous vehicles under carefully controlled conditions in order to obtain meaningful results.

In addition to the problem of using too few vehicles, the emissions tests performed by the media on two cars are not an accurate indicator of real-world emissions because the tests were performed with common

Smog Check equipment. Based on this test, the media concluded that cleaner-burning gasoline does not reduce emissions.

Smog Check tests are designed to identify vehicles with emission-control problems. A small number of these tests are not precise enough to measure the relatively small differences in emissions from different types of gasoline. For accurate results, numerous vehicles must be tested on dynamometers over the full-driving cycle. The ARB's calculation of the emission benefits of cleaner-burning gasoline were based on extensive testing of scores of vehicles. This testing was overseen by a wide variety of technical experts. Since the time of the adoption of the regulations, several studies have been done that confirm the estimated benefits of the program. Each of these studies was based on extensive dynamometer testing of many vehicles.

**2. The Air Resources Board testing on fuel economy is suspect because the report contained data from only two of the eight test fleets. Data from the other fleets may indicate fuel-economy losses greater than those reported by the Air Resources Board.**

**Response:** The test program evaluated the overall performance of cleaner-burning gasoline under both normal and atypical operating conditions. Fuel economy was one of several characteristics evaluated, and it was known from the beginning that several test fleets would not be suitable for valid fuel-economy calculations because of abnormal operating conditions or lack of reliable pre-test fueling records. There was not a problem because extensive investigations of the fuel economy effects of reformulated gasolines were done prior to the fleet testing and provide sufficient information to calculate the fuel economy impacts of cleaner-burning gasoline. However, the fleet testing provided an opportunity to obtain additional fuel economy data which has served to corroborate the earlier results.

In addition to the Board's test fleets, extensive testing by the Auto/Oil Air Quality Improvement Research Project, the United States Department of Energy and others were consistent with the Performance Subcommittee's finding of a 3 percent difference in fuel economy. All these findings are consistent with the fact that cleaner-burning gasoline has about 3 percent less energy density than conventional gasoline and therefore should result in a decrease of about 3 percent in fuel economy.

Of the 829 test vehicles in the eight fleets, test data on fuel use was sufficient to estimate fuel economy for 118 test vehicles in two fleets (the Sacramento Police Department and Sacramento County fleets) and an additional 13 test vehicles from the Cal State Fresno fleet. These fleets have data that allow a comparison of historic gas mileage for those vehicles with gas mileage from cleaner-burning gasoline. Data from these 131 vehicles formed the basis for the finding of a 2.4 percent difference in fuel economy reported for the On-Road Fleet Testing entry in Table 49 on page 1-69 of the Performance and Compatibility Test Program report. Data from the Fresno vehicles was not included in the "CaRFG's vs. Control" portion of Table 46 on page 1-65 of the report because the Fresno fleet had no "control" vehicles using commercially available gasoline.

The fuel-economy data obtained on 131 test vehicles (driving approximately 900,000 miles on cleaner-burning gasoline), augmented by the other studies cited in the report, is fully adequate to characterize the expected fuel-economy effects of cleaner-burning gasoline.

**The reasons why fuel-mileage data from other fleets was not used are:**

**Pacific Bell (North and South) and GTE fleet** -- Many of the 393 test vehicles in these three fleets performed maintenance and repair work on telephone systems.

Gasoline from the vehicles' fuel tanks was used to power generators used in connection with this work. Therefore, valid data from these fleets could not be generated. However, GTE Fleet Manager, Larry Bligh, has said in writing (see enclosure) that his fleet experienced just over a 1 percent difference in fuel economy between cleaner-burning gasoline and the federal reformulated gasoline that was commercially used at the time in GTE's service area.

**Bank of America** -- Fuel mileage data was not used from this 20-vehicle fleet because test vehicles at times were fueled with commercially available gas. The Performance Subcommittee determined that data from the fleet was not suitable for fuel-mileage calculations but was acceptable for evaluating other performance characteristics of cleaner-burning gasoline.

**Caltrans** -- The 25-vehicle Caltrans fleet consisted mostly of heavy-duty vehicles used primarily for performing highway maintenance work involving conditions (such as extended periods of idling) that would not be encountered by a typical California motorist. While this fleet provided an opportunity for testing the performance of cleaner-burning gasoline in heavy-duty vehicles under these extreme conditions, valid miles-per-gallon figures could not be generated because of the unusual operating conditions.

**Cal State Fresno** -- Except for the 13 vehicles mentioned previously, the 112-vehicle Fresno fleet were used primarily for making extremely short trips on the Fresno campus. As with the Caltrans fleet, this provided an opportunity for testing the fuel's performance under unusual conditions, but valid fuel-economy data could not be produced because of those unusual conditions.

**Sacramento City and County fleets** -- Fuel-economy data was not used for 161 of the 279 vehicles in these two fleets primarily because of a lack of fuel-economy data on those specific vehicles during the pre-test period and lack of accurate data on fueling during the test period.

**3. The California Air Resources Board (may have) used only the test results that agreed with its position.**

**Response:** The Board staff and the Performance Subcommittee absolutely did not withhold any information from any test fleets for the purpose of skewing test results. Decisions to use or not use data collected in any phase of the study were based strictly on scientific considerations and were made as part of the Performance Subcommittee's open, public process.

**4. The ARB's tests compared California gas with federal reformulated gas and found a 3 percent difference in fuel economy. Since there is a 4 percent difference in fuel economy between conventional gas and federal reformulated gas, the actual fuel-mileage is 7 percent.**

**Response:** This is incorrect. The fuel-economy data in the Performance and Compatibility Test Program report was based on a comparison of cleaner-burning gasoline and commercially available 1994 gasoline, which did not meet the specifications for federal reformulated gasoline.

Data from these tests and others show that cleaner-burning gas yields about 1 percent less fuel economy than federal reformulated gas and 3 percent less than conventional gas.

**5. The ARB never actually tested the gasoline that went on sale last month, the test gas was produced in Texas and California refiners were free to come up with their own formulas, all different. Furthermore, the test fuel was 89 octane, not the 87 octane commonly sold as regular, unleaded fuel.**

**Response:** As stated on page 1-4 of the test report, it is true that Phillips 66 Chemical Company manufactured the test fuel at its refinery in Borger, Texas. The refinery's experience in making test fuels was the primary reason it was chosen to make the gasoline for the Performance Subcommittee's test program. However, the fact that the fuel was produced in Texas in no way limits the validity of the testing program.

There are an indefinite number of possible formulations for both conventional and cleaner-burning gasoline. Gasoline formulations have always varied from brand to brand, from season to season, and from region to region. It is impossible to test all of the formulations that will be marketed. The specific formulation for the test fuel was designed by the technical experts on the Performance Subcommittee to typify cleaner-burning gasoline formulations expected to be on the market. This is the established method for designing test fuels. The test fuel specifications also ensured that the test fuel would be produced using the same refining processes as commercially available cleaner-burning gasoline. This process produced a fuel that is typical of the gasoline now being used by California motorists.

The 89-octane test fuel represented an "average" of the various octane levels of gasoline on the market. The test results on fuel economy are not affected, because octane level is not an important factor related to vehicle fuel.

#### **6. Reductions in fuel mileage may reduce the clean-air benefits of the gasoline.**

**Response:** The fuel economy loss associated with cleaner-burning gasoline does not cause an increase in emissions. Tailpipe emissions are determined as a function of distance traveled, not the volume of gasoline used.

Tests performed by the Auto/Oil Air Quality Improvement Research Project, a preeminent industry group composed of the major automakers and oil companies, have shown that the fuel-economy penalty due to the use of reformulated fuels does not increase emissions.