


To: Honorable Board Members
From: Richard W. Corey, Executive Officer 
Date: December 23, 2021
Subject: Outcomes of the Board-Directed Heavy-Duty Warranty Cost Study Working Group

This memo responds to Board direction to further consider CARB's projected warranty costs in its Heavy-Duty Engine and Vehicle Omnibus Regulation and Associated Amendments (Omnibus Regulation), passed by the Board at the public hearing on August 27, 2020. It determines that those estimates were accurate, addresses stakeholder questions the Board directed be investigated, and further demonstrates the cost-effective nature of the Omnibus Regulation. It is further strong evidence for the feasibility and importance of controlling heavy-duty vehicle emissions.

The Omnibus Regulation will dramatically reduce oxides of nitrogen (NOx) emissions by comprehensively overhauling exhaust emission standards, test procedures and other emissions-related requirements for 2024 and subsequent model year California-certified heavy-duty engines. The Omnibus Regulation includes updates to warranty requirements that are intended to ensure that emissions control equipment performs as needed for the life of heavy-duty vehicles. These requirements are critical because these vehicles dominate mobile source air pollution and are likely to expose near-roadway communities to excessive pollution if they are not properly maintained. The Omnibus Regulation will result in NOx reductions of 23 tons per day in 2031 and 3,900 lives saved over the life of the rule. The Omnibus Regulation was found to be cost-effective, with benefits outweighing costs by a factor of 10 (i.e., monetized benefits of \$23.4 billion vs. costs of \$2.39 billion).

As part of the Omnibus Regulation's approval, the Board directed staff to convene a working group to better understand the differences between California Air Resources Board (CARB) staff's estimates of warranty cost and higher estimates provided by industry stakeholders. The attached report entitled, "California Air Resources Board Staff Report on the Warranty Cost Study for 2022 and Subsequent Model Year Heavy-Duty Diesel Engines," documents the results of the 9-month working group process in which staff met with stakeholders over 16 times. The highlights are as follows.

Based on what was learned from the workgroup process and study, CARB staff believes that our methodology provides reasonable and defensible estimates of the average compliance cost that affected parties will face under the Omnibus Regulation. We do not believe that changes to CARB's estimates are needed. The requirements continue to be well-supported. Key findings of the report are:

- **CARB's method for determining the effect of the rulemaking on all owners is appropriate for considering the statewide impact of warranty costs.** Although the

warranty cost estimates for MY 2022 made by CARB and those presented by the Truck and Engine Manufacturers Association (EMA) differ by a factor of nine, the warranty costs “per miles covered” reasonably agree. The average incremental miles covered under warranty in CARB’s estimate is small because CARB’s method accounts for the fact that most vehicle owners already purchase extended warranties voluntarily. They would not be affected by the rulemaking as much as those who have minimum regulatory warranties only. On the other hand, manufacturers’ estimates are biased high because they only consider individual customers who do not already have extended warranty, which is not the majority.

- **CARB staff believes it is simply part of the fundamental engineering cost to design durable components and does not believe that this cost should be attributed to warranty.** Thus, some industry groups’ attribution of these costs to the warranty provision is not supported. The warranty is intended to cover defects in materials and workmanship which cause the failure of a warranted part to be identical in all material respects to that part as described in the vehicle or engine manufacturer’s application for certification. Therefore, warranty is not intended to cover failure of parts that are not designed properly. When the lower NOx standards take effect and longer useful life and warranty requirements are phased-in for MY 2027 and 2031, EMA’s warranty cost methodology projects additional repair costs due to the lower NOx standards, higher unit prices for parts due to longer useful life, and the introduction of premature new technologies with elevated failure rates. CARB staff objected to these assumptions. Although there will be some new technologies introduced to meet MY 2027/2031 requirements, such as cylinder deactivation or light-off selective catalytic reduction, nearly all emission-related components expected for meeting the Omnibus standards will be the same as the technologies used today.
- **CARB staff concluded that even if the higher warranty costs for new technologies were included, it would not have changed the staff proposal.** CARB staff’s additional sensitivity analysis suggested that if the warranty costs for new technology were included, it would increase the estimate of Omnibus Regulation costs by about 11 percent. The hypothetical increase was well within the bounds of the previous CARB Staff Report sensitivity analysis. This additional sensitivity analysis was conducted in response to EMA’s comments during the working group, and evaluated the potential impact of new technologies on the warranty cost.
- **Results from CARB staff’s fleet owner operator survey suggest that higher initial vehicle purchase prices are likely to be passed on to the subsequent vehicle owners by increasing overall vehicle value, which potentially reduces the cost impact that the Omnibus Regulation warranty amendments may have on first owners.** A survey of fleet owner operators and dealers was conducted to better understand the value of remaining warranties to the purchasers of used vehicles. The survey results indicate that the remaining residual warranties do in fact add value to vehicles sold in the secondary

market, averaging approximately \$2,000 for a 2 years/200,000 miles period of residual warranties, and \$4,000 for a 4 years/400,000 miles residual period.¹

Although CARB staff did not concur with EMA's analysis methods, CARB staff agreed that the different viewpoints led to different baseline assumptions that ultimately affected the respective warranty costing methodologies. CARB's method accounted for the optional longer warranties people currently buy in the baseline to assess the impact of the rulemaking on the entire vehicle populations. On the other hand, individual manufacturers considered the first point they encounter their customers, rather than the average vehicle population as their baseline.

A full discussion and comparison of CARB and stakeholder differences is contained in the attached report and will be posted on the Omnibus website. There are no immediate next steps needed beyond this, and staff will continue to monitor the Omnibus Regulation implementation process.

Attachment: Heavy-Duty Warranty Cost Study Final Report.pdf

cc: Liane M. Randolph, Chair
Annette Hébert, Deputy Executive Officer
Craig Segall, Deputy Executive Officer
Dr. Sydney Vergis, Chief, Mobile Source Control Division

¹ The values of individual residual warranties should not be confused with the average incremental cost of the regulation. For example, even if the required warranty period is increased by 200,000 miles, the average incremental cost can be much less than \$2,000 since many owners already buy extended warranties voluntarily.