

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-231-4  
Relating to Exemptions Under Section 27156  
of the Vehicle Code

WHIPPLE INDUSTRIES, INC.  
CALIBRATION PROM

Pursuant to the authority vested in the Air Resources Board (ARB) by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-5;

IT IS ORDERED AND RESOLVED: That the installation of the Calibration PROM manufactured by Whipple Industries, Inc. have been found not to reduce the effectiveness of required motor vehicle pollution control devices and, therefore, are exempt from the prohibitions of Section 27156 of the Vehicle Code for installation on 1991 to 1993 General Motors G20 or G30 heavy-duty trucks powered by a 5.7L or 7.4L V8 gasoline engine and a 4L80E transmission.

This Executive Order is valid provided that installation instructions for the Calibration PROM will not recommend tuning the vehicle to specifications different from those submitted by the device manufacturer.

Changes made to the design or operating conditions of the device, as exempted by the ARB, that adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this device using an identification other than that shown in this Executive Order or marketing of this device for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the ARB.

This Executive Order does not constitute any opinion as to the effect the use of this device may have on any warranty either expressed or implied by the vehicle manufacturer.

This Executive Order is granted based on results from emissions tests conducted in accordance with Cold-Start CVS-75 Federal Test Procedure. However, the ARB finds that reasonable grounds exist to believe that use of the Calibration PROM may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the previously prescribed test procedures. Accordingly, the ARB reserves the right to conduct additional emission tests, in the future, as such tests are developed, that will more adequately measure emissions from all cycle phases. If such test results demonstrate that the Calibration PROM adversely affect emissions during off-cycle conditions (defined as those conditions which are beyond the parameters of the Cold-Start CVS-75 Federal Test Procedure), this Executive Order shall be effectively rescinded as of the date the test results are validated. Further, if such test results or

other evidence provides the ARB with reason to suspect that the Calibration PROM will affect the durability of the emission control system, Whipple Industries, Inc. shall be required to submit durability data to show that the durability of the vehicle emission control system is not, in fact, affected and/or that the add-on or modified part demonstrates adequate durability.

In addition to the foregoing, the ARB reserves the right in the future to review this Executive Order and the exemption provided herein to assure that the exempted add-on or modified part continues to meet the standards and procedures of Title 13, California Code of Regulations, Section 2222, et seq.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF WHIPPLE INDUSTRIES, INC.'S CALIBRATION PROM.

No claim of any kind, such as "Approved by the Air Resources Board" may be made with respect to the action taken herein in any advertising or other oral or written communication.

Section 17500 of the Business and Professions Code makes untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

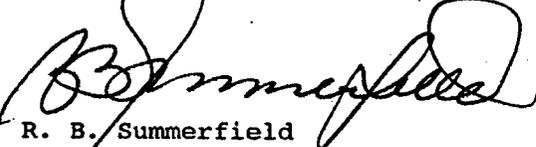
Section 43644 of the Health and Safety Code provides as follows:

"43644, (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor."

Any apparent violation of the conditions of this Executive Order may result in its rescission or submission to the Attorney General of California for such action as he deems advisable.

The Bureau of Automotive Repair will be notified by copy of this order.

Executed at El Monte, California, this 27<sup>th</sup> day of May, 1993.

  
R. B. Summerfield  
Assistant Division Chief  
Mobile Source Division

State of California  
AIR RESOURCES BOARD

EVALUATION OF WHIPPLE INDUSTRIES, INC.'S CALIBRATION PROM  
FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE  
SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF  
THE CALIFORNIA CODE OF REGULATIONS

May 1993

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AIR RESOURCES BOARD

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by

Mobile Source Division  
State of California  
Air Resources Board  
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(This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.)

SUMMARY

Whipple Industries, Inc. has applied for an exemption from the prohibitions of Vehicle Code Section 27156 for their Calibration PROM. The Calibration PROM is a programmable read only memory (PROM) computer chip for installation on 1991 to 1993 General Motors G20 or G30 heavy-duty trucks powered by a 5.7L or 7.4L V8 gasoline engine and a 4L80E transmission. Whipple Industries, Inc. has submitted a completed application and all the required information, as well as exhaust emissions test data performed at Automotive Testing & Development Services.

Based on the submitted information and results of the emissions tests performed at Automotive Testing & Development Services, the staff concludes that the installation of Whipple Industries, Inc.'s Calibration PROM will not adversely affect exhaust emissions on the specified vehicles.

The staff recommends Whipple Industries, Inc. be granted an exemption as requested and that Executive Order D-231-4 be issued.

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EVALUATION OF WHIPPLE INDUSTRIES, INC.'S CALIBRATION PROM FOR  
EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE SECTION 27156 IN ACCORDANCE  
WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA CODE OF REGULATIONS

I. INTRODUCTION

Whipple Industries, Inc. of 3292 N. Weber Ave., Fresno, CA 93722, has applied for an exemption from the prohibitions of Vehicle Code Section 27156 for their Calibration PROM. The Calibration PROM is a programmable read only memory (PROM) computer chip, for installation on 1991 to 1993 General Motors G20 or G30 heavy-duty trucks powered by a 5.7L or 7.4L V8 gasoline engine and a 4L80E transmission. Whipple Industries, Inc. has submitted a completed application and all the required information, as well as exhaust emissions test data performed at Automotive Testing & Development Services on a 1991 7.4L Chevrolet C3500 truck.

II. CONCLUSION

Based on the submitted information and the results from exhaust emissions test performed at Automotive Testing & Development Services, the staff concludes that Whipple Industries, Inc.'s Calibration PROM will not adversely affect exhaust emissions from vehicles for which the exemption is requested.

III. RECOMMENDATION

The staff recommends that Whipple Industries, Inc. be granted an exemption as requested and that Executive Order D-231-4 be issued.

IV. CALIBRATION PROM DESCRIPTION

Many computer controlled vehicles are equipped with an electronic control unit (ECU) which is programmed using a PROM. Signals detected by the vehicle's sensors are fed directly into the ECU where they are analyzed and compared to the operational data programmed inside the PROM. The PROM

sends out signals for appropriate adjustments to be made in the engine's operation in response to any changing conditions. For example, a PROM will make adjustments to the spark and fuel delivery of the engine to maintain optimum performance and economy. Thus, by modifying data in the PROM, spark timing and fuel delivery can be adjusted.

Whipple Industries, Inc.'s Calibration PROM modify the spark tables and fuel curves of the original equipment manufacturer's (OEM) PROM under full throttle operation. Therefore, the PROM monitors and modifies the vehicle operation under open-loop modes. Whipple Industries, Inc. claims these modifications translate to an increase in torque and horsepower. No modifications contained in the Calibration PROM affect throttle response and driveability, under closed-loop conditions (normal day-to-day driving). The manufacturer claims that the modifications offer enhanced performance and acceleration during high speed/torque operation. This is obtained by altering the OEM fuel and timing tables in the PROM which affect open-loop parameters.

#### V. EVALUATION OF THE CALIBRATION PROM

A 1991 Chevrolet C3500 truck powered by a 7.4L engine was used for the evaluation of the Calibration Prom. The dynamometer inertia weight and loading used during the testing were 8000 lbs. and 16.3 hp, respectively.

Emissions testing conducted by Automotive Testing & Development Services consisted of one cold-start CVS-75 Federal Test Procedure with the vehicle in the baseline configuration followed by one cold-start CVS-75 Federal Test Procedure with the vehicle in the modified configuration (Calibration PROM installed). Modified emission levels were compared against the vehicle's baseline emission levels.

The results of the exhaust emissions tests performed at the Automotive Testing & Development Services are shown in Table 1.

Table 1

CVS-75 TEST RESULTS

(Automotive Testing & Development Services)

	<u>HC</u>	<u>CO</u>	<u>NOx</u>
Baseline	0.58	11.93	2.86
Device	0.60	13.13	2.63
Difference	0.02	1.20	-0.23

The CVS-75 emissions test results at the Automotive Testing & Development Services demonstrated that the HC, CO and NOx emission levels are within the comparative emission allowances of 0.1 grams per mile or 10 percent of baseline on HC and NOx, and 1.0 grams per mile or 15 percent of baseline on CO. Staff did not perform confirmatory testing to validate test data submitted by Whipple Industries.

Whipple Industries has submitted all the required information and fulfilled the requirements for an exemption. The test results confirm that the Whipple Industries' Calibration PROMs meet the requirements for the exemption.