State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-378
Relating to Exemptions Under Section 27156
of the Vehicle Code

DELPHI AUTOMOTIVE SYSTEMS
"NEW AFTERMARKET CATALYTIC CONVERTERS"

WHEREAS, Vehicle Code Sections 27156 and 38391, and Title 13, California Code of Regulations (hereafter "CCR") Section 2222(h), authorize the California Air Resources Board (ARB) and its Executive Officer to exempt new aftermarket catalytic converters from the prohibitions of Vehicle Code Section 27156.

WHEREAS, Delphi Automotive Systems of 1300 N. Dort Highway, Flint, Michigan 48556, has applied to the ARB for exemption from the prohibitions in Vehicle Code Sections 27156 and 38391 for their new aftermarket three-way plus oxidation catalytic converter (TWC + OC) and oxidation catalytic converter (OC) for the following application:

Converter Type	Use	Series No.	Max. Eng. Size	Max. Test Wt.
TWC + OC	TWC + OC	5800	5.0L (307 CID)	4,000 lbs.
OC	OC	6110	6.6L (400 CID)	4,500 lbs.

The catalysts can be used to replace non-functioning original equipment manufacturer (OEM) catalysts on vehicles that are no longer under vehicle manufacturer's emission control systems warranty.

WHEREAS, pursuant to the authority vested in the Executive Officer by Health and Safety Code Section 39515 and in the Chief, Mobile Source Division by Health and Safety Code Section 39516 and Executive Order G-45-5, the ARB finds that the above aftermarket catalytic converters comply with the California Vehicle Code Section 27156 and Title 13, California Code of Regulations, Section 2222(h). Emission performance of the catalytic converters was based on durability mileage accumulation of 25,000 miles using the AMA durability driving schedule (Reference Appendix IV, Title 40, part 86, Code of Federal Regulations (June 28, 1977)).

IT IS HEREBY RESOLVED that the above catalytic converters are exempt from the prohibitions in Vehicle Code Section 27156 for installation on the approved application vehicles subject to the following conditions:

1. No changes are permitted to the converters as described in the application for exemption. Any changes to the converters or any of their components, and other factors addressed in this order must be evaluated and approved by the ARB prior to marketing in California.

2. Marketing of the converters using identifications other than those shown in the exemption application, and in this Executive Order, or marketing of the converters for application other than the ones listed in the application catalog shall be prohibited unless prior approval is obtained from the ARB. Exemption of these products shall not be construed as an exemption to sell, offer for sale, or advertise any components of the converters as individual devices.

3. Any oral or written references to this Executive Order or its content by Delphi Automotive Systems, its principals, agents, employees, distributors, dealers, or other representatives must include the disclaimer that the Executive Order or the exemption it provides is not an endorsement or approval of any emissions reduction claims for the catalytic converters and is only a finding that the converters are exempt from the prohibitions of Vehicle Code Section 27156.

4. Upon installation, the catalytic converters must carry a manufacturer's warranty for 25,000 miles on the substrates and 50,000 miles or five years on the shell.

5. Delphi must submit production audit test data for the two catalysts to the ARB for review for the first production audit report following the exemption of their catalytic converters, in accordance with Paragraph IX of California Evaluation Procedures for New Aftermarket Non-Original Equipment Catalytic Converters. Thereafter, the ARB may accept Delphi's quality control procedures as alternative to production audit testing.

Violation of any of the above conditions shall be grounds for revocation of this order. The order may be revoked only after ten day written notice of intention to revoke it, during which period the holder of the order may request in writing a hearing to contest the proposed revocation. If a hearing is requested, it shall be held within ten days of receipt of the request, and the order may not be revoked until a determination is made, after the hearing, that grounds for revocation exist.

Executed at El Monte, California, this 20th day of April 1995.

R.B. Summerfield
Assistant Division Chief
Mobile Source Division

State of California
AIR RESOURCES BOARD

EVALUATION OF DELPHI AUTOMOTIVE SYSTEMS NEW AFTERMARKET THREE-WAY PLUS OXIDATION CATALYTIC CONVERTER FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTIONS 27156 AND 38391, AND TITLE 13, CALIFORNIA CODE OF REGULATIONS, SECTION 2222(h)

April, 1995

EVALUATION OF DELPHI AUTOMOTIVE SYSTEMS NEW AFTERMARKET THREE-WAY PLUS OXIDATION CATALYTIC CONVERTER FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTIONS 27156 AND 38391, AND TITLE 13, CALIFORNIA CODE OF REGULATIONS, SECTION 2222(h)

by

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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 mention of trade names or commercial products constitute endorsement or recommendation for use.)

SUMMARY

Delphi Automotive Systems (Delphi) of 1300 N. Dort Highway, Flint, Michigan 48556, has applied for an exemption from the prohibitions in Vehicle Code Sections 27156 and 38391, for their new aftermarket Three-way plus Oxidation Catalytic Converter (TWC + OC) and Oxidation Catalytic Converter (OC), in accordance with California regulations for new aftermarket catalytic converters. The catalysts are for installation on TWC + OC vehicles with maximum engine displacement/equivalent test weight of 5.0L/4,000 lbs., and OC vehicles with maximum engine displacement/equivalent test weight of 6.6L/4,500 lbs. respectively.

Emissions data submitted show that the catalytic converters meet the requirements of Vehicle Code Sections 27156 and 38391, and Title 13, California Code of Regulations, Section 2222(h) for the stated application. Based on the above, the staff recommends that the exemption be granted as requested and that Executive Order D-378 be issued.

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I. INTRODUCTION

Delphi Automotive Systems (Delphi) of 1300 N. Dort Highway, Flint, Michigan 48556, has applied for an exemption from the prohibitions in Vehicle Code Sections 27156 and 38391 for their new aftermarket three-way plus oxidation catalytic converter (TWC + OC) and oxidation catalytic converter (OC), in accordance with California regulations on new aftermarket catalytic converters. The new aftermarket catalysts were tested for the following applications:

Converter Type	Use	Max. Eng. Size/Test Weight
TWC + OC	TWC + OC	5.0L/4,000 lbs.
OC	OC	6.6L/4,500 lbs.

II. CONCLUSION

The applicant has submitted all the required information and based on the submitted exhaust emissions test data from Automotive Testing and Development Services, Inc. (ATDS), Ontario, California, and General Motor Test Laboratory, Panorama City, California, the staff concludes that the catalytic converters meet the criteria set forth in Vehicle Code Section 27156 and Title 13, California Code of Regulations, Section 2222(h) for the stated application.

III. RECOMMENDATION

The staff recommends that the exemption be granted as requested and that Executive Order No. D-378 be issued, permitting the advertisement, sale and installation of the new aftermarket catalytic converters.

IV. DEVICE DESCRIPTION

Ceramic monolithic substrates which are coated with platinum and palladium are used in the manufacture of Delphi's new aftermarket three-way plus oxidation catalyst and oxidation catalyst. The substrates are wrapped with expanding paper or intumescent mat and enclosed in a clam shaped stainless steel shell using seam welding. Heat shields are welded on top and bottom of the converter shell to protect the vehicle underbody from excessive heat and accidental fire. The catalytic converters are sold with installation instructions, and may be sold with flanges, end pipes, and air-tubes as a kit in the application catalog. They are also sold with a warranty for 25,000 miles on the substrates and five years or 50,000 miles on the container or shell.

V. DEVICE EVALUATION

Delphi has submitted the test data on the catalytic converters from testing conducted at Automotive Testing and Development Services, Inc. (ATDS) in Ontario, California, and General Motor Test Laboratory (GMTL), Panorama City, California. Mileage accumulation for the two catalysts was conducted by ATDS. Emission tests were conducted with each of two test converters installed, followed by two CVS-75 tests with exhaust backpressure simulator. A 1977 6.6L Pontiac Grand Prix and a 1977 6.6L Oldsmobile Delta 88 were used as the mileage accumulation vehicles for the oxidation vehicle. A 1984 5.0L Buick LeSabre and a 1981 5.0L Oldsmobile Delta 88 were used as mileage accumulation vehicles for the three-way plus oxidation converter. Emissions tests were conducted using the 1984 5.0L Buick LeSabre for the TWC + OC and the 1977 6.6L Pontiac Grand Prix for the OC. The equivalent test weight (ETW) for the TWC + OC and OC were 4,000 lbs. and 4,500 lbs. respectively. Upon completion of testing at ATDS, the ARB conducted

confirmatory tests at the Haagen-Smit Laboratory, El Monte, California. The TWC + OC failed the NOx conversion efficiency, achieving 40.6 percent instead of the required minimum efficiency of 50 percent. The OC achieved only 67.9 percent of HC conversion efficiency instead of the required 70 percent. Upon request, Delphi was allowed to retest the converters in a different laboratory than ATDS. The second independent laboratory tests were conducted at General Motor Corporation's Laboratory in Panorama City, California. The test results from the GM Laboratory were averaged with the test results from ATDS to determine the performance of the converters. The test results and conversion efficiencies for the converter are shown below:

ATDS, ONTARIO

TWC + OC	Simulator	Cat. #5440	Cat. #5441	Avg. Conv. Eff.
HC (g/mi)	2.679	0.711	0.748	72.8%
CO (g/mi)	29.882	8.182	8.760	71.6%
NOx (g/mi)	2.977	1.132	1.244	60.1%

OC	Simulator	Cat.#5G-0102	Cat.#5G-0103	Avg. Conv. Eff.
HC (g/mi)	4.079	1.205	1.018	72.7%
CO (g/mi)	18.435	1.049	0.790	95.0%

HAAGEN-SMIT LABORATORY, EL MONTE

TWC + OC	Simulator	Cat.#5440	Cat.#5441	Avg. Conv. Eff.
HC (g/mi)	2.428	0.662	0.502	76.0%
CO (g/mi)	33.606	5.427	5.460	83.9%
NOx (g/mi)	2.041	1.230	1.194	40.6%

OC	Simulator	Cat.#5G-0102	Cat.#5G-0103	Avg. Conv. Eff.
HC (g/mi)	4.485	1.388	1.500	67.9%
CO (g/mi)	17.194	1.377	2.163	89.7%

GM TEST LABORATORY, PANORAMA CITY

TWC + OC	Simulator	Cat.#5440	Cat.#5441	Avg. Conv. Eff.
HC (g/mi)	2.993	0.550	0.659	79.8%
CO (g/mi)	28.208	2.361	3.374	89.8%
NOx (g/mi)	1.933	0.704	0.749	62.4%

OC	Simulator	Cat.#5G-0102	Cat.#5G-0103	Avg. Conv. Eff.
(g/mi)	5.020	1.486	1.479	70.4%
(g/mi)	13.312	0.617	0.686	95.1%

Combined conversion efficiencies from ATDS and GMTL test results are HC=76.3%, CO=80.7%, and NOx=61.1%, for the TWC + OC, and HC=71.6%, and

CO=95% for the OC. All of the conversion efficiencies meet the requirements of the California regulations. The staff based the evaluation of the aftermarket catalytic converters on the information submitted by Delphi and on test results from ATDS and GMTL. However, since the catalysts failed the ARB confirmatory testing, Delphi must conduct production audit testing as part of their first semi-annual production report, in accordance with Paragraph IX of California Evaluation Procedures for New Aftermarket Non-Original Equipment Catalytic Converters. Thereafter, the ARB may accept their quality control procedures.