

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-510
Relating to Exemptions Under Section 27156
of the Vehicle Code

EASTERN MANUFACTURING, INC.
"THREE-WAY CATALYTIC CONVERTER SERIES 4100"

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 converter from the prohibitions of Vehicle Code Section 27156.

WHEREAS, Eastern Manufacturing, Inc. (Eastern) of 1604 Hanford Street, Levittown, Pennsylvania, has applied to the ARB for exemption from the prohibitions in Vehicle Code Sections 27156 and 38391 to market their aftermarket series 4100 three-way catalytic converter (TWC) for the following application, except for vehicles equipped with an OBD II system:

<u>Type</u>	<u>Use</u>	<u>Series No.</u>	<u>Max. Eng. Size</u>	<u>Max. Veh. Test Wt.</u>
TWC	TWC	4100	5.0L (302 CID)	4500 lbs.

WHEREAS, pursuant to the authority vested in the Executive Officer by Health and Safety Code Section 39515 and in the Chief, Mobile Source Operations Division by Health and Safety Code Section 39516 and Executive Order G-45-9, the ARB finds that the above aftermarket catalytic converter complies with the California Vehicle Code Section 27156 and Title 13, California Code of Regulations, Section 2222(h). Emission performance of the catalytic converter was based on durability bench-aging of the catalyst using Johnson Matthey's bench-aging cycle EDC-53 for 25 hours, accepted by the ARB for this application to be equivalent to 25,000 miles road aging on AMA driving cycle (Reference Appendix IV, Title 40, part 86, Code of Federal Regulations (June 28, 1977)).

Whereas, emissions tests conducted at Automotive Testing and Development Services (ATDS), Ontario, California, showed the following conversion efficiencies which meet the minimum requirements for new aftermarket catalytic converters:

<u>Pollution Component</u>	<u>Catalyst Application Type</u>	<u>TWC</u> (% Conversion)
HC: Min. Requirement		70
Eastern's series 4100		84.0
CO: Min. Requirement		70
Eastern's series 4100		80.8
NOx: Min. Requirement		60
Eastern's series 4100		78.9

IT IS HEREBY RESOLVED that the above catalytic converter is 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 catalytic converter as described in the application for exemption. Any changes to the catalytic converter or any of its 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 catalytic converter using any identification other than those shown in the exemption application and in this Executive Order, or marketing of the catalytic converter for an application other than shown in this Executive Order shall be prohibited unless prior approval is obtained from the ARB. Exemption of this product shall not be construed as an exemption to sell, offer for sale, or advertise any components of the catalytic converter as individual devices.
3. Any oral or written references to this Executive Order or its content by Eastern Manufacturing, Inc., 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 emission reduction claims for the catalytic converter and is only a finding that the catalytic converter is exempt from the prohibitions of Vehicle Code Section 27156.
4. Eastern Manufacturing, Inc. installation instructions for the new catalytic converter must conform to requirements in Paragraphs I and IX of California Evaluation Procedures for New Aftermarket Non-Original Equipment Catalytic Converters.

EASTERN MANUFACTURING, INC.
"SERIES 4100 TWC"

EXECUTIVE ORDER D-510
(Page 3 of 3)

5. Upon installation, the catalytic converter must carry a manufacturer's warranty for 25,000 miles on the substrate and 50,000 miles or five years on the shell and end pipes.

Violation of any of the above conditions shall be grounds for revocation of this order. The order may be revoked only after a 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 21ST day of November 2000.

 FOR
R. B. Summerfield, Chief
Mobile Source Operations Division

State of California
AIR RESOURCES BOARD

EVALUATION OF EASTERN MANUFACTURING, INC.'S SERIES 4100 NEW
AFTERMARKET THREE-WAY CATALYTIC CONVERTER FOR EXEMPTION
FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156, AND
TITLE 13, CALIFORNIA CODE OF REGULATIONS SECTION 2222(h)

November 2000

by

Mobile Source Division

9528 Telstar Avenue
El Monte, CA 91731-2990

(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

Eastern Manufacturing, Inc. (Eastern) of 1604 Hanford Street, Levittown, Pennsylvania 19057, has applied for an exemption of its series 4100 new aftermarket three-way catalytic converter (TWC) from the prohibitions in Vehicle Code Section 27156, in accordance with California regulations for new aftermarket catalytic converters. The two test catalysts were aged using Johnson Matthey's rapid aging cycle EDC-53. The oval shaped substrates are ceramic monolith types. The front and rear substrates are coated with platinum and rhodium in a 1:1 ratio. The precious metal loading on the catalyst is 12 grams per cubic foot. The emission tests were conducted on a 1994 Dodge Ram 1500, 5.9L at the equivalent test weight of 5750 pounds (lbs.). The new catalytic converter is for installation on vehicles equipped with three-way catalytic converter (TWC). Based on the aging parameters, the catalyst maximum application limits are 5.0L and 4500 lbs. The corresponding maximum gross vehicle weight rating (GVWR) is 5039 lbs.

Emissions data submitted by the applicant show that the catalytic converter meets the requirements of Vehicle Code Section 27156 and Title 13, California Code of Regulations, Section 2222(h) for the stated applications. Based on the above, the staff recommends that the exemption be granted as requested and that Executive Order D-510 be issued.

CONTENTS

Page Number

<u>SUMMARY</u>	i
<u>CONTENTS</u>	ii
I. <u>INTRODUCTION</u>	1
II. <u>CONCLUSION</u>	1
III. <u>RECOMMENDATION</u>	2
IV. <u>DEVICE DESCRIPTION</u>	2
V. <u>DEVICE EVALUATION</u>	2

EVALUATION OF EASTERN MANUFACTURING, INC.'S SERIES 4100 NEW
AFTERMARKET THREE-WAY CATALYTIC CONVERTER FOR EXEMPTION
FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156, AND
TITLE 13, CALIFORNIA CODE OF REGULATIONS SECTION 2222(h)

I. INTRODUCTION

Eastern Manufacturing, Inc. (Eastern) of 1604 Hanford Street, Levittown, Pennsylvania 19057, has applied for an exemption from the prohibitions in Vehicle Code Section 27156 for its series 4100 new aftermarket three-way catalytic converter (TWC) in accordance with California regulations for new aftermarket catalytic converters. The new aftermarket catalytic converter is intended for the following vehicle application:

<u>Converter Type</u>	<u>Converter Use</u>	<u>PN/Series</u>	<u>Max. Eng.Size</u>	<u>Max.Veh.Test Wt.</u>
TWC	TWC	4100	5.0L	4500 lbs.

The maximum Gross Vehicle Weight (GVW) for the catalytic converter application is 5,039 lbs.

Eastern intends to market the new TWC as a replacement for catalytic converters on applicable vehicles whose manufacturer's warranty has expired and the need for replacement of the original equipment manufacturer (OEM) catalytic converter has been established and documented. The catalytic converter is not for installation on vehicles equipped with On-Board Diagnostic II (OBD-II) system.

II. CONCLUSION

The applicant has submitted all the required information, and based on the exhaust emissions test data, the staff concludes that the new aftermarket catalytic converter meets 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

Staff recommends that the exemption be granted as requested and that Executive Order No. D-510 be issued, permitting the advertisement, sale, and installation of the new aftermarket catalytic converter on applicable vehicles.

IV. DEVICE DESCRIPTION

Eastern's new aftermarket TWC is designed to use two oval shaped ceramic monolith substrates. The substrates are coated with platinum and rhodium in a 1:1 ratio. The precious metal loading of the catalyst is 12 grams per cubic foot. The dimensions for each substrate are 3.15 inches for the minor axis, 4.75 inches for the major axis, and 2.1 inches long. The total volume of the two substrates is 53.54 cubic inches. The substrates are contained in an outer 409 stainless steel shell with compressed interam or expanding mat, to prevent vibration and exhaust by-pass. The clamshell halves are sealed by seam weld, and the end pipes are attached to the shell by arc welding. An aluminized heat shield is spot-welded to the upper side of the converter to protect the vehicle from excessive heat. The catalytic converter may be sold as a unit with installation instructions or may be used in customized direct fit exhaust applications. It is sold with a warranty for 25,000 miles on the substrates, and five years or 50,000 miles on the container or shell, and the end pipes.

V. DEVICE EVALUATION

Eastern submitted data from testing conducted by Automotive Testing and Development Services (ATDS) laboratory, Ontario, California. Catalyst bench-aging was conducted by Johnson Matthey using its EDC-53 rapid-aging cycle for a duration of 25 hours. The aging cycle was accepted by the ARB to be equivalent to 25,000 miles of road aging using the AMA driving cycle. Emissions tests were conducted on a 1994 Dodge Ram 1500 . The test vehicle parameters were 5.9L and the equivalent test weight of 5750 lbs. However, since the catalyst

loading and aging parameters were based on 5.0L and 4,500 lbs. equivalent test weight, the catalyst application cannot exceed these limits. Eastern requested to be allowed to use the 1994 Dodge Ram 1500 because it was available at the test laboratory, and more cost effective than to procure a vehicle with the exact test parameters.

The evaluation of Eastern's new aftermarket catalytic converter is solely based on the bench-aging conducted by Johnson Matthey and the emission tests conducted at ATDS. The limits of application of the new series 4100 TWC are 5.0L/4,500 lbs. and the corresponding maximum gross vehicle weight (GVW) is 5,039 lbs. The two test catalysts were labeled AFM.030.01 and AFM.030.02, respectively. Testing consisted of two cold-start CVS-75 tests with a simulator ("dummy" catalyst), followed by two cold-start CVS-75 tests for each of the test catalysts. The average of the two test results for each test catalyst was used to calculate the conversion efficiency. The overall conversion efficiency for the catalyst model is the average conversion efficiency of the two test catalysts. The test results for the catalyst are shown below:

Automotive Testing and Development Services, Ontario, California

TWC

	<u>Simulator</u> <u>Average</u>	<u>Catalyst AFM.030.02</u> <u>Average</u>	<u>Catalyst AFM.030.02</u> <u>Average</u>	<u>Conv. Eff.</u> <u>Average</u>
HC (g/mi)	2.167	0.355	0.339	84.0%
CO (g/mi)	22.041	4.249	4.211	80.8%
NOx (g/mi)	3.822	0.827	0.784	78.9%

The above conversion efficiencies meet the minimum requirements of the California regulations for new aftermarket catalytic converters. The ARB did not conduct confirmatory testing on the catalyst.