State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-499
Relating to Exemptions Under Section 27156
of the Vehicle Code

EX-AIR COMPANY INTERNATIONAL
"THREE-WAY PLUS OXIDATION CATALYTIC CONVERTER SERIES 4000"

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, Ex-Air Company International of 1007 South Elmora Avenue, Elizabeth, New Jersey 07202, has applied to the ARB for exemption from the prohibitions in Vehicle Code Sections 27156 and 38391 to market their aftermarket series 4000 three-way plus oxidation catalytic converter (TWC + OC) for the following applications, except for vehicles equipped with an on-board diagnostic II (OBD-II) system (Title 13, CCR, Section1968.1):

Type	Use	Series No.	Max. Eng. Size	Max. Test Veh. Wt.
TWC + OC	TWC + OC	4000	5.9L (360 CID)	6,500 lbs.
TWC + OC	TWC	4000	5.9L (360 CID)	6,500 lbs.
TWC + OC	OC	4000	5.9L (360 CID)	6,500 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 mileage accumulation on the catalyst for 25,000 miles using two 1978 Dodge Ram Vans powered by a 5.9L gasoline engine and AMA driving cycle (Reference Appendix IV, Title 40, part 86, Code of Federal Regulations (June 28, 1977)).

WHEREAS, emissions tests conducted at California Environmental Engineering (CEE), Santa Ana, California, showed the following conversion efficiencies which meet the minimum requirements for new aftermarket catalytic converters:

Catalyst Application Type

Pollution Component	TWC + OC	TWC	OC
HC: Min. Requirement	70%	70%	70
Ex-Air's series 4000	87.8	81.6	72.3
CO: Min. Requirement	70	70	70
Ex-Air's series 4000	86.5	75.7	73.2
NOx: Min. Requirement	50	60	
Ex-Air's series 4000	63.0	68.1	

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 identifications other than those shown in the exemption application, and in this Executive Order, or marketing of the catalytic converter for application other than the ones 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 Ex-Air Company International, 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. Ex-Air Company International 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.

5. Upon installation, the catalytic converter must carry a manufacturer's warranty for 25,000 miles on the substrates 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 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 4th day of May 2000.

R.B. Summerfield, Chief
Mobile Source Operations Division

State of California
AIR RESOURCES BOARD

EVALUATION OF EX-AIR CO. INTERNATIONAL'S SERIES 4000 NEW AFTERMARKET THREE-WAY PLUS OXIDATION CATALYTIC CONVERTER FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156, AND TITLE 13, CALIFORNIA CODE OF REGULATIONS SECTION 2222(h)

May 2000

by

Mobile Source Division

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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

Ex-Air Company International (Ex-Air) of 1007 South Elmora Ave, Elizabeth, New Jersey 07202, has applied for an exemption of their series 4000 new aftermarket three-way plus oxidation catalytic converter (TWC + OC) from the prohibitions in Vehicle Code Sections 27156, in accordance with California regulations on new aftermarket catalytic converters. The two test catalysts were aged using two 1978 Dodge Ram Vans powered by a 5.9L gasoline engine. The vans were ballasted to 6,500 pounds (lbs.) equivalent test weight for the mileage accumulation. The mileage accumulation was conducted using the Automobile Manufacturers Association (AMA) driving cycle. The oval substrates are of ceramic monolith type. The front and rear substrates both contain palladium, iridium, and rhodium in 23:6:1 ratio. The emission tests were conducted on a 1991 Dodge Ram Van 5.9L for the TWC + OC application, a 1989 Dodge Ram Van 5.9L for TWC application, and a 1978 Dodge Ram Van 5.9L for OC application. The new catalytic converter may be installed on TWC + OC, TWC, and OC vehicles powered by an engine having a maximum displacement of 5.9L, and a maximum equivalent test weight of 6,500 lbs. The corresponding maximum gross vehicle weight (GVW) is 8,380 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 application. Based on the above, the staff recommends that the exemption be granted as requested and that Executive Order D-499 be issued.

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EVALUATION OF EX-AIR CO. INTERNATIONAL'S SERIES 4000 NEW AFTERMARKET THREE-WAY PLUS OXIDATION CATALYTIC CONVERTER FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156, AND TITLE 13, CALIFORNIA CODE OF REGULATIONS SECTION 2222(h)

I. INTRODUCTION

Ex-Air Company International (Ex-Air) of 1007 South Elmora Avenue, Elizabeth, New Jersey 07202, has applied for an exemption from the prohibitions in Vehicle Code Section 27156 for their new series 4000 aftermarket three-way plus oxidation catalytic converter (TWC + OC) in accordance with California regulations on new aftermarket catalytic converters. Ex-Air will provide the washcoat for the catalyst substrates as well as can the catalytic converter. The new aftermarket catalytic converter is intended for the following vehicle applications:

Converter Type	Converter Use	PN/Series	Max. Eng.Size	Max.Veh.Test Wt.
TWC + OC	TWC + OC	4000	5.9L	6,500 lbs.
TWC + OC	TWC	4000	5.9L	6,500 lbs.
TWC + OC	OC	4000	5.9L	6,500 lbs.

The GVW calculated from the ballasted mileage accumulation vehicle is 8,380 lbs., which represents the maximum GVW for the catalyst application. Ex-Air intends to market the new TWC + OC as a replacement for catalytic converters on applicable vehicles whose manufacturers' warranty has expired and the need for replacement of the original equipment manufacturer (OEM) catalytic converter has been established and documented, except those vehicles equipped with On-Board Diagnostic II (OBD-II) system.

II. CONCLUSION

The applicant has submitted all the required information, and based on the applicant's submitted exhaust emissions test data, the staff concludes that the new aftermarket catalyst 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-499 be issued, permitting the advertisement, sale, and installation of the new aftermarket catalyst on applicable vehicles.

IV. DEVICE DESCRIPTION

Ex-Air's new aftermarket TWC + OC is designed to use two oval ceramic monolith substrates. The front and rear substrates are both coated with palladium, rhodium, and iridium. The dimensions of the front and rear substrates are 4.75 inches for the major axis, 3.15 inches for the minor axis, and 2.0 inches in length. The combined volume of the front and rear substrates is 54.3 cubic inches. The substrates are contained in outer 409 stainless steel shell with Unifrax Corporation XPE Expanding Mat, to prevent vibration and exhaust by-pass. The shell is sealed by seam weld. Aluminized heat shield is spot-welded to the upper side of the converter to protect the vehicle underbody from excessive heat. The catalyst 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. The new TWC + OC will be manufactured in Hungary, where Ex-Air factory and head office are located, and then shipped to distributors in California.

V. DEVICE EVALUATION

Ex-Air submitted data from testing conducted by California Environmental Engineering (CEE) laboratory, Santa Ana, California. Mileage accumulation was conducted by CEE using two 1978 Dodge Ram Vans powered by a 5.9L gasoline engine. The two mileage

accumulation vehicles were ballasted in order to achieve the required equivalent test weight of 6,500 pounds. Emissions tests were conducted on a 1991 Dodge Ram Van 5.9L for the TWC + OC application, a 1989 Dodge Ram Van 5.9L for the TWC application, and a 1978 Dodge Ram Van 5.9L for the OC application. The emission test vehicles were ballasted in order to obtain the equivalent test weight of 6,500 pounds.

Since the ARB has no record of Ex-Air's previous experience as a catalyst supplier for new vehicle certification, Ex-Air provided documentation to demonstrate that the company has the expertise in catalyst washcoat technology. The ARB has not verified the information submitted by the company. Test data and other documents submitted by Ex-Air from various organizations and test facilities from overseas, as testimony to the performance of its catalyst, cannot be verified by the ARB. Therefore, the evaluation of their new aftermarket catalytic converter is solely based on the mileage accumulation and emission tests conducted at CEE. The limits of application of Ex-Air's series 4000 TWC + OC will be 5.9L/6,500 pounds, with the corresponding maximum gross vehicle weight of 8,380 pounds. The test catalysts were labeled 01 and 02. Testing consisted of two cold-start CVS-75 with a simulator ("dummy" catalyst), followed by two cold-start CVS-75 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:

California Environmental Engineering, Santa Ana, California

	Simulator Average	Catalyst 01 Average	Catalyst 02 Average	Conv. Eff. Average
			TWC + OC	
HC (g/mi)	2.340	0.290	0.281	87.8%
CO (g/mi)	32.418	4.373	4.331	86.5%
NOx (g/mi)	3.589	1.408	1.250	63.0%
			TWC	
HC (g/mi)	2.485	0.641	0.373	81.6%
CO (g/mi)	41.768	11.277	8.957	75.7%
NOx (g/mi)	3.759	1.254	1.144	68.1%
			OC	
HC (g/mi)	1.469	0.416	0.397	72.3%
CO (g/mi)	42.091	11.682	10.821	73.2%

The above test results meet the minimum requirements of the California regulations on new aftermarket catalytic converters. Due to time constraints, the ARB did not conduct confirmatory testing on the catalyst.