

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-226
Relating to Exemptions Under Section 27156
of the Vehicle Code

EXHAUST TECHNOLOGIES, INC.
TURBOLATOR

Pursuant to the authority vested in the Air Resources Board 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 Turbolator device manufactured by Exhaust Technologies, Inc. of P. O. Box 2822, Spokane, WA 99220, has been found not to reduce the effectiveness of the applicable vehicle pollution control system and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for 1991 and older model-year vehicles.

This Executive Order is valid provided that installation instructions for this turbolator device will not recommend tuning the vehicle to specifications different from those submitted by Exhaust Technologies, Inc.

Changes made to the design or operating conditions of the device, as exempt by the Air Resources Board, which adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this device using any 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 Air Resources Board. Exemption of the device shall not be construed as exemption to sell, offer for sale, or advertise any component of the Turbolator device as an individual device.

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 DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF EXHAUST TECHNOLOGIES, INC.'S TURBOLATOR DEVICE.

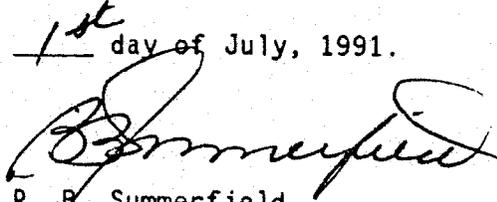
EXHAST TECHNOLOGIES, INC.
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(Page 2 of 2)

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.

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 the order, in 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 after hearing that grounds for revocation exist.

Executed at El Monte, California, this 1st day of July, 1991.



R. B. Summerfield
Assistant Division Chief
Mobile Source Division

State of California
AIR RESOURCES BOARD

EVALUATION OF THE EXHAUST TECHNOLOGIES, INC.'S TURBOLATOR DEVICE
FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE
CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE
CALIFORNIA CODE OF REGULATIONS

June 1991

State of California
AIR RESOURCES BOARD

EVALUATION OF THE EXHAUST TECHNOLOGIES, INC.'S TURBOLATOR DEVICE
FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE
CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE
CALIFORNIA CODE OF REGULATIONS

by

Mobile Source Division
State of California
Air Resources Board
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

Exhaust Technologies, Inc., of P. O. Box 2822, Spokane, Washington 99220 has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the Turbolator. The Turbolator is designed for installation on 1991 and older model-year vehicles.

Based on the results from comparative exhaust emission tests performed at two independent laboratories on a 1991 Chevrolet Camaro and a 1982 Nissan Stanza, the staff concludes that Exhaust Technologies, Inc.'s Turbolator will not adversely affect exhaust emission from vehicles for which an exemption is requested.

The staff recommends that Exhaust Technologies, Inc. be granted an exemption as requested and that Executive Order D-226 be issued.

TABLE OF CONTENTS

	Page Number
SUMMARY	i
CONTENTS	ii
I. INTRODUCTION	1
II. CONCLUSION	1
III. RECOMMENDATION	1
IV. DEVICE DESCRIPTION	2
V. TURBOLATOR EVALUATION AND DISCUSSION	2
APPENDIX	
APPENDIX A: INSTALLATION INSTRUCTIONS	A-1
APPENDIX B: BACK PRESSURE TEST RESULTS	A-2

EVALUATION OF EXHAUST TECHNOLOGIES, INC.'S TURBOLATOR
FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE
CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE
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I. INTRODUCTION

Exhaust Technologies, Inc. of P.O. Box 2822, Spokane, Washington 99220 has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code for the Turbolator. The Turbolator is designed for installation on 1991 and older model-year vehicles.

Exhaust Technologies, Inc. has submitted data from comparative emission tests conducted on a 1991 Chevrolet Camaro at Northern California Emissions Laboratory, Berkeley, California and a 1982 Nissan Stanza at Automotive Testing and Development Services, Inc., Huntington Beach, California.

II. CONCLUSIONS

Based on the results from comparative exhaust emission tests performed at Northern California Emissions Laboratory on a 1991 Chevrolet Camaro and at Automotive Testing and Development Services, Inc. on a 1982 Nissan Stanza, the staff concludes that Exhaust Technologies, Inc.'s Turbolator will not adversely affect exhaust emissions from vehicles for which an exemption is requested.

III. RECOMMENDATION

The staff recommends that Exhaust Technologies, Inc. be granted an exemption for their Turbolator for installation on 1991 and older model-year vehicles. The staff also recommends that Executive Order D-226 be issued.

IV. DEVICE DESCRIPTION

The Turbolator is designed for installation on 1991 and older model-year vehicles. It is composed of a multi-spring perforated butterfly valve mounted in a tube housing. The butterfly valve is regulated by a pre-loaded torsion spring. The tube housing is installed either directly behind the catalytic converter or directly behind the muffler. The Turbolator comes in 5 sizes which are 6 inches long with an outside diameter varying from 2 7/8 inches to 4 1/8 inches depending on the exhaust pipe size. Two Turbolators are installed for a vehicle equipped with dual exhaust. The installation instructions and the installation locations are shown in Appendix A.

The purpose of the Turbolator is to regulate exhaust flow from the engine. The manufacturer claims that by regulating the exhaust flow, the device creates a more efficient fuel burning engine, thus, creating more horsepower and torque without other changes to the engine. The manufacturer also claims the Turbolator causes exhaust noise to decrease. The ARB has not substantiated any of these claims.

The system operates in conjunction with the OEM computer controlled electronic port fuel injection and emission control systems already certified with the stock engine. Installation of the Turbolator does not alter the OEM location of the oxygen sensor and the catalyst. The tune-up specifications also remain the same.

V. TURBOLATOR EVALUATION AND DISCUSSION

A 1991 Chevrolet Camaro equipped with a 3.1 liter fuel injected gasoline engine and a 1982 Nissan Stanza equipped with a 2.0 liter carbureted gasoline

engine were used for the evaluation of the Turbolator. The dynamometer inertia weight and loading used were 3750-lbs and 12.3-hp, and 3000-lbs and 5.6-hp respectively. Northern California Emissions Laboratory conducted the initial emission tests on the 1991 Camaro and 1982 Nissan Stanza. However, when the Nissan Stanza was brought to the ARB laboratory for confirmatory tests, the vehicle was found to be a non-California vehicle. Since the regulations specify that the test vehicle must be a California vehicle, tests using the Nissan vehicle were voided. Shortly after these test were conducted, Northern California Emissions Laboratory closed business and Exhaust Technologies, Inc. hired Automotive Testing and Development Services, Inc. to procure and test a California certified 1982 Nissan Stanza.

Comparative emissions tests conducted by the laboratories for Exhaust Technologies, Inc. consisted of one Cold-Start CVS-75 emission test in the unmodified (baseline) configuration, followed by one Cold-Start CVS-75 emission test in the modified (Turbolator installed) configuration. The back pressure was monitored during both baseline and modified configurations and the results are located in Appendix B. The ARB did not perform tests to confirm the test results submitted by the applicant. A summary of the test results is shown below:

Exhaust Emissions Test Results
On A 1991 Chevrolet Camaro

Test Mode	Exhaust Emissions (gm/mi)		
	HC	CO	NOx
Baseline	.338	5.486	.268
Device	.309	5.402	.301
Difference	-.029	-0.084	+.033
% Difference	-8.6%	-1.5%	+12.3%

Exhaust Emissions Test Results
On a 1982 Nissan Stanza

<u>Test Mode</u>	Exhaust Emissions (gm/mi)		
	<u>HC</u>	<u>CO</u>	<u>NOx</u>
Baseline	.417	6.270	.783
Device	.316	5.944	.728
Difference	-.101	-.326	-.055
% Difference	-24.2%	-5.2%	-7.0%

The differences between the device emission test results and baseline emission test results submitted by the applicant were within the allowed limits of .1 gm/mile or 10 percent of baseline HC, 1.0 gm/mile or 15 percent of baseline CO and .1 gm/mile or 10 percent of baseline NOx as specified in the "Procedures for Exemption of Add-On and Modified Parts." The back pressure remained stable for most of the tests and did not appear to affect the exhaust emissions significantly. Based on the test results, the staff concludes that the installation of the Turbolator did not have an adverse effect on exhaust emissions of the affected vehicles. Therefore, Exhaust Technologies, Inc. has submitted all the required information and fulfilled the requirements for exemption.

Appendix

INSTALLER GUIDELINES

CADTION!

This unit must be installed behind the catalytic converter. Immediately behind the muffler (or as room permits rear muffler units install in front of muffler).

Each unit is designed for a specific pipe size, "Do Not Interchange".

Ex-178 - 1 3/4"

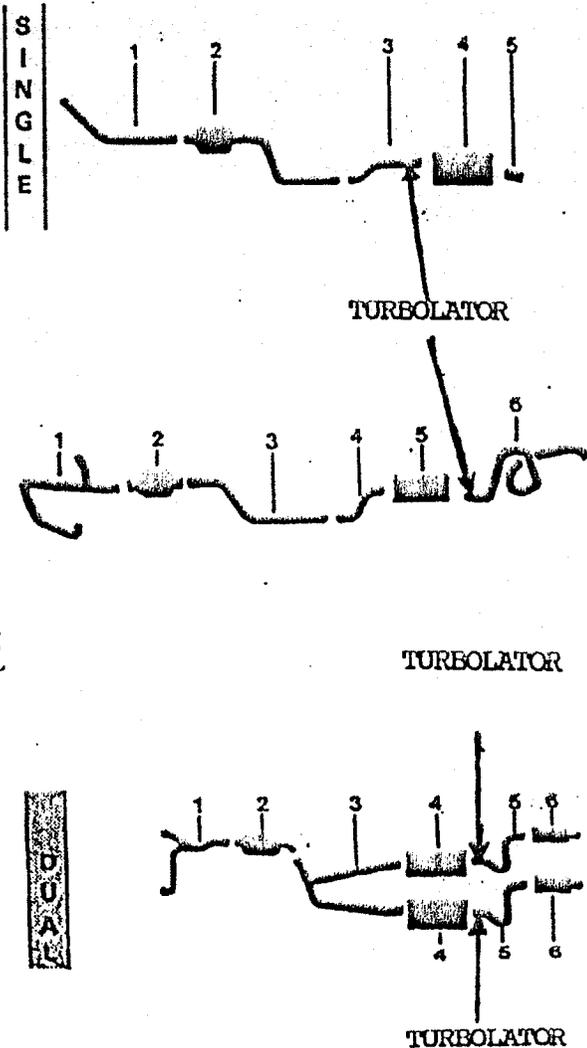
Ex-238 - 2 1/4"

Ex-218 - 2"

Ex-258 - 2 1/2"

Ex-318 - 3"

IMPORTANT: Inlet forward. Bottom side down. Do not insert pipe past outer shell of unit. Most muffler shops are equipped to install this unit. We recommend welding to prevent rattles & leaks in the system.



To install this unit simply cut out 6" of pipe at the selected point and replace with Turbolator.

Make sure end stamped inlet is facing towards engine and bottom side is down.

INSTALLER GUIDELINES

CAUTION!

This unit must be installed behind the catalytic converter. Immediately behind the muffler (or as room permits rear muffler units install in front of muffler).

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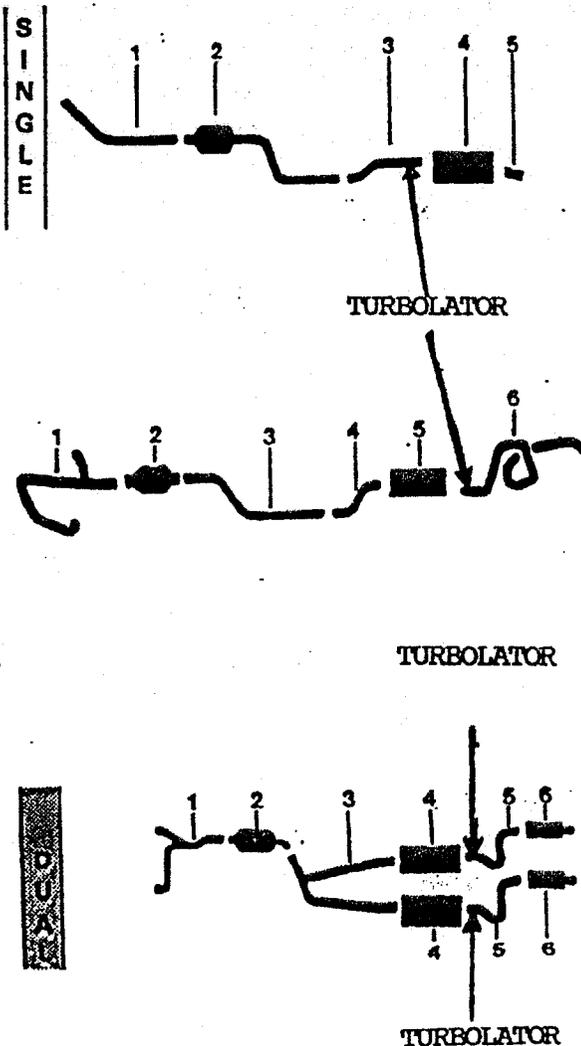
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To install this unit simply cut out 6" of pipe at the selected point and replace with Turbolator.

Make sure end stamped inlet is facing towards engine and bottom side is down.

APPENDIX B

BACK PRESSURE TEST RESULTS

1991 Chevrolet Camaro

Tests performed at Northern California Emissions Laboratory

All tests measured in psi.

gear	All tests done in drive.					
speed	0	10	20	30	40	50
baseline	.5	.7	.8	.9	1.1	1.2
device	.5	.7	.8	1.0	1.3	1.3

1982 Nissan Stanza

Tests performed at Automotive Testing and Development Services, Inc.

All tests measured in inches of water and converted to psi.

gear	All tests done in drive.				
speed	20	30	40	50	60
baseline	-.034	-.034	-.034	-.034	-.036
device	-.017	-.0094	-.0043	-.0065	-.0094