

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-2  
Relating to Exemptions under Section 27156  
of the Vehicle Code

TVI MARKETING, INC.  
"TURBO VAPOR INJECTOR"

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 Section 39023 of the Health and Safety Code;

IT IS ORDERED AND RESOLVED: That the installation of a "Turbo Vapor Injector" manufactured by TVI Marketing, Inc. has been found to not reduce the effectiveness of required emission control devices in vehicles and therefore is exempt from the prohibitions of Section 27156 of the Vehicle Code for 1966-1970 model-year vehicles with engines having greater than 140 cubic inch displacement. The device consists of a plastic fluid container, metering valve and hoses.

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different than those listed 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 ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THE "TURBO VAPOR INJECTOR" DEVICE.

No claim of any kind, such as "Approved by 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 unlawful, untrue or misleading advertising and Section 17534 makes violation punishable as a misdemeanor.

Section 39130 and 39184 of the Health and Safety Code provide as follows:

"39130. No person shall install, sell, offer for sale, or advertise, or, except in an application to the board for certification of a device, represent, any device as a motor vehicle pollution control device unless that device has been certified by the 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 section is a misdemeanor."

"39184. No person shall install, sell, offer for sale, or advertise, or, except in an application to the board for accreditation 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 accredited by the board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as an accredited device. Any violation of this section is a misdemeanor."

Any apparent violation of the policy or laws will be submitted to the Attorney General of California for such action as he deems advisable.

Executed at Sacramento, California, this 27<sup>th</sup> day of April, 1973.

JOHN A. MAGA  
Executive Officer

State of California

AIR RESOURCES BOARD

April 17, 1973

Staff Report

Evaluation of TVI Marketing, Inc.,  
"Turbo Vapor Injector" for Compliance  
with the Requirements of Section 27156  
of the Motor Vehicle Code

I. Introduction

TVI Marketing, Inc., Marysville, Michigan, has applied for exemptions to the prohibitions to Section 27156 of the Motor Vehicle Code for its "Turbo Vapor Injector". The exemption has been requested for 1966 through 1973 model-year vehicles. Section 27156 prohibits the installation of any device which reduces the effectiveness of motor vehicle emission control systems. The applicant claims the device improves performance and fuel economy.

II. System Description

The device consists of a plastic fuel storage container mounted in the engine compartment with a hose connection to the intake manifold. This connection is usually routed through the PCV system. The vapor injector metering valve is located on the container.

III. System Function

The vapor injector system operates on the principle of injecting fuel-water-air vapor mixture into the combustion process. The manufacturer maintains this will improve engine performance and economy.

The fuel-air vapor mixture is produced by venting the bottom of the fluid storage container to atmosphere and drawing a vacuum above the fluid level. The flow of the vapor mixture is controlled by a metering valve which acts as an orifice. The resulting vapors are drawn into the intake manifold through the PCV system.

#### IV. System Evaluation

Vapor injector systems of similar design have, in the past, been evaluated as to their effects on reducing emissions. None of these devices have injected enough liquid mist or vapor to effect reductions in oxides of nitrogen through a lowering of the combustion temperatures. A more predominate effect of the device is the air bleed. Air bleed systems are used for reducing hydrocarbon and carbon monoxide and will produce slight increases in oxides of nitrogen emissions. However, tests of the devices indicate only insignificant changes in these emissions.

In addition to emission testing the previously exempted devices, bench tests were also performed to determine the maximum air flow through the system. The quantity of air flow that was bled into the intake manifold with these devices serves as the criteria for evaluating other vapor injector devices. Also, air bleed systems should not be installed on engines with oxides of nitrogen control systems (1971 model-year and later).

Air flow tests were conducted by the Air Resources Board Laboratory to determine the maximum flow of the TVI Marketing "Turbo Vapor

Injector. The maximum measured air flow was .663 SCFM at 23.5 in. Hg. vacuum. This is the air flow that could occur during high speed decelerations. This flow is no greater than previously exempted devices for vehicles larger than 140 CID which utilize an air bleed feature in their design.

V. Conclusions and Recommendations

It is the staff's opinion that the TVI Marketing, Inc., "Turbo Vapor Injector" will not adversely effect the performance of the emission control systems of motor vehicles having engines of greater than 140 CID. Therefore, the "Turbo Vapor Injector" should be exempt from the prohibitions of Section 27156 of the Motor Vehicle Code on 1966-70 model-year vehicles with engines of greater than 140 cubic inch displacement.

State of California  
AIR RESOURCES BOARD

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EXECUTIVE ORDER D-2-1  
Relating to Exemptions under Section 27156  
of the Vehicle Code

TVI MARKETING, INC.  
"TURBO VAPOR INJECTOR"

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 Section 39023 of the Health and Safety Code;

IT IS ORDERED AND RESOLVED: That the installation of "Turbo Vapor Injector" manufactured by TVI Marketing, Inc., has been found to not reduce the effectiveness of required motor vehicle pollution control devices and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for 1974 model-year vehicles and older. This device consists of a plastic bottle, rubber hose, and proprietary fluid. This exemption is for Model No. CA-03 and VA-04 devices equipped with .022 inch orifice diameter, and fluid specification number 1072.

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different than those listed by the vehicle manufacturer.

Changes made to the design or operating conditions of the device as originally submitted to the Air Resources Board for evaluation that adversely affect the performance of the vehicle's pollution control devices 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 have prior approval of the Air Resources Board.

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 THE "TURBO VAPOR INJECTOR" DEVICE.

No claim of any kind, such as "Approved by 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 unlawful, untrue or misleading advertising and Section 17534 makes violation punishable as a misdemeanor.

Section 39130 and 39184 of the Health and Safety Code provide as follows:

"39130. No person shall install, sell, offer for sale, or advertise, or, except in an application to the board for certification of a device, represent, any device as a motor vehicle pollution control device unless that device has been certified by the 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 section is a misdemeanor."

"39184. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the board for accreditation 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 accredited by the board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as an accredited device which, in fact, is not an accredited device. Any violation of this subdivision is a misdemeanor.

Any apparent violation of the policy or laws will be submitted to the Attorney General of California for such action as he deems advisable.

Executed at Sacramento, California, this 28<sup>th</sup> day of February, 1974.

WILLIAM SIMMONS  
Executive Officer

State of California

AIR RESOURCES BOARD

February 19, 1974

Staff Report

Evaluation of TVI Marketing, Inc.,  
"TURBO VAPOR INJECTOR"  
for Exemption from the Prohibitions of  
Section 27156 of the Motor Vehicle Code

I. Introduction

TVI Marketing, Inc. of Marysville, Michigan, has applied for an exemption from the prohibitions of Section 27156 of the Motor Vehicle Code for its "Turbo Vapor Injector". This section prohibits the installation of any device which reduces the effectiveness of the motor vehicle emission control system. The applicant is requesting an exemption for 1966-1974 model year vehicles with Model No. CA-03 and VA-04.

The applicant was originally granted an exemption to Section 27156 for its "Turbo Vapor Injector" by Executive Order D-2 dated April 17, 1973, for 1970 and older vehicles greater than 140 CID. The present application is for an identical device which has an orifice diameter of .022 inches as compared to .095 inches for the original device.

II. System Description

This device consists of a vapor injector system and a proprietary fluid which is admitted into the PCV system. A plastic bottle is mounted



in the engine compartment with a rubber hose providing the connection with the engine.

According to the applicant, the proprietary fluid has the same chemical composition as the fluid manufactured by Kem Krest for the "Lift Fuel Efficiency System" which was granted an exemption on January 22, 1974 by Executive Order D-24. This is identified by Kem Krest Specification No. T072.

The control valve which admits vapor to the engine is located on the cap of the bottle. This valve can be adjusted to control the flow rate of the vaporous-fluid mixtures. It has a maximum orifice diameter of .022 in. The system contains a standpipe which provides venting to the atmosphere. The same model is used for applications on all vehicles.

### III. System Function

The vapor injection system operates by applying manifold vacuum to a tee in the PCV line thereby allowing fluid vapor from a storage tank to be displaced through an interconnecting rubber tube into the intake manifold of the engine. Air enters the fluid tank through a standpipe creating bubbles at the end of the standpipe due to the venting action

caused by the engine vacuum. The formed bubbles and its subsequent rising action enhance the evaporation rate of the fluid. This vaporous-fluid-mixture generally enters the engine through the PCV adapter plate located at the base of the carburetor.

IV. System Evaluation

The applicant had submitted emission data which were performed by Scott Research Laboratory of San Bernardino, California. These tests were performed with the orifice diameter of .055". The applicant's data generally showed no adverse effect with the exception of test conducted on vehicles with a STP retrofit device. These data showed a 97% and 16% increase in CO and hydrocarbon emissions respectively; however, the applicant has reduced the size of his orifice diameter to .022 in. and submitted maximum air flow limits. These limits are within those established by the staff for systems with a fixed orifice size which admits air below the carburetor. Exceeding these criteria would be judged as having an adverse effect on the existing pollution control system. The equivalent air flow rate with this diameter size would not exceed the established 0.1 SCFM flow limit.

V. Conclusion

It is the opinion of the staff that this device would not have an adverse effect on the operation of the existing pollution control system. Therefore, the staff recommends that TVI Marketing, Inc., be granted an exemption for its "Turbo Vapor Injector".