State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-97-19
Relating to Exemptions under Section 27156
of the Vehicle Code

BAE TURBOSYSTEMS
TURBOCHARGER KIT NO. 28-0000-3

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 turbocharger kit No. 28-0000-3 (using a RaJay turbocharger with an A/R ratio of 0.25) manufactured by BAE Turbosystems, of 3032 Kashiwa Street, Torrance, California 90505, has been found not to 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 1981, 1982, and 1983 model-year Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models powered by a 105 cubic inch displacement four-cylinder gasoline engine.

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

Changes made to the design or operating conditions of the device, as exempted by the Air Resources Board, that adversely affect the performance of a vehicle's pollution control system 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 be prohibited unless prior approval is obtained from the Air Resources Board. Exemption of a kit shall not be construed as an exemption to sell, offer for sale, or advertise any component of a kit as an individual device.

This Executive Order does not constitute any opinion as to the effect that 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 ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THE BAE TURBOCHARGER, KIT NO. 28-0000-3.

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 untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

Section 43644 of the Health and Safety Code provides as follows:

> "43644. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification 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 certified by the state 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 subdivision is a misdemeanor."

Any apparent violation of the conditions of this Executive Order will be submitted to the Attorney General of California for such action as he deems advisable.

Executive Order No. D-97-10, dated December 9, 1981, is superseded and of no further force and effect.

Executed at El Monte, California, this 20th day of May, 1983.

K. D. Drachand, Chief
Mobile Source Control Division

STATE OF CALIFORNIA
AIR RESOURCES BOARD

EVALUATION OF THE BAE TURBOCHARGER KIT NO. 28-0000-3 FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE CALIFORNIA ADMINISTRATIVE CODE

May 9, 1983

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by

State of California
Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731

(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

BAE Turbosystems of 3032 Kashiwa Street, Torrance, CA 90505, has requested an update to the existing Air Resources Board's Executive Order (E.O.) No. D-97-10. The applicant requested that their add-on turbocharger kit No. 28-0000-3 be also exempted from the prohibitions in Vehicle Code (V.C.) Section 27156 for the 1983 model-year Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models powered by a 105 cubic inch displacement (CID) four-cylinder gasoline engine.

Based on the previous comparative exhaust emission tests performed on a 1981 model-year Volkswagen pick-up truck and the fact that the engines used in the 1983 model-year Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models are carry-overs (identical engine design) from the 1981 and 1982 models, the staff concludes that the kit will not adversely affect exhaust emissions from the 1983 Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models.

The staff recommends that BAE Turbosystems be granted their update request to include the 1983 model-year Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models in the exemption of their add-on turbocharger kit No. 28-0000-3. The staff recommends that Executive Order No. D-97-19 be adopted.

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I. INTRODUCTION

BAE Turbosystems of 3032 Kashiwa Street, Torrance, CA 90505, has requested an update to the existing Air Resources Board's Executive Order (E.O.) No. D-97-10. The applicant requested that their add-on turbocharger kit No. 28-0000-3 be also exempted from the prohibitions in Vehicle Code (V.C.) Section 27156 for the 1983 model-year Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models powered by a 105 CID four-cylinder gasoline engine.

II. CONCLUSION

Based on the previous comparative exhaust emission tests performed on a 1981 model-year Volkswagen pick-up truck and the fact that the engines used in the 1983 model-year Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models are carry-overs (identical engine design) from the 1981 and 1982 models, the staff concludes that the kit will not adversely affect exhaust emissions from the 1983 Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models.

III. RECOMMENDATIONS

The staff recommends that BAE Turbosystems be granted their update request to include the 1983 model-year Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models in the exemption of their add-on turbocharger kit No. 28-0000-3. The staff recommends that Executive Order No. D-97-19 be adopted.

IV. TURBOCHARGER KIT DESCRIPTION AND OPERATION

The purpose of turbocharging is to increase the volumetric efficiency of an engine by forcing more air into an engine than it would take under naturally aspirated conditions.

The major components of the turbocharger kit are a Rajay Turbocharger Model No. 300B with an A/R ratio of 0.25, a replacement BAE exhaust manifold, and intake, discharge, and exhaust pipes. The components are packaged with installation hardware and instructions and sold as a kit.

The original equipment manufacturer (OEM) exhaust manifold is replaced by a BAE manifold. The turbine inlet mounts directly to the replacement manifold. The turbine, driven by exhaust gases, is linked to the compressor by a solid shaft. Intake air from the air box, of the K-Jetronic System, is routed through the intake pipe to the compressor. Compressed air is then routed to the BAE replacement intake plenum.

Lubrication of the turbocharger is provided by a steel-braided line from the oil filter adaptor to the turbocharger bearing housing. Oil from the turbocharger is returned to the oil pan.

Maximum positive manifold pressure (boost) is limited to 5 psig by a wastegate positioned on the exhaust manifold. The wastegate is preset to dump excess exhaust gases when intake manifold pressure reaches 5 psig of boost.

A vacuum-delay valve is used to control NOx exhaust emissions and to suppress detonation. The valve is installed in the vacuum line prior to the vacuum retard mechanism of the distributor.

No modifications to the OEM tune-up specifications are required or permitted when the turbocharger kit is installed. All OEM emission controls are left intact.

V. DISCUSSION

BAE turbocharger kit No. 28-0000-3 applicable to 1981 and 1982 model-year Volkswagen Rabbit, Dasher, Jetta, and pick-up truck, and Audi 4000 models powered by a 105 CID four-cylinder gasoline engine was granted an exemption (E.O. No. D-97-10) on December 9, 1981. The exemption was granted on the basis that the effectiveness of the vehicle's pollution control system was not reduced. Evaluation consisted of comparative (without and with the kit installed on a test vehicle) chassis dynamometer CVS-75 and Highway Fuel Economy tests at normal dynamometer road loading.

The applicant is making available kit No. 28-0000-3 for the 1983 models also. The applicant has requested that the exmeption be updated to include the 1983 models.

In response to the request, the staff compared the engine design of 1981, 1982, and 1983 model-years. Since the engines in the 1983 models are identically designed as the 1981 and 1982 engines, the staff is of the opinion that the 1983 vehicles will have the same degree of performance/emissions impact as in the 1981 and 1982 models. Because the test data on a 1981 test vehicle showed that the vehicle's emissions were not adversely affected when the turbocharger kit was installed, the kit will have no adverse effect on the 1983 models either. No additional testing was required or performed.