

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-114-1  
Relating to Exemptions under Section 27156  
of the Vehicle Code

MARTIN TURBO ENGINEERING, INC.  
TURBOCHARGER KIT NO. 301 E10

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. 301 E10 (using a Rajay turbocharger with an A/R ratio of 1.0) manufactured by Martin Turbo Engineering, Inc., of 1310 Johnson Drive, City of Industry, California 91745, 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 1983 and older model-year gasoline engine powered passenger cars (up to 6000 lbs. GVWR) having a Chevrolet 305 or 350 CID eight-cylinder engine (carbureted only) and automatic transmission.

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 MARTIN TURBO ENGINEERING, INC., TURBOCHARGER KIT NO. 301 E10.

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.

Executed at El Monte, California, this 28<sup>th</sup> day of May, 1983.

  
K. D. Drachand, Chief  
Mobile Source Control Division

STATE OF CALIFORNIA  
AIR RESOURCES BOARD

EVALUATION OF THE MARTIN TURBO ENGINEERING, INC.'S TURBOCHARGER KIT NO. 301  
EIO FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN  
ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE CALIFORNIA ADMINISTRATIVE CODE.

May 2, 1983

Issue Date: May 2, 1983

EVALUATION OF THE MARTIN TURBO ENGINEERING, INC.'S TURBOCHARGER KIT NO. 301  
E10 FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN  
ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE CALIFORNIA ADMINISTRATIVE CODE.

by

Mobile Source Division

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

Martin Turbo Engineering, Inc., of 1310 Johnson Drive, City of Industry, CA 91745, has requested an update to the existing Air Resources Board's Executive Order No. D-114. The applicant requested that their add-on turbocharger kit No. 301 E10 be also exempted from the prohibitions in Vehicle Code Section 27156 for the 1982 and 1983 model-year gasoline engine powered passenger cars having a Chevrolet 350 cubic inch displacement (CID) and 1983 and older passenger cars with a 305 CID eight-cylinder carbureted engine and automatic transmission.

Based on test data from previous comparative exhaust emission tests performed on a 1981 Corvette and the fact that the Chevrolet 350 CID closed-loop carbureted engines used in the 1982 and 1983 model-year passenger cars up to 6000 lbs. GVWR are carryovers (identical engine designs) from the 1981 model-year and that the 305 CID engines are in the same engine family (dual engine displacement family), the staff concludes that the applicant's turbocharger kit will not adversely affect exhaust emissions from passenger cars up to 6000 lbs. GVWR having a Chevrolet 305 or 350 CID eight-cylinder carbureted engine and automatic transmission. However, the 1983 medium-duty vehicles (6000 to 8500 lbs. GVWR) with this engine size are not carryovers and, therefore, are not included in the update exemption.

The staff recommends that Martin Turbo Engineering, Inc. be granted their update request for passenger cars up to 6000 lbs. GVWR and that Executive Order No. D-114-1 be adopted.

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EVALUATION OF THE MARTIN TURBO ENGINEERING, INC.'S TURBOCHARGER KIT NO. 301 E10 FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE CALIFORNIA ADMINISTRATIVE CODE.

I. INTRODUCTION

Martin Turbo Engineering, Inc., of 1310 Johnson Drive, City of Industry, CA 91745, has requested an update to the existing Air Resources Board's Executive Order (E.O.) No. D-114. The applicant requested that their add-on turbocharger kit No. 301 E10 be also exempted from the prohibitions in Vehicle Code (VC) Section 27156 for the 1982 and 1983 model-year gasoline engine powered motor vehicles having a Chevrolet 350 CID and 1983 and older motor vehicles with a Chevrolet 305 CID eight-cylinder engine (carbureted only) and automatic transmission.

II. CONCLUSION

Based on test data from previous comparative exhaust emission tests performed on a 1981 Corvette and the fact that the closed-loop carbureted Chevrolet 350 CID engines used in the 1982 and 1983 model-year passenger cars up to 6000 lbs. GVWR are carryovers (identical engine designs) from the 1981 model-year the 305 CID engines are in the same engine family (dual engine displacement family), the staff concludes that the turbocharger kit will not adversely affect exhaust emissions from 1983 and older model-year gasoline engine powered passenger cars having a Chevrolet 305 or 350 CID eight-cylinder engine (carbureted only) and automatic transmission. However, the 1983 medium-duty (MD) vehicles (6000 to 8500 lbs. GVWR) with this engine size are not carryovers and, therefore, cannot be included in the update exemption.

### III. RECOMMENDATIONS

The staff recommends that Martin Turbo Engineering, Inc. be granted their update request for gasoline engine powered passenger cars up to 6000 lbs. GVWR having a Chevrolet 305 or 350 CID eight-cylinder engine (carbureted only) and automatic transmission in the exemption of their add-on turbocharger kit No. 301 E10. The staff recommends that Executive Order No. D-114-1 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 in under naturally aspirated conditions.

The major components of the turbocharger kit are a RaJay turbocharger model No. 301 E10 with an A/R ratio of 1.0, a replacement Martin inlet manifold lid and exhaust manifold (right cylinder bank), a crossover pipe, replacement secondary metering rods, and a water injection unit. The components are packaged with installation hardware and instructions and sold as a kit.

The crossover pipe routes exhaust from the left cylinder bank to join the right cylinder bank exhaust at the Martin exhaust manifold. The turbine inlet of the turbocharger mounts directly to the exhaust manifold. The turbine and the compressor are linked together by a solid shaft and driven by exhaust gases. Intake air/fuel mixture is compressed by the compressor and returned to the intake manifold lid.

Maximum positive manifold pressure (boost) is limited to 5 psig by a pressure control valve positioned in the intake manifold lid. No wastegate or other active limiting device is used.



Lubrication of the turbocharger is provided by a line from the oil pressure sending unit mounted on the engine block to the turbocharger bearing housing. Oil from the turbocharger is returned to the oil drain adapter positioned between the fuel pump and engine block.

The original equipment manufacturer (OEM) secondary metering rods (ID CH) in the carburetor are replaced by Martin's No. 937050 metering rods (ID CJ). The metering rods are raised by 0.005 of an inch from the OEM position. The applicant claims that the replacement metering rods increases secondary fuel delivery for proper and efficient operation of the kit.

Water injection is employed to control NOx emissions and to suppress detonation. Water is drawn from a small plastic reservoir by a pump and injected into the top of the carburetor through a nozzle. Flow is restricted by a 0.015 inch orifice ahead of the nozzle. The pump is activated when manifold vacuum is below 6 inches Hg.

No modifications to the OEM tune-up specifications are required nor permitted when the turbocharger kit is installed. All OEM emissions controls are left intact.

#### V. DISCUSSION

Martin Turbo Engineering, Inc's. turbocharger kit No. 301 E10, applicable to 1981 and older model-year-gasoline engine powered motor vehicles having a Chevrolet 350 CID eight-cylinder engine and automatic transmission, was granted an exemption (E.O. No. D-714) on July 29, 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 HFE tests at normal certification dynamometer road loading.

The applicant is making available kit No. 301 E10 for the 1982 and 1983 models with a Chevrolet 305 CID engine and 1983 and older model-year vehicles with a Chevrolet 305 CID engine models also. The applicant requested that the exemption be updated to include these vehicles.

In response to the request, the staff compared the engine design of 1981, 1982, and 1983 model-years for both Chevrolet 305 and 350 CID models. Since the closed-loop carbureted Chevrolet 350 CID engines used in the 1982 and 1983 model-year passenger cars up to 6000 lbs. GVWR are carryovers and the fact that the passenger cars with a Chevrolet 305 CID engines are in the same engine family (dual engine displacement family), the staff is of the opinion that the 1982 and 1983 passenger cars will have the same degree of performance/emissions impact as in the 1981 passenger cars up to 6000 lbs. GVWR models. Because of the 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 passenger cars up to 6000 lbs. GVWR models with a Chevrolet 305 or 350 CID engine either. No additional testing was required or performed for updating the passenger car exemption. However, the 1983 MD vehicles (6001 to 8500 lbs. GVWR) with this engine size are not carryovers and additional testing will be required for updating the MD exemption.