

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-114-2  
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 1984 and older 305 CID and 1983 and older 350 CID carbureted only engines equipped with automatic transmission, found on General Motors Corporation vehicles up to 6000 lbs. GVW.

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.

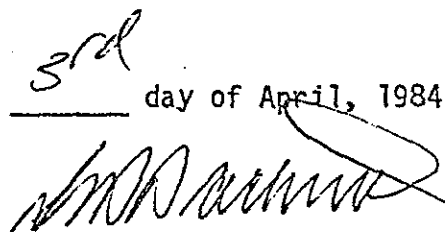
Section 43644 of the Health and Safety Code provides as follows:

"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.

Executive Order No. D-114-1, dated May 28, 1983, is superseded and of no further force and effect.

Executed at El Monte, California, this 3rd day of April, 1984.

  
K. D. Drachand, Chief  
Mobile Source Division

STATE OF CALIFORNIA  
AIR RESOURCES BOARD

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.

April 2, 1984

Issue Date: April 2, 1984

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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, California 91745, has requested an update to the existing Air Resources Board's Executive Order No. D-114-1. 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 1984 model-year vehicles up to 6000 lbs. GVW powered by a General Motors (GM) 305 or 350 cubic inch displacement (CID) eight-cylinder carbureted engine and automatic transmission.

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Based on the fact that the closed-loop carbureted engines used in the 1984 model-year GM vehicles up to 6000 lbs. GVW are carryovers (identical engine designs and calibrations) from the 1983 model-year, the staff concludes that the applicant's turbocharger kit will not adversely affect exhaust emissions from 1984 GM vehicles up to 6000 lbs. GVW powered by a GM 305 CID eight-cylinder carbureted engine and automatic transmission. However, since the Air Resources Board did not certify any GM vehicles up to 6000 lbs. GVW powered by a 350 CID engine in 1984, the staff is unable to include the 1984 GM 350 CID vehicles upto 6000 lbs. GVW in the update exemption.

The staff recommends that Martin Turbo Engineering, Inc. be granted their update request for vehicles up to 6000 lbs. GVW powered by a GM 305 CID eight-cylinder carbureted engine and automatic transmission in the exemption of their add-on turbocharger kit No. 301 E10. The staff recommends that Executive Order No. D-114-2 be issued.

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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, California 91745, has requested an update to the existing Air Resources Board's Executive Order (E.O.) No. D-114-1. 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 1984 model-year vehicles powered by a General Motors (GM) 305 or 350 CID eight-cylinder carbureted engine and automatic transmission.

II. CONCLUSION

Based on the fact that the closed-loop carbureted engines used in the 1984 model-year GM 305 CID vehicles up to 6000 lbs. GVW are carryovers (identical engine designs) from the 1983 model-year, the staff concludes that the turbocharger kit will not adversely affect exhaust emissions from 1984 vehicles powered by a GM 305 CID eight-cylinder carbureted engine and automatic transmission. However, since the Air Resources Board did not certify any GM vehicles up to 6000 lbs. GVW powered by a 350 CID engine in 1984, the staff is unable to include the 1984 GM 350 CID passenger cars in the update exemption.

III. RECOMMENDATIONS

The staff recommends that Martin Turbo Engineering, Inc. be granted their update request for gasoline engine powered vehicles up to 6000 lbs. GVW powered by a GM 305 CID eight-cylinder carbureted engine and automatic transmission in the exemption of their add-on turbocharger kit No. 301 E10. The staff recommends that Executive Order No. D-114-2 be issued.

#### 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 psi 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 1983 and older model-year vehicles up to 6000 lbs. GVW powered by a GM 305 or 350 CID eight-cylinder carbureted engine and automatic transmission, was granted an exemption (E.O. No. D-114-1) on May 28, 1983. 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 1984 models powered by a GM 305 or 350 CID engine also. The applicant requested that the exemption be updated to include these vehicles.

In response to the request, the staff reviewed the 1984 model-year certification for application submitted by GM. The staff revealed that:

1. no GM vehicles up to 6000 lbs. GVW powered by a 350 CID engine were California-certified in 1984; and
2. the closed-loop carbureted GM 305 CID engines used in the 1984 model-year vehicles up to 6000 lbs. GVW are carryovers.

The staff is therefore, of the opinion that the 1984 GM 305 CID vehicles up to 6000 lbs. GVW will have the same degree of performance/emissions impact as in the 1983 model-year GM vehicles up to 6000 lbs. GVW models which have been granted exemption under Executive Order D-114-1. No additional testing was required or performed for updating the passenger car exemption.