

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-114-3  
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 the following General Motors Corporation passenger cars up to 6000 lbs. gross vehicle weight:

1. 1984 and older model-year passenger cars with a 305 cubic inch displacement (CID) carbureted engine, and
2. 1982 and older model-year passenger cars with a 350 CID carbureted 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.

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

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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-114-2, dated April 3, 1984, is superseded and of no further force and effect.

Executed at El Monte, California, this 12<sup>th</sup> day of April, 1985.



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  
EIO FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN  
ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA ADMINISTRATIVE CODE.

March 22, 1985

Issue Date: March 22, 1985

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, California 91745, has requested an update of its existing Air Resources Board's Executive Order (E.O.) No. D-114-2. The company's turbocharger kit No. 301 E10, was exempted from the prohibitions of Vehicle Code (V.C.) Section 27156 for use on the following limited General Motors (GM) Corporation's passenger cars equipped with automatic transmissions:

1. 1984 and older model-year passenger cars with a 305 CID carbureted engine, and
2. 1982 and older model-year passenger cars with a 350 CID carbureted engine.

The company is requesting the update of the existing Executive Order for the same list of limited vehicles but equipped with manual transmissions.

Comparative data from previous tests of the Martin turbocharger kit No. 301 E10 when installed on the above specified GM's vehicles equipped with automatic transmissions show emissions levels that were at or below the baseline vehicle levels. A review of GM's certification applications revealed that the engine(s) of the specified model-year vehicle(s), whether equipped with automatic or manual transmission, is in the same engine family. The staff, therefore, concludes that the Martin Turbo Engineering turbocharger kit No. 301 E10 will not adversely affect exhaust emissions when installed on the same engine family vehicles equipped with manual transmissions.

The staff recommends that Martin Turbo Engineering, Inc. be granted an updated V.C. Section 27156 exemption as requested and that Executive Order No. D-114-3 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 of its existing Air Resources Board's Executive Order (E.O.) No. D-114-2. The company's turbocharger kit No. 301 E10, was exempted from the prohibitions in Vehicle Code (V.C.) Section 27156 for use on the following limited General Motors (GM) Corporation's passenger cars equipped with automatic transmissions:

1. 1984 and older model-year passenger cars with a 305 CID carbureted engine, and
2. 1982 and older model-year passenger cars with a 350 CID carbureted engine.

The company is requesting the update of the existing Executive Order for the same list of limited vehicles but equipped with manual transmissions.

II. CONCLUSION

Comparative data from previous tests of the Martin turbocharger kit No. 310 E10 when installed on the specified GM's vehicles equipped with automatic transmissions show emissions levels that were at or below the baseline vehicle levels. A review of GM's certification applications revealed that the engine(s) of the specified model-year vehicle(s), whether equipped with automatic or manual transmission, is in the same engine family. The staff, therefore, concludes that the Martin Turbo Engineering turbocharger kit No. 301 E10 will not adversely affect exhaust emissions when installed on the same engine family vehicles equipped with manual transmissions.

III. RECOMMENDATIONS

The staff recommends that Martin Turbo Engineering, Inc. be granted an updated V.C. Section 27156 exemption as requested and that Executive Order No. D-114-3 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 would be inspired under naturally aspirated conditions.

The major components of the Martin turbocharger kit No. 310 E10 are a RaJay model No. 301 E10 turbocharger 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 gases from the left cylinder bank to the right cylinder bank where all of the exhaust gases flow into 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. The intake air/fuel mixture is compressed by the compressor and returned to the intake manifold lid.

The 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 tubing from the oil pressure sensing 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 the engine block.

The original equipment manufacturer's (OEM) secondary metering rods (Rochester Identification Code CH) in the carburetor are replaced by Martin's No. 937050 metering rods which are Rochester Identification Code CJ rods. The

applicant claims that the replacement metering rods will increase 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. The flow of water is restricted by a 0.015 inch orifice ahead of the nozzle. The pump is activated by a vacuum switch when manifold vacuum is below 6 inches Hg.

No modifications to the OEM tune-up specifications are required 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 1984 and older model-year GM's 305 CID and 1982 and older 350 CID carbureted engine vehicles equipped with automatic transmission was granted an exemption (E.O. No. D-114-2) from prohibitions of V.C. Section 27156 on April 3, 1984. The exemption was granted on the basis that the effectiveness of the vehicle's pollution control system was not reduced. Comparative, baseline configuration versus modified (with the kit installed) configuration, emission data from chassis dynamometer CVS-75 and HFE tests, were used for the evaluation.

The comparative emission test data indicate that the emissions levels of the modified configuration with the turbocharger kit installed were at or below the emissions levels of the baseline configuration.

The applicant is making available kit No. 301 E10 for use on the same model-year and displacement engines installed in the specified vehicles equipped with manual transmission. The applicant requested that the current E.O. No. D-112-2 be updated to include the same list of limited vehicles but equipped with manual transmissions.

In response to the request, the staff reviewed past new vehicle certification documents submitted by GM. The review revealed that the noted engines used in the specified vehicles equipped with manual transmissions are in the same engine family as those in the specified vehicles equipped with automatic transmissions. The staff is, therefore, of the opinion that the emissions impact of the Martin turbocharger kit No. 310 E10 on the specified vehicles equipped with manual transmission will be the same as that on vehicles with the same engines but equipped with automatic transmission. As a result, no additional testing was required.