

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-161-9  
Relating to Exemptions under Section 27156  
of the Vehicle Code

GALE BANKS ENGINEERING  
TURBOCHARGER KIT MODEL NO. 6.9F FOR FORD HEAVY-DUTY VEHICLES  
POWERED BY A 6.9 OR A 7.3 LITER NAVISTAR INTERNATIONAL  
HEAVY-DUTY DIESEL ENGINE

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 add-on turbocharger kit Model No. 6.9F manufactured by Gale Banks Engineering, 546 Duggan Avenue, Azusa, California 91702, using a Rotomaster turbocharger Model No. T04B or a Schwitzer/Banks turbocharger Model No. T04B25 with an A/R ratio of 1.0 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 vehicles:

1. 1983-1987 model-year Ford Motor Company vehicles powered by a 6.9 liter Navistar International heavy-duty diesel engine; and
2. 1988 model-year Ford Motor Company vehicles powered by a 7.3 liter Navistar International heavy-duty diesel engine.

Modifications to the OEM emission-related parts due to the installation of the turbocharger kit include a new air cleaner assembly, a new 3" low-restriction muffler and 3" diameter exhaust pipe.

This exemption shall not apply to any device, apparatus, or mechanism advertised, offered for sale or sold with, or installed on, a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

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 GALE BANKS ENGINEERING TURBOCHARGER KIT FOR INSTALLATION ON FORD MOTOR COMPANY VEHICLES POWERED BY A 6.9 OR A 7.3 LITER NAVISTAR INTERNATIONAL HEAVY-DUTY DIESEL ENGINE.

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-161-6, dated October 19, 1987, is superseded and of no further force and effect.

Executed at El Monte, California, this 4<sup>th</sup> day of December, 1987.



K. D. Drachand, Chief  
Mobile Source Division

State of California  
AIR RESOURCES BOARD

EVALUATION OF GALE BANKS ENGINEERING'S ADD-ON TURBOCHARGER KIT  
MODEL NO. 6.9F FOR INSTALLATION IN 1983-1987 MODEL-YEAR FORD MOTOR COMPANY  
HEAVY-DUTY VEHICLES POWERED BY A 6.9 LITER NAVISTAR INTERNATIONAL  
HEAVY-DUTY DIESEL ENGINE AND 1988 MODEL-YEAR FORD COMPANY HEAVY-DUTY  
VEHICLES POWERED BY A 7.3 LITER NAVISTAR INTERNATIONAL HEAVY-DUTY  
DIESEL ENGINE FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE  
SECTION 27156 IN ACCORDANCE WITH SECTION 2222,  
TITLE 13, OF THE CALIFORNIA ADMINISTRATIVE CODE

December, 1987

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TITLE 13, OF THE CALIFORNIA ADMINISTRATIVE CODE

by

Mobile Source Division

State of California  
AIR RESOURCES BOARD  
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(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

Gale Banks Engineering (Banks) has requested an update to Executive Order D-161-6, which exempts their turbocharger kit model No. 6.9F for 1983-1987 model-year Ford Motor Company heavy-duty vehicles powered by a 6.9 liter Navistar International heavy-duty diesel engine. They have requested that the exemption be updated to include the 1988 model-year Ford Motor Company heavy-duty vehicles powered by a 7.3 liter Navistar International heavy-duty diesel engine.

Based on the following: (1) the fact that the kit applicable to 1988 model-year 7.3 liter Navistar International heavy-duty diesel engine is identical to the exempted kit; (2) the fact that the 1988 7.3 liter Navistar International heavy-duty diesel engine is a replacement engine for the 1987 6.9 liter Navistar International heavy-duty diesel engine and that both engines have similar designs; (3) the test data from previous comparative exhaust emission tests performed for exempting the kit; and (4) that the engine design complies with the carryover criteria as outlined in EPA's Advisory Circulars 17F and 20B, the staff believes that the add-on turbocharger kit will have no adverse effect on the engines for which exemption update is requested.

The staff recommends that Banks be granted an update as requested, and the Executive Order D-161-9 be issued.

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I. INTRODUCTION

Gale Banks Engineering (Banks) of 546 Duggan Avenue, Azusa, California 91702, has requested an update to the existing Air Resources Board Executive Order (E.O.) D-161-6 dated October 19, 1987. E.O. D-161-6 exempted the Banks' turbocharger kit model No. 6.9F from the prohibitions in Vehicle Code Section 27156 for 1983-1987 model-year Ford Motor Company heavy-duty vehicles powered by a 6.9 liter Navistar International heavy-duty diesel engine. The applicant has requested that the exemption be updated to include the 1988 model-year Ford Motor Company heavy-duty vehicles powered by a 7.3 liter Navistar International heavy-duty diesel engine.

II. CONCLUSION

Based on the following: (1) the fact that the kit applicable to 1988 model-year 7.3 liter Navistar International heavy-duty diesel engine is identical to the exempted kit; (2) the fact that the 1988 7.3 liter Navistar International heavy-duty diesel engine is a replacement engine for the 1987 6.9 liter Navistar International heavy-duty diesel engine and that both engines have similar designs; (3) the test data from previous comparative exhaust emission tests performed for exempting the kit; and (4) that the engine design complies with the carryover criteria as outlined in EPA's Advisory Circulars 17F and 20B, the staff believes that the add-on turbocharger kit will have no adverse effect on the engines for which exemption update is requested.

### III. RECOMMENDATIONS

The staff recommends that Banks be granted an update as requested, and that Executive Order D-161-9 be issued.

### IV. TURBOCHARGER KIT DESCRIPTION AND OPERATION

The purpose of the Banks turbocharger kit is to increase the power output of the engine by increasing its volumetric efficiency. This is accomplished by compressing the intake charge to pressures above that of the atmosphere. The increased pressure allows a greater charge density to enter the combustion chamber providing more oxygen for combustion. The maximum fuel delivery is slightly increased in order to maintain proper air-fuel ratios with the increased air flow from the turbocharger when it is providing positive manifold pressure (boost).

The major components of the kit include a 1.0 A/R ratio Rotomaster model No. T04B or a Schwitzer/Banks Model No. T04B25 turbocharger, custom intake and exhaust tubing, air cleaner assembly, brackets, hoses and the hardware necessary to complete the installation.

Maximum positive manifold pressure is limited to 7 psi by the size of the turbine and the compressor. The maximum engine speed is regulated by the OEM fuel injection governor which is not modified by the installation of the kit. Therefore, by controlling maximum engine speed, maximum turbine speed and corresponding boost pressures are also controlled.

No OEM emission controls are removed or disconnected when the turbocharger kit is installed.

### V. DISCUSSION

Banks' add-on turbocharger kit model No. 6.9F is designed for installation on 1983-1987 model-year Ford Motor Company vehicles powered by

a 6.9 liter Navistar International heavy-duty diesel engine. The exemption was granted on the basis that the effectiveness of the vehicle's pollution control system was not reduced. Evaluation consisted of comparative (baseline versus turbocharged) steady state tests.

The applicant is making available the add-on turbocharger kit model No. 6.9F for the 1988 model-year Ford Motor Company vehicles powered by a 7.3 liter Navistar International heavy-duty diesel engine. The applicant claims that no modifications to the kit are needed in order to be compatible with the 1988 models. They have requested that the exemption be updated to include these 1988 model-year vehicles.

In response to the applicant's request, the staff compared the engine design of 1987 and 1988 model-year Ford Motor Company vehicles powered by a 6.9 or a 7.3 liter Navistar International heavy-duty diesel engine. Certification documents and correspondence from Navistar International to the ARB indicated that the 1988 model-year 7.3 liter engine is the replacement engine for the 1987 model-year 6.9 liter engine. The staff also noted that the engine designs of both 1987 and 1988 engines are similar.

Because the data on a 1987 6.9 liter test vehicle showed that the emissions were not adversely affected when the turbocharger kit was installed, and that the engine design complies with the carryover criteria as outlined in EPA's Advisory Circulars 17F and 20B, the add-on turbocharger kit will have no adverse effect on the 1988 model-year Ford Motor Company heavy-duty vehicles powered by a 7.3 liter Navistar International heavy-duty diesel engine. No additional testing was required or performed for updating the exemption as requested.