

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-440  
Relating to Exemptions Under Section 27156  
of the Vehicle Code

MECHTECH MOTORSPORTS, INC.  
5 PSI. TURBO SYSTEM

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 Section 39515 and Section 39516 of the Health and Safety Code and Executive Order G-45-9;

IT IS ORDERED AND RESOLVED: That the installation of the 5 PSI. Turbo System, manufactured and marketed by Mechtech Motorsports, Inc., 1277 Simpson Way, Escondido, California 92029 has been found not to reduce the effectiveness of the applicable vehicle pollution control system and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for 1996/97 BMW vehicles equipped with a 6 cylinder engine.

The 5 PSI. Turbo System includes the following main components: Aerodyne turbocharger, model no. MT6000, cast iron exhaust manifold with oxygen sensor at collector, new connecting pipes, fuel pressure regulator located on the fuel return line, intercooler, replacement air inlet box using a K&N style filter, check valves placed in crankcase breather hoses, and all necessary hardware and tubing for installation. Manufacturer recommends 92 or higher octane fuel. The turbocharger does not require any auxiliary oil or water lines for lubrication or cooling.

This Executive Order is valid provided that the installation instructions for the turbocharger will not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer.

Changes made to the design or operating conditions of the turbocharger, as exempt by the Air Resources Board, which adversely affect the performance of the vehicle's pollution control system shall invalidate this Executive Order.

Marketing of the turbocharger using any identification other than that shown in this Executive Order or marketing of the turbocharger 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 the turbocharger shall not be construed as exemption to sell, offer for sale, or advertise any component of the kit as an individual device.

This Executive Order does not constitute any opinion as to the effect the use of the turbocharger may have on any warranty either expressed or implied by the vehicle manufacturer.

This Executive Order is granted based on submitted emissions test data which showed that the Mechtech Motorsports, Inc.'s 5 PSI. Turbo System did not adversely affect tailpipe emissions during the Cold Start CVS-75 Federal Test Procedure. However, the ARB finds that reasonable grounds exist to believe that use of the Mechtech Motorsports, Inc.'s Turbo System may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the previously prescribed test procedures.

Accordingly, the ARB reserves the right to conduct additional emission tests, in the future, as such tests are developed, that will more adequately measure emissions from all cycle phases. If such test results demonstrate that the turbocharger adversely affects emissions during off-cycle conditions (defined as those conditions which are beyond the parameters of the Cold-Start CVS-75 Federal Test Procedure), this Executive Order shall be effectively rescinded as of the date the test results are validated. Further, if such test results or other evidence provides the ARB with reason to suspect that the turbocharger will affect the durability of the emission control systems, Mechtech Motorsports, Inc. shall be required to submit durability data to show that the durability of the vehicle emission control system is not, in fact, affected and/or that the add-on or modified part demonstrates adequate durability.

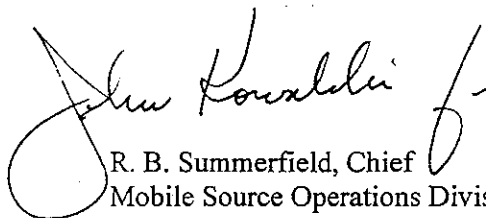
In addition to the foregoing, the ARB reserves the right in the future to review this Executive Order and the exemption provided herein to assure that the exempted add-on or modified part continues to meet the standards and procedures of Title 13, California Code of Regulations, Section 2222, et seq.

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 MECHTECH MOTORSPORTS, INC.'S TURBO SYSTEM.

No claim of any kind, such as "Approved by the Air Resources Board", may be made with respect to the action taken herein in any advertising or other oral or written communication.

Violation of any of the above conditions shall be grounds for revocation of this order. The order may be revoked only after a ten-day written notice of intention to revoke the order, in which period the holder of the order may request in writing a hearing to contest the proposed revocation. If a hearing is requested, it shall be held within ten days of receipt of the request and the order may not be revoked until a determination after hearing that grounds for revocation exist.

Executed at El Monte, California, this 6<sup>th</sup> day of November 1997.

  
R. B. Summerfield, Chief  
Mobile Source Operations Division

State of California  
AIR RESOURCES BOARD

EVALUATION OF MECHTECH MOTORSPORTS, INC.'S TURBO SYSTEM  
FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE  
SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE  
CALIFORNIA CODE OF REGULATIONS

November 1997

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by

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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

Mechtech Motorsports, Inc. of 1277 Simpson Way, Escondido, California 92029 has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for their turbocharger designed for 1996/97 BMW vehicles equipped with a 6 cylinder engine.

Based on submitted emissions test data, the staff concludes that the turbocharger will not adversely affect exhaust emissions from vehicles for which the exemption is requested.

The staff recommends that Mechtech Motorsports, Inc. be granted an exemption as requested and that Executive Order D-440 be issued.

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I. INTRODUCTION

Mechtech Motorsports, Inc. of 1277 Simpson Way, Escondido, California 92029 has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for their turbocharger designed for 1996/97 BMW vehicles equipped with a 6 cylinder engine.

II. CONCLUSIONS

Based on submitted emissions test data, the staff concludes that Mechtech Motorsports, Inc.'s 5 PSI. Turbo System will not adversely affect exhaust emissions from the vehicles for which the exemption is requested.

III. RECOMMENDATION

The staff recommends that Mechtech Motorsports, Inc. be granted an exemption for their 5 PSI. Turbo System for installation on those applicable BMW vehicles. The staff also recommends that Executive Order D-440 be issued.

IV. TURBO SYSTEM DESCRIPTION

The 5 PSI. Turbo System has been specifically designed for installation on 1996/97 BMW vehicles equipped with a 6 cylinder engine. The kit operates in conjunction with the original equipment manufacturer's (OEM) computer controlled fuel injection system and emission control system already certified with the stock engine.

The purpose of turbocharging an engine is to increase its volumetric efficiency and power output at particular engine loads and throttle openings. At light engine loads and small throttle openings, power output is the same as a normally aspirated engine. At heavy engine loads and increased throttle openings, the manifold pressure is increased by the turbocharger allowing more air to enter the engine, resulting in a higher power output. The turbocharger is driven utilizing the engine's exhaust system.

The turbocharger used for this kit is an Aerodyne turbocharger, model no. MT66000, designed to have a maximum boost of 5 PSI. Boost is limited only by the design of the turbocharger.

The installation of the kit does not require any major modifications to the stock motor, except the replacement of existing manifold with a new cast iron exhaust manifold, new connecting pipes from the turbocharger to the converter, a fuel pressure regulator located on the fuel return line, addition of an intercooler, replacement of an air inlet box using a K&N style filter, and addition of check valves placed in the crankcase breather hoses. As with the stock configuration the oxygen sensor is located at the collector of the new exhaust manifold. The turbocharger does not require the use of an auxiliary oil or water feed line for lubrication or cooling.

V. DISCUSSION OF THE TURBO SYSTEM

A 1997 BMW Z3 with a 2.8L fuel injected engine was used for the evaluation of the turbocharger. Testing consisted of one Cold Start CVS-75 Federal Test Procedure in the modified configuration, and an OBD II evaluation. The dynamometer inertia weight and horsepower settings were 3125-lbs and 7.6-hp, respectively. The emissions testing was conducted by Environmental Testing Corporation. Table 1. list emission results in gm/mi.

Table 1.

	NMOG	CO	NOx
Standards	0.125	3.4	0.4
Device w/ dfs	0.103	1.89	0.15

Results from the emission tests conducted at Environmental Testing Corporation show the vehicle emissions with the 5 PSI. Turbocharger installed to be below the vehicle's emission standards with deterioration factors. Based on the test results, the staff concludes that the installation of the Mechtech Motorsports, Inc.'s 5 PSI. Turbo System will not have an adverse effect on exhaust emissions of the affected vehicles. The ARB did not perform testing to confirm the emission test results submitted by the applicant; however, ARB staff evaluated the impact of the turbocharger on the OBD II system. Scan tool testing confirmed that the turbocharger did not affect the vehicle's ability to perform the OBD II system operation. Therefore, based on the test results and OBD II evaluation, the staff concludes that the



installation of the turbocharger will not have an adverse effect on exhaust emissions on those applicable vehicles when operated similar to the CVS-75 Federal Test Procedure.

BMW certified some 2.8 liter engine families in 1996/97 to the Enhanced Evaporative Emission Standards. The vehicle's evaporative emissions should not be affected because the installation of Mechtech Motorsports, Inc.'s Turbo System does not modify the vehicle's fuel or evaporative emission control system in a way that would affect its function. Mechtech Motorsports, Inc. has submitted all the required information and fulfilled the requirements for an exemption.