

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-126-4

Relating to Exemptions Under Section 27156  
of the California Vehicle Code

General Motors Service Parts Operations  
GMSPO 2.4 L Supercharger Kit

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-02-003;

IT IS ORDERED AND RESOLVED: That the installation of the GMSPO 2.4 L Supercharger Kit (p/n 12498287), marketed by General Motors Service Parts Operations, and produced by Roush Industries, 28400 Plymouth Rd., Livonia, Michigan 48150, has been found not to reduce the effectiveness of the applicable vehicle pollution control systems and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for the 2000-2002 GM 2.4 liter Cavalier & Sunfire vehicles with manual transmission.

The GMSPO 2.4 L Supercharger Kit (p/n 12498287) consists of a new intake manifold assembly that contains a Magnuson supercharger assembly, an intake manifold, a set of 3.7 gram/sec fuel injectors to replace the stock injectors (3.3 gram/sec), replacement manifold absolute pressure sensor, and a new fuel calibration that is downloaded onto the stock ECU. The GMSPO Supercharger Kit utilizes a 2.800 inch diameter pulley, the stock crankshaft pulley is retained.

This Executive Order is valid provided that the installation instructions for the GMSPO 2.4 L Supercharger Kit 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 GMSPO 2.4 L Supercharger Kit, as exempt by the Air Resources Board, which adversely affect the performance of the vehicle's pollution control system shall invalidate this Executive Order.

This Executive Order shall not apply to any GMSPO 2.4 L Supercharger Kit advertised, offered for sale, sold with, or installed on a new motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

Marketing of the GMSPO 2.4 L Supercharger Kit using any identification other than that shown in this Executive Order or marketing of the GMSPO 2.4 L Supercharger Kit for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board.

This Executive Order does not constitute any opinion as to the effect the use of the GMSPO 2.4 L Supercharger Kit may have on any warranty either expressed or implied by the vehicle manufacturer.

This Executive Order is granted based on emission test results in the modified configuration using the Cold-Start CVS-75 Federal Test Procedure and an examination of the On-Board Diagnostic II (OBD II) system. A 2002 GM Sunfire with a 2.4 liter engine (2GMXV02.4022, LEV, PC) was used for the evaluation of the GMSPO 2.4 L Supercharger Kit. Results from emissions testing conducted at Roush Industries Vehicle Emissions Laboratory, of Livonia, Michigan, are shown below (in grams per mile):

50k	NMOG	CO	NOx	HCHO
Emission Level	0.067	1.120	0.163	0.001
(w. DF applied)				
STD	0.075	3.4	0.2	0.015
100k	NMOG	CO	NOx	HCHO
Emission Level	0.068	1.240	0.183	0.001
(w. DF applied)				
STD	0.090	4.2	0.3	0.018

The emission test results in the modified configuration were below the applicable certification standards. Examination of the OBD II system showed the GMSPO 2.4 L Supercharger Kit does not affect OBD II operation. Therefore, based on the test results, the staff concludes that the GMSPO 2.4 L Supercharger Kit meets the criteria for exempting general criteria parts.

However, the ARB finds that reasonable grounds exist to believe that use of the GMSPO 2.4 L Supercharger Kit may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the CVS-75 Federal Test Procedure. 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 GMSPO 2.4 L Supercharger Kit adversely affect 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 GMSPO 2.4 L Supercharger Kit will affect the durability of emission control systems, General Motors Service Parts Operations shall be required to submit durability data to show that the durability of vehicle emission control systems are not, in fact, affected and/or that the add-on or modified part demonstrates adequate durability.

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

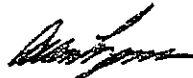
continues to meet the standards and procedures of Title 13, California Code of Regulations, Section 2222, et seq.

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 THE GMSPO 2.4 L SUPERCHARGER KIT.

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 is made after the hearing that grounds for revocation exist.

Executed at El Monte, California, this 12<sup>TH</sup> day of June, 2002.



Allen Lyons, Chief  
Mobile Source Operations Division

## EVALUATION SUMMARY

Manufacturer Name: General Motors Service Parts Operations

Name of Device: GMSPO 2.4 L Supercharger Kit

### Background:

Roush Industries of 28400 Plymouth Rd., Livonia, Michigan 48150, on behalf of General Motors Service Parts Operations, has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the GMSPO 2.4 L Supercharger Kit designed for the 2000-2002 GM 2.4 liter Cavalier & Sunfire vehicles with manual transmission.

### Recommendation:

Grant exemption to General Motors Service Parts Operations as requested, and issue Executive Order D-126-4.

### Device Description:

The intent of installing the GMSPO 2.4 L Supercharger Kit is to increase power output from the engine. The power increase is due to the increase in air induction by pressurization by the supercharger, which is accompanied by fuel enrichment by the upgraded fuel injectors and fuel calibration.

The GMSPO 2.4 L Supercharger Kit was designed to be installed on 2000-2002 GM 2.4 liter Cavalier & Sunfire vehicles with manual transmission. The GMSPO Supercharger Kit (p/n 12498287) includes a new intake manifold assembly that contains a Magnuson supercharger assembly, an intake manifold, a set of 3.7 gram/sec fuel injectors to replace the stock injectors (3.3 gram/sec), replacement manifold absolute pressure sensor, and a new fuel calibration that is downloaded onto the stock ECU. The GMSPO Supercharger Kit utilizes a 2.800 inch diameter pulley, and the stock crankshaft pulley is retained. Maximum boost produced by the supercharger is 5.14 PSI.

### Discussion/Basis for the Recommendation:

A 2002 GM Sunfire with a 2.4 liter engine (2GMXV02.4022) was used for the evaluation of the GMSPO 2.4 L Supercharger Kit. The test vehicle was certified to the passenger car Low-Emission Vehicle emission standards and was equipped with On-Board Diagnostic (OBD) II system. Testing consisted of one CVS-75 FTP in the modified configuration to set all readiness codes, and measure emissions. The ARB did not perform testing to confirm the test results submitted by the applicant.

Results from emissions testing conducted at Roush Industries Vehicle Emissions Laboratory, of Livonia, Michigan, are shown below (in grams per mile):

50k	NMOG	CO	NOx	HCHO
Emission Level (w. DF applied)	0.067	1.120	0.163	0.001
STD	0.075	3.4	0.2	0.015
100k	NMOG	CO	NOx	HCHO
Emission Level (w. DF applied)	0.068	1.240	0.183	0.001
STD	0.090	4.2	0.3	0.018

The emission test results in the modified configuration were below the applicable certification standards. All OBD II system readiness indicators set in the modified configuration, and no diagnostic trouble codes were triggered. Therefore, based on the test results, the staff concludes that the GMSPO 2.4 L Supercharger Kit meets the criteria for the exemption of general criteria parts. However, the ARB finds that reasonable grounds exist to believe that use of the GMSPO 2.4 L Supercharger Kit may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the previously prescribed test procedure. Accordingly, the ARB reserves the right to conduct additional emission tests in the future, as such tests are developed.

Based on the CVS-75 FTP and OBD-II test results, the staff concludes that the GMSPO 2.4 L Supercharger Kit meets the requirements for a VC 27156 exemption for the 2000-2002 GM 2.4 liter Cavalier & Sunfire vehicles with manual transmission.