

State of California
AIR RESOURCES BOARD

Executive Order D-392
Relating to Exemptions Under Section 27156
of the Vehicle Code

ADVANCED ENGINE MANAGEMENT
AEM COLD AIR SYSTEM
PART NUMBERS 21-400 and 21-401

Pursuant to the authority vested in the Air Resources Board (ARB) 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-45-9;

IT IS ORDERED AND RESOLVED: That the installation of the AEM Cold Air System, part numbers 21-400 and 21-401, manufactured by Advanced Engine Management of 15606 S. Broadway Center Street, Gardena, California 90248 has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the AEM Cold Air System, part numbers 21-400 and 21-401, is exempt from the prohibitions of Section 27156 of the California Vehicle Code for installation on 1988-1991 model-year Honda Civics (part number 21-400) and 1992-1995 model-year Honda Civics (part number 21-401), excluding those Honda Civics that have been certified to meet the California Transitional Low Emission Vehicle emission standards (0.125 grams/mile NMOG).

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

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

Marketing of the device using an identification other than that shown in this Executive Order or marketing of the device for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the ARB. Exemption of the device 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 is granted based on the determination that the device would not show an adverse effect in emissions if tested using the Cold-Start CVS-75 Federal Test Procedure. However, the ARB finds that reasonable grounds exist to believe that use of the device 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 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 device 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 device will affect the durability of the emission control system, Advanced Engine Management 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 any opinion as to the effect the use of the 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 ADVANCED ENGINE MANAGEMENT'S AEM COLD AIR SYSTEM, PART NUMBERS 21-400 AND 21-401.

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 Executive Order. The Executive Order may be revoked only after a ten-day written notice of intention to revoke the Executive Order, in which period the holder of the Executive 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 Executive Order may not be revoked until a determination after the hearing that grounds for revocation exist.

Executed at El Monte, California, this 19th day of December 1995.


R. B. Summerfield
Assistant Division Chief
Mobile Source Division

State of California
AIR RESOURCES BOARD

EVALUATION OF ADVANCED ENGINE MANAGEMENT'S
AEM COLD AIR SYSTEM, PART NUMBERS 21-400 & 21-401
FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE
SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE
CALIFORNIA CODE OF REGULATIONS

December 1995

State of California
AIR RESOURCES BOARD

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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 the mention of trade names or commercial products constitute endorsement or recommendation for use.)

SUMMARY

Advanced Engine Management of 15606 S. Broadway Center Street, Gardena, California 90248 has applied for exemption from the prohibitions of Section 27156 of the California Vehicle Code for their AEM Cold Air System, part numbers 21-400 and 21-401. The cold air system is designed for installation on 1988-1995 model-year Honda Civics, excluding those Honda Civics that have been certified to meet the Transitional Low Emission Vehicle emission standards (0.125 grams/mile NMOG).

Based on engineering evaluation of the AEM Cold Air System, the staff concludes that Advanced Engine Management's AEM Cold Air System will not adversely affect the exhaust emissions from those vehicles for which the exemption is requested. The staff recommends that Advanced Engine Management be granted an exemption as requested and that Executive Order Number D-392 be issued.

CONTENTS

	Page Number
SUMMARY	i
CONTENTS	ii
I. INTRODUCTION	1
II. CONCLUSION	1
III. RECOMMENDATION	1
IV. DEVICE DESCRIPTION AND OPERATION	2
V. DEVICE EVALUATION AND DISCUSSION	2

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EVALUATION OF ADVANCED ENGINE MANAGEMENT'S AEM COLD AIR SYSTEM,
PART NUMBERS 21-400 & 21-401 FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE
CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13 OF
THE CALIFORNIA CODE OF REGULATIONS

I. INTRODUCTION

Advanced Engine Management (AEM) of 15606 S. Broadway Center Street, Gardena, California 90248 has applied for an exemption from the prohibitions of Section 27156 of the California Vehicle Code for their AEM Cold Air System, part numbers 21-400 and 21-401, for installation on 1988-1991 model-year Honda Civics and 1992-1995 model-year Honda Civics, respectively, excluding those Honda Civics that have been certified to meet the California Transitional Low Emission Vehicle emission standards (0.125 grams/mile NMOG). AEM has submitted all the drawings, specifications, and the installation instructions for the AEM Cold Air System for evaluation.

II. CONCLUSION

Based on an engineering evaluation, the staff concludes that the AEM Cold Air System, part numbers 21-400 and 21-401, will not adversely affect the exhaust emissions from those vehicles for which the exemption is requested, and therefore, meets the criteria set forth in Section 27156 of the California Vehicle Code and Title 13 of the California Code of Regulations.

III. RECOMMENDATION

The staff recommends that AEM be granted an exemption as requested for their AEM Cold Air System, part numbers 21-400 and 21-401, and that Executive Order No. D-392 be issued.

IV. DEVICE DESCRIPTION AND OPERATION

The AEM Cold Air System, part numbers 21-400 and 21-401, is designed to replace the original equipment manufacturer (OEM) intake air system including the intake air pipe, resonator, air cleaner, and the intake air duct. The AEM Cold Air System, part number 21-400, has been designed for installation on 1988-1991 model-year Honda Civics, and part number 21-401 has been designed for installation on 1992-1995 model-year Honda Civics. The two systems are identical in their components with the exception of the air pipes - part number 21-400 consists of two connecting air pipes whereas part number 21-401 consists of only one air pipe.

The AEM Cold Air System utilizes an air filter, Turbo-Flow Air Funnel, inlet air pipe(s), and the necessary connection hoses and clamps. The air filter is a conical frustum with woven cotton fabric sandwiched between two layers of wire mesh screen. The filter diameters range from 5 to 7 inches, and the height measures 6 inches. The base of the air filter is attached to the Turbo-Flow Air Funnel measuring 7 inches in diameter and connects to the 2.5 inches diameter Turbo-Flow Air Horn. The air pipes are constructed of aluminum for its high resistant to corrosion and its light weight. The two connecting air pipes for part number 21-400 measure 23.07 inches and 11.30 inches in centerline lengths, 2.5 inches in outer diameter, and 0.065 inches in wall thickness. The air pipe for part number 21-401 measures 35.03 inches in centerline length, 2.5 inches in outer diameter, and 0.065 inches in wall thickness. The outlet of the air pipe is fitted to the throttle body using a connector and a clamp.

The AEM Cold Air System operates in conjunction with the OEM computer-controlled fuel injection and emission control systems. The installation of the AEM Cold Air System does not re-route, modify, remove, or interfere with the required emission control system components. The

tune-up specifications are also unaltered from the OEM tune-up parameters.

V. DEVICE EVALUATION AND DISCUSSION

The AEM Cold Air System has been designed for application on 1988-1995 model-year Honda Civics. An engineering evaluation was conducted to determine the impact of the AEM Cold Air System on exhaust emissions. The major concerns regarding the cold air system are that the system may significantly alter the air flow resulting in an increase in evaporative and/or exhaust emissions and the system modifies the existing intake air duct which may affect exhaust emissions.

Since the AEM Cold Air System replaces a closed air cleaner housing with an open element air cleaner, gasoline vapors could escape into the atmosphere. The vehicles for which the exemption is requested are equipped with electronic fuel injection systems which by design eliminate potential leaks. The fuel injection valves are electromagnetically actuated where during static conditions, the fuel injectors are designed to be closed tightly. The electromagnet pulls the injector open against the fuel flow making it more difficult to open with increased fuel flow and pressure. In addition, fuel injected systems utilize intake manifolds which are designed to allow air flow in only one direction, inward to the intake valve. The installation of the AEM Cold Air System does not alter the location of the evaporative emissions canister or hoses. With these findings, staff concludes that use of the open element air cleaner will not have an adverse effect on evaporative emissions.

The vehicles for which the exemption is requested use speed density fuel injection systems where intake manifold pressure and engine speed are used to calculate the air flow volume. Based on the calculated air flow, the engine control module (ECM) determines the required amount of

fuel for achieving the proper air-fuel ratio under various vehicle operating conditions. Since the AEM Cold Air System inlet is placed low and outside of the engine compartment, it may draw in colder and denser air. In order to maintain the proper air-fuel ratio, the ECM compensates for this change in air density through a signal from the intake air temperature sensor which is located in the intake manifold. The installation of the AEM Cold Air System does not alter the location of the intake air temperature sensor. Therefore, the change in the air induction system will not affect the air-fuel ratio, and in turn, the exhaust emissions.

Since the primary purpose of the air cleaner duct is to reduce intake tract noise on fuel injected vehicles, the replacement of the OEM air duct and the resonator with the AEM Cold Air System will not adversely affect exhaust emissions.

Based on the above evaluation, staff concludes that the AEM Cold Air System will have no adverse effect on exhaust emissions during closed-loop operations, which are characterized by the Cold-Start CVS-75 Federal Test Procedure. However, during open-loop conditions, such as quick accelerations, stoichiometric air-fuel ratio is not maintained, and the exhaust emissions could potentially increase. Since there is no established test procedure to evaluate emissions during open-loop driving conditions, the ARB has not required or conducted any testing. The ARB reserves the right to conduct emission tests, in the future, as such tests are developed, that will more adequately measure emissions from all driving cycles.

Advanced Engine Management has submitted all the required information and has fulfilled the requirements for an exemption.