

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-377-3
Relating to Exemptions Under Section 27156
of the Vehicle Code

AUTOMOTIVE SYSTEMS GROUP, INC.
HIPERFLOW INDUCTION 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 Hiperflow Induction system manufactured by Automotive Systems Group, Inc. of 6644 San Fernando Road, Glendale, California, 91201, 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 the following vehicles:

<u>Part Number</u>	<u>Model Years</u>	<u>Vehicle Models</u>	<u>Displacement</u>
H03041	1988-1991	Honda Civic and CRX	1.6L
H03042	1992-1995	Honda Civic DX, EX, LX, Si	1.6L
H03042	1992-1995	Honda Civic del Sol S and Si	1.6L
H03045	1994-1995	Acura Integra RS and LS	1.8L
H03046	1994-1995	Acura Integra GSR	1.6L

This Executive Order is valid provided that the installation instructions for the Hiperflow Induction system will not recommend tuning the vehicle to specifications different from those submitted by Automotive Systems Group, Inc.

Changes made to the design or operating conditions of the Hiperflow Induction system, as exempt by the Air Resources Board, which adversely affect the performance of a vehicle's pollution control system shall invalidate this executive order.

Marketing of the Hiperflow Induction system using any identification other than that shown in this Executive Order or marketing of the Hiperflow Induction system 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 Hiperflow Induction system 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 that the use of the Hiperflow Induction system may have on any warranty either expressed or implied by the vehicle manufacturer.

This Executive Order is granted based on an evaluation of emissions tests were conducted in accordance with Cold-Start CVS-75 Federal Test Procedure. However, the Air Resources Board finds that reasonable grounds exist to believe that use of the Hiperflow Induction system may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the previously prescribed test procedures. Accordingly, the Air Resources Board 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 Hiperflow Induction system 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 Air Resources Board with reason to suspect that the Hiperflow Induction system will affect the durability of the emission control, Automotive Systems Group, Inc. shall be required to submit durability data to show that the durability of the vehicle emissions control system is not, in fact, affected and/or that the add-on or modified part demonstrates adequate durability.

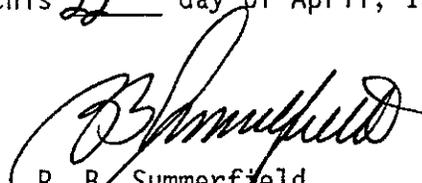
In addition to the foregoing, the Air Resources Board reserves the right in the future to review this Executive Order and the exemption provided herein to assure that the exempted add-on or modified part continues to meet the standards and procedures of Title 13, California Code of Regulations, Section 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 AUTOMOTIVE SYSTEMS GROUP, INC.'S HIPERFLOW INDUCTION 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 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 22nd day of April, 1996.


R. B. Summerfield
Assistant Division Chief
Mobile Source Division

State of California
AIR RESOURCES BOARD

EVALUATION OF AUTOMOTIVE SYSTEMS GROUP, INC.'S
HIPERFLOW INDUCTION SYSTEM
FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE
SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE
CALIFORNIA CODE OF REGULATIONS

APRIL 1996

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by

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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

Automotive Systems Group, Inc. of 6644 San Fernando Road, Glendale, CA 91201 has applied for exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the Hiperflow Induction system designed for the following vehicles:

<u>Part Number</u>	<u>Model Years</u>	<u>Vehicle Models</u>	<u>Displacement</u>
H03041	1988-1991	Honda Civic and CRX	1.6L
H03042	1992-1995	Honda Civic DX, EX, LX, Si	1.6L
H03042	1992-1995	Honda Civic del Sol S and Si	1.6L
H03045	1994-1995	Acura Integra RS and LS	1.8L
H03046	1994-1995	Acura Integra GSR	1.6L

Based on an engineering evaluation of the Hiperflow Induction system, the staff concludes that the Hiperflow Induction system will not adversely affect exhaust emission from vehicles for which the exemption is requested.

The staff recommends that Automotive Systems Group, Inc. be granted an exemption as requested and that Executive Order D-377-3 be issued.

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EVALUATION OF AUTOMOTIVE SYSTEMS GROUP, INC.'S HIPERFLOW INDUCTION SYSTEM
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

Automotive Systems Group, Inc. (ASG) of 6644 San Fernando Road, Glendale, CA, 91201 has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code for the Hiperflow Induction system designed for installation on the following vehicles:

<u>Part Number</u>	<u>Model Years</u>	<u>Vehicle Models</u>	<u>Displacement</u>
H03041	1988-1991	Honda Civic CRX	1.6L
H03042	1992-1995	Honda Civic DX, EX, LX, Si	1.6L
H03042	1992-1995	Honda Civic del Sol S and Si	1.6L
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H03046	1994-1995	Acura Integra GSR	1.6L

Automotive Systems Group, Inc. submitted installation instructions with drawings and description of the kit. Automotive Systems Group, Inc. has submitted a sample Hiperflow Induction system which was evaluated for this application.

II. CONCLUSIONS

Based on an engineering evaluation of the Hiperflow Induction system, the staff concludes that Automotive Systems Group, Inc.'s Hiperflow Induction system will not adversely affect exhaust emissions from the vehicles for which the exemption is requested.

III. RECOMMENDATION

The staff recommends that ASG be granted an exemption for their Hiperflow Induction system for installation on the vehicles listed above. The staff also recommends that Executive Order D-377-3 be issued.

IV. HIPERFLOW INDUCTION SYSTEM DESCRIPTION AND OPERATION

The Hiperflow Induction system consists of an open element air filter and intake pipe with all the necessary mounting brackets, bolts, screws, and nuts for installation. According to ASG, the Hiperflow Induction system is designed to be less restrictive than the OEM air filter system to allow the engine to gain more horsepower. The Hiperflow Induction system does not require any significant relocation or modification of any of the OEM emission control components.

The Hiperflow Induction system uses a K & N filter made of woven fabric sandwiched between two layers of wire mesh screen and a velocity stack which serves to smooth the incoming air flow. The Hiperflow Induction system does not defeat any emission control devices required by the manufacturer nor does it alter or circumvent the vehicle's on-board diagnostic system.

All of the Honda Civic and Acura Integra models in this application have a positive crankcase ventilation (PCV) breather hose attached to the original equipment manufacturer's (OEM's) intake tract. ASG provides a port for the PCV breather hose and an extension for this hose since the intake tract requires this hose to be moved slightly upstream from the OEM configuration.

The Automotive Systems Group, Inc. Hiperflow Induction system does not affect the tune-up specifications.

V. DISCUSSION

The ASG Hiperflow Induction system is designed for installation on the vehicles listed below:

<u>Part Number</u>	<u>Model Years</u>	<u>Vehicle Models</u>	<u>Displacement</u>
H03041	1988-1991	Honda Civic CRX	1.6L
H03042	1992-1995	Honda Civic DX, EX, LX, Si	1.6L
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An engineering evaluation was conducted to determine the impact of the Hiperflow Induction system on emissions. The Air Resources Board's (ARB's) concerns regarding the air filter are that the air flow could significantly increase evaporative emissions, changes in the mass air flow measurement could affect exhaust emissions, and the positive crankcase ventilation (PCV) system may be compromised by an open element air filter.

Since the ASG Hiperflow Induction system replaces a closed air cleaner housing with an open element filter, the ARB was concerned that gasoline vapors could escape from the manifold, through the open element filter, into the atmosphere. The vehicles for which exemption is requested are equipped with electronic fuel injection, which is designed to eliminate potential gasoline vapor leaks. During static condition, the fuel injectors are designed to operate by an electromagnet that pulls the injector open against the fuel flow. The ARB has previously reviewed tests conducted on various fuel injector sizes in which fuel flow and pressure were simultaneously increased. The tests

showed that as pressure is increased, the fuel injectors tend to hydraulically lock. This condition causes the injector to be more difficult to open and reduces leaks. In addition, fuel injected vehicles use intake manifolds which are designed to flow air in only one direction, inward to the intake valve. Furthermore, the design of the Hiperflow Induction system does not alter the location of the evaporative emissions components or hoses. With these findings, staff concludes there will be no adverse impact on evaporative emissions due to the use of an open element air cleaner.

ASG stated that the mass air flow measurement technique used on the vehicles for which the exemption is requested are the manifold absolute pressure sensor for speed-density calculations. The open element air filter does not have a housing or intake ducting which straighten the intake flow to allow for laminar flow. This could cause the intake flow to be turbulent. ASG states that the Hiperflow Induction system does not require alteration or modification of the OEM specifications. The manifold absolute pressure sensors on the vehicles listed above are located downstream from the air filter element and thus, the pressure sensing and subsequent fuel metering capabilities will not be adversely affected by the Hiperflow Induction system. In addition, pressure sensing capabilities should not be significantly affected by changes in flow conditions caused by an open element air filter.

All of the Honda Civic and Acura Integra models in this application have a positive crankcase ventilation (PCV) hose attached to the original equipment manufacturer's (OEM's) intake tract. ASG provides a port for the PCV breather hose and an extension for this hose since the intake tract requires this hose to be moved slightly upstream from the OEM configuration. Thus the placement of this hose on the Hiperflow Induction system filter should not affect the operation of the system. Additionally, the PCV breather hose is used to

supply fresh air to the crankcase through a one-way checkvalve which does not allow the passage of vapors in the air cleaner direction. Therefore, no emissions impact is expected from this connection.

The vehicles for which the exemption is requested are designed to operate in a closed-loop configuration, which is characterized by the Cold-Start CVS-75 Federal Test Procedure driving cycle. While the vehicle operates under closed-loop configuration, the on-board computer monitors the air/fuel mixture to maintain it near a stoichiometric condition. The on-board computer receives voltage signals from the oxygen sensor and interprets them as either richer or leaner than a stoichiometric fuel mixture. Based on the oxygen sensor signal, the on-board computer either increases the amount of air flow (to lean the mixture) or increases the amount of fuel (to richen the mixture) to maintain the fuel mixture near stoichiometric. Although the Hiperflow Induction system could change the air flow, the on-board computer will compensate and keep the air/fuel mixture at stoichiometric levels during closed-loop operations. Therefore, the Hiperflow Induction system will have no adverse affects on exhaust emissions of the affected vehicles during closed-loop operations.

However, during open-loop operations such as quick accelerations, air and fuel is being supplied on demand and the fuel mixture is not necessarily maintained near stoichiometric. Although the Hiperflow Induction system could potentially increase emissions during open-loop operations, the ARB has not established an official test procedure to evaluate emissions during open-loop operations. The ARB, therefore, reserves the right to conduct emissions tests, in the future, as such tests are developed, that will more adequately measure emissions from all driving cycles.