

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-75-2
Relating to Exemptions under Section 27156
of the Vehicle Code

CAGLE CORPORATION
"CAGLE MARK II AUTOMATIC FUEL CONTROL" DEVICE

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 "Cagle Mark II Automatic Fuel Control" device manufactured by Cagle Corporation, 2667 E. 28th St, Long Beach, CA 90806 has been found to not 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 1979 and older model year gasoline powered motor vehicles using conventional or variable venturi carburetors and mechanical or electric fuel pumps with and without recirculation systems.

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.

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 "CAGLE MARK II AUTOMATIC FUEL CONTROL" DEVICE.

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.

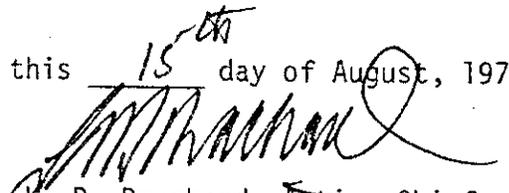
Section 43644 of the Health and Safety Code provides as follows:

"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 Orders D-75, dated June 13, 1977 and D-75-1, dated September 21, 1977 are superseded and of no further force and effect.

Executed at El Monte, California, this ^{15th} day of August, 1979.


R. D. Drachand, Acting Chief
Mobile Source Control Division

State of California
AIR RESOURCES BOARD

August 3, 1979

Addendum to Staff Report
Dated September 15, 1977

Evaluation of the Cagle Corporation
Mark II Automatic Fuel
Control" Device for Compliance
with the requirements of Section
27156 of the Vehicle Code.

I. Introduction

The Cagle Corporation by letter dated November 7, 1978, (Exhibit A) has requested an update of their Executive Order D-75-1 to include the 1979 and older model year vehicles. A description of the device, its operation, previous test data, and a discussion of the theory will be found in the attached Staff report dated September 15, 1977.

II. Air Resources Board Laboratory Tests

Since the late model vehicles tend to run on leaner air-fuel ratios, and the emission control systems are more complex, the staff thought it advisable to perform tests on 1979 vehicles.

The following tests were run.

Vehicle #1.

This was a 1979 Ford LTD Landau with a 302 CID engine and a variable venturi carburetor. Two devices were run on this vehicle since there was a stalling problem at idle during the cold start tests after the devices were installed. Two starts were required.

The results were as follows:

Device #1

	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
Baseline	0.313	0.34	1.59	13.0
Device	0.283	1.52	1.55	13.0
% Change	-9.6	+347.1	-2.5	0.0

The increase in CO was attributed to the stalling problem and therefore the tests were repeated using a second device.

Device #2

	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
Baseline	0.233	0.66	1.53	12.9
Device	0.348	1.56	1.57	12.8
% Change	+49.4	+136.4	+2.6	-0.8

The increase in HC and CO was again attributed to the stalling problem during the device test. In order to eliminate any chance that it might be the vehicle that was at fault, a second vehicle was tested using the second device:

Vehicle #2 - 1979 Ford LTD, 302 CID engine with a variable venturi carburetor, License #811 VPE.

The results were as follows:

	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
Baseline #1	0.527	1.09	1.47	13.2
Baseline #2	<u>0.638</u>	<u>0.84</u>	<u>1.64</u>	<u>12.9</u>
Average	0.582	0.97	1.55	13.1

	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
Device	0.6504	1.45	1.54	13.2
% Change	+3.9	+51.5	0.0	+0.8

This vehicle also stalled during the cold start test with the device. Three starts were required.

Based on the above test results which showed increased emissions, the application was denied (Exhibit B)

III. Applicant's request for reconsideration

The applicant requested reconsideration of its application and submitted the following test data in support of this request (Exhibit C)

Laboratory - W. R. Grace, Garden Grove, CA

Test Vehicles - 1979 Ford Granada 302 CID, Vehicle #172600

(variable venturi carburetor)

- 1979 Chevrolet El Camino 305 CID Vehicle # 410354

	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
Ford Baseline	0.230	0.850	1.139	14.367
Device	0.260	0.900	1.219	14.306
% Change	+13.0	+5.9	+7.0	-.4
Chevrolet Baseline	0.410	4.320	1.269	14.534
Device	0.460	2.620	1.252	14.285
% Change	+12.2	-39.4	-1.3	-1.7

No stalling problems were noted. Emissions could be considered within acceptable testing variation limits.

IV. Air Resources Board Confirmatory Tests

In order to confirm the W. R. Grace data, the applicant was requested to submit the same Ford vehicle tested by W. R. Grace to this laboratory for confirmatory testing. The results were as follows.

	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
Baseline	0.259	1.69	1.18	14.2
Device	0.255	1.43	1.20	14.2
% Change	-1.5	-15.4	+1.7	0.0

No stalling problems and no increase in emissions were noted.

Since both the vehicle and the device were submitted by the applicant, the staff felt that additional tests were needed. By adjusting the float in the carburetor fuel bowl, the results could be altered to favor the device. The staff therefore chose the devices to be tested from the applicants inventory at the factory and the vehicles were rented from Hertz.

The results of these tests were as follows:

Vehicle #1 - 1979 Ford Fairmont, License No. 637 WCH,
302 CID engine with a variable venturi carburetor.

	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
Baseline	0.492	3.37	2.46	15.2
Device	0.517	3.65	2.48	15.2
% Change	+5.1	+8.3	+0.8	0.0

Vehicle #2 - 1979 Chevrolet Malibu, License No. 604 WOF, 231

CID engine, 6 cyl.

	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
Baseline	0.440	9.43	0.89	15.2
Device	0.353	6.21	0.89	16.0
% Change	-19.8	-34.1	0.0	+5.3

In addition fuel pressure measurements were taken before and after the regulator for various manifold vacuums. The results were as follows for the Chevrolet vehicle.

<u>Manifold Vacuum</u>	<u>Normal Fuel Pressure #/in²</u>	<u>Regulated Fuel Pressure #/in²</u>	<u>Change in Pressure</u>
15	4.2	2.55	1.65
13	4.2	2.50	1.70
11	4.2	2.50	1.70
9	4.2	3.05	1.15
7	4.2	3.70	0.50
5	4.2	3.88	0.32
3	3.6	3.6	0

V. Discussion

The staff is at a loss to explain the stalling problem in the first two vehicles tested. However subsequent tests did not show any such problem and the vehicle emissions were within acceptable limits. The device did not show any significant increase in miles per gallon.

VI. Conclusion

Based on the majority of the test results and an engineering evaluation, the staff feels that the use of the "Cagle Mark II Automatic Fuel Control" Device should not have an adverse effect on the exhaust emission control systems of vehicles with conventional or variable venturi carburetors and mechanical or electric fuel pumps with and without recirculation systems.

VII. Recommendation

In view of the above discussion and conclusion the staff feels that granting the Cagle Corporation an exemption from the prohibitions of Section 27156 of the California Vehicle Code for its "Cagle Automatic Fuel Control" device for installation on 1979 and older model vehicles using conventional or variable venturi carburetors with mechanical or electric fuel pumps with and without recirculating systems is justified. The staff recommend adopting Executive Order D-75-2.