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State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-20
Relating to exemptions under Section 27156
of the Vehicle Code

TRI-STAR CORPORATION
"TIGER 500"

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 39023 of the Health and Safety Code;

IT IS ORDERED AND RESOLVED: That the installation of "Tiger 500" ignition system manufactured by Tri-Star Corporation 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 1955-74 model-year vehicles except 1973-74 Mercedes Benz, Mazda, Audi and Porsche vehicles, all General Motors Corporation vehicles equipped with an integrated coil and distributor, and those 1966-70 model-year vehicles equipped with incompatible NOx retrofit systems such as the Dana and Carter devices which employ electronic speed sensors. The device consists of a d-c to d-c converter, capacitor, and silicon controlled rectifier electronic switch.

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

Changes made to the design or operating conditions of the device as originally submitted to the Air Resources Board for evaluation that adversely affect the performance of the vehicle's pollution control devices 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 have prior approval of the Air Resources Board.

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 "TIGER 500" 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.

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Section 17500 of the Business and Professions Code makes unlawful, untrue or misleading advertising and Section 17534 makes violation punishable as a misdemeanor.

Section 39130 and 39184 of the Health and Safety Code provide as follows:

"39130. No person shall install, sell, offer for sale, or advertise, or, except in an application to the board for certification of a device, represent, any device as a motor vehicle pollution control device unless that device has been certified by the 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 section is a misdemeanor."

"39184. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the board for accreditation 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 accredited by the board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as an accredited device which, in fact, is not an accredited device. Any violation of this subdivision is a misdemeanor."

Any apparent violation of the policy or laws will be submitted to the Attorney General of California for such action as he deems advisable.

Executed at Sacramento, California, this 28th day of February, 1974.

WILLIAM SIMMONS
Executive Officer

State of California

AIR RESOURCES BOARD

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Staff Report

Evaluation of the Tri-Star Corporation
"Tiger 500"
Capacitive Discharge Ignition
Systems for Exemption to the Prohibitions
of Section 27156 of the Motor Vehicle Code

I. Introduction

The Tri-Star Corporation, Grand Junction, Colorado, has applied for exemption to the prohibitions of Section 27156 of the Motor Vehicle Code for the "Tiger 500" capacitive discharge ignition system.

Section 27156 prohibits the installation of any device which reduces the effectiveness of motor vehicle emission control systems. The applicant intends to sell the device as an "add-on" part to the standard ignition system of 1974 and older model-year vehicles.

II. System Description

For a general description of capacitive discharge ignition systems, see staff report "Evaluation of Capacitive Discharge and Transistorized Ignition Systems for Compliance with the Requirements of Section 27156 of the Motor Vehicle Code", dated February 14, 1973.

The "Tiger 500" device consists of circuits for a d-c to d-c converter, storage capacitor and a silicon controlled rectifier which serves as an electronic switch, and a trigger conditioner.

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III. Emission Testing

The applicant submitted an electrical schematic and described the system operation in addition to supplying CVS test data on three vehicles. Based on the manufacturer's data and claims regarding no significant ignition system deterioration, there were no adverse effects expected. The emission data supplied was acquired at an altitude of 5,000 feet and consequently confirmatory sea level tests were conducted by the ARB laboratory.

The "Tiger 500" device was tested by the ARB laboratory on the following vehicles:

1973 Chevrolet, 350 CID, 2 Bbl. Carb., EGR/AIR, Auto. Trans.

1973 Mercury, 302 CID, 2 Bbl. Carb., EGR, Auto. Trans.

1973 Plymouth, 360 CID, 2 Bbl. Carb., EGR/AIR, Auto. Trans.

The idle air fuel mixture and ignition systems of both vehicles were prechecked to insure proper engine operation. For all tests, with and without the device, the engine settings were adjusted to the vehicle manufacturer's specifications.

The results of the ARB tests are shown below:

<u>Hot CVS - grams/mile</u>			
	<u>HC</u>	<u>CO</u>	<u>NOx</u>
1973 Plymouth - Baseline	0.87	6.33	2.38
Device	0.94	5.88	2.38
% Change	8.05	-7.11	0
1973 Mercury - Baseline	2.45	14.09	2.53
Device	2.61	14.90	2.60
% Change	6.53	5.75	2.77
1973 Chevrolet- Baseline			
(Avg. 3 tests)	1.80	18.10	2.07
Device			
(Avg. 3 tests)	1.79	17.20	2.06
% Change	-0.56	-4.97	-0.48

Baseline and device spark timing advances were measured and with no significant difference noted in the engine timing between the two installations.

Open circuit voltages were measured at idle and 2,200 engine rpm on a 1973 Pontiac.

	<u>Open Circuit Spark Voltage</u>	
	<u>Idle (600 rpm)</u>	<u>2,200 rpm</u>
Baseline	22,000 volts	22,000 volts
Device	30,000 volts	28,000 volts

IV. Conclusions and Recommendations

It is the staff's opinion that the Tri-Star Corporation "Tiger 500" capacitive discharge ignition system will not adversely affect motor vehicle exhaust emissions when evaluated with respect to the exhaust emissions obtained with a conventional ignition system of a "tuned"

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engine. This device may also have a beneficial effect in the control of exhaust emissions if it maintains the "tuned" condition of the engine for a longer period of time. Therefore, the "Tiger 500" capacitive discharge ignition system should be exempt from the prohibitions of Section 27156 of the Motor Vehicle Code for the model years shown in Executive Order D-20.