

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-33
Relating to Exemptions under Section 27156
of the Vehicle Code

RoInCo
"STAMPEDE"

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 "Stampede" electronic capacitive discharge ignition system manufactured by RoInCo., 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 1974 and older model-year vehicles with 12-volt battery, standard ignition coil, contact set and negative ground except the following:

1. Vehicles originally equipped with an electronic ignition system whether it is a breakerless, capacitive discharge, or transistorized type.
2. All 1966-1970 model-year vehicles equipped with a Dana or Carter NOx retrofit device using an electronic speed sensor.

The device consists of a coil, capacitors, rectifiers, resistors, and a 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 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 "STAMPEDE" 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 unlawful, untrue or misleading advertising and Section 17534 makes violation punishable as a misdemeanor.

Sections 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 conditions of this Executive Order will be submitted to the Attorney General of California for such action as he deems advisable.

Executed at Sacramento, California, this 31 day of May, 1974.

WILLIAM SIMONS
Executive Officer

State of California

AIR RESOURCES BOARD

May 28, 1974

Staff Report

Evaluation of RoInCo.
"Stampede"

Electronic Capacitive Discharge Ignition System
For Exemption from the Prohibitions of
Section 27156 of the Motor Vehicle Code

I. Introduction

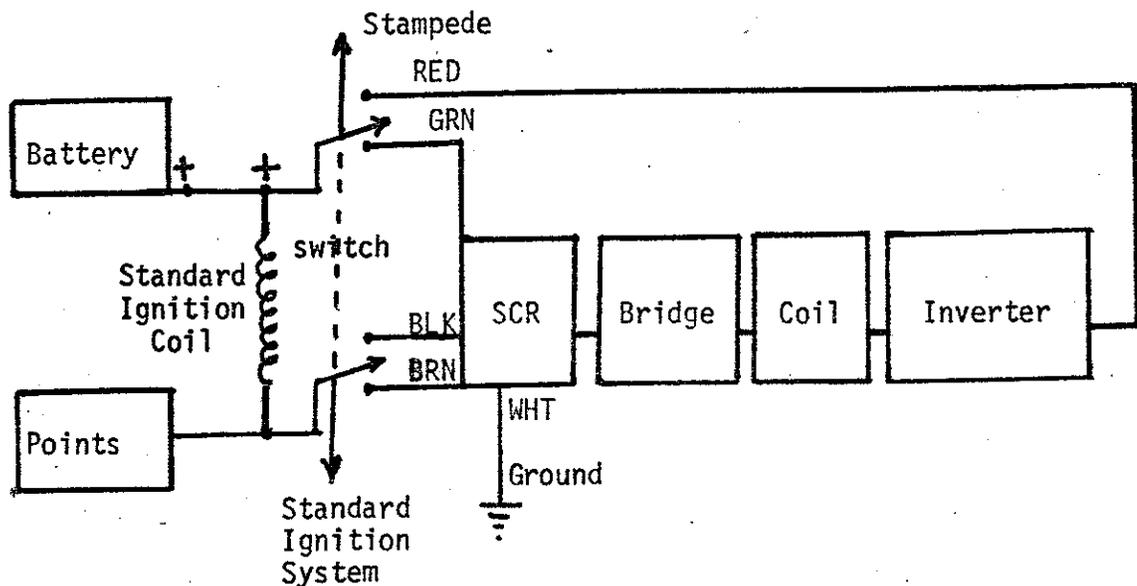
RoInCo., Edina, Minnesota, has applied for exemption from the prohibitions of Section 27156 of the Motor Vehicle Code for the "Stampede" electronic capacitive discharge system. Section 27156 prohibits the installation of any device which reduces the effectiveness of motor vehicle emission control systems. The applicant intends to sell the device as an "after-market" part to augment the existing standard ignition system for all 1974 and older model year vehicles equipped with a 12-volt battery, standard ignition coil, contact set, and negative ground except those vehicles having an OEM solid state ignition system.

The Air Resources Board has adopted criteria for the evaluation of "after-market" devices for compliance with Section 27156. The basis for evaluation is defined in the "Air Resources Board Criteria for Determining Compliance with Section 27156 of the Motor Vehicle Code, dated February 17, 1971.

II. System Description

For a general description of electronic capacitive discharge 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 "Stampede" device is a solid-state printed-circuit ignition system which consists of an inverter, a rectifier bridge, a storage capacitor, a coil, resistors, a silicon control rectifier and a switch. The switch is to allow converting back to the conventional ignition system (see Figure 1 below). The manufacturer claims that the "Stampede" device can deliver up to 40 KV with a relatively short rise time in any climate, keeps the engine in a "just tuned" condition up to 50,000 miles, and improves gas mileage.



"Stampede" Electronic Ignition System Schematic

Figure I

III. Laboratory Test Data

A. Applicant test data

The applicant submitted 1972 Federal hot start exhaust emission tests conducted by Olson Laboratories, Inc. of Dearborn, Michigan, Report # 8712-5201 dated January 14, 1974. The following vehicles were used:

1. 1969 Ambassador, 343 CID, 2 bbl Carb., Auto. trans. (KTK 453)
2. 1972 Oldsmobile Cutlass, 350 CID, 2V Carb., Auto. trans. (KZG 182).

The following results were obtained:

	Exhaust Emissions in gm/mile		
	<u>HC</u>	<u>CO</u>	<u>NOx</u>
1969 Ambassador			
Baseline	2.47	37.9	3.01
Device	2.27	35.5	3.19
% Change	-8.1	-6.3	+6.0
1972 Oldsmobile			
Baseline	2.53	17.1	4.47
Device	2.41	18.6	3.63
% Change	-4.7	+8.8	-18.8

B. ARB test data

The ARB performed calibration tests to investigate the effect of the "Stampede" device on the engine electrical system. A 1974 Ambassador, 360 CID, 2 bbl. Carb., Auto trans. (E 833605), vehicle was used. The following results were obtained.

1. Centrifugal spark advance angle measured from TDC (degrees)

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
Idle (700)	5	5
1000	5	5
1500	16	15
2000	19	19
2500	21	21
3000	23	22.5

2. Secondary voltage rise time (microseconds)

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
Idle	25	15

3. Spark duration (microseconds)

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
Idle	1300	80
2000	1000	80

4. Maximum available secondary voltage (KV)

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
Idle	²⁶ 25-27	²⁷ 25-28
2200	²⁷ 25-28	²⁶ 24-27

5. Required secondary voltage (KV)

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
Idle	9 ¹¹ - 13	9 ¹¹ - 12
2200	9 - 11	8 - 11

6. Idle exhaust emissions

<u>HC</u>	<u>Baseline</u>	<u>CO</u>	<u>HC</u>	<u>Device</u>	<u>CO</u>
87 ppm		0.10 %	84 ppm		0.10 %

IV. Staff Evaluation

The applicant's data are considered within the normal instrumentation error except for the noticeable reduction in NOx emitted from the second vehicle which had relatively high baseline NOx emissions.

The ARB data show that the "Stampede" device has little or no effect on the centrifugal spark advance, the maximum available secondary voltage, the required secondary voltage, or the idle exhaust emissions. Based on the ARB test data, the manufacturer's claim that "Stampede" device is capable of delivering up to 40 kilo-volts is not valid since insignificant change was observed with the device when compared with the baseline. However, it was observed that "Stampede" device shortens the secondary voltage rise time. The faster voltage rise rate enables the output energy to reach its maximum value in a relatively short time. The spark duration is also reduced significantly to make the spark much hotter since the output energy is unchanged. The spark duration, however, being significantly reduced is still far above the minimum limit required by auto manufacturers for combustion.

Vehicles equipped with NOx emission control devices using a speed sensor such as the Dana or Carter device cannot be equipped with the "Stampede" device. The speed sensor switch will interfere with the timing of the "Stampede" device and might cause excessive misfire. The device will not function properly for vehicles equipped with electronic ignition system whether it is a breakerless, capacitive discharge, or transistorized type. The "Stampede" output voltage might overlap with the existing electronic ignition system causing damage to the engine's electrical system by overloading the ignition wires or coil. It also could cause excessive misfiring due to erratic triggering from the points.

V. Conclusions and Recommendations

It is the staff opinion that RoInCo "Stampede" electronic 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" engine. This device may also have a beneficial effect in the control of exhaust emissions in that the device may maintain the "tuned" condition for a longer period of time. Therefore, the "Stampede" electronic capacitive discharge ignition system should be exempt from the prohibitions of Section 27156 of the Motor Vehicle Code for 1974 and older model-year vehicles equipped with a 12-volt battery, standard ignition coil, contact set, and negative ground except the following:

1. Vehicles originally equipped with an electronic ignition system whether it is a breakerless, capacitive discharge, or transistorized type.
2. All 1966-1970 model-year vehicles equipped with a Dana or Carter NOx retrofit device using an electronic speed sensor.