

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-11-1  
Relating to Exemptions under Section 27156  
of the Vehicle Code

WESTERN CONTROLS INC.  
"WESTERN CONTROLS"

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 "Western Controls" breakerless capacitive discharge ignition system manufactured by Western Controls Inc., 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 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 sensor, d-c converter, storage capacitor and an 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 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.

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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 "WESTERN CONTROLS" 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 12 day of April, 1974.

WILLIAM SIMMONS  
Executive Officer

State of California

AIR RESOURCES BOARD

April 2, 1974

Staff Report

Evaluation of Western Controls, Inc.  
"Western Controls" Breakerless  
Capacitive Discharge Ignition System For  
Exemption from the Prohibitions of Section  
27156 of the Motor Vehicle Code

I. Introduction

Western Controls, Inc., Phoenix, Arizona, has applied for exemption from the prohibitions of Section 27156 of the Motor Vehicle Code for the "Western Controls" breakerless 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 replace the standard ignition system.

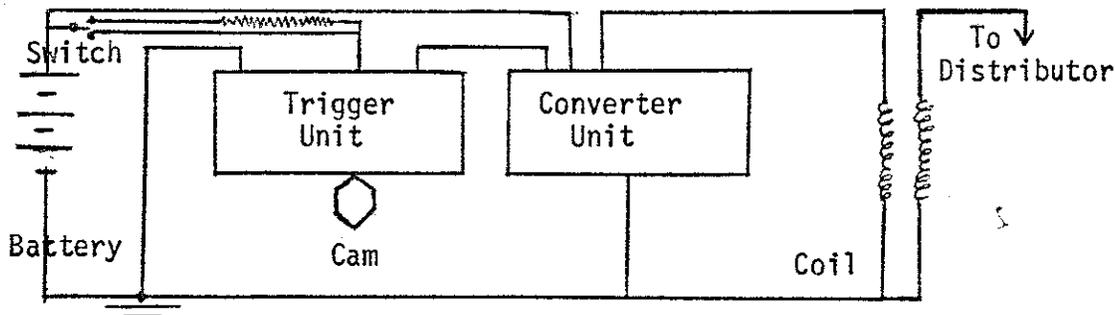
The Air Resources Board has adopted criteria for the evaluation of "after-market" devices for compliance with Section 27156. The basis for evaluation is defined in the "Air Resources Board Criteria for Determining Compliance with Section 27156 of the Motor Vehicle Code, dated February 17, 1971. Western Controls, Inc., is the manufacturer of "Western Controls" device also known as "Thermotronic", distributed by Thermo King Corporation, Minneapolis, Minnesota.

II. System Description

For a general description of breakerless 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 "Western Controls" device consists of two major components: A sensor and power unit (see schematic).



The sensor is a magnetic pulse generator whose pulses are generated by movement of the distributor cam in the magnetic field. This signal is fed into the capacitive discharge circuit discharging the storage capacitor into the primary windings of the ignition coil. The capacitive discharge circuit consists of a d-c converter, storage capacitor and an electronic switching circuit. The system is capable of an output of 32 KV and 60 millijoules according to manufacturer.

### III. Laboratory Test Data

The 1972 Federal hot start exhaust emission test conducted by Scott Research Laboratories, Inc., Report #2092 01 01 73, show an average 5.8% decrease in hydrocarbons, an average 10.5% decrease in carbon monoxide and an average 3.0% increase in oxides of nitrogen. The device unit used in this test was labeled "Thermotronic". The following

*only 25KV*

vehicles were used:

- (1) 1973 Chevrolet Pick-up, 350 CID, 4V Bbl. Carb., Auto. Trans(82901M),
- (2) 1973 Ford Gran Torino, 351 CID, 2V Bbl. Carb. Auto. Trans (826GHL).

The ARB performed a confirmatory test to investigate the effect of the "Western Controls" device on a vehicle electrical system. The following results were obtained:

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
Centrifugal Spark Advance Angle in degrees measured from TDC.		
Idle 600	6	6
1000	8	7.5
1500	14	16
2000	19.5	20
2500	23.5	24
3000	27.5	29
Spark Duration in microseconds.		
Idle	1300	300
2000	1000	320
(Required) Secondary Voltage in KV.		
Idle	8 <sup>9</sup> to 10	7 <sup>9</sup> to 10
2200	5 <sup>6</sup> to 7	5 <sup>6</sup> to 8
Secondary Voltage Rise Time in Microseconds.		
Idle	18	0.5

<u>RPM</u>	<u>Baseline</u>		<u>Device</u>	
	Exhaust Emission			
	<u>HC</u>	<u>CO</u>	<u>HC</u>	<u>CO</u>
Idle	117 ppm	0.17%	100 ppm	0.17%

The vehicle used for this test was a 1973 Ford Galaxie, 351 CID, 2 Bbl. Carb., Auto. Trans. (719 HGY).

IV. Staff Evaluation

Based upon available data the device's main function can clearly be observed in shortening the secondary voltage time rise. This shortening enables the output energy to reach its maximum value in a reasonably 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 reduced is still far above the minimum limit required by auto manufacturers for combustion. The device has no significant effect on the centrifugal spark advance curve. Vehicles equipped with NOx emission control devices using a speed sensor such as the Dana or Carter device cannot be equipped with the "Western Controls" device. The speed sensor switch will interfere with the timing of the "Western Controls" device and might cause excessive misfire.

V. Conclusions and Recommendations

It is the staff opinion that Western Controls, Inc. "Western Controls" breakerless capacitive discharge ignition system will not adversely affect motor vehicle exhaust emissions when evaluated with respect to

April 2, 1974

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 "Western Controls" breakerless 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 except those equipped with Dana or Carter NOx emission control devices.