

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-36
Relating to Exemptions under Section 27156
of the Vehicle Code

ENERGY INNOVATIONS
"GAS ENERGIZER EI-100"

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 "Gas Energizer EI-100" device manufactured by Energy Innovations of 32136 Beach Lake Lane, Westlake Village, California 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. All vehicles equipped with an electronic ignition system.
2. All 1966-70 model-year vehicles equipped with a Dana or Carter NOx retrofit device using an electronic speed sensor.

The "Gas Energizer EI-100" is a single wire coil wound in alternating directions with a non-magnetic core. The coil is encapsulated in a plastic mold and is stationary mounted by plastic tie down fasteners. The device also includes two snap-fit electronic suppression cables.

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 "GAS ENERGIZER EI-100" 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 29th day of August, 1974.

WILLIAM SIMMONS
Executive Officer

State of California

AIR RESOURCES BOARD

August 22, 1974

Staff Report

Evaluation of the Energy Innovations
"Gas Energizer EI-100"
Non-Magnetic Coil for Exemption from
the Prohibition of Section 27156 of the Vehicle Code

I. Introduction

Energy Innovations, 32136 Beach Lake Lane, Westlake Village, California 91361 has applied for exemption from the prohibitions of Section 27156 of the Vehicle Code for its "Gas Energizer EI-100" device. This section prohibits the installation of any device which may reduce the effectiveness of the motor vehicle emission control system. The applicant is requesting the exemption be granted for all 1974 and older model-year vehicles except the following:

- 1 - All vehicles equipped with an electronic ignition system.
- 2 - All 1966-70 model-year vehicles equipped with a Dana or Carter NOx retrofit device using an electronic speed sensor.

II. System Description and Function

The device is a non-magnetic coil consisting of a single insulated copper wire wound in alternating directions around a Cycloc (plastic) core. The device shown in Figure 1 is 2 in. x 2 in. square, 9 in. long, and weighs approximately 1-1/4 lbs. The coil shown in Figure 2 has 200 to 214 turns and is encapsulated in Cycloc. It has an electrical resistance of 1.2 to 1.4 ohms and uses No. 22 SPN insulated copper wire. TVRS (TV and radio suppression) cables with snap-fit connection are inserted into the terminals at each end of the coil. The TVRS cables are connected to the OEM coil and to the distributor.

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The applicant claims that the "Gas Energizer EI-100" will reduce the output voltage of the OEM coil if high and will increase the output voltage of the OEM coil if low. The ARB staff is of the opinion that this device would have an insignificant effect on the output voltage in either direction since the device has no magnetic core and has a relatively small electrical resistance.

III. System Evaluation

A. Applicant's Data

The applicant submitted superimposed spark curve pictures taken from a 1969 Lincoln Continental Mark III, see Figure 3. These pictures show a decrease in the output voltage. The applicant also submitted Olson Laboratories, Inc. report # 8855-5101 dated July 2, 1974. This report contains data from Federal hot CVS tests performed on the following vehicles:

1974 Ford Pinto, 2.3L, 4-cylinders, auto. trans. (915 KHN),

1967 Lincoln Continental, 462 CID, V-8, auto. trans. (TRA 886).

The obtained data are as follows:

<u>Ford Pinto</u>	<u>Grams/Mile</u>		
	<u>HC</u>	<u>CO</u>	<u>NOx</u>
Baseline	0.51	21.00	1.18
Device	0.99	20.09	1.07
% Change	94.1	-4.3	-9.3

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<u>Lincoln Continental</u>	<u>Grams/Mile</u>		
	<u>HC</u>	<u>CO</u>	<u>NOx</u>
Baseline	2.38	37.22	6.16
Device	2.36	36.40	5.79
% Change	-0.8	-2.2	-6.0

An evaluation of the above data indicates that the increase in HC from the Ford Pinto may have been due to a possible misfire or a restart during the test. Consequently, the ARB staff performed a confirmatory test series on an identical Ford Pinto to investigate this increase in HC. In addition, a 1974 Dodge 360 CID was used to investigate detailed electrical system characteristics.

B. ARB Testing

The ARB performed calibration tests to investigate the effect of the "Gas Energizer EI-100" on the engine electrical system. A 1974 Dodge Monaco, 360 CID, V-8, auto. trans. (DH 43J-4167587) vehicle was used. The following results were obtained with the engine in the unloaded condition.

1. Centrifugal spark advance - degrees (BTDC)

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
1000	7	8
1500	21	21
2000	23	23
2500	25	26
3000	27	27

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2. Secondary voltage rise time (microseconds)

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
750	25	22-30
2000	20	18-22

3. Spark duration (milliseconds)

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
750	1.2	1.2
2000	1.0	1.0

4. Available secondary voltage (KV)

<u>RPM</u>	<u>Baseline</u>	<u>Device</u>
650 Idle (in gear)	16	19
750	15	18
2200	9	11

5. Idle exhaust emissions

<u>RPM</u>	<u>HC in PPM</u>		<u>% CO</u>	
	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
650 Idle (in gear)	62	121	0.6	0.7
750	95	93	0.3	0.5
2200	54	50	0.1	0.1

The above data indicate that no significant effects occur beyond
what is considered normal test variability.

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Confirmatory emission tests were performed by the Hot CVS-1 test method on a 1974 Ford Pinto, 2.3L, 4-cylinders, auto. trans.

(195 LEK). This vehicle is similar to the vehicle tested by Olson Laboratories Inc. and submitted by the applicant. Three back-to-back Hot CVS exhaust emission tests were performed with and without the device. The following data were obtained:

	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
Avg. Baseline	0.74	15.5	1.21	17.0
Avg. Device	0.77	15.8	1.24	16.9
Avg. % Change	4.1	2.0	2.5	-0.6

The above data indicate that the device did not produce any significant effects on exhaust emissions or fuel economy.

IV. Conclusion and Recommendation

Based on the staff's evaluation and the available test data, the use of the "Gas Energizer EI-100" would not result in any significant effect on exhaust emissions or fuel economy of a motor vehicle. It is the staff's opinion that "Gas Energizer EI-100" manufactured by Energy Innovations of Westlake Village, California should be granted an exemption from the prohibitions of Section 27156 of the Vehicle Code for 1974 and older model year vehicles except for the following:

- 1 - All vehicles equipped with electronic ignition systems.
- 2 - All 1966-70 model-year vehicles equipped with an NOx retrofit device using an electronic speed sensor such as the Dana or Carter device.

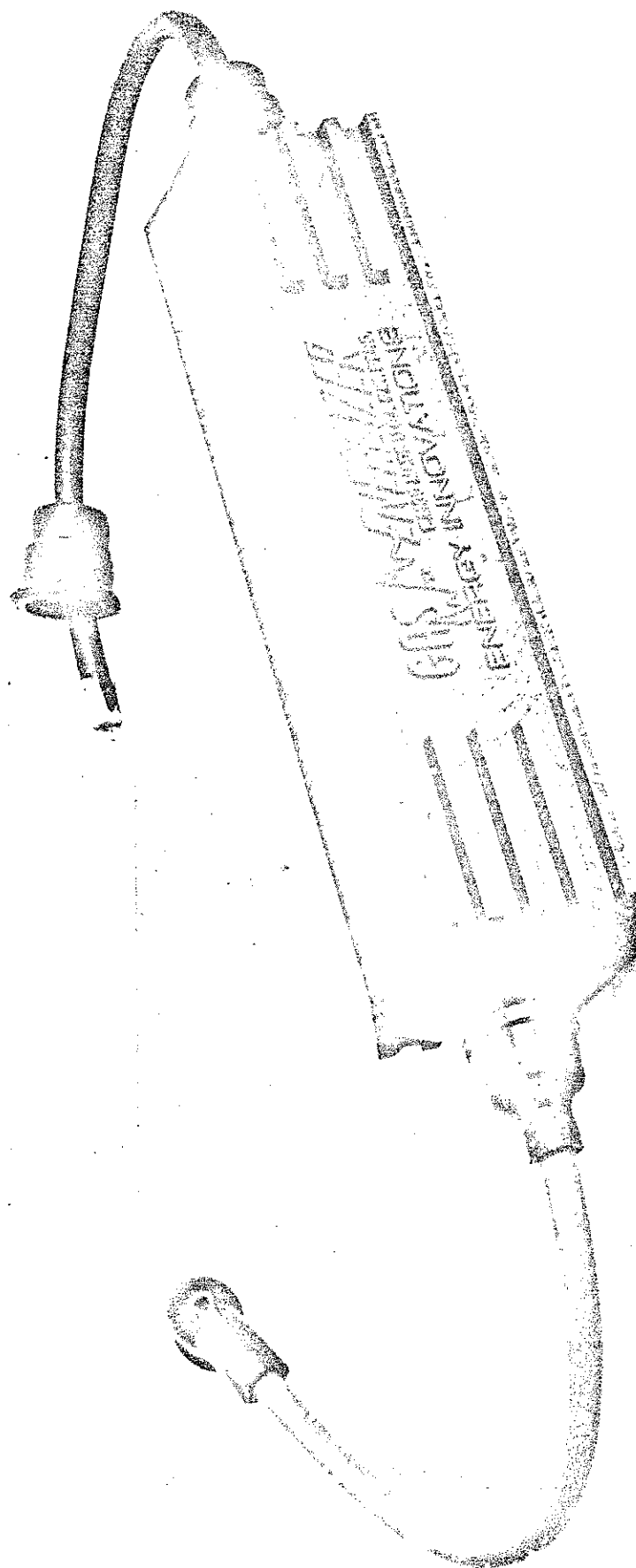


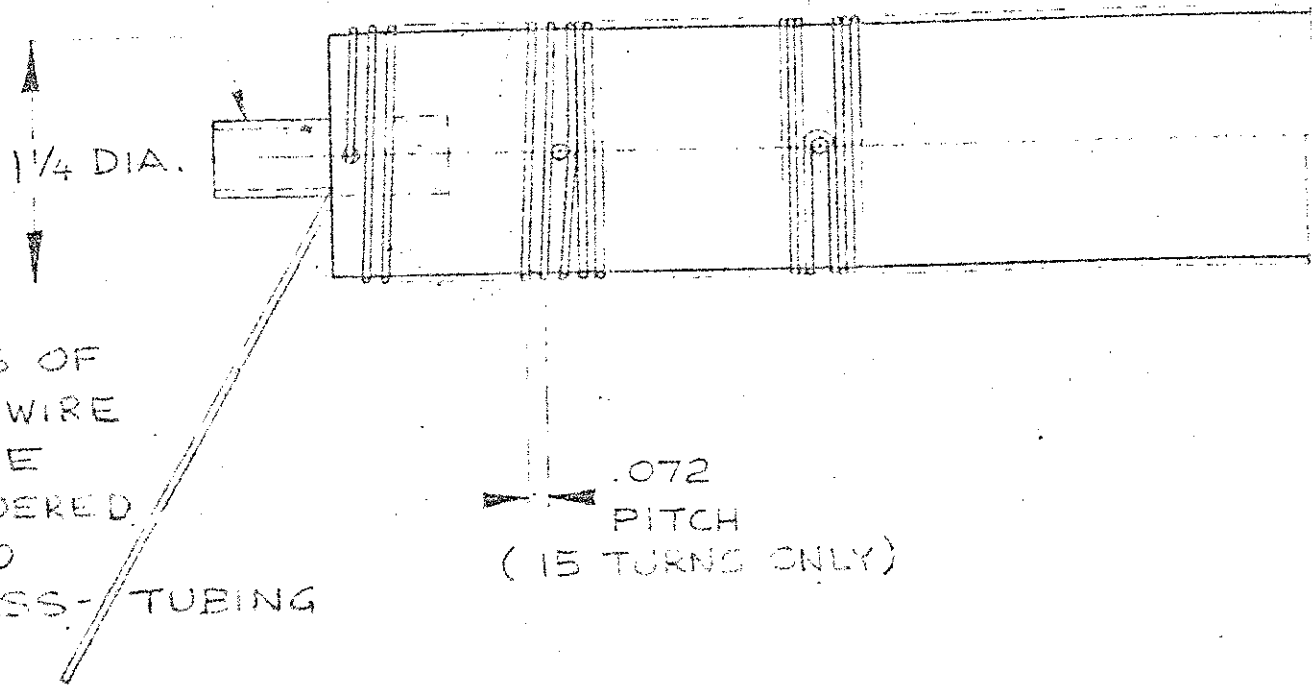
Figure 1 GAS ENERGIZER DEVICE

6 5/8

HOLLOW BRASS-
TUBING (TYP.)

(MOLDED INTO
HASTELLOY)

15^{±1} TURNS L.H. 48^{±2} TURNS L.H. 96^{±2} TURNS R.H.



ENDS OF
COIL-WIRE
TO BE
SOLDERED
ONTO
BRASS-TUBING

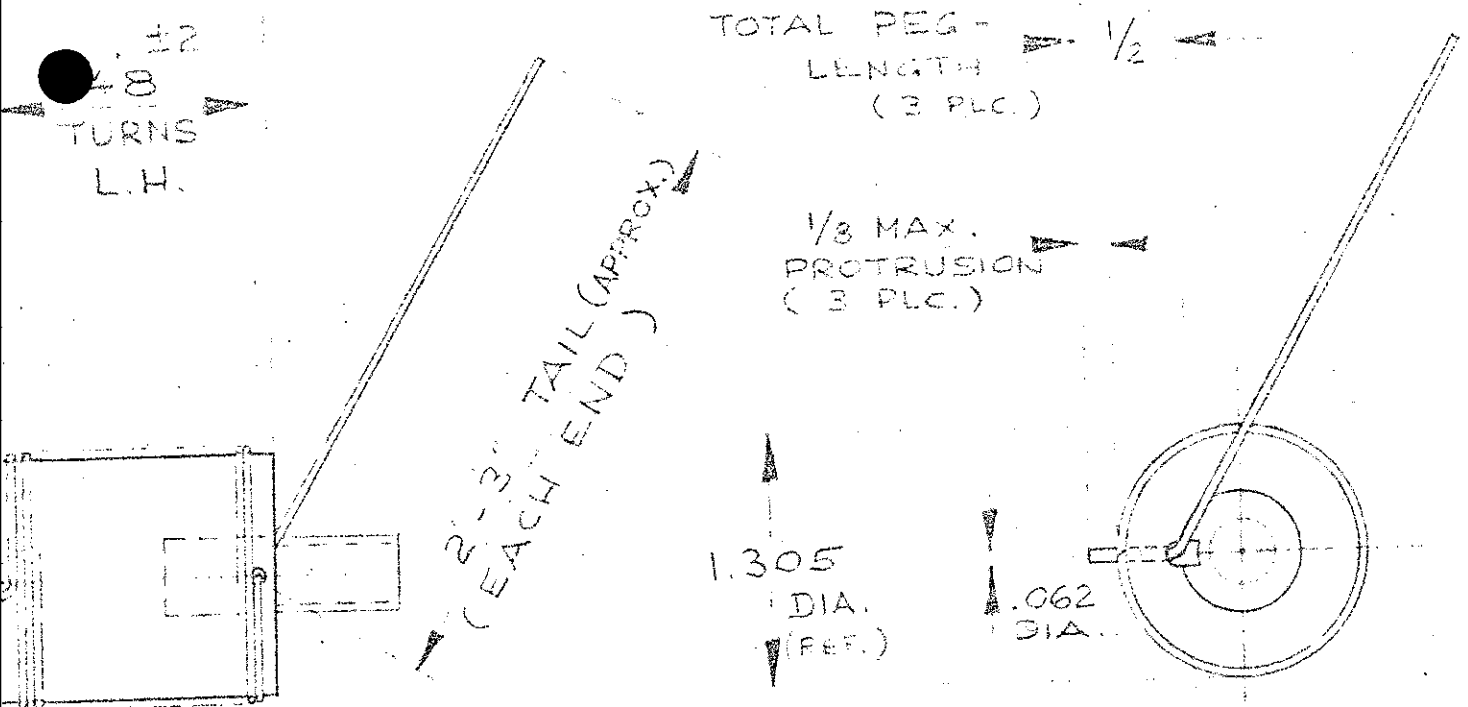
NOTES (CONTINUED) :

8. TOTAL NUMBER OF TURNS = 200 (MIN) 214 (MAX)
9. TOTAL WIRE-LENGTH PER COIL = 67' (MIN) 73' (MAX.)
(INCLUDING BOTH TAILS)
10. ACTUAL COIL RESISTANCE IN OHMS (AT 20°C)
MINIMUM = 1.0 OHM, MAXIMUM = 1.4 OHM
11. WEIGHT OF COIL : 7 1/2 OUNCE

12. COMMERCIAL WIRE DESIGNATION:
22 SPN (MAGNET WIRE SUPPLY Co.)
20731 MARILLA ST. CHATSWORTH, CAL.)
51311

B	ADDED COIL RESIST & WGT
A	CHANGED WIRE TO # 22 MAG # 24
REV.	E.O./E.C.O

Figure 2 GAS ENERGIZER COIL DESIGN DRAWING



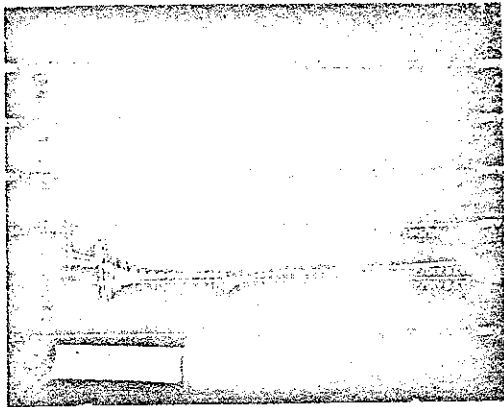
NOTES :

1. WIRE-SIZE : # 22 GAGE (.0253 $\pm .0003$ DIA.)
PURE COPPER WIRE
LAQUER - INSULATED (.0273 MAX. DIA.)
2. AREA : 640. CIRCULAR MILLS
3. RESISTANCE : 16.2 $\pm .4$ OHMS/1000 FT. (BARE WIRE)
4. WEIGHT : 1.94 lbs/1000 FT. (BARE WIRE)
5. FOOT-LENGTH PER lbs : 516.0 (BARE WIRE)
6. COIL PITCH DIA. = 1.2773
7. ONE TURN OF WIRE = 4.012" LONG

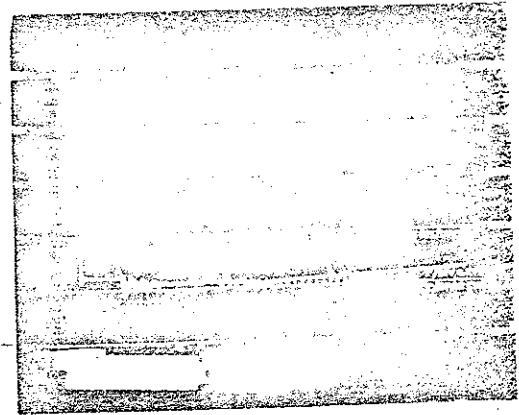
2

MATERIAL		HEAT TREAT	FINISH	RAW MATERIAL SIZE
CORE - MOLDED PLASTIC				"CYCLACK"
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE :		REFERENCE		SCALE
ANGLE FRACT. .X .XX .XXX		GAS ENERGIZER COIL		1:1
$\pm 1^\circ$ $\pm 1/64$ $\pm .010$ $\pm .005$		TITLE		
HARRY FRANKS CONSULTING ENGINEER CHATSWORTH, CALIFORNIA 91311		COIL, (FINISH WOUND)		
DRAWN 1/7/77		ENERGY INNOVATIONS, WESTLAKE VILLAGE		
CHECKED		DRAWING NUMBER		SHEET
APPROVED		E1-100 COIL		No. 3 OF
DATE 1/5/77				

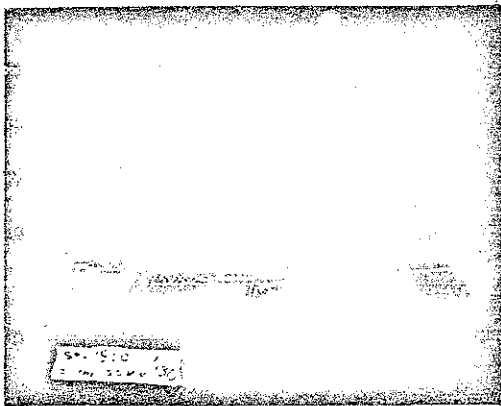
Spark Curves of Baseline Versus "Gas-Energizer"
from 1969 Lincoln Continental
Figure 3



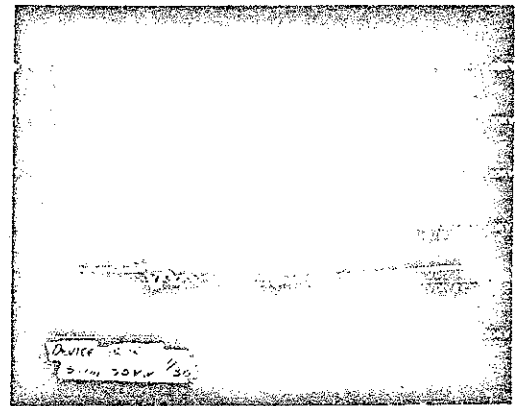
Baseline at 750 RPM



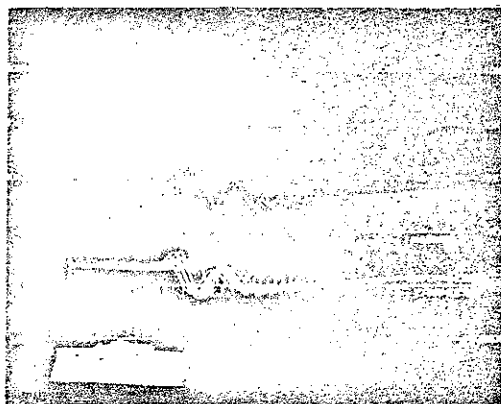
"Gas Energizer" at 750 RPM



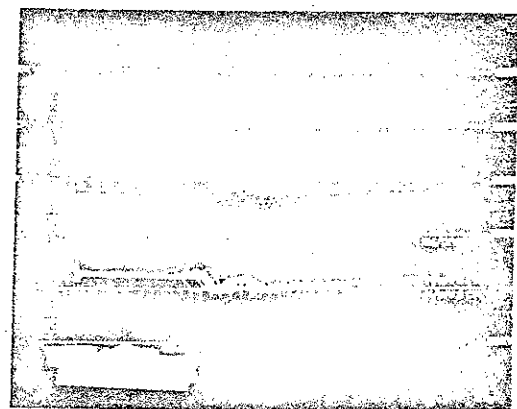
Baseline at 1800 RPM



"Gas Energizer" at 1800 RPM



Baseline at 3500 RPM



"Gas Energizer" at 3500 RPM