

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-130
Relating to Exemptions under Section 27156
of the Vehicle Code

OLDE WORLDE, INC.
"MILEAGE MAKER"

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 "Mileage Maker" (combination of a water/vapor injector, a fuel heater, a fuel pressure regulator, and an air conditioner compressor cut-off switch) manufactured by Olde Worlde, Inc., of 401 Fraley Road, High Point, NC 27261 has been found not to 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 pre-catalyst and oxidation catalyst equipped 1980 and older model-year General Motors, Ford, and Chrysler vehicles powered by a six- or eight-cylinder carbureted engine. Vehicles equipped with three-way catalyst using open-loop or closed-loop (computer controlled) carburetion system are excluded.

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. Exemption of a kit shall not be construed as an exemption to sell, offer for sale, or advertise any component of a kit as an individual device.

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 "MILEAGE MAKER".

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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.

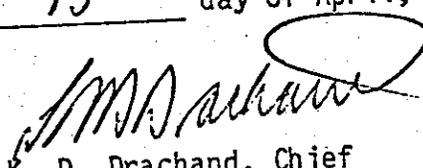
Section 17500 of the Business and Professions Code makes untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

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.

Executed at El Monte, California, this 19th day of April, 1983.


K. D. Drachand, Chief
Mobile Source Control Division

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Issue Date: April 12, 1983

Evaluation of Olde Worlde's Mileage Maker Device for Exemption from the Prohibitions in Vehicle Code Section 27156 in Accordance with Section 2222, Title 13 of the California Administrative Code

by

Mobile Source Control Division

State of California
Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731

(This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.)

STATE OF CALIFORNIA

AIR RESOURCES BOARD

EVALUATION OF OLDE WORLDE'S MILEAGE MAKER DEVICE FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE CALIFORNIA ADMINISTRATIVE CODE.

APRIL 12, 1983

SUMMARY

Olde Worlde, Inc., of 401 Fraley Road, High Point, NC 27261 has requested an exemption from the prohibitions in California Vehicle Code Section 27156 for their "Mileage Maker" add-on device. Exemption has been requested for pre-catalyst and oxidation catalyst equipped 1980 and older model-year General Motors, Ford, and Chrysler vehicles powered by a six- or eight-cylinder carbureted engine.

Based on the results of comparative exhaust emissions tests performed on two vehicles and based on an engineering evaluation, the staff concludes that the "Mileage Maker" will not adversely affect exhaust emissions from the vehicles for which exemption is requested.

The staff recommends that Olde Worlde, Inc. be granted their request. The staff recommends that Executive Order No. D-130 be adopted.

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EVALUATION OF OLDE WORLDE'S MILEAGE MAKER DEVICE FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE CALIFORNIA ADMINISTRATIVE CODE

I. INTRODUCTION

Olde Worlde, Inc., of 401 Fraley Road, High Point, NC 27261 has requested an exemption from the prohibitions in California Vehicle Code Section 27156. The applicant has requested that their "Mileage Maker" add-on device for automobiles be exempted for 1980 and older model-year General Motors, Ford, and Chrysler vehicles powered by a six- or eight-cylinder carbureted engine. Vehicles equipped with three-way catalyst using open-loop or closed-loop (computer controlled) carburetion system were excluded.

II. CONCLUSION

Based on the results from comparative exhaust emissions tests performed by the applicant at an independent laboratory on two (a six-cylinder and an eight-cylinder) 1980 model-year oxidation catalyst equipped vehicles, and from confirmatory tests performed by the staff at the Air Resources Board (ARB) facility on the eight-cylinder vehicle, and also based on an engineering evaluation of the device, the staff concludes that the "Mileage Maker" will not adversely affect exhaust emissions from the vehicles for which exemption is requested.

III. RECOMMENDATION

The staff recommends that Olde Worlde, Inc. be granted an exemption for their "Mileage Maker" add-on device for 1980 and older model-year General Motors, Ford, and Chrysler vehicles powered by a six- or eight-cylinder carbureted engine. The staff recommends that Executive Order No. D-130 be adopted.

IV. DEVICE DESCRIPTION AND OPERATION

The "Mileage maker" device is a combination of a water/vapor injector, a fuel pressure regulator, a fuel heater, and an air conditioner compressor cut-off switch. The device is packaged with installation hardware and instructions and sold as a kit.

The water/vapor injector is designed to allow a preselected amount of water/vapor into the engine through the positive crankcase ventilation (PCV) system. Water/vapor is drawn from a two liter plastic reservoir through a 0.25 inch I.D. plastic tubing which tees into the PCV system. An air-stone (as those found in home aquariums) at the end of the tubing and positioned in the reservoir filters the water to prevent particulates from clogging the device. An 0.005 inch diameter capillary is positioned inside the plastic tubing to reduce the effective cross-sectional area of the tubing and to limit the amount of water flow. A rotary clicking valve controls the amount of air bleed. The inlet air is mixed with the water to form water/vapor mist which is then siphoned into the engine.

The fuel heater and fuel pressure regulator are positioned in series between the fuel pump and carburetor inlet. The fuel heater consists of a heat exchanger, a thermostat switch, and a solenoid valve. When the fuel in the thermostat chamber is below 120°F, the solenoid valve allows engine coolant to flow through the heat exchanger and heats the fuel. When the fuel in the thermostat chamber reaches a temperature of 120°F, the solenoid valve will be closed thus cutting off the flow of engine coolant to the heat exchanger. As fuel flows out of the heat exchanger, at a maximum temperature of 120°F, the fuel passes through the fuel pressure regulator and into the carburetor inlet. Carburetor inlet fuel pressure is limited to 3.5 psi by the design of the fuel pressure regulator.

The air conditioner compressor cut-off switch consists of a manifold vacuum switch which monitors engine vacuum drop during power demand periods. When manifold vacuum drops below five inches of Hg. for six-cylinder vehicles and seven inches of Hg. for eight-cylinder vehicles, the switch cuts off the electrical current to the air conditioner compressor clutch, thus disengaging the compressor and the complete air conditioning system.

No modifications to the OEM tune-up specifications are required, nor permitted, when the "Mileage Maker" is installed.

A schematic diagram of the "Mileage Maker" is shown in the Appendix.

V. EVALUATION

Evaluation of the "Mileage Maker" consisted of comparative (stock vehicle versus vehicle with device installed) exhaust emission tests of representative vehicles on a chassis dynamometer and an engineering evaluation, by the staff, of each component of the device.

Two oxidation catalyst equipped 1980 Ford vehicles (a six-cylinder and an eight-cylinder) were used for the exhaust emission tests. A description of each vehicle is given in the Appendix. Each vehicle was subjected to the following tests by the applicant:

- . Baseline test (vehicle in stock configuration) with A/C off.
- . Baseline test (vehicle in stock configuration) with A/C on.
- . Device test (vehicle with "Mileage Maker" installed) with A/C on and water/vapor injector set to manufacturer's installation instructions.
- . Device test simulating worst case condition (vehicle with "Mileage Maker" installed) with water/vapor injector set for maximum water flow and A/C on.

The above tests on both vehicles were performed by FCI International Testing Laboratory in Santa Ana, California, under contract by Olde Worlde, Inc.

In addition to the tests performed by the applicant, the ARB laboratory in El Monte performed confirmatory tests on the eight-cylinder 1980 Ford vehicle. The vehicle was subjected to the following tests:

- . Baseline test (vehicle in stock configuration) with A/C on.
 - . Device test (vehicle with "Mileage Maker" installed) with A/C on and water/vapor injector set to manufacturer's installation instructions.
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- . Device test simulating worst case condition (vehicle with "Mileage Maker" installed) with water/vapor injector set for maximum water flow and A/C on.

The staff also performed an engineering evaluation on each component of the "Mileage Maker", the water/vapor injector, the fuel pressure regulator, the fuel heater, and the air conditioner compressor cut-off switch. The performance parameters, threshold points, and design specifications were reviewed by the staff to determine if the individual components will have any adverse effect on exhaust emissions from vehicles for which exemption is requested.

VI. TEST RESULTS

The applicant's emissions test data in Tables 1 and 2 were generated under contract by FCI International Testing Laboratory in Santa Ana, California.

Table 1

Applicant's Emissions Test Data
 1980 Ford Mustang - 200 CID
 "Mileage Maker" Device

Test Mode	Exhaust Emissions (g/mi)			Fuel Economy (mpg)	Water Cons. (gm)
	HC	CO	NOx		
Baseline A/C OFF	0.79	11.8	0.6	16.2	-
Baseline A/C ON	0.59	10.3	0.9	15.2	-
Baseline A/C ON	<u>0.60</u>	<u>8.3</u>	<u>0.9</u>	14.7	-
Average*	0.60	9.3	0.9	15.0	-
Device A/C ON (set as recommended)	0.44	6.3	0.8	15.1	5.7
Device A/C ON (worst case)	0.47	7.9	0.7	15.1	14.4

Table 2

Applicant's Emissions Test Data
 1980 Ford Granada - 302 CID
 "Mileage Maker" Device

Test Mode	Exhaust Emissions (g/mi)			Fuel Economy (mpg)	Water Cons. (gm)
	HC	CO	NOx		
Baseline A/C OFF	0.92	6.1	0.4	13.5	-
Baseline A/C ON	0.92	7.1	0.5	12.5	-
Baseline A/C ON	<u>0.76</u>	<u>5.1</u>	<u>0.5</u>	<u>12.1</u>	-
Average*	0.85	6.1	0.5	12.3	-
Device A/C ON (set as recommended)	0.76	4.3	0.4	12.9	3.3
Device A/C ON (worst case)	0.73	4.4	0.4	12.8	147.3

*A/C (Air Conditioner) ON only

The ARB's confirmatory emissions test data are shown in Table 3.

Table 3

ARB's Emissions Test Data
1980 Ford Granada - 302 CID
"Mileage Maker" Device

Test Mode	Exhaust Emissions (g/mi)			Fuel Economy (mpg)	Water Cons. (gm)
	HC	CO	NOx		
Baseline A/C ON	0.69	2.1	1.3	13.7	-
Device A/C ON (as recommended)	0.77	3.1	1.2	13.6	11.9
Device A/C ON (worst case)	0.60	3.4	1.0	13.1	29.0

VII. DISCUSSION

Tables 1 and 2 show the applicant's data generated from two 1980 oxidation catalyst equipped Ford vehicles, a six-cylinder and an eight-cylinder. The baseline data for both vehicles (with A/C off mode) did not meet the hydrocarbon emission standard of 0.41 grams per mile. Prior to the installation of the device on the vehicle, the vehicle was diagnosed by a qualified mechanic. No abnormal conditions of the engine or the emission controls were noted by the mechanic and the baseline data were accepted.

A second baseline (with A/C on) was performed on both vehicles for the evaluation of the device, since all device tests were performed with the air conditioner on. The device was installed as recommended by the manufacturer (device intact and water/vapor injector air bleed valve set at an opening of one click per cylinder from complete close) and emission tested. A second device test was also performed simulating worst case condition of maximum water flow into the engine.

A comparison (baseline A/C on versus device as recommended and worst case) of the exhaust emission results submitted by the applicant on both vehicles indicates that the device did not have an adverse effect on exhaust emissions from the vehicles tested.

In addition to the tests performed by the applicant, the ARB laboratory performed confirmatory tests at the ARB facility on the same Ford Granada test vehicle. The test program performed by the applicant was duplicated by the staff, except for the baseline with the air conditioner off test which was omitted.

An analysis of the data in Table 3 indicates that the device did not have a significant adverse effect on exhaust emission from the vehicle tested. The differences in laboratory results (linear shift in HC and NOx values) may be attributed to the fact that the static ignition timing was changed by the ARB personnel from 0° TDC to the OEM specifications of 6° BTDC when the vehicle was received by the ARB. The insignificant increase in CO noted by the staff is unexplainable. However, the extremely low baseline CO value is questionable since an average CO value of 3.0 grams per mile was noted on Quality Audit reports from a data bank of over 250 vehicles tested.

In addition to the ARB confirmatory emission tests performed, the staff evaluated the design parameters of each component (water/vapor injector, fuel pressure regulator, fuel heater, and air conditioner compressor cut-off switch) individually. The applicant's submitted design parameters are as follows:

- water/vapor injector - 0.005 inch capillary which restricts water flow.

- . fuel pressure regulator - maximum fuel pressure into carburetor inlet of 3.5 psi.
- . fuel heater - maximum fuel temperature of 120°F into carburetor inlet.
- . air conditioner compressor cut-off switch - interruption of voltage to air conditioner compressor when manifold vacuum falls below five inches of Hg. for six-cylinder and seven inches of Hg. for eight-cylinder engines.

The staff has previously evaluated these devices individually and has noted that these design parameters will not have an adverse effect on exhaust emissions or driveability of automobiles.

The ARB has exempted a number of individual water injection systems, fuel heaters, fuel pressure regulators, and an air conditioner compressor cut-off device. ARB's test data do not show such devices will have any significant effect on fuel mileage of motor vehicles. The "Mileage Maker" device is a combination of these four devices; their combined action still does not effect any measurable changes in fuel mileage from the test vehicles.

APENDICES

Description of Test Vehicles

	<u>Vehicle 1</u>	<u>Vehicle 2</u>
Model Year:	1980	1980
Make:	Ford	Ford
Model:	Mustang	Granada
CID:	200/I6	302/V8
Transmission:	Auto	Auto
ECS:	EGR, AI, OC	EGR, AI, OC

EGR: exhaust gas recirculation

AI: air injection

OC: oxidation catalyst

SCHEMATIC DIAGRAM OF

"MILEAGE MAKER"

(A/C cut-off switch not shown)

