

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-128  
Relating to Exemptions under Section 27156  
of the Vehicle Code

CHEVRON U.S.A., INC.  
ENGINE MODIFICATION

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 Chevron U.S.A., Inc. purposed engine modifications at their Richmond, California refinery 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 the following vehicles.

MODIFIED VEHICLES AT RICHMOND REFINERY

<u>Refinery Identification</u>	<u>Type of Vehicle</u>	<u>California License Plate Number</u>
53-007	1980 Chevrolet 1/2 ton pick-up truck	1W42551
50-325	1973 Ford 1/2 ton pick-up truck	59453N
52-523	1975 Dodge 3/4 ton pick-up truck	1A76197
50-245	1972 Chevrolet 1/2 ton pick-up truck	55009L
51-058	1980 Chevrolet 1/2 ton pick-up truck	1W42652
50-845	1978 Chevrolet 1/2 ton pick-up truck	1J74982
11-348	1973 Plymouth Sedan*	714HKB
11-873	1978 Plymouth Volare Sedan	760YQZ
11-344	1973 Ford Sedan*	935GLY
50-840	1978 Chevrolet 1/2 ton pick-up truck	1J75176
50-838	1978 Chevrolet 1/2 ton pick-up truck	1J74984
57-507	1966 Ford 1-1/2 ton pump truck	none
52-836	1978 Ford Club Wagon	277UIA
12-365	1973 Plymouth Sedan	218NVA
11-865	1978 Chevrolet Malibu Sedan	078UIA
52-432	1974 GMC 3/4 ton pick-up truck	94986W
54-934	1979 Chevrolet 3/4 ton pick-up truck	IN26039
36-003	1981 Ford aerial-lift truck	2A17823

\* Retired 2-9-83 per Mr. D. S. Williams, on their letter dated 2-9-83.

This Executive Order is valid provided that instructions for these engine modifications are followed.

Changes made to the design or operating conditions of the engine modifications, as exempted by the Air Resources Board, that adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Installation of these engine modifications for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board.

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This Executive Order does not constitute any opinion as to the effect that the use of these modifications 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, SUCH AS SAFETY, OF THE CHEVRON U.S.A., INC. ENGINE MODIFICATION.

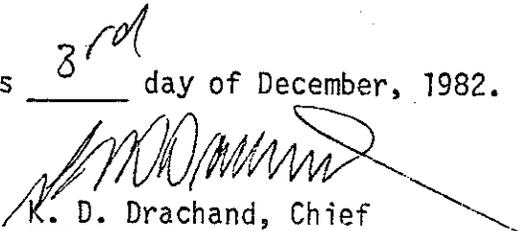
No claim of any kind, such as "Approved by Air Resources Board" may be made with respect to the action taken herein in any oral or written communication.

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 3<sup>rd</sup> day of December, 1982.

  
K. D. Drachand, Chief  
Mobile Source Control Division

State of California  
AIR RESOURCES BOARD

EVALUATION OF CHEVRON OIL COMPANY'S  
REQUEST FOR EXEMPTION FROM THE  
PROHIBITIONS OF VEHICLE CODE SECTION 27156  
FOR MODIFYING REFINERY USE VEHICLES

October 26, 1982

EVALUATION OF CHEVRON OIL COMPANY'S  
REQUEST FOR EXEMPTION FROM THE  
PROHIBITIONS OF VEHICLE CODE SECTION 27156  
FOR MODIFYING REFINERY USE VEHICLES

By  
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.)

## SUMMARY

Chevron U.S.A., Inc. requested an exemption from the prohibitions of Vehicle Code (VC) Section 27156 for modifications for a fleet of 18 vehicles used at the Richmond, California oil refinery.

The requested modifications involve sealing or replacing various items in the vehicle's electrical system to prevent combustible vapors from entering and being ignited.

The staff does not foresee any adverse emissions impact due to the proposed modifications. The staff, therefore, recommends exemption of the modification from the prohibitions of VC Section 27156.

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# Evaluation of Chevron Oil Company's Request for Exemption from the Prohibitions of Vehicle Code Section 27156 for Modifying Refinery Use Vehicles

## I. INTRODUCTION

Chevron U.S.A., Inc. has requested the Air Resources Board to exempt a fleet of 18 vehicles used at their Richmond, California oil refinery from the prohibitions of VC Section 27156. The requested modifications involve sealing or replacing various items in the vehicle's electrical system to prevent combustible vapors from entering and being ignited. Combustible vapors commonly exist in the environment of an oil refinery.

## II. CONCLUSION

All machineries used in hazardous environments are required to be made safe during their operations. The motor vehicle is no exception. Chevron's proposed modifications are designed to prevent combustible vapors from being ignited when a vehicle is being operated.

The addition of covers, seals, protective devices, etc., does not affect the function of the vehicle's electrical system. The replacement ignition wires and Mallory Unilite distributor are of equivalent quality (or better) than the OEM parts.

The removal of the distributor's vacuum advance, according to ARB's recent surveillance testing, will not adversely affect the vehicle's exhaust emissions. However, the retard in total timing caused by the removal of the vacuum advance will result in higher engine exhaust temperatures, which may affect the catalytic converter's useful life.

### III. RECOMMENDATION

The staff does not foresee any adverse emissions impact due to Chevron's proposed modifications. The staff believes that, even though the exhaust gas temperature will be higher, there will be very little change in the catalyst's life due to the limited usage of these vehicles in the 3.5 square mile Chevron refinery. The staff recommends that they be granted exemption from the prohibitions of VC 27156 for the fleet of vehicles listed in Attachment II and that Executive Order D-128 be adopted.

### IV. MODIFICATIONS DESCRIPTION

Chevron's proposed modifications are found in Attachment I. The purpose of the modifications is to prevent combustible vapors from being ignited by the vehicle's electrical system. The modifications involve sealing of the vents in the starter motor, generator/alternator, voltage regulator, switches, lights, and auxiliary electrical systems. Additionally, the ignition system is modified by one or more of the following:

- i) The OEM secondary ignition wires are replaced with a high temperature silicon rubber type.
- ii) The Kettering ignition points are replaced with a solid state ignition system.
- iii) A new distributor cap with a safety retention strap is installed.
- iv) The vacuum advance is removed and replaced with a sealed cover on some models with OEM Kettering ignition systems.
- v) A flame arrestor vent is installed in the distributor's body.
- vi) Certain late model Ford vehicles with Dura-Spark ignition distributors are replaced with Mallory Unilite Systems since the Dura-Spark systems could not be safely modified.

### Necessary Engine Modifications

The purpose of the modifications is to minimize fire loss risks associated with the use of the engines in restricted areas.

#### 1. Starter Motor

The starter, starter motor switch, and solenoid are inspected to ensure there are no openings into which vapors could leak. In those vehicles which had openings, one or more of the following modifications was made:

- a. The starter motor was fitted with a tight-fitting cover band with a gasket to shield commutator arcing.
- b. The starter motor switch was fitted with a tight-fitting cover, or the switch cover to the solenoid was sealed with epoxy.
- c. The starter solenoid was either gasketed to the starter housing (if located on the starter motor) or sealed with epoxy (if located away from the starter motor).
- d. The terminals were covered with protective boots or other material to avoid accidental shorting.

#### 2. Generator, Voltage Regulator, Switches, Lighting, and Auxiliary Systems

The following modifications were made:

- a. The generator system was equipped with an enclosed marine-type alternator and voltage regulator.
- b. Protective boots or covers were placed on exposed electrical terminals and battery terminals to protect against accidental shorting.

#### 3. Ignition System

The ignition systems were modified in one or more of the following ways:

- a. If necessary, "Standard Equipment" high tension wire was replaced with high temperature silicon rubber ignition wire. This measure eliminates arcing to ground through insulation leaks on lower quality wire. Most of the late model vehicles came equipped with the rubber wire.
- b. The contact points were replaced with a solid-state ignition system.
- c. The distributor was modified to reduce the chance of flame escaping from the distributor if hydrocarbon vapor is ignited inside the distributor. The following modifications were generally done:

- i. A new distributor cap was installed to reduce the chance of arcing through an electrical leak in an old cap.
- ii. A clamp was installed to securely hold the distributor cap in place in case of an ignition of vapor inside the distributor. The clamp consisted of a metal bar, drilled to allow the connector wells to penetrate and be clamped to the distributor body.
- iii. The vacuum advance unit was removed. A metal cover was installed and sealed with epoxy. The vacuum advance units in the 1980 model year vehicles were not removed since these vehicles have electronic ignition systems.
- iv. A flame arrestor vent was installed in the distributor body.

The Refinery has obtained some late-model Ford vehicles for use in restricted areas of the Refinery. However, these vehicles' distributors have a two-piece cap and cannot be sealed. Therefore, the Refinery intends to replace the existing ignition systems with Mallory Unilite systems. However, modifications ii-iv (above) will still be required.

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52-523	1975 Dodge 3/4 ton pick-up truck	1A16197
50-245	1972 Chevrolet 1/2 ton pick-up truck	55009L
51-068	1980 Chevrolet 1/2 ton pick-up truck	1W42652
50-845	1978 Chevrolet 1/2 ton pick-up truck	1J74982
11-348	1973 Plymouth Sedan	714HKB
11-873	1978 Plymouth Volare Sedan	760YQZ
11-344	1973 Ford Sedan	935GLY
50-840	1978 Chevrolet 1/2 ton pick-up truck	1J75176
50-838	1978 Chevrolet 1/2 ton pick-up truck	1J74984
57-607	1966 Ford 1-1/2 ton pump truck	none <sup>1</sup>
52-836	1978 Ford Club Wagon	277UIA
12-365	1973 Plymouth Sedan	218NVA
11-865	1978 Chevrolet Malibu Sedan	078UIA
52-432	1974 GMC 3/4 ton pick-up truck	94986W
54-934	1979 Chevrolet 3/4 ton pick-up truck	1N26039
36-003	1981 Ford aerial-lift truck	2A17823

Notes:

1. This truck is kept at, and normally does not leave, the Long Wharf.
2. Revised - September 24, 1982