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- Resolution 64-1 Porsche filed an application for a certificate of approval for a crankcase emission control system on Dec. 12, 1963.
- Resolution 64-2 Bayerische Motorenwerke A. G. (Bavarian Motor Works) filed an application for a certificate of approval for a crankcase emission control system on January 17, 1964.
- Resolution 64-3 Section 24398, Chapter 3, Division 20 of the Health and Safety Code authorizes the MVPCB to contract for the performance of tests or other services.
- Resolution 64-4 Lotus Cars, Limited, Cheshunt, England filed an application for certification of approval for a crankcase emission control system.
- Resolution 64-5 Renault Billancourt, Seine, France, filed an application for certification of approval for a crankcase control system.
- Resolution 64-6 Humber Limited, Coventry, England, filed an application for certification of approval for a crankcase emission control system.
- Resolution 64-7 American Motors Corporation, Detroit, Michigan, filed an application for a certificate of approval for an open crankcase emission control system.
- Resolution 64-8 Volkswagen of America, Inc. A subsidiary of Volkswagenwerk AG in Wolfsburg, Germany, filed an application for certificate of approval of a crankcase emission control system on Dec. 30, 1963.
- Resolution 64-9 Public Law 88-206 improves, strengthens and accelerates programs for the prevention and abatement of air pollution, recognizes the importance of automobile pollution; and permits increase of appropriation of funds to carry out its provisions.
- Resolution 64-10 The MVPCB has designated the Scott Research Labs, Inc. automotive testing facility as an authorized motor vehicle pollution control testing laboratory.
- Resolution 64-11 The MVPCB has designated Scott Research Labs., Inc. automotive testing facility as an authorized motor vehicle pollution control testing laboratory.
- Resolution 64-12

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- Resolution 64-12 Walker Manufacturing Company, a subsidiary of Kern County Land Co., Inc. and American Cyanamid Co., Inc. filed a joint application for approval of an exhaust emission control system on September 14, 1961.
- Resolution 64-13 American Machine and Foundry Co., Inc. and Chromalloy Corporation filed a joint application for approval of an exhaust emission control system on March 7, 1961.
- Resolution 64-14 Arvin Industries, Inc. and Universal Oil Products, Inc. filed a joint application for approval of an exhaust emission control system on February 16, 1961.
- Resolution 64-15 W. R. Grace & Co., Inc. and Norris Thermador Corp. filed a joint application for approval of an exhaust emission control system on May 15, 1961.
- Resolution 64-16 The Motor Vehicle Pollution Control Board has designated several laboratories as "authorized" facilities in accordance with Section 24397 of the Health and Safety Code.
- Resolution 64-17 The State Department of Public Health performs testing services for the Motor Vehicle Pollution Control Board at its facilities at 434 South San Pedro, Los Angeles.
- Resolution 64-18 General Motors Corporation has actively cooperated with the State of California in its program to control emissions from motor vehicles.
- Resolution 64-19 Ford Motor Company has actively cooperated with the State of California in its program to control emissions from motor vehicles.
- Resolution 64-20 Chrysler Corporation has actively cooperated with the State of California in its program to control emissions from motor vehicles.
- Resolution 64-21 American Motors Corporation has actively cooperated with the State of California in its program to control emissions from motor vehicles.
- Resolution 64-22 The people of the State of California are faced with an absolute need to return clear air to their skies. Be it resolved that the MVPCB express their appreciation to F. W. Hesse, VP, Space Technology Corporation for his interest and participation in this effort.
- Resolution 64-23 Commendation to Yellow Cab Company.
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# REPORT ON DR ING PORSCHE KG CRANKCASE EMISSION CONTROL SYSTEM

## Introduction

This is a report on the staff evaluation of the Porsche crankcase emission control system. The bases of the evaluation is the "ALTERNATE TESTING PROCEDURE FOR EVALUATION OF DEVICES TO CONTROL CRANKCASE EMISSIONS (Factory Installations)," June 5, 1963, revision. The report does not include evidence concerning compliance with the Board's criteria.

## Description of Device

The Porsche crankcase emission control system consists of a tube leading from the side of the oil filler spout to the clean side of the right-hand bank carburetor air cleaner. There is no crankcase emission control connection to the left-hand bank air cleaner of the engine. A stainless steel crimped material is inserted in the tube, just before entering the clean side of the air cleaner, to protect against crankcase explosion. Hydrocarbons cannot escape from the system as it is completely sealed. The oil filler cap is sealed. There is no provision made for the introduction of ventilation air. Porsche markets two automobiles in California; the 1600 C and the 1600 SC, both of which are in Group (a) with an equivalent of 96.5 cubic inches engine displacement.

## Maintenance

According to the manufacturer, the service requirements for the Porsche crankcase emission control system is exactly the same as for those automobiles which are not equipped with the system. This refers, particularly, to service of the air cleaner element. The flame arrestor screen is to be cleaned annually.

## Compliance with Crankcase Emission Standards

The applicant has demonstrated to the satisfaction of the staff that the system does, in fact, meet the State standards and odor criterion.

## Compliance with Board Criteria

The Board has on file, a letter from Porsche containing the manufacturer's representation that the system which will be manufactured for original equipment installation only will comply with the Board's criteria, and will not be offered for replacement except on the same new vehicles, upon which it was originally installed at the factory.

## Summary and Conclusions

1. The Porsche sealed crankcase emission control system meets the crankcase emission standards of the California Department of Public Health, when operating efficiently.
2. The applicant has made representation that the system as produced for original equipment installation only will comply with the Board's criteria including odor criterion.
3. The staff recommends that the Porsche Sealed Crankcase Emission Control System be granted a certificate of approval for factory installation only on new 1964 Porsche and subsequent model cars in Group (a) as per the attached resolution.

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RESOLUTION 64-1

WHEREAS the Porsche filed an application for a certificate of approval for a crankcase emission control system on December 12, 1963, which system is described as follows:

The Porsche crankcase emission control system consists of a tube from the side of the oil filler spout to the clean side of the right-hand bank carburetor air cleaner. There is no crankcase emission control connection to the left-hand bank air cleaner of the engine. A stainless crimped material is inserted in the tube just before entering the clean side of the air cleaner to protect against crankcase explosions. Hydrocarbons cannot escape from the system, as it is completely sealed. The oil filler cap is sealed. There is no provision made for the introduction of ventilation air. Porsche markets two automobiles in California; the 1600 C and the 1600 SC, both of which are in Group (a) with an equivalent of 96.5 cubic inches engine displacement; and

WHEREAS the device has been found to meet the crankcase emission standards established by the State Department of Public Health as published in Title 17 of the California Administrative Code, Chapter 5, Sub-Chapter 5, Article 1, Section 30530; and

WHEREAS after considering representations submitted by the manufacturer, the Board finds that the device meets the criteria of the Motor Vehicle Pollution Control Board as published in Title 13 of the California Administrative Code, Chapter 3, Sub-Chapter 1, Article 1, Section 2003.

THEREFORE, BE IT RESOLVED, that this Board

Issue a certificate of approval to the Porsche Company for a Sealed Crankcase Emission Control System for factory installation only on new 1964 and subsequent model Porsche cars in motor vehicle classification (a) as designated in Title 13, of the California Administrative Code, Chapter 3, Sub-Chapter 1, Article 1, Section 2004.

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REPORT OF BAYERISCHE MOTORENWERKE A.G. (BAVARIAN MOTOR WORKS) CRANKCASE EMISSION CONTROL SYSTEM

Introduction

This is a report on the staff evaluation of the Bayerische Motorenwerke A. G. (Bavarian Motor Works) crankcase emission control system. The bases of the evaluation is the "ALTERNATE TESTING PROCEDURE FOR EVALUATION OF DEVICES TO CONTROL CRANKCASE EMISSIONS (Factory Installation)," June 5, 1963, revision. The report does not include evidence concerning compliance with the Board's criteria.

Description of Device

The Bavarian Motor Works crankcase emission control system consists of a tube leading from the side of the oil dipstick tube to the clean side of the air cleaner. Hydrocarbons cannot escape to the atmosphere as the system is completely sealed. There is no provision for the introduction of ventilation air into the crankcase. A flame arrestor is inserted into the tube at the take-off point from the crankcase and consists of stainless steel crimped material. The Bavarian Motor Works are currently bringing into California the 1500 cc, 1800 cc, and 1800 cc TI automobiles all of which are in Group (a). The BMW engines range in size from 91.5 cubic inches to 110 cubic inches.

Maintenance

According to the manufacturer, the service requirements of the Bavarian Motor Works crankcase emission control system is exactly the same as for those automobiles which are not equipped with this system. The flame arrestor is to be cleaned annually.

Compliance with Crankcase Emission Standards

The applicant has demonstrated to the satisfaction of the staff that the system does, in fact, meet the State standards and odor criterion.

Compliance with Board Criteria

The Board has on file, a letter from the Bavarian Motor Works containing the manufacturer's representation that the system which will be manufactured for original equipment installation only will comply with the Board's criteria, and will not be offered for replacement except on the same new automobiles, upon which it was originally installed at the factory.

Summary and Conclusions

1. The Bavarian Motor Works Sealed Crankcase Emission Control System meets the crankcase emission standards of the California Department of Public Health, when operating efficiently.
2. The applicant has made representation that the system as produced for original equipment installation only will comply with the Board's criteria, including odor criterion.
3. The staff recommends that the Bavarian Motor Works Sealed Crankcase Emission Control System be granted a certificate of approval for factory installation only on new 1964 Bavarian Motor Works cars and subsequent model cars in Group (a) as per the attached resolution.

RESOLUTION 64-2

WHEREAS the Bayerische Motorenwerke A. G. (Bavarian Motor Works) filed an application for a certificate of approval for a crankcase emission control system on January 17, 1964, which system is described as follows:

The Bavarian Motor Works crankcase emission control system consists of a tube leading from the side of the oil dipstick tube to the clean side of the air cleaner. Hydrocarbons cannot escape to the atmosphere as the system is completely sealed. There is no provision for the introduction of ventilation air into the crankcase. A flame arrestor is inserted into the tube at the point of take-off from the crankcase and consists of stainless steel crimped material. The Bavarian Motor Works are currently bringing into California the BMW 1500 cc, 1800 cc, and 1800 cc TI automobiles all in Group (a). The BMW engines range in size from 91.5 cubic inches to 110 cubic inches; and

WHEREAS the device has been found to meet the crankcase emission standards as established by the State Department of Public Health as published in Title 17 of the California Administrative Code, Chapter 5, Sub-Chapter 5, Article 1, Section 30530; and

WHEREAS after considering representations submitted by the manufacturer, the Board finds that the device meets the criteria of the Motor Vehicle Pollution Control Board as published in Title 13 of the California Administrative Code, Chapter 3, Sub-Chapter 1, Article 1, Section 2003.

THEREFORE, BE IT RESOLVED, that this Board

Issue a certificate of approval for the Bavarian Motor Works Sealed Crankcase Emission Control System for factory installation only on new 1964 and subsequent model Bavarian Motor Works cars in motor vehicle classification (a) as designated in Title 13, of the California Administrative Code, Chapter 3, Sub-Chapter 1, Article 1, Section 2004.

1/23/64  
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# REPORT OF THE LOTUS CARS, LIMITED, CRANKCASE EMISSION CONTROL SYSTEM.

## Introduction

This is a report on the staff evaluation of the Lotus Cars, Limited, Crankcase Emission Control System. The basis for the evaluation is the Alternate Testing Procedure for Evaluation of Devices to Control Crankcase Emissions (Factory Installation), June 1963 revision. The report does not include evidence concerning compliance with the Board's criteria.

## Description of Device

The Lotus Crankcase Emission Control System consists of a one-half inch rubber tube connecting the rocker arm cover to the clean side of the air cleaner. The system is completely sealed, there being no provision made for the introduction of ventilation air. A conical type copper gauze flame arrestor is installed in the system where the tube takes off from the rocker arm cover. The oil filler cap is sealed and the rubber tube used in the system is ozone and oil resistant.

It is recommended that the flame arrestor be checked on an annual basis and the service on the air cleaner is the same as for an automobile engine without the system installed. Lotus plans to install the crankcase ventilation system on the Elan 1600 and the Ford Consul Cortina, both having an engine displacement of 97.5 cubic inches and are in Group (a).

## Compliance with Crankcase Emission Standards

The applicant has demonstrated to the satisfaction of the staff that the system when operating efficiently meets the State standards.

## Compliance with Board Criteria

The Board has on file a letter from Lotus Cars, Limited, signed by a legally authorized officer of the company, containing the manufacturer's representation that the device which will be manufactured for original equipment installation only, will comply with the Board's criteria including odor criterion. The letter also states that the system will not be used for automobiles other than those for which it was originally installed at the factory.

## Summary and Conclusions

1. The crankcase emission control system meets the crankcase emission standards of the California Department of Public Health when operating efficiently.
2. The applicant has made representation that the device as produced for original equipment installation only, will comply with the Board's criteria.
3. The staff recommends that the Lotus Sealed Crankcase Emission Control System be approved for new cars, factory installation only for 1964 and subsequent Lotus and Ford Consul Cortina automobiles in classification (a).

RESOLUTION 64-4

WHEREAS Lotus Cars, Limited, Cheshunt, England filed an application for certification of approval for a crankcase emission control system which is described as follows:

Lotus Cars, Limited, Sealed Crankcase Emission Control System consists of a rubber tube connecting the rocker arm cover to the clean side of the air cleaner. The system is completely sealed; there being no provision made for the introduction of ventilation air. The system is equipped with a flame arrestor consisting of a conical shaped copper gauze screen. The oil filler cap is sealed and the rubber tube used to connect the various components of the system is ozone and oil resistant.

WHEREAS the system has been found to meet the crankcase emission standards established by the California Department of Public Health as published in Title 17 of the California Administrative Code, Chapter 5, Subchapter 5, Article 1, Section 30530; and

WHEREAS after considering representations submitted by the manufacturer, the Board finds that the device meets the criteria of the Motor Vehicle Pollution Control Board, including the ~~odor~~ criterion, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 1, Section 2003.

THEREFORE, BE IT RESOLVED, that this Board

Issue a certificate of approval for the Lotus Sealed Crankcase Emission Control System for installation on 1964 and subsequent model Lotus and Ford Consul Cortina automobiles for factory installation in motor vehicle classification (a), as described in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 1, Section 2004.

3/11/64

## REPORT ON THE RENAULT CRANKCASE EMISSION CONTROL SYSTEM

### Introduction

This is a report of the staff evaluation of Renault crankcase emission control system. The basis for the evaluation is the Alternate Testing Procedure for Evaluation of Devices to Control Crankcase Emissions (Factory Installation), June 1963 revision. The report does not include evidence concerning compliance with the Board's criteria.

### Description of Device

The Renault system consists of two circuits, one from the rocker-arm cover to the air cleaner with a tee connection from this line which leads to the intake manifold. The flow in the two circuits is controlled by calibrated orifices. The one leading to the clean side of the air cleaner has a 1/8" orifice while the circuit leading to the intake manifold contains a 1/16" diameter orifice. No ventilation air is pulled into the system as it is completely sealed, including the oil filler cap and dipstick. The flow in the system is split between the air cleaner and the intake manifold depending on the intake manifold vacuum. In order to combat oil carryover, metallic packing is inserted inside the rocker-arm cover just ahead of the point of take-off to the air cleaner. The metallic packing also serves as a flame arrestor. The hose used to join the various components in the system is ozone and oil resistant.

The maintenance of the system calls for inspection of the metal packing at least once a year while the service for the air cleaner is the same as for a car without the system installed. Renault anticipates using this system on the R-4 and 670 Dauphine engines, both of which have a capacity of 52 cubic inches and are in group (a).

### Compliance with Crankcase Emission Standards

The applicant has demonstrated to the satisfaction of the staff that the system when operating efficiently meets the State standards.

### Compliance with Board Criteria

The Board has on file a letter from Renault, signed by a legally authorized officer of the company, containing the manufacturer's representation that the device which will be manufactured for original equipment installation only, will comply with the Board's criteria including odor criterion. The letter also states that the system will not be used for automobiles other than those for which it was originally installed at the factory.

### Summary and Conclusions

1. The crankcase emission control system meets the crankcase emission standards of the California Department of Public Health when operating efficiently.
2. The applicant has made representation that the device as produced for original equipment installation only, will comply with the Board's criteria.

RESOLUTION 64-5

WHEREAS Renault Billancourt, Seine, France, filed an application for certification of approval for a crankcase emission control system which is described as follows:

The Renault Crankcase Emission Control System consists of a tube leading from the rocker arm cover to the clean side of the air cleaner with a branch line from this tube leading into the intake manifold. The flow in each leg of the system is controlled by an orifice. The system is completely sealed, there being no provision made for the introduction of ventilation air. Metallic packing is inserted into the inside of the rocker arm cover to serve as a deterrent for oil carryover and to act as a flame arrestor. The oil filler cap and dipstick are sealed and the rubber used to connect the various components of the system is ozone and oil resistant;

WHEREAS the system has been found to meet the crankcase emission standards established by the California Department of Public Health as published in Title 17 of the California Administrative Code, Chapter 5, Subchapter 5, Article 1, Section 30530; and

WHEREAS after considering representations submitted by the manufacturer, the Board finds that the device meets the criteria of the Motor Vehicle Pollution Control Board, including the odor criterion, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 1, Section 2003.

THEREFORE, BE IT RESOLVED, that this Board

Issue a certificate of approval for Renault Sealed Crankcase Emission Control System for new car factory installation on 1964 and subsequent model motor cars in vehicle classification (a), as described in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 1, Section 2004.

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## REPORT OF THE HUMBER LIMITED CRANKCASE EMISSION CONTROL SYSTEM

### Introduction

This is a report on the staff evaluation of the Humber Limited Sealed Crankcase Emission Control System. The basis for the evaluation is the Alternate Testing Procedure for Evaluation of Devices to Control Crankcase Emissions (Factory Installation), June, 1963, revision. The report does not include evidence concerning compliance with the Board's criteria.

### Description of Device

The Humber Sealed Crankcase Emission Control System consists of a rubber tube connecting the oil filler spout to the clean side of the air cleaner. The system is completely sealed, there being no provision made for the introduction of ventilation air. The oil filler cap and the dipstick are sealed. A flame arrestor is installed in the system to eliminate the possibility of crankcase explosion. The rubber tube used in the system is ozone and oil resistant. It is recommended that the flame arrestor be checked on an annual basis, and the service on the air cleaner is the same as for an automobile engine without the system installed.

### Compliance with Crankcase Emission Standards

The applicant has demonstrated to the satisfaction of the staff that the system when operating efficiently meets the State standards.

### Compliance with Board Criteria

The Board has on file a letter from Humber Limited, signed by a legally authorized officer of the company, containing the manufacturer's representation that the device which will be manufactured for original equipment only, will comply with the Board's criteria including odor criterion. The letter also states that the system will not be used for automobiles other than those for which it was originally installed at the factory.

### Summary and Conclusions

1. The crankcase emission control system meets the crankcase emission standards of the California Department of Public Health when operating efficiently.
2. The applicant has made representation that the device as produced, for original equipment installation only, will comply with the Board's criteria.
3. The staff recommends that the Humber Sealed Crankcase Emission Control System be approved for new cars, factory installation only on 1964 and subsequent model Humber automobiles in classification (a).

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RESOLUTION 64-6

WHEREAS Humber Limited, Coventry, England filed an application for certification of approval for a crankcase emission control system which is described as follows:

Humber Limited Sealed Crankcase Emission Control System consists of a rubber tube connecting the oil filler spout to the clean side of the air cleaner. The system is completely sealed; there being no provision made for the introduction of ventilation air. The oil filler cap and the dipstick are sealed. The system is equipped with a flame arrestor to eliminate the possibility of crankcase explosion. The rubber tube used to connect the various components of the system is ozone and oil resistant.

WHEREAS the system has been found to meet the crankcase emission standards established by the California Department of Public Health as published in Title 17 of the California Administrative Code, Chapter 5, Subchapter 5, Article 1, Section 30530; and

WHEREAS after considering representations submitted by the manufacturer, the Board finds that the device meets the criteria of the Motor Vehicle Pollution Control Board, including the odor criterion, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 1, Section 2003.

THEREFORE, BE IT RESOLVED, that this Board

Issue a certificate of approval for the Humber Sealed Crankcase Emission Control System for installation on 1964 and subsequent model Humber automobiles for factory installation in motor vehicle classification (a) as described in Title 13 of the California Code, Chapter 3, Subchapter 1, Article 1, Section 2004.

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RESOLUTION 64-7

WHEREAS, American Motors Corporation, Detroit, Michigan, filed an application for a certificate of approval for an open crankcase emission control system described as the American Motors Corporation open crankcase emission control system having the following specifications:

A spring-loaded regulating valve (capacity 4.6 CFM at 30 MPH, 2" Hg IM Vacuum) assembly actuated by intake manifold vacuum which meters the flow of crankcase gases to the engine intake manifold. An unrestricted flow, oil filler cap is used which permits the entrance of ventilation air into the system. An ozone resistant, oil resistant rubber hose together with necessary fittings is used to connect the various components of the system; and

WHEREAS, the system has been found to meet the crankcase emission control standards established by the California Department of Public Health as published in Title 17 of the California Administrative Code, Chapter 5, Sub-Chapter 5, Article 1, Section 30530; and

WHEREAS, after considering representations submitted by the manufacturer, the Board finds that the device meets the criteria, including odor criterion, of the Motor Vehicle Pollution Control Board as published in Title 13 of the California Administrative Code, Chapter 3, Sub-Chapter 1, Article 1, Section 2003.

THEREFORE, BE IT RESOLVED, That this Board

Issue a certificate of approval for the American Motors Corporation open crankcase emission control system for new American Motors Corporation cars, factory installation, on 1965 and subsequent models of motor vehicles in classification (b) as designated in Title 13 of the California Administrative Code, Chapter 3, Sub-Chapter 1, Article 1, Section 2004.

3/11/64

REPORT ON  
THE AMERICAN MOTORS CORPORATION OPEN CRANKCASE EMISSION CONTROL SYSTEM

Introduction

This is a report on the staff evaluation of the American Motors Corporation open crankcase emission control system. The basis of the evaluation is the Alternate Testing Procedure for Evaluation of Devices to Control Crankcase Emissions, (Factory Installation), June 1, 1963, revision. This report does not include evidence concerning compliance with the Board's criteria.

Description of System

The American Motors Corporation open crankcase emission control system consists of a spring-loaded regulating valve (capacity 4.6 CFM at 30 MPH, 2" hg Intake Manifold Vacuum) assembly which meters the crankcase gases through the valve and into the intake manifold. A standard unrestricted flow, oil filler cap is used through which ventilation air is pulled into the system. Three engines are involved in the application for certification and these are:

1. 1965, Rambler "American" with 196 C.I.D. "L" head engine.
2. 196 C.I.D. cast iron OHV engine. This engine is standard in the "Classic" series, and will also be offered in the "American" equipped with the positive crankcase ventilation valve in a two-barrel carburetor option.
3. 196 C.I.D. aluminum OHV engine. This engine will be offered as option in the "Classic" series.

The rubber used in connecting the components of the system is ozone and oil resistant. The maintenance recommendation for the valve and system calls for inspection, cleaning, or replacement of the valve at 8,000 mile intervals. The control valve proposed to be used by American Motors is manufactured by the Chicago Screw Company and is of the solid tapered plunger type (no orifice) which has been in use by American Motors since February 15, 1963 with no complaints. The simple open system with other type valves was approved by the Board for 1961, 1962, and 1963 models only.

Compliance with Crankcase Emission Standards

The applicant has demonstrated to the satisfaction of the staff that the system when operating efficiently meets the State standards.

Compliance with Board Criteria

The Board has on file a letter from the American Motors Corporation, signed by a legally authorized officer, containing the manufacturer's representation that the device which will be manufactured for original equipment installation only, will comply with the Board's criteria, including odor criterion. The letter also states that the system will not be used as replacement other than for cars upon which it was originally installed.

Summary and Conclusions

1. The crankcase emission control system meets the crankcase emissions standards of the California Department of Public Health when operating efficiently.
2. The applicant has made representation that the device as produced for original equipment installation only will comply with the Board's criteria.
3. The staff recommends that the American Motors Corporation open crankcase emission control system be approved for new American Motors Corporation automobiles, factory installation, on 1965 and subsequent models of motor vehicles in classification (b).

3/11/64

MOTOR VEHICLE POLLUTION CONTROL BOARD  
REPORT OF VOLKSWAGEN OF AMERICA CRANKCASE EMISSION CONTROL SYSTEM

I. INTRODUCTION

This report presents the evaluation of the Volkswagen of America Crankcase Emission Control System by the staff of the Motor Vehicle Pollution Control Board. The basis of evaluation are the requirements set forth in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Sections 2000 to 2004. Since approval is sought for used car installation, the report deals with both the California Crankcase Emission standard and compliance with the Board's criteria. Cost and marketing factors will be discussed.

II. DESCRIPTION OF SYSTEM

The Volkswagen of America Crankcase Emission Control System consists of a tube to air cleaner type device which conducts crankcase gases from a sealed crankcase to the upstream side of the air cleaner, with a carburetor jet change. Volkswagen is requesting certification of this device for used car installation on Volkswagen in 1950-1960 age group, including the first three months of the 1961 model production. The tube-to-air cleaner system is similar to that approved by the Motor Vehicle Pollution Control Board for new car, factory installation under Board resolution 62-7 on April 11, 1962. On a worldwide basis beginning in April, 1961, and all cars manufactured by Volkswagen have been equipped with the device. For used cars (and new cars since Sept. 1963) the device includes a water trap which drains condensate out of the tube-to-air-cleaner, and discharges it underneath the automobile.

Elements comprise one-half inch diameter neoprene rubber hose resistant to oil, ozone and gasoline, steel fittings and a screw-on sealed oil filler cap equipped with a cork gasket.

There is no provision in the system for the introduction of ventilation air.

III. PRINCIPLE OF OPERATION

The Volkswagen Crankcase Emission Control System being completely sealed, there is no opportunity for the escape of hydrocarbons into the atmosphere. On account of the discharge of the crankcase gases to the dirty side of the air cleaner, there is not sufficient pressure drop in the system to maintain a vacuum in the crankcase under all operating conditions. Under most operating conditions. Under most operating conditions a slight pressure exists in the crankcase which varies from 0.1" of water to about 0.6" of water. The crankcase gases are thereby forced into the air cleaner and on into the induction system where they are burned. It is a comparatively simple system and so far has been equipped on approximately 3 million Volkswagens scattered throughout the world.

IV. COMPLIANCE WITH AIR-FUEL RATIO CHANGE

In April, 1962, the Board passed resolution 62-2 which established limits of acceptable average change in air/fuel ratio attributable to the installation of

crankcase emission control devices as follows:

- A. Air/fuel ratio decrease not greater than 1%
- B. Air/fuel ratio increase not greater than 4%

Several used representative Volkswagens were tested at Scott Research Laboratory equipped with the tube-to-air cleaner device, and it was found that the average enrichment of all the automobiles tested was 2.16%. They therefore did not comply with the 1% enrichment limitation. To correct this condition Scott then installed in the test vehicles a one-step leaner jet together with a slighter leaner pilot or idle jet. The same cars were then tested, and it was found that, for these vehicles, instead of enriching there was an average of 3.8% on the leaning side which is within the 4% allowed.

The question naturally arises, what is the effect of leaning out the carburetor with regard to performance. Considerable work was done along this line at the Volkswagen factory in Wolfsburg, Germany, and advice has been received that the installation of the 120 Main jet and 50 Pilot jet had no effect on the performance of the automobile with these leaner jets. It is the feeling of the staff that with the use of the leaner jets the uncalibrated fuel being returned to the air cleaner is compensated for insofar as the 1% rich and 4% lean ruling is concerned.

In order to corroborate the fact that there is no increase in carbon monoxide in the tail pipe Scott also tested the same automobiles for carbon monoxide content with and without the device and with the use of the leaner jets. It was found that the cars equipped with the Volkswagen system without any compensating jets that the carbon monoxide in the tail pipe was approximately twice as high as the same automobiles when tested with the leaner jets.

#### V. COMPLIANCE WITH BOARD CRITERIA

The Board criteria are stated in Title 13, Chapter 3, Subchapter 1, Article 1, Section 2003, as follows:

Every device controlling crankcase emissions from motor vehicles receiving a certified approval from the Motor Vehicle Pollution Control Board, shall meet the following criteria:

- A. Be so designed as to have no adverse effect on engine operation or vehicle performance.

The staff is satisfied that there will be no adverse effect on engine operation or vehicle performance with the installation of the Volkswagen system.

- B. Operate in a safe manner.

With over 3 million Volkswagen equipped automobiles, it is felt that the crankcase emission control system will operate in a safe manner.

- C. Have sufficient durability so as to operate efficiently for at least 12,000 miles with normal maintenance.

(Commencing with the 1966 model year, but not later than October 1, 1965)

crankcase emission control devices as follows:

- A. Air/fuel ratio decrease not greater than 1%
- B. Air/fuel ratio increase not greater than 4%

Several used representative Volkswagens were tested at Scott Research Laboratory equipped with the tube-to-air cleaner device, and it was found that the average enrichment of all the automobiles tested was 2.16%. They therefore did not comply with the 1% enrichment limitation. To correct this condition Scott then installed in the test vehicles a one-step leaner jet together with a slighter leaner pilot or idle jet. The same cars were then tested, and it was found that, for these vehicles, instead of enriching there was an average of 3.8% on the leaning side which is within the 4% allowed.

The question naturally arises, what is the effect of leaning out the carburetor with regard to performance. Considerable work was done along this line at the Volkswagen factory in Wolfsburg, Germany, and advice has been received that the installation of the 120 Main jet and 50 Pilot jet had no effect on the performance of the automobile with these leaner jets. It is the feeling of the staff that with the use of the leaner jets the uncalibrated fuel being returned to the air cleaner is compensated for insofar as the 1% rich and 4% lean ruling is concerned.

In order to corroborate the fact that there is no increase in carbon monoxide in the tail pipe Scott also tested the same automobiles for carbon monoxide content with and without the device and with the use of the leaner jets. It was found that the cars equipped with the Volkswagen system without any compensating jets that the carbon monoxide in the tail pipe was approximately twice as high as the same automobiles when tested with the leaner jets.

#### V. COMPLIANCE WITH BOARD CRITERIA

The Board criteria are stated in Title 13, Chapter 3, Subchapter 1, **Article 1**, Section 2003, as follows:

Every device controlling crankcase emissions from motor vehicles receiving a certified approval from the Motor Vehicle Pollution Control Board, shall meet the following criteria:

- A. Be so designed as to have no adverse effect on engine operation or vehicle performance.

The staff is satisfied that there will be no adverse effect on engine operation or vehicle performance with the installation of the Volkswagen system.

- B. Operate in a safe manner.

With over 3 million Volkswagen equipped automobiles, it is felt that the crankcase emission control system will operate in a safe manner.

- C. Have sufficient durability so as to operate efficiently for at least 12,000 miles with normal maintenance.

(Commencing with the 1966 model year, but not later than October 1, 1965)

manufacture, Criterion (c) is amended to read "Have sufficient durability so as to operate within the State Standards and other Motor Vehicle Pollution Control Board criteria for, at least, 12,000 miles without maintenance.)

The Volkswagen system has sufficient durability to operate for at least 12,000 miles without maintenance.

- D. Operate in such a manner so as not to create excessive heat, noise, or odor beyond the standard characteristic of the motor vehicle without such a device.

The Volkswagen system does not create excessive heat, noise, or odor beyond the standard characteristic of the motor vehicle without such a device.

- E. The purchase or cost of installation of such device shall not constitute an undue cost burden to the motorist.

The Volkswagen crankcase emission control system is manufactured at Wolfsburg, Germany and the cost of the parts to the motorist will be \$5.00 plus tax. It is estimated that approximately one-half hour will be required to install the system. The total cost of the installation will therefore be in the range of \$7 to \$9 to the motorist. The jets can be replaced without removing the carburetor.

- F. Installation of such device shall not create or contribute to a noxious or toxic effect in the ambient air.

The installation of the Volkswagen device with the use of the leaner jets will not create or contribute to obnoxious or toxic effects in the ambient air.

## VI. OTHER CONSIDERATIONS

In addition to the criteria, the flame arresting ~~qualities~~ of this system were evaluated and it was found that in over 3 million installations there has been no record of a crankcase explosion. The discharge of this crankcase gases to the dirty side of the air cleaner eliminates the necessity of a flame arrestor.

Oil consumption has been carefully evaluated and there is no increase in oil consumption due to the installation of the system.

The average life of the Volkswagen engine is approximately 5 years and at the end of that average period it is the recommendation of Volkswagen that the engine be completely replaced with one that has been factory rebuilt. It will ~~therefore~~ be expected that many of the engines up to 1959 models have had rebuilt engines installed in them. The rebuilt engines are completely equipped with the crankcase emission control system at the factory and are returned to California.

The matter of icing has been considered, and a great deal of experience is available with the Volkswagen crankcase emission control system in colder

climates particularly in Canada. The air cleaner is an oil bath type and there is no record of icing under any of the conditions which the cars are operated.

#### VII. AVAILABILITY OF DEVICES

The availability of the devices for used cars through the distribution system set up by Volkswagen in California was studied. There are approximately 120 licensed distributors of Volkswagen automobiles in the State of which about 1/3 are in the Metropolitan Los Angeles area and the other 2/3 scattered throughout the State. All of these dealers will stock the crankcase emission control system and it is anticipated that most of the crankcase control installations will be made by the Volkswagen dealers.

#### VIII. ADVISORY COMMITTEE RECOMMENDATION

The Volkswagen used car system was considered at a March 18, 1964 meeting of the Technical Advisory Group for Crankcase Emission Control Devices. The Group unanimously approved the system for used cars.

#### Summary and Conclusions

1. The Volkswagen Crankcase Emission Control System meets the crankcase emission standards of the California Department of Public Health when operating efficiently.
2. The Volkswagen Crankcase Emission Control System complies with the Board criteria.
3. The Staff recommends that the Volkswagen Crankcase Emission Control System be granted a certificate of approval for used car installation in Group (a) as per the attached resolution.

MPS/JRS/vf

4/15/64

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Summary and Conclusions

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2. The Volkswagen Crankcase Emission Control System complies with the Board criteria.
3. The Staff recommends that the Volkswagen Crankcase Emission Control System be granted a certificate of approval for used car installation in Group (a) as per the attached resolution.

MPS/JRS/vf

4/15/64

RESOLUTION 64-8

WHEREAS Volkswagen of America, Inc., a subsidiary of Volkswagenwerk AG in Wolfsburg, Germany, filed an application for certificate of approval of a crankcase emission control system on December 30, 1963; which system is described as a control system having the following specifications:

A tube-to-air cleaner device which conducts crankcase gases from a sealed crankcase to the upstream side of the air cleaner and a condensate removal trap, along with one-step leaner main jets; and

WHEREAS the system has been found to meet the crankcase emission standards established by the State Department of Public Health, as published in Title 17 of the California Administrative Code, Chapter 5, Sub-Chapter 5, Article 1, Section 30530; and

WHEREAS based upon demonstration of compliance with established test procedures, the Board finds that the device meets the criteria of the Motor Vehicle Pollution Control Board, including the odor criterion, as published in Title 13 of the California Administrative Code, Chapter 3, Sub-Chapter 1, Article 1, Section 2003.

THEREFORE, BE IT RESOLVED, That this Board

Issue a certificate of approval for the Volkswagen of America Crankcase Emission Control System for used Volkswagen motor vehicles in classification (a) as designated by Title 13, California Administrative Code, Chapter 3, Sub-Chapter 1, Article 1, Section 2004.

4/15/64

RESOLUTION 64-9

WHEREAS, Public Law 88-206 improves, strengthens and accelerates programs for the prevention and abatement of air pollution; recognizes the importance of automotive pollution; and permits increase of appropriation of funds to carry out its provisions; and

WHEREAS, California has pioneered in the establishment of ambient air quality and motor vehicle emission standards; and

WHEREAS, California's research, testing, and approval of crankcase emission control devices has led to the installation of crankcase control devices on new cars sold in all states; and

WHEREAS, California State and counties have provided and continue to expend considerable funds for automotive air pollution research and control; and

WHEREAS, considerable more research and data are needed to solve the extremely complex automotive air pollution problem; and

WHEREAS, California because of its severe photochemical smog problem must make decisions leading to the mandatory installation of devices and systems to control automotive emissions although adequate data are not always available; and

WHEREAS, California activities and findings have accrued to the benefit of other states;

THEREFORE, BE IT RESOLVED, that the Surgeon General is urged by the California Motor Vehicle Pollution Control Board to use funds appropriated under Public Law 88-206 for research on vehicle-created air pollution, particularly those projects of vital concern to California listed in the attachment; and,

That the Surgeon General be advised of the willingness of the California State Department of Public Health to be consulted on the planning of automotive pollution research projects that may be of benefit to California.

4/15/64

8

MOTOR VEHICLE POLLUTION CONTROL BOARD

Needed Automotive Air Pollution Studies

1. Photochemical Air Pollution Studies

- a. Effects of varying concentrations of hydrocarbons and oxides of nitrogen on photochemical formation of eye irritation, plant damage, aerosols, and ozone concentrations.
- b. Determination of relative reactivity of specific hydrocarbons and organic compounds in producing photochemical smog effects.
- c. Study of apparent differences of smog produced in the atmosphere and smog produced in environmental chambers to enable reliable applications of laboratory data to control program.

2. Motor Vehicle Emissions and Driving Patterns

- a. Comparison of exhaust emissions when vehicles are driven on the road versus dynamometer cycle emissions.
- b. Determination of concentrations of specific hydrocarbons and other organic compounds emitted from motor vehicles and from various control devices or systems.
- c. Emissions of hydrocarbons from the fuel tank through evaporation, spillage, overflow, breathing losses, and displacement losses.
- d. Carburetor hot soak losses.
- e. Traffic patterns and test cycles for heavy trucks and buses and for passenger cars by size.

3. Oxides of Nitrogen

- a. Effects of nitrogen dioxide on man, animals, and plants.
- b. Atmospheric coloration by nitrogen dioxide.
- c. Evaluation of methods and devices to control oxides of nitrogen.

4. Diesel Exhaust Odor

- a. Determination of compounds which cause odor.
- b. Approaches to establishing standards for diesel odor.

RESOLUTION 64-10

WHEREAS the Motor Vehicle Pollution Control Board has designated the Scott Research Laboratories, Inc. automotive testing facility as an authorized motor vehicle pollution control testing laboratory; and

WHEREAS Chapter 3, Section 24398 authorizes the Motor Vehicle Pollution Control Board to contract for the use of, or the performance of tests or other services; and

WHEREAS the Board has contracted with Scott for prior contracts and found their performance to be satisfactory; and

WHEREAS it is necessary for the State to continue device testing and evaluation and since Scott has agreed to perform such additional work, the Board accepts the proposed agreement to increase the contract amount by \$4,000.00, and

WHEREAS this will be used primarily for evaluating vehicles in respect to criteria to determine if exhaust devices are in compliance.

THEREFORE, BE IT RESOLVED, That this Board,

Approves the Scott Research Laboratories, Inc. State Contract No. 147 amended, dated August 14, 1963 to increase the contract to a total of \$29,000.00 as presented and directs the Executive Officer to sign on behalf of the State Motor Vehicle Pollution Control Board.

5/13/64

mj

RESOLUTION 64-11

WHEREAS the Motor Vehicle Pollution Control Board has designated Scott Research Laboratories, Inc., automotive testing facility as an authorized motor vehicle pollution control testing laboratory; and

WHEREAS Section 24398, Chapter 3, Division 20 of the Health and Safety Code authorizes the Motor Vehicle Pollution Control Board to contract for the use of, or the performance of tests or other services; and

WHEREAS the California Vehicle Test Laboratory operated by the State Department of Public Health is not equipped and is unable to perform certain necessary tests as required by the criteria established by the Motor Vehicle Pollution Control Board; and

WHEREAS the Board has contracted with Scott for prior contracts and found their performance to be satisfactory; and

WHEREAS it is necessary for the State to evaluate automobile emission control devices as to their performance in relation to established criteria and State standards as published by the Department of Public Health; and

WHEREAS Scott Research Laboratories, Inc. has agreed to perform the desired work as specified in the contract and the Motor Vehicle Pollution Control Board finds the contract to be satisfactory;

THEREFORE, BE IT RESOLVED, that this Board authorizes the Executive Officer to execute a contract with Scott Research Laboratories, Inc. for a maximum amount of \$30,000 during the 1964-5 fiscal year, and directs the Executive Officer to sign the contract on behalf of the State Motor Vehicle Pollution Control Board.

5/13/64

g

RESOLUTION 64-12

WHEREAS, Walker Manufacturing Company, a subsidiary of Kern County Land Co., Inc. and American Cyanamid Co., Inc. filed a joint application for approval of an exhaust emission control system on September 14, 1961; and

WHEREAS, the system is described as the Walker-Cyanamid Exhaust Control System, with major components comprised as follows:

1. A catalytic exhaust converter (with no overtemperature bypass),
2. A diaphragm-type air pump,
3. A Carburetor throttle positioner, and
4. Specified engine adjustments and Annual tuneup;

WHEREAS, the Motor Vehicle Pollution Control Board finds that the system complies with the exhaust emission standards of the State Department of Public Health of 275 PPM of hydrocarbons and 1.5% of carbon monoxide, as established pursuant to Sections 426.1 and 426.5 of the Health and Safety Code, State of California, and as determined according to established procedures of the Board; and

WHEREAS, based upon demonstration of compliance with established procedures, the Board finds that the system meets the criteria of the Board, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 2, Section 2103.

THEREFORE, BE IT RESOLVED,

That this Board, under the powers and authority granted in Chapter 3, (Commencing at Section 24378) Division 20 of the Health and Safety Code,

Issue a certificate of approval for the Walker-Cyanamid Exhaust Control System for new 1966 and subsequent model motor vehicles, factory installation, in classifications (b), (c), (d), (e) and (f), pursuant to Title 13, California Administrative Code, Chapter 3, Subchapter 1, Article 2, Sections 2104 and 2105.

6/10/64

vf

RESOLUTION 64-13

WHEREAS, American Machine and Foundry Co., Inc. and Chromalloy Corporation, filed a joint application for approval of an exhaust emission control system on March 7, 1961; and

WHEREAS, the system is described as the AMF-Chromalloy Mark XII-W "Smog Burner", with major components comprised as follows:

1. A direct-flame exhaust converter (with modulating bypass valve),
2. A venturi for secondary air induction,
3. A specially calibrated carburetor, and
4. Specified engine adjustments and annual tuneup;

WHEREAS, the Motor Vehicle Pollution Control Board finds that the system complies with the exhaust emission standards of the State Department of Public Health of 275 PPM of hydrocarbons and 1.5% of carbon monoxide, as established pursuant to Sections 426.1 and 426.5 of the Health and Safety Code, State of California, and as determined according to established procedures of the Board; and

WHEREAS, based upon demonstration of compliance with established procedures, the Board finds that the system meets the criteria of the Board, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 2, Section 2103.

THEREFORE, BE IT RESOLVED,

That this Board, under the powers and authority granted in Chapter 3, (Commencing at Section 24378) Division 20 of the Health and Safety Code,

Issue a certificate of approval for the AMF-Chromalloy Mark XII-W "Smog Burner" for 1962 and subsequent model motor vehicles, in classifications (b), (c), (d), (e) and (f), pursuant to Title 13, California Administrative Code, Chapter 3, Subchapter 1, Article 2, Sections 2104 and 2105.

6/10/64  
mg

RESOLUTION 64-14

WHEREAS, Arvin Industries, Inc. and Universal Oil Products, Inc. filed a joint application for approval of an exhaust emission control system on February 16, 1961; and

WHEREAS, the system is described as the Arvin-UOP Exhaust Control System, with major components comprised as follows:

1. A catalytic exhaust converter (with no overtemperature bypass), and
2. A diaphragm-type air pump;

WHEREAS, the Motor Vehicle Pollution Control Board finds that the system complies with the exhaust emission standards of the State Department of Public Health of 275 PPM of hydrocarbons and 1.5% of carbon monoxide, as established pursuant to Sections 426.1 and 426.5 of the Health and Safety Code, State of California, and as determined according to established procedures of the Board; and

WHEREAS, based upon demonstration of compliance with established procedures, the Board finds that the system meets the criteria of the Board, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 2, Section 2103.

THEREFORE, BE IT RESOLVED,

That this Board, under the powers and authority granted in Chapter 3, (Commencing at Section 24378) Division 20 of the Health and Safety Code,

Issue a certificate of approval for the Arvin-UOP Exhaust Control System for new 1966 and subsequent model motor vehicles, factory installation, in classifications (b), (c), (d), (e) and (f), pursuant to Title 13, California Administrative Code, Chapter 3, Subchapter 1, Article 2, Sections 2104 and 2105.

6/10/64  
mg

RESOLUTION 64-15

WHEREAS, W. R. Grace & Co., Inc. and Norris Thermador Corp. filed a joint application for approval of an exhaust emission control system on May 15, 1961; and

WHEREAS, the system is described as the Grace-Norris Exhaust Control System, with major components comprised as follows:

1. A catalytic exhaust converter (with an overtemperature bypass),
2. A rotary vane-type air pump, and
3. Exhaust valve air injection;

WHEREAS, the Motor Vehicle Pollution Control Board finds that the system complies with the exhaust emission standards of the State Department of Public Health of 275 PPM of hydrocarbons and 1.5% of carbon monoxide, as established pursuant to Sections 426.1 and 426.5 of the Health and Safety Code, State of California, and as determined according to established procedures of the Board; and

WHEREAS, based upon demonstration of compliance with established procedures, the Board finds that the system meets the criteria of the Board, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 2, Section 2103.

THEREFORE, BE IT RESOLVED,

That this Board, under the powers and authority granted in Chapter 3, (Commencing at Section 24378) Division 20 of the Health and Safety Code,

Issue a certificate of approval for the Grace-Norris Exhaust Control System for new 1966 and subsequent model motor vehicles, factory installation, in classifications (b), (c), (d), (e) and (f), pursuant to Title 13, California Administrative Code, Chapter 3, Subchapter 1, Article 2, Sections 2104 and 2105.

6/17/64  
mg

## RESOLUTION 64-16

WHEREAS the Motor Vehicle Pollution Control Board has designated several laboratories as "authorized" facilities in accordance with Section 24397 of the Health and Safety Code; and

WHEREAS the State of California is operating its own official laboratory as a testing facility in Los Angeles; and

WHEREAS the question has been raised as to the validity of conflicting test results in respect to eventual Board action in approving exhaust emission control devices;

WHEREAS, however, to facilitate testing for devices makes and models of vehicles, certain other laboratories are also acceptable;

NOW THEREFORE, BE IT RESOLVED AND DECLARED TO BE THE PUBLIC POLICY OF THIS BOARD THAT:

1. For purposes of approval of exhaust emission control devices, only data obtained by, or results equivalent to, the official California Vehicle Pollution Laboratory will be considered by the Board.
2. Procedures for accepting data from Authorized Laboratories shall be as given in Exhibit I attached.
3. This resolution supersedes and rescinds Resolution 63-37.

8/12/64  
vf

MOTOR VEHICLE POLLUTION CONTROL BOARD  
REPORT OF THE COMMITTEE ON TEST PROCEDURES AND THEIR EVALUATION

The Test Procedures Committee met in Sacramento on August 4, 1964.

Based on Board direction at the June 17, 1964 meeting, the Committee is recommending approval of a procedure for qualifying as an authorized vehicle pollution control testing laboratory. This formalizes existing policy including the requirement for cross-checks. It is attached as Exhibit "A".

To further implement this policy, we recommend approval of Resolution 64-16, attached as Exhibit "B" which rescinds Resolution 63-37. This action is based on previous Board policy which required all tests for exhaust device approval to be conducted at the State laboratory in Los Angeles until two or more devices were approved. Now that the law is activated, the old resolution can be rescinded and tests from non-State laboratories as provided by law can be accepted.

The Committee did feel that for used cars, because of the wide applicability potential in devices that at least 50% of the tests should still be done in the State laboratory and that the ratio established by these tests should be applied to the remainder of the results. This provision is included in the procedure which is part of our recommended resolution.

The Committee reviewed the procedure for approval of factory-built systems for new cars and noted that section (10) required a written representation from the automobile company as to compliance with California standards and criteria.

They are recommending that this same language be applied to the test procedures for criteria "B" which would apply to devices being approved under the previous procedure, e.g. for used cars.

Exhibit "C" attached shows the specific change recommended by the Committee. It utilizes the same requirement already approved by the Board for factory-built systems for new cars.

Finally, the Committee reviewed some minor technical changes in the dynamometer test procedure in respect to:

- 1) Inertia wheel for small pickup trucks
- 2) Shift speeds for Class (a) vehicles
- 3) Clarification of deceleration mode

These are all for clarification and do not materially change the tests as previously run at the State laboratory. These minor revisions are shown as Exhibit "D" attached. We recommend approval as submitted.

Respectively submitted,

Malcolm Merrill, M.D.  
Chairman, Committee on Test  
Procedures and Their Evaluation

MHM  
DAJ/vf/mj  
8/12/64

State of California  
MOTOR VEHICLE POLLUTION CONTROL BOARD

Procedures for Qualifying as an  
Authorized Vehicle Pollution Control Testing Laboratory

Laboratories, public or private, applying to be designated by the Board as authorized vehicle pollution control testing laboratories, are to submit written information to the Board, and the laboratories will be examined by a Board staff member, with respect to each of the following:

1. Testing equipment and instrumentation is to be the same as, or shown to be equivalent to, that specified in the "California Test Procedure and Criteria for Motor Vehicle Exhaust Emission Control."
2. Personnel responsible for the testing are to have adequate qualifications and experience in the field of vehicle exhaust emission testing.
3. Testing procedures must be those specified in the "California Test Procedure and Criteria for Motor Vehicle Exhaust Emission Control."
4. Cross checks of emission test results on one or more vehicles may be required between the applicant laboratory, and the California Vehicle Pollution Laboratory. A sample cross check procedure is described in the Board memorandum dated June 10, 1964. From time to time, after "authorization", further crosschecks may be necessary, as determined by the Board engineering staff.

MPS/eh

8/12/64

State of California  
MOTOR VEHICLE POLLUTION CONTROL BOARD

Exhaust Device  
Certification Procedure Utilizing an  
Authorized Vehicle Pollution Control Testing Laboratory  
(other than the California Vehicle Pollution Laboratory)

An applicant for certification of an exhaust control device may accomplish the required testing at a laboratory designated as "authorized" by the Board, subject to the procedure outlined below. The reference for details of all testing is "California Test Procedure and Criteria for Motor Vehicle Exhaust Emission Control".

I. General Procedure

In accordance with established Board policy, the description of test vehicles, results, including emission data, etc., are to be submitted to the engineering staff as specified in the "Summary of Certification Procedure" in the front of the reference. To prevent wasted effort, the data from each step should be evaluated and agreement obtained from the Board staff before proceeding to the next step.

A written agreement will be required in advance of starting a testing program, for the results from a laboratory other than a State Laboratory to be acceptable towards device certification. This will satisfy section 24398 of Chapter 3, Division 20 of the Health and Safety Code.

Prior to the written agreement described above, details of the proposed testing and a list, including serial numbers and emissions of vehicles, engines, devices, etc. comprising the test fleet, are to be furnished. As the test progresses, device unit histories including emission data malfunctions, etc. are to be furnished. Except if otherwise agreed, Fleet and Life testing is to be in accordance with Part 3, and Accelerated testing is to be in accordance with Part 4 of the reference.

Two vehicles for each type of control system are to be supplied to the Board for a reasonable time for evaluation of emission performance and criteria compliance.

II. Certification for factory installation on new cars only

Applicants for new cars only can accomplish all the testing at any laboratory "authorized" by the Board. From time to time, data crosschecks between laboratories may be necessary, as determined by the Board staff.

III. Certification for installation on used cars

Applicants for used cars are to accomplish the testing at an "authorized" laboratory in Southern California. At least 50% of the non-state emission tests during the Fleet & Life Testing are to be crosschecked by the California Vehicle Pollution Laboratory. The ratio of the California Vehicle Pollution laboratory results to non-state laboratory results will then serve as a factor to be applied to the non-state laboratory data before inclusion in the official results.

8-12-64

hlb

## C. Special Considerations

5. Flywheels giving equivalent inertia as shown in the following table should be used.

<u>Loaded Vehicle Weight, lb.</u>	<u>Equivalent Inertia Wheels, lb.</u>
up to 2250	2000
2250 to 2750	2500
2751 to 3500	3000
3501 to 4500	4000
4501 to 6000	5000

To obtain passenger car or light truck (less than 6000 lb. G.V.W.) loaded weights, add 400 pounds to the published shipping weight. Truck-loaded weights are the manufacturers' recommended gross vehicle weight ratings (GVW) as given on the nameplate or in published data. If published weight is unknown, add 300 pounds to the actual weight to determine weight category.

## 9. Three-Speed Manual Transmission Vehicles

- f. Deceleration - The modes should be run at closed throttle in high gear with clutch engaged, maintaining a constant deceleration rate by using the vehicle brakes. For those modes which decelerate to zero, the clutch should be depressed when speed drops below 15 mph.

If the vehicle decelerates more rapidly than required with no braking, the decelerations should be made at closed throttle even though less than the specified time is required. Indicate the end of the (50-0 or 30-15) deceleration, continue at that speed until the specified time has elapsed, then proceed with the next sequence.

This procedure does not alter the time and, therefore, does not change the percentage of time allotted to that mode and upset the heat balance.

## 10. Four-Speed Manual Transmissions.

Use the same procedure as three-speed manual transmissions with the following exceptions:

<u>Mode</u>	<u>Shift Speed or Gear Used</u>
0-25 accel.	15 and 25
30 cruise	3rd gear
30-15 decel.	3rd gear

RESOLUTION 64-17

WHEREAS the State Department of Public Health performs testing services for the Motor Vehicle Pollution Control Board at its facilities at 434 South San Pedro, Los Angeles and

WHEREAS that laboratory is an officially authorized testing facility and

WHEREAS the sum budgeted for these services during the 1964-65 fiscal year is the same as for the 1963-64 fiscal year

NOW THEREFORE BE IT RESOLVED THAT

1. The Motor Vehicle Pollution Control Board at its regular meeting in San Francisco on August 12, 1964 approves an inter agency agreement with the State Department of Public Health for use of their laboratory services in a total amount which shall not exceed \$229,954.00 and
2. Further, the Motor Vehicle Pollution Control Board authorizes D. A. Jensen, Executive Officer to execute this agreement on behalf of the Board.

vf  
8/12/64

RESOLUTION 64-17 (AMENDED)

WHEREAS, the State Department of Public Health performs testing services for the Motor Vehicle Pollution Control Board at its facilities at 434 South San Pedro, Los Angeles; and

WHEREAS, that laboratory is an officially authorized testing facility; and

WHEREAS, the sum budgeted for these services during the 1964-65 fiscal year is basically the same as for the 1963-64 fiscal year except for the salary increases authorized by the Legislature, now

THEREFORE, BE IT RESOLVED, That

1. The Motor Vehicle Pollution Control Board at its regular meeting in Los Angeles on October 14, 1964, approves an inter-agency agreement with the State Department of Public Health for use of their laboratory services in a total amount which shall not exceed \$243,591 and
2. Further, the Motor Vehicle Pollution Control Board authorizes D. A. Jensen, Executive Officer, to execute this agreement on behalf of the Board.

8/12/64  
Amended 10/14/64  
ep

RESOLUTION 64-18

WHEREAS, General Motors Corporation has actively cooperated with the State of California in its program to control emissions from motor vehicles and;

WHEREAS, this assistance has included guidance and technical help on testing, development of instrumentation, including actual experimentation with cars and devices and;

WHEREAS, much basic research by General Motors Corporation has materially assisted the State of California in defining its air pollution problem as a first step toward solution and;

WHEREAS, General Motors Corporation, together with other car companies, voluntarily installed crankcase control systems on 1961 model California vehicles and;

WHEREAS, on August 12, 1964, General Motors Corporation told the Motor Vehicle Pollution Control Board in San Francisco they would meet California requirements for exhaust emission control for most 1966 model new vehicles sold in this State,

THEREFORE, BE IT RESOLVED,

That the California Motor Vehicle Pollution Control Board;

1. Congratulates General Motors Corporation on this significant contribution to the health and well being of the citizens of California and further
2. Urges General Motors Corporation to continue their outstanding developmental efforts to better control emissions from their motor vehicles.

Adopted unanimously at a regular meeting of the California Motor Vehicle Pollution Control Board in San Francisco, August 12, 1964.

.....  
D. A. Jensen,  
Executive Officer

RESOLUTION 64-19

WHEREAS, Ford Motor Company has actively cooperated with the State of California in its program to control emissions from motor vehicles and;

WHEREAS, this assistance has included guidance and technical help on testing, development of instrumentation, including actual experimentation with cars and devices and;

WHEREAS, much basic research by Ford Motor Company has materially assisted the State of California in first defining its air pollution problem as a first step toward solution and;

WHEREAS, Ford Motor Company, together with other car companies, voluntarily assisted the State through installation of crankcase control systems on 1961 California vehicles and;

WHEREAS, on August 12, 1964, Ford Motor Company told the Motor Vehicle Pollution Control Board in San Francisco they would meet California requirements for exhaust emission control for most 1966 model new vehicles sold in this State,

NOW, THEREFORE BE IT RESOLVED,

That the California Motor Vehicle Pollution Control Board:

1. Congratulates Ford Motor Company on this outstanding contribution to the health and well being of the citizens of California and further
2. Urges Ford Motor Company to continue their outstanding developmental efforts to better control emissions from their motor vehicles.

Adopted unanimously at a regular meeting of the California Motor Vehicle Pollution Control Board in San Francisco, August 12, 1964.

.....  
D. A. Jensen,  
Executive Officer

RESOLUTION 64-20

WHEREAS, Chrysler Corporation has actively cooperated with the State of California in its program to control emissions from motor vehicles and;

WHEREAS, this assistance has included guidance and technical help on testing, development of instrumentation, including actual experimentation with cars and devices and;

WHEREAS, much basic research by Chrysler Corporation has materially assisted the State of California in defining its air pollution problem as a first step toward solution and;

WHEREAS, Chrysler Corporation, together with other car companies, voluntarily installed crankcase control systems on 1961 model California vehicles and;

WHEREAS, on August 12, 1964, Chrysler Corporation told the Motor Vehicle Pollution Control Board in San Francisco they would meet California requirements for exhaust emission control for most 1966 model new vehicles sold in this State.

THEREFORE, BE IT RESOLVED,

That the California Motor Vehicle Pollution Control Board:

1. Congratulates Chrysler Corporation on this significant contribution to the health and well being of the citizens of California, and further
2. Urges Chrysler Corporation to continue their outstanding developmental efforts to better control emissions from their motor vehicles.

Adopted unanimously at a regular meeting of the California Motor Vehicle Pollution Control Board in San Francisco, August 12, 1964.

.....  
D. A. Jensen,  
Executive Officer

RESOLUTION 64-21

WHEREAS, American Motors Corporation has actively cooperated with the State of California in its program to control emissions from motor vehicles and;

WHEREAS, this assistance has included guidance and technical help on testing, development of instrumentation, including actual experimentation with cars and devices and;

WHEREAS, much basic research by American Motors Corporation has materially assisted the State of California in defining its air pollution problem as a first step toward solution and;

WHEREAS, American Motors Corporation, together with other car companies, voluntarily installed crankcase control systems on 1961 model California vehicles and;

WHEREAS, on August 12, 1964, American Motors Corporation told the Motor Vehicle Pollution Control Board in San Francisco they would meet California requirements for exhaust emission control for most 1966 model new vehicles sold in this State,

THEREFORE, BE IT RESOLVED,

That the California Motor Vehicle Pollution Control Board:

1. Congratulates American Motors Corporation on this significant contribution to the health and well being of the citizens of California and further
2. Urges American Motors Corporation to continue their outstanding developmental efforts to better control emissions from their motor vehicles.

Adopted unanimously at a regular meeting of the California Motor Vehicle Pollution Control Board in San Francisco, August 12, 1964.

.....  
D. A. Jensen  
Executive Officer

RESOLUTION 64-22

WHEREAS, the People of the State of California are faced with an absolute need to return clear air to their skies; and

WHEREAS, the accomplishment of this objective requires the effort and cooperation of all Californians; and

WHEREAS, Space Technology Corporation has provided vehicles for test installations of exhaust control devices by the Motor Vehicle Pollution Control Board, now

THEREFORE, BE IT RESOLVED,

That the Chairman and Members of the Motor Vehicle Pollution Control Board express their appreciation to

FREDERICK W. HESSE, VICE PRESIDENT  
SPACE TECHNOLOGY CORPORATION

for his interest and participation in this important effort to eliminate the motor vehicle as a source of air pollution in the State of California.

8/27/64  
vf

RESOLUTION 64-23

WHEREAS, the People of the State of California are faced with an absolute need to return clear air to their skies; and

WHEREAS, the accomplishment of this objective requires the effort and cooperation of all Californians; and

WHEREAS, Yellow Cab Company has provided vehicles for test installations of exhaust control devices by the Motor Vehicle Pollution Control Board, now

THEREFORE, BE IT RESOLVED,

That the Chairman and Members of the Motor Vehicle Pollution Control Board express their appreciation to

REX TAYLOR, PRESIDENT  
YELLOW CAB COMPANY

for his interest and participation in this important effort to eliminate the motor vehicle as a source of air pollution in the State of California.

8/27/64  
vf

RESOLUTION 64-24

WHEREAS, the People of the State of California are faced with an absolute need to return clear air to their skies; and

WHEREAS, the accomplishment of this objective requires the effort and cooperation of all Californians; and

WHEREAS, the Los Angeles Police Department has provided vehicles for test installations of exhaust control devices by the Motor Vehicle Pollution Control Board, now

THEREFORE, BE IT RESOLVED,

That the Chairman and Members of the Motor Vehicle Pollution Control Board express their appreciation to

CHIEF WILLIAM PARKER  
LOS ANGELES POLICE DEPARTMENT

for his interest and participation in this important effort to eliminate the motor vehicle as a source of air pollution in the State of California.

8/27/64  
vf

RESOLUTION 64-25

WHEREAS, the People of the State of California are faced with an absolute need to return clear air to their skies; and

WHEREAS, the accomplishment of this objective requires the effort and cooperation of all Californians; and

WHEREAS, the Los Angeles Department of Water and Power has provided vehicles for test installations of exhaust control devices by the Motor Vehicle Pollution Control Board, now

THEREFORE, BE IT RESOLVED,

That the Chairman and Members of the Motor Vehicle Pollution Control Board express their appreciation to

SAMUEL NELSON, GENERAL MANAGER  
LOS ANGELES DEPARTMENT OF WATER AND POWER

for his interest and participation in this important effort to eliminate the motor vehicle as a source of air pollution in the State of California.

8/27/64  
vf

RESOLUTION 64-26

WHEREAS, the People of the State of California are faced with an absolute need to return clear air to their skies; and

WHEREAS, the accomplishment of this objective requires the effort and cooperation of all Californians; and

WHEREAS, Southern Counties Gas Company of California has provided vehicles for test installations of exhaust control devices by the Motor Vehicle Pollution Control Board, now

THEREFORE, BE IT RESOLVED,

That the Chairman and Members of the Motor Vehicle Pollution Control Board express their appreciation to

GUY W. WADSWORTH, JR., PRESIDENT  
SOUTHERN COUNTIES GAS COMPANY OF CALIFORNIA

for his interest and participation in this important effort to eliminate the motor vehicle as a source of air pollution in the State of California.

8/27/64  
vf

RESOLUTION 64-27

WHEREAS, the People of the State of California are faced with an absolute need to return clear air to their skies; and

WHEREAS, the accomplishment of this objective requires the effort and cooperation of all Californians; and

WHEREAS, the Los Angeles Police Department has provided vehicles for test installations of exhaust control devices by the Motor Vehicle Pollution Control Board, now

THEREFORE, BE IT RESOLVED,

That the Chairman and Members of the Motor Vehicle Pollution Control Board express their appreciation to

GORDON HOUGH  
PACIFIC TELEPHONE COMPANY

for his interest and participation in this important effort to eliminate the motor vehicle as a source of air pollution in the State of California.

8/27/64  
ep

RESOLUTION 64-28

WHEREAS Chapter 3, Division 20, Section 24397 of the Health and Safety Code provides that "The Motor Vehicle Pollution Control Board may designate such laboratories as it finds are qualified and equipped to analyze and determine, on the basis of the standards established by the Board, devices which are so designed and equipped to meet the standards set by the State Department under Section 426.5 and the criteria established by the Motor Vehicle Pollution Control Board;" and

WHEREAS the Board's Executive Officer and Supervising Engineer have both reviewed the test facility and interviewed personnel and observed test procedures; and

WHEREAS Chrysler Corporation has been found to be adequately equipped and qualified to conduct testing of exhaust and crankcase control devices in accordance with the standards established by the State Department of Public Health under Section 426.5 of the Health and Safety Code and Motor Vehicle Pollution Control Board criteria; and

WHEREAS adequate cross-checks are prescribed by Board procedures to insure accurate and satisfactory test reports and evaluations; and

WHEREAS Chrysler Corporation has agreed in writing to conduct all tests and evaluations for the purposes of certification according to procedures established by the Board;

NOW, THEREFORE, BE IT RESOLVED, That the Motor Vehicle Pollution Control Board hereby designates the Chrysler Corporation's vehicle testing laboratory at Engineering Staff facilities, Highland Park, Michigan as an Authorized Vehicle Pollution Control Testing Laboratory.

EPG/eh  
10/14/64

RESOLUTION 64-29

WHEREAS Chapter 3, Division 20, Section 24397 of the Health and Safety Code provides that "The Motor Vehicle Pollution Control Board may designate such laboratories as it finds are qualified and equipped to analyze and determine, on the basis of the standards established by the Board, devices which are so designed and equipped to meet the standards set by the State Department under Section 426.5 and the criteria established by the Motor Vehicle Pollution Control Board;" and

WHEREAS the Board's Executive Officer and Supervising Engineer have both reviewed the test facility and interviewed personnel and observed test procedures; and

WHEREAS General Motors Corporation has been found to be adequately equipped and qualified to conduct testing of exhaust and crankcase control devices in accordance with the standards established by the State Department of Public Health under Section 426.5 of the Health and Safety Code and Motor Vehicle Pollution Control Board criteria; and

WHEREAS General Motors Corporation has agreed in writing to conduct all tests and evaluations for the purposes of certification according to procedures established by the Board;

NOW, THEREFORE, BE IT RESOLVED, That the Motor Vehicle Pollution Control Board hereby designates the General Motors Corporation's vehicle testing facility at General Motors Proving Grounds, Milford, Michigan, as an authorized Vehicle Pollution Control Testing Laboratory.

EPG/eh  
10/14/64

RESOLUTION 64-30

WHEREAS Chapter 3, Division 20, Section 24397 of the Health and Safety Code provides that "The Motor Vehicle Pollution Control Board may designate such laboratories as it finds are qualified and equipped to analyze and determine, on the basis of the standards established by the Board, devices which are so designed and equipped to meet the standards set by the State Department under Section 426.5 and the criteria established by the Motor Vehicle Pollution Control Board;" and

WHEREAS the Board's Executive Officer and Supervising Engineer have both reviewed the test facility and interviewed personnel and observed test procedures; and

WHEREAS Ford Motor Company has been found to be adequately equipped and qualified to conduct testing of exhaust and crankcase control devices in accordance with the standards established by the State Department of Public Health under Section 426.5 of the Health and Safety Code and Motor Vehicle Pollution Control Board criteria; and

WHEREAS adequate cross-checks are prescribed by Board procedures to insure accurate and satisfactory test reports and evaluations; and

WHEREAS Ford Motor Company has agreed in writing to conduct all tests and evaluations for the purposes of certification according to procedures established by the Board;

NOW, THEREFORE, BE IT RESOLVED, That the Motor Vehicle Pollution Control Board hereby designates the Ford Motor Company's vehicle testing facility at the Research & Engineering Center in Dearborn, Michigan as an Authorized Vehicle Pollution Control Testing Laboratory.

EPG/eh  
10/14/64

RESOLUTION 64-31

WHEREAS Chapter 3, Division 20, Section 24397 of the Health and Safety Code provides that "The Motor Vehicle Pollution Control Board may designate such laboratories as it finds are qualified and equipped to analyze and determine, on the basis of the standards established by the Board, devices which are so designed and equipped to meet the standards set by the State Department under Section 426.5 and the criteria established by the Motor Vehicle Pollution Control Board;" and

WHEREAS the Board's Executive Officer and Supervising Engineer have both reviewed the test facility and interviewed personnel and observed test procedures; and

WHEREAS American Motors Corporation has been found to be adequately equipped and qualified to conduct testing of exhaust and crankcase control devices in accordance with the standards established by the State Department of Public Health under Section 426.5 of the Health and Safety Code and Motor Vehicle Pollution Control Board criteria; and

WHEREAS adequate cross-checks are prescribed by Board procedures to insure accurate and satisfactory test reports and evaluations; and

WHEREAS American Motors Corporation has agreed in writing to conduct all tests and evaluations for the purposes of certification according to procedures established by the Board;

NOW, THEREFORE, BE IT RESOLVED, That the Motor Vehicle Pollution Control Board hereby designates the American Motor's vehicle testing facility at the Research and Engineering Center in Detroit, Michigan as an Authorized Vehicle Pollution Control Testing Laboratory.

EPG/eh  
10/14/64

RESOLUTION 64-32

WHEREAS Chapter 3, Division 20, Section 24397 of the Health and Safety Code provides that " The Motor Vehicle Pollution Control Board may designate such laboratories as it finds are qualified and equipped to analyze and determine, on the basis of the standards established by the Board, devices which are so designed and equipped to meet the standards set by the State Department under Section 426.5 and the criteria established by the Motor Vehicle Pollution Control Board;" and

WHEREAS the Board's Executive Officer and Supervising Engineer have both reviewed the test facility and interviewed personnel and observed test procedures; and

WHEREAS Ethyl Corporation has been found to be adequately equipped and qualified to conduct testing of exhaust and crankcase control devices in accordance with the standards established by the State Department of Public Health under Section 426.5 of the Health and Safety Code and Motor Vehicle Pollution Control Board criteria; and

WHEREAS adequate cross-checks are prescribed by Board procedures to insure accurate and satisfactory test reports and evaluations; and

WHEREAS Ethyl Corporation has agreed in writing to conduct all tests and evaluations for the purposes of certification according to procedures established by the Board:

NOW, THEREFORE, BE IT RESOLVED, That the Motor Vehicle Pollution Control Board hereby designates the Ethyl Corporation's vehicle testing facility at the Research Laboratory in Detroit, Michigan as an Authorized Vehicle Pollution Control Testing Laboratory.

EPG/eh  
10/14/64

RESOLUTION 64-33

WHEREAS Chapter 3, Division 20, Section 24397 of the Health and Safety Code provides that "The Motor Vehicle Pollution Control Board may designate such laboratories as it finds are qualified and equipped to analyze and determine, on the basis of the standards established by the Board, devices which are so designed and equipped to meet the standards set by the State Department under Section 426.5 and the criteria established by the Motor Vehicle Pollution Control Board;" and

WHEREAS the Board's Executive Officer and Supervising Engineer have both reviewed the test facility and interviewed personnel and observed test procedures; and

WHEREAS International Harvester has been found to be adequately equipped and qualified to conduct testing of exhaust and crankcase control devices in accordance with the standards established by the State Department of Public Health under Section 426.5 of the Health and Safety Code and Motor Vehicle Pollution Control Board criteria; and

WHEREAS adequate cross-checks are prescribed by Board procedures to insure accurate and satisfactory test reports and evaluations; and

WHEREAS International Harvester has agreed in writing to conduct all tests and evaluations for the purposes of certification according to procedures established by the Board;

NOW, THEREFORE, BE IT RESOLVED, That the Motor Vehicle Pollution Control Board hereby designates the International Harvester's vehicle testing facility at the Motor Truck Division, Engineering Department at Fort Wayne, Indiana as an Authorized Vehicle Pollution Control Testing Laboratory.

EPG/eh  
10/14/64

RESOLUTION 64-34

WHEREAS Chapter 3, Division 20, Section 24397 of the Health and Safety Code provides that "The Motor Vehicle Pollution Control Board may designate such laboratories as it finds are qualified and equipped to analyze and determine, on the basis of the standards established by the Board, devices which are so designed and equipped to meet the standards set by the State Department under Section 426.5 and the criteria established by the Motor Vehicle Pollution Control Board;" and

WHEREAS the Board's Executive Officer and Supervising Engineer have both reviewed the test facility and interviewed personnel and observed test procedures; and

WHEREAS Kaiser-Jeep Corporation has been found to be adequately equipped and qualified to conduct testing of exhaust and crankcase control devices in accordance with the standards established by the State Department of Public Health under Section 426.5 of the Health and Safety Code and Motor Vehicle Pollution Control Board criteria; and

WHEREAS adequate cross-checks are prescribed by Board procedures to insure accurate and satisfactory test reports and evaluations; and

WHEREAS KAISER-JEEP has agreed in writing to conduct all tests and evaluations for the purposes of certification according to procedures established by the Board:

NOW, THEREFORE, BE IT RESOLVED, That the Motor Vehicle Pollution Control Board hereby designates the Kaiser-Jeep Corporation's vehicle testing facility at the Experimental Division Laboratory in Toledo, Ohio as an Authorized Vehicle Pollution Control Testing Laboratory.

EPG/eh  
10/14/64

RESOLUTION 64-35

WHEREAS, Walker Manufacturing Company, a subsidiary of Kern County Land Co., Inc., and American Cyanamid Co., Inc., filed a joint application for approval of an exhaust emission control system on September 14, 1961; and

WHEREAS, the system is described as the Walker-Cyanamid Exhaust Control System, with major components comprised as follows:

1. A catalytic exhaust converter (with no overtemperature bypass),
2. An aspirator for auxiliary air supply,
3. A carburetor throttle positioner, and
4. Specified engine adjustments and annual tuneup;

WHEREAS, the Motor Vehicle Pollution Control Board finds that the system complies with the exhaust emission standards of the State Department of Public Health of 275 PPM of hydrocarbons and 1.5% of carbon monoxide, as established pursuant to Sections 426.1 and 426.5 of the Health and Safety Code, State of California, and as determined according to established procedures of the Board; and

WHEREAS, based upon demonstration of compliance with established procedures, the Board finds that the system meets the criteria of the Board, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 2, Section 2103.

THEREFORE, BE IT RESOLVED,

That this Board, under the powers and authority granted in Chapter 3, (Commencing at Section 24378) Division 20 of the Health and Safety Code,

Issue a certificate of approval for the Walker-Cyanamid Exhaust Control System for 1962 and subsequent model motor vehicles in classifications (b), (c), (d), (e) and (f), pursuant to Title 13, California Administrative Code, Chapter 3, Subchapter 1, Article 2, Sections 2104 and 2105.

10/14/64  
mj

MOTOR VEHICLE POLLUTION CONTROL BOARD

RESOLUTION 64-36

WHEREAS, Chrysler Corporation filed an application for approval of an exhaust emission control system on July 11, 1964; and

WHEREAS, the system is described as the Chrysler "Cleaner Air Package" with major components comprised as follows:

1. A vacuum-controlled valve for deceleration ignition advance
2. Leaner carburetion
3. Retarded ignition at idle
4. Specified annual engine tuneup and adjustments

WHEREAS, the Motor Vehicle Pollution Control Board finds that the system complies with the exhaust emission standards of the State Department of Public Health of 275 PPM of hydrocarbons and 1.5% of carbon monoxide, as established pursuant to Sections 426.1 and 426.5 of the Health and Safety Code, State of California, and as determined according to established procedures of the Board; and

WHEREAS, based upon demonstration of compliance with established procedures, the Board finds that the system meets the criteria of the Board, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 2, Section 2103, and

WHEREAS the Board must take into consideration continued performance and compliance and any other factors which render a device suitable or unsuitable for the control of motor vehicle air pollution, and

WHEREAS additional data is required showing continued compliance with the emission standards and criteria when in continued public use.

NOW THEREFORE, BE IT RESOLVED,

That this Board, under the powers and authority granted in Chapter 3, (Commencing at Section 24378) Division 20 of the Health and Safety Code,

Issue a certificate of approval for the "Chrysler Cleaner Air Package" for 1966 model motor vehicles only, in classifications (b), (c), (d), (e) and (f), pursuant to Title 13, California Administrative Code, Chapter 3, Subchapter 1, Article 2, Sections 2104 and 2105.

10/14/64

h1b

MOTOR VEHICLE POLLUTION CONTROL BOARD

RESOLUTION 64-37

WHEREAS, Chrysler Corporation filed an application for approval of an exhaust emission control system on July 11, 1964; and

WHEREAS, the system is described as the Chrysler "Cleaner Air Package" with major components comprised as follows:

1. A vacuum-controlled valve for deceleration ignition advance
2. Leaner carburetion
3. Retarded ignition at idle
4. Specified annual engine tuneup and adjustments.

WHEREAS, the Motor Vehicle Pollution Control Board finds that the system complies with the exhaust emission standards of the State Department of Public Health of 275 PPM of hydrocarbons and 1.5% of carbon monoxide, as established pursuant to Sections 426.1 and 426.5 of the Health and Safety Code, State of California, and as determined according to established procedures of the Board: and

WHEREAS, based upon demonstration of compliance with established procedures, the Board finds that the system meets the criteria of the Board, as published in Title 13 of the California Administrative Code, Chapter 3, Subchapter 1, Article 2, Section 2103,

NOW THEREFORE, BE IT RESOLVED,

That this Board, under the powers and authority granted in Chapter 3, (Commencing at Section 24378) Division 20 of the Health and Safety Code,

Issue a certificate of approval for the "Chrysler Cleaner Air Package" for 1966 and subsequent model motor vehicles in classifications (b), (c), (d), (e) and (f), pursuant to title 13, California Administrative Code, Chapter 3, subchapter 1, Article 2, Sections 2104 and 2105.

10/14/64

h1b

RESOLUTION 64 - 38

WHEREAS, public information and knowledge of the Motor Vehicle Pollution Control Board's program of eliminating the motor vehicles as a source of pollution is essential; and

WHEREAS, outdoor advertising companies have graciously contributed valuable space to promote California's auto smog control program and to inform the public; and

WHEREAS, they have co-operated with the Motor Vehicle Pollution Control Board by offering professional talent and help on art work, printing and posting of outdoor advertising billboards.

NOW THEREFORE BE IT RESOLVED,

That Pacific Outdoor Advertising Company be commended by this Board and the people of the State of California for their civic-minded attitude and spirit of cooperation in this important effort to return clean air to our skies.

11/18/64

hlb

RESOLUTION 64 - 39

WHEREAS, public information and knowledge of the Motor Vehicle Pollution Control Board's program of eliminating the motor vehicles as a source of pollution is essential; and

WHEREAS, outdoor advertising companies have graciously contributed valuable space to promote California's auto smog control program and to inform the public; and

WHEREAS, they have co-operated with the Motor Vehicle Pollution Control Board by offering professional talent and help on art work, printing and posting of outdoor advertising billboards.

NOW THEREFORE BE IT RESOLVED,

That Eller Outdoor Advertising Company be commended by this Board and the people of the State of California for their civic-minded attitude and spirit of cooperation in this important effort to return clean air to our skies.

11/18/64

hlb

RESOLUTION 64 - 40

WHEREAS, public information and knowledge of the Motor Vehicle Pollution Control Board's program of eliminating the motor vehicles as a source of pollution is essential; and

WHEREAS, outdoor advertising companies have graciously contributed valuable space to promote California's auto smog control program and to inform the public; and

WHEREAS, they have co-operated with the Motor Vehicle Pollution Control Board by offering professional talent and help on art work, printing and posting of outdoor advertising billboards.

NOW THEREFORE BE IT RESOLVED,

That West Coast Advertising Company be commended by this Board and the people of the State of California for their civic-minded attitude and spirit of cooperation in this important effort to return clean air to our skies.

11/18/64

hlb

RESOLUTION 64 - 41

WHEREAS, public information and knowledge of the Motor Vehicle Pollution Control Board's program of eliminating the motor vehicles as a source of pollution is essential; and

WHEREAS, outdoor advertising companies have graciously contributed valuable space to promote California's auto smog control program and to inform the public; and

WHEREAS, they have co-operated with the Motor Vehicle Pollution Control Board by offering professional talent and help on art work, printing and posting of outdoor advertising billboards.

NOW THEREFORE BE IT RESOLVED,

That Naegele Advertising Companies, Inc. be commended by this Board and the people of the State of California for their civic-minded attitude and spirit of cooperation in this important effort to return clean air to our skies.

11/18/64

hlb

RESOLUTION 64 - 42

WHEREAS, public information and knowledge of the Motor Vehicle Pollution Control Board's program of eliminating the motor vehicles as a source of pollution is essential; and

WHEREAS, outdoor advertising companies have graciously contributed valuable space to promote California's auto smog control program and to inform the public; and

WHEREAS, they have co-operated with the Motor Vehicle Pollution Control Board by offering professional talent and help on art work, printing and posting of outdoor advertising billboards.

NOW THEREFORE BE IT RESOLVED,

That Ryan Outdoor Advertising, Inc. be commended by this Board and the people of the State of California for their civic-minded attitude and spirit of cooperation in this important effort to return clean air to our skies.

11/18/64

hlb

RESOLUTION 64 - 43

WHEREAS, public information and knowledge of the Motor Vehicle Pollution Control Board's program of eliminating the motor vehicles as a source of pollution is essential; and

WHEREAS, outdoor advertising companies have graciously contributed valuable space to promote California's auto smog control program and to inform the public; and

WHEREAS, they have co-operated with the Motor Vehicle Pollution Control Board by offering professional talent and help on art work, printing and posting of outdoor advertising billboards.

NOW THEREFORE BE IT RESOLVED,

That Capitol Outdoor be commended by this Board and the people of the State of California for their civic-minded attitude and spirit of cooperation in this important effort to return clean air to our skies.

11/18/64

hlb

RESOLUTION 64-44

WHEREAS Chapter 3, Division 20, Section 24397 of the Health and Safety Code provides that "The Motor Vehicle Pollution Control Board may designate such laboratories as it finds are qualified and equipped to analyze and determine, on the basis of the standards established by the Board, devices which are so designed and equipped to meet the standards set by the State Department under Section 426.5 and the criteria established by the Motor Vehicle Pollution Control Board;" and

WHEREAS the Board's staff has reviewed the test facility and interviewed personnel and observed test procedures; and

WHEREAS Walker Manufacturing Company has been found to be adequately equipped and qualified to conduct testing of exhaust and crankcase control devices in accordance with the standards established by the State Department of Public Health under Section 426.5 of the Health and Safety Code and Motor Vehicle Pollution Control Board criteria; and

WHEREAS adequate cross-checks are prescribed by Board procedures to insure accurate and satisfactory test reports and evaluations; and

WHEREAS Walker Manufacturing Company has agreed in writing to conduct all tests and evaluations for the purposes of certification according to procedures established by the Board;

NOW, THEREFORE, BE IT RESOLVED, That the Motor Vehicle Pollution Control Board hereby designate the Walker Manufacturing Company's vehicle testing laboratories at Bakersfield, California, and at Jackson, Michigan, as Authorized Vehicle Pollution Control Testing Laboratories.

MLB:jh:mj  
11/18/64

RESOLUTION 64-45

WHEREAS Chapter 3, Division 20, Section 24397 of the Health and Safety Code provides that "The Motor Vehicle Pollution Control Board may designate such laboratories as it finds are qualified and equipped to analyze and determine, on the basis of the standards established by the Board, devices which are so designed and equipped to meet the standards set by the State Department under Section 426.5 and the criteria established by the Motor Vehicle Pollution Control Board;" and

WHEREAS the Board's staff has reviewed the test facility and interviewed personnel and observed test procedures; and

WHEREAS Arvin Industries, Inc. has been found to be adequately equipped and qualified to conduct testing of exhaust and crankcase control devices in accordance with the standards established by the State Department of Public Health under Section 426.5 of the Health and Safety Code and Motor Vehicle Pollution Control Board criteria; and

WHEREAS adequate cross-checks are prescribed by Board procedures to insure accurate and satisfactory test reports and evaluations; and

WHEREAS Arvin Industries, Inc. has agreed in writing to conduct all tests and evaluations for the purposes of certification according to procedures established by the Board;

NOW, THEREFORE, BE IT RESOLVED, That the Motor Vehicle Pollution Control Board hereby designates the Arvin Industries, Inc. vehicle testing laboratory at Columbus, Indiana, as an Authorized Vehicle Pollution Control Testing Laboratory.

C O P Y

Arvin Industries, Inc.  
Columbus, Indiana 47201 . Area Code 812 Phone 372 7271

Automotive Mufflers & Parts  
Arvinyl Laminates  
Electronics & Appliances  
Furniture & Housewares

November 13, 1964

Mr. D. A. Jensen, Executive Officer,  
Motor Vehicle Pollution Control Board,  
Room 906, State Building,  
107 South Broadway,  
Los Angeles 12, California.

Dear Don:

We submit the following in applying for the State of California, Motor Vehicle Pollution Control Board's approval of Arvin Industries, Inc. vehicle pollution control testing laboratories as an authorized testing facility under Section 24397 of the California Health & Safety code.

1. The attached schematic diagram of the equipment used by Arvin Industries, is equivalent to that specified in the "California Test Procedure for Motor Vehicle Exhaust Control".
2. The personnel responsible for testing have the necessary qualifications and experience in the field of exhaust analysis.
3. The test procedures used are identical to those specified in the "California Test Procedure and Criteria for Motor Vehicle Exhaust Control".
4. Included are twenty (20) copies of our results on the cross-check vehicle (per your letter of September 25, 1964 to Mr. Howard Hesselberg of Ethyl Corporation) and the two cylinders of reference gases.

Based on the above, we respectfully request that the Arvin Industries Laboratory be designated as an approved Laboratory of the Motor Vehicle Pollution Control Board of the State of California.

As an authorized laboratory, Arvin Industries, Inc. will be supporting the automotive industry in the development of an approved means of controlling exhaust emissions.

Arvin Industries, Inc.,  
Automotive Division

T. A. Danner - Vice President  
Automotive Engineering

TAD:lrs  
Enc.

# REPORT OF SPELIN, INC. CRANKCASE EMISSION CONTROL SYSTEM

*no  
gabane  
modulation*

## Introduction

This report presents the evaluation of the Spelin, Inc. (formerly Drysdale) Crankcase Emission Control System by the staff of the Motor Vehicle Pollution Control Board. The bases of the evaluation are the requirements set forth in Title 13 of the California Administrative Code, Chapter 3, Sub-Chapter 1, Section 2000 to 2004. Since approval is sought for used car installation, the report deals with both the California Crankcase Emission Standard and compliance with the Board's criteria. Cost and marketing factors will be discussed.

The Spelin, Inc. Crankcase Emission System was submitted for certification at the March 10, 1965, Board meeting. By a split vote, Board members rejected certification until the fan employed in the Spelin System could be tested in "normal auto service." Subsequently, Spelin, Inc. engaged in additional testing designed to satisfy the Board's "normal auto service" requirement. This report includes a summary of the device history and testing to date.

## Description of System

The Spelin Crankcase Emission Control System consists of a small electric fan, an orifice and suitable tubing. The fan inlet is connected to the crankcase and the fan outlet is connected to the air cleaner. The orifice is located in the outlet side of the fan and is connected to the intake manifold. An oil drain is incorporated in the fan housing, which allows recovery of any oil carry-over from the crankcase. An unrestricted flow oil filler cap is used to provide ventilation air. No flame arrestors need be used with the system.

## Principle of Operation

The electric fan induces a vacuum in the crankcase of up to 0.8 inches of water. The discharge of the blower is directed to the air cleaner and to the intake manifold through the orifice. The unrestricted flow filler cap and the slight crankcase vacuum provide ventilation air under all operating conditions.

## Compliance with Air/Fuel Ratio Change Limits

Test data obtained at Scott Research Laboratory confirm that the average air/fuel ratio change for Spelin equipped cars is within the 4% lean, 1% rich limits.

## Compliance with Board Criteria

According to Section 2003; Other Criteria, every device controlling crankcase emissions from motor vehicles shall meet the following criteria:

- (a) "Be so designed as to have no adverse effect on engine operation or vehicle performance."

The staff is satisfied that there will be no adverse effect on engine operation or vehicle performance with the installation of the Spelin System.

24

- (b) "Operate in a safe manner."

Based on experience with at least 20 Spelin-equipped cars, it is felt that the present Spelin System will operate in a safe manner.

- (c) "Have sufficient durability so as to operate efficiently for at least 12,000 miles without maintenance."

Based on test results, the staff concludes that the Spelin System has sufficient durability to operate for at least 12,000 miles without maintenance.

- (d) "Operate in such a manner so as to not create excessive heat, noise or odor beyond the standard characteristics of the motor vehicle without such a device."

The Spelin System does not create excessive heat, noise, or odor beyond the standard characteristics of the motor vehicle without such a device.

- (e) "The purchase or cost of installation of such device shall not constitute an undue cost burden to the motorist."

The Spelin System is assembled by Spelin, who buys component parts from manufacturers in the United States. The electric motor and fan is purchased from a supplier in the East and the other components are purchased in the open market. Spelin states that the cost of the device (kit form), without installation, will be \$19.95. They estimate that it will take a half to one hour to install the system, making the total cost to the consumer of \$25 to \$30. This is substantially higher than the price for competing systems. However, the staff believes that this is not an undue cost burden since the public is aware of other lower-cost devices, and would not purchase such a device unless persuaded or convinced of other benefits.

- (f) "Installation of such device shall not create or contribute to a noxious or toxic effect in the ambient air."

The installation of the Spelin System will not create or contribute to noxious or toxic effects in the ambient air.

#### Other Considerations

- (a) Spelin requests certification for displacement classes (b), (c), (d), (e), and (f) and has driven two device-equipped cars in each class for 12,000 miles. All cars were selected according to the crankcase procedure. The Spelin System maintained a slight crankcase vacuum at 2" Hg. manifold vacuum, 30 mph with 10th decile blowby before and after the 12,000 miles of extended service.
- (b) Oil consumption was carefully evaluated during 12,000 mile service. There was no noticeable increase in oil consumption after installing the Spelin System.

(c) In evaluating this device, it was found that some of the orifice sizes used were too large, and Spelin will standardize on an orifice with a capacity of 2.35 cfm. at 16" Hg. for classes (c), (d), (e), and (f). Classes (b) and (c) orifices have a capacity of 1.5 cfm. at 16" Hg. All these size orifices meet air/fuel ratio change limits.

(d) The question of "fail safe" was investigated. On three of the cars tested at Scott Research Laboratory, the Spelin electric fans were shut down with the engine operating. It was found that a positive pressure developed in the crankcase, at the four test points, so that crankcase gases would be discharged into the atmosphere. However, no adverse engine effect would be caused. It was felt that from a "fail safe" standpoint, the driver would quickly learn that something was wrong with the system because he would notice the odor of crankcase gases.

(e) Flame tests conducted at Scott Laboratory show that flame does not propagate back through the fan with it running or shut-down.

Spelin has given consideration to reduction of clearances within the fan housing which would further reduce the possibility of crankcase explosion.

(f) The filtering capacity of the unrestricted flow oil filler cap was considered by the staff. Because of no backflow through the cap, the element is always dry. Spelin has agreed, that as a part of their specified maintenance of the system, the cap will be oiled periodically.

(g) The staff has considered the number of kits which Spelin plans to use to cover classes (b), (c), (d), (e) and (f). Spelin estimates that six kits will cover these classes but the staff has some doubt that this will be enough. Spelin is studying this matter further and will supply sufficient kits to adequately cover these five classes.

(h) During extended service of a previous model of the device, one orifice clogged completely after 9500 miles and another was partially clogged at the end of the test. Two motors failed during extended service due to brush wear; one at 10819 and the other at 11940 miles. However, it was later discovered that these two motors were operated 425 hours prior to installation for extended service. Thus, failure occurred after an equivalent of at least 22000-24000 miles.

A special bench test was set up to evaluate the reliability of the electric motors. This was accomplished by Scott Research Laboratory on ten Spelin electric fans with improved brushes under high blowby flow rate, 160° to 200° F., stop-start operation for a total of 1200 hours. Actual motor operation was for 800 hours or an equivalent of 24,000 miles at 30 mph. The brushes were about one-half worn. Current draw was about the same as the start of the test (0.2-0.5 amps. D.C.)

At the March 10, 1965 meeting, the Board members felt, after thorough discussion, that tests on device-equipped cars in "normal auto service" would be superior to bench tests for certain parts of such a device. Spelin consulted with the staff on further testing.

Subsequently, Spelin installed 10 improved devices on Yellow Cab taxis, each with at least 45000 odometer miles. By May 12, 1965, an average of 6500 miles, in severe taxi service, have been accumulated since the devices were installed. The electric fans are still functioning properly. Orifices have been flowed and do not show any sign of clogging. Yellow Cab have no complaints with the Spelin System. The staff feels that sufficient mileage in normal service has been accumulated, which demonstrates that the problems heretofore encountered with the orifices and electric fans have been overcome.

#### Availability of Devices and Distributors

The Board requires that there be adequate geographic availability of the device and replace parts, so that installations can be made and serviced properly at reasonable cost to the motorist.

Spelin has negotiated with Nodak, Ltd. of Maywood, California to handle distribution of the Spelin device. Nodak manufactures puncture repair materials for tubeless tires, and deals directly with 2000 accounts in California. A staff member visited Nodak and discussed the distribution system with them. The devices will be handled through Spelin's representative to warehouses, then jobbers and finally to retail outlets or installers.

The staff feels that Spelin has met the requirement of adequate device distribution systems.

#### Field Follow-up on Complaints

Because improper installation, poor maintenance and complaints on devices are very real problems, the applicant must have qualified field personnel available. Follow-up of complaints and training of installers are necessary. As with previous devices, certification implies heavy reliance on abilities, judgment and financial capabilities of the manufacturer to overcome these problems and stand behind the product.

Spelin advised the staff that they will have seven or more engineers, as required, throughout the twelve counties for training installers and to follow-up complaints and satisfy customers with respect to the device and its function.

#### Advisory Committee Recommendation

At a meeting in Los Angeles on March 18, 1964, the Technical Advisory Group for Crankcase Emission Control Devices, considered the previous (Drysdale) version of the Spelin Emission Control System and voted, three for approval, three for disapproval and one vote for approval, with reservations. The demonstration of improvements to the device has been adequate, in the staff's opinion, to not require any further consideration by the Technical Advisory Group.

Summary and Staff Recommendations

1. The Spelin Crankcase Emission Control System meets the crankcase emission standards of the Department of Public Health, when operating efficiently. Bench and taxicab tests provided data which shows that the fan and motor have durability well in excess of 12,000 miles.
2. There are a number of potential adverse effects on automobile operation and performance, as in previously approved systems, if proper installation or maintenance of the system is neglected. Also, as in the past, approval implies reliance on the ability of the manufacturer to adapt the system to a variety of vehicles without error resulting in adverse engine effects. It is the judgment of the staff that the basic system can operate with no risk of adverse effects

The staff recommends approval of the Spelin Crankcase Emission Control System for used cars for classes (b), (c), (d), (e) and (f) as defined in Section 2004.

CV/S  
5/2/65

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MOTOR VEHICLE POLLUTION CONTROL BOARD

RESOLUTION 64-46

WHEREAS, Ethyl Corporation filed an application for approval of an exhaust emission control system on February 26, 1963; and

WHEREAS, the system is described as the Ethyl Corporation Exhaust Control System, with major components comprised as follows:

1. A catalytic exhaust converter (with an overtemperature bypass)
2. A diaphragm type air pump

WHEREAS, the Ethyl Corporation Exhaust Emission Control System has been under test by the California Motor Vehicle Pollution Control Board since May 16, 1963 in accordance with established procedures

NOW THEREFORE, BE IT RESOLVED,

That this Board finds that:

1. The Ethyl system complies with the exhaust emission standards of the State Department of Public Health of 275 ppm of hydrocarbons and 1.5% of carbon monoxide, as established pursuant to Sections 426.1 and 426.5 of the Health and Safety Code, State of California.
2. This action is not considered an official certification.

12/16/64  
eh