

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-120  
Relating to Exemptions under Section 27156  
of the Vehicle Code

CUMMINS WEST  
855 CID DIESEL ENGINES

Pursuant to the authority vested in the Air Resources Board by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-5;

IT IS ORDERED AND RESOLVED: That the modification of 1974 and older California certified and 1978 and older Federally certified engines by Cummins West, Inc., has been found not to reduce the effectiveness of required motor vehicle pollution control devices and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for Cummins 855 CID 6 cylinder engines.

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different from those submitted by the device manufacturer.

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

Marketing of this device using an identification other than that shown in this Executive Order or marketing of this device for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board. Exemption of a kit shall not be construed as an exemption to sell, offer for sale or advertise any component of a kit as an individual device.

This Executive Order does not constitute any opinion as to the effect that the use of this device may have on any warranty either expressed or implied by the vehicle manufacturer.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THIS MODIFICATION.

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

CUMMINS WEST, INC.  
DIESEL ENGINE MODIFICATION

EXECUTIVE ORDER D-120  
(Page 2 of 2)

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

Section 43644 of the Health and Safety Code provides as follows:

"43644. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor."

Any apparent violation of the conditions of this Executive Order will be submitted to the Attorney General of California for such action as he deems advisable.

Executed at El Monte, California, this 13<sup>th</sup> day of January, 1982.

*K. D. Drachand*  
K. D. Drachand, Chief  
Mobile Source Control Division

State of California  
AIR RESOURCES BOARD

Staff Report

Evaluation of Cummins West, Inc.,  
Engine Modifications in Accordance  
With Section 2222, Title 13 of the  
California Administrative Code

I. INTRODUCTION

Cummins West, Incorporated, of San Francisco, California, and Cummins Service and Sales, Inc., of Los Angeles, California, are independent corporations franchised by Cummins Engine Company, Incorporated, to provide aftermarket engines, parts, and service for users of diesel Cummins engines in California. Cummins West, Inc., acting in behalf of both companies, has applied for an exemption from the prohibitions of Vehicle Code Section 27156 for an uncertified engine configuration. These Cummins franchises propose to upgrade older certified engines to the hybrid specification which utilizes some components of more recent engines. The purpose of this modification is to improve fuel economy.

II. DEVICE DESCRIPTION

The applicant proposes two different parts packages to be used in rebuilding certain 1973 through 1978 Cummins 855 CID engines. One will produce 300 HP, the other 350. These packages will replace nine existing engine configurations. Tables I and II list these parts. Table III contains the injector timing specifications.

The fuel injection rate is controlled by the output pressure of the injection pump. This pressure is a complex function of engine speed and power demand. The power curve of the engine is defined by the pump calibration. Cummins Engine Company has thousands of these calibrations. The count of the calibrations applicable to CPL 021 and 024, respectively, is 37 and 8. Cummins West has submitted two additional calibrations which are not in the Cummins list. The 350 HP calibration is very similar to the 3077 calibration of the CPL 024 engine which meets 1975-76 standards. The 300 HP calibration does not appear to closely match any published calibration. It is similar, however, to a 1974 calibration from CPL 174.

### III. DEVICE EVALUATION

On October 29 contact was made with Mr. Robert Ryan of the Cummins Engine Company's Engine Certification Laboratory in Columbus, Indiana. He is of the opinion that these modifications will have no adverse effect upon emissions. He also stated that Cummins West had submitted a modified engine to the evaluation. Emissions testing of the engine was to be conducted in about three weeks from that date.

Although it is probable that the selected components will assemble into an engine which meets the 1977-78 California emissions standards, it is felt, that without supporting test data, the staff can only predict with reasonable certainty that the 1974 California and 1978 federal standards will be met.

### IV. RECOMMENDATION

The staff finds that the Cummins West modification to Cummins 855 CID Cummins diesel engines will not result in increased emissions from engines designed to meet the 1974 and earlier California or 1978 and earlier federal emissions standards. It is, therefore, recommended that E.O. D-120 be granted.

Table I

Cummins West 350 HP

Engine Parts List

| <u>Item</u>      | <u>Cummins No.</u> | <u>Years Certified</u> |
|------------------|--------------------|------------------------|
| Injector         | 3018834-178A       | 1973-78 <sup>(1)</sup> |
| Camshaft         | 143450             | 1973-78                |
| Piston           | 3017349            | 1981                   |
| Turbocharger     | 3018068            | 1980-81                |
| After Cooler     | 3001519            | (2)                    |
| Exhaust Manifold | 3801222            | (3)                    |

Table II

Cummins West 300 HP

Engine Parts List

| <u>Item</u>      | <u>Cummins No.</u> | <u>Years Certified</u> |
|------------------|--------------------|------------------------|
| Injector         | 3018323-183        | 1973-75                |
| Camshaft         | 143450             | 1977-78                |
| Piston           | 3017348            | 1981                   |
| Turbocharger     | 3018067            | 1980-81                |
| After Cooler     | AR 8617            | (2)                    |
| Exhaust Manifold | 3801222            | (3)                    |

1. Federal - All - 1976-78.
2. Certification data does not give aftercooler part number.
3. Appears from text to be 1980-81 part. Part numbers not in certification data.

Table III  
Injection Timing

| <u>CPL No.</u> | <u>OEM Specification</u> |               | <u>Rebuilt Engine</u> |               |
|----------------|--------------------------|---------------|-----------------------|---------------|
|                | <u>HP</u>                | <u>Timing</u> | <u>HP</u>             | <u>Timing</u> |
| 021            | 350-335                  | .036          | 350                   | .046          |
| 069            | 290-335-300              | .036          | 300                   | .050          |
|                |                          |               | 350                   | .046          |
| 101            | 290-295                  | .0335         | 300                   | .050          |
|                |                          |               | 350                   | .046          |
| 160            | 350                      | .035          | 350                   | .046          |
| 174            | 290-335-300              | .036          | 300                   | .050          |
|                |                          |               | 350                   | .046          |
| 190            | 335-290                  | .046          | 300                   | .050          |
|                |                          |               | 350                   | .046          |
| 0204           | 350                      | .045          | 350                   | .046          |
| 0207           | 270                      | .042          | 300                   | .050          |
|                |                          |               | 350                   | .046          |
| 0217           | 290-270                  | .050          | 300                   | .050          |
|                |                          |               | 350                   | .046          |