# Air Resources Board

**Alan C. Lloyd, Ph.D.**
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February 20, 2002

Dr. Marc Rumminger
Cleaire Advanced Emission Controls
14775 Wicks Boulevard
San Leandro, California 94577-6779

Dear Dr. Rumminger:

The Air Resources Board (ARB) previously verified that the Engelhard DPX (both MEX and NEX catalyst formulations) catalyzed diesel particulate filter reduces emissions of diesel particulate matter (PM) by 85 percent or greater from Cummins M11, 1994-1998 engines, for an emissions durability of 150,000 miles, thereby qualifying the DPX as a Level 3 retrofit device. The ARB has now reviewed Cleaire's request for extending the verification of the DPX to include Cleaire's Flash and Catch™ system. Based on its evaluation of the data provided by Cleaire, ARB hereby approves Cleaire's Flash and Catch™ Engelhard DPX based system as a Level 3 retrofit device which also obtains a 25 percent NOx reduction for long haul truck (steady state) applications. All the conditions and stipulations of the Engelhard verification and extension verification hereby apply in full to Cleaire's Flash and Catch™ retrofit system. These conditions are:

- Certified in California for on-road applications,

  Four-stroke,

- Certified at a PM emission level of at most 0.1 grams per brake horsepower-hour (g/bhp-hr), and

- Turbocharged

Additional conditions specific to Flash and Catch™ are:

- The engine and Control Parts List (CPL) numbers must be covered by the Cummins Consent Decree.

- The engine's injectors must be replaced with Cummins ReCon® replacement fuel injectors.

The approved engines do not employ exhaust gas recirculation (EGR) and were not certified new with diesel particulate filters. The engines families and CPL number combinations in Table 1 are those that are covered by the Consent Decree and have received prior verification for the Engelhard DPX.

**Table 1. Overview of Cummins M11 Engines Model Years 1994-1998**

| Engine Family | Control Parts List Number |
|---|---|
| RCE661EJDARW | 1856 |
| RCE661FJDARA | 1855, 1857 |
| SCE661EJDARW | 1856 |
| SCE661EJDARA | 1855, 1857 |
| SCE661EJDASW | 2036 |
| SCE661EJDATW | 2037 |
| TCE661EJDARW | 1856 |
| TCE661EJDASW | 1855, 1857 |
| TCE661EJDARB | 2036 |
| TCE661EJDATW | 2037 |
| VCE661EJDATW | 2037 |
| VCE661EJDASA | 1855, 1856, 1857 |
| VCE661EJDARB | 2036 |
| WCEXH0661MAA | 2371 |
| WCEXH0661MAB | 2370 |

The aforementioned extension of verification is valid provided the following operating criteria are met:

1 The engine must be operated with a fuel that has a sulfur content of no more than 15 parts per million by weight.

2. The average engine exhaust temperature must be at least 225 degrees Celsius.

3. The engine should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.

4. Cleaire must install a backpressure monitor and indicator light on all vehicles retrofitted with a DPX.

5. The vehicle is used for predominantly long haul steady state applications.

6. The engine family and corresponding CPL number has a corresponding low NOx recalibration supported by Cummins (Attachment 1).

7. The fuel injectors are replaced with reconditioned Cummins fuel injectors (Table 2).

**Table 2: CPL and ReCon® Injector Combinations**

| CPL Number | ReCon® Injector Number |
|---|---|
| 1855, 1856, 1857 | 3087557 PX |
| 2036, 2037, 2370, 2371 | 3411753 PX |

Since there may be significant variations from application to application, Cleaire must review actual vehicle operating conditions and perform temperature and speed data logging prior to retrofitting a vehicle with the DPX to ensure compatibility.

The ARB estimates that the Cleaire Flash and Catch™ DPX system will incur no discernible fuel economy penalty when used in a compatible application.

The ARB granting verification to the Cleaire Flash and Catch™ system is independent of the Consent Decree agreement between Cummins Engine Company and The United States of America. Verification of the Cleaire Flash and Catch™ system by the ARB neither fulfills nor releases Cummins from any of their obligations under the consent decree. The ARB verifies that the reflashed engines granted verification by this letter achieve NOx reductions for retrofit purposes, not that these reflashed engines now comply with the stipulations of the Consent Decree.

Thank you for participating in ARB's diesel retrofit verification program. Should you have any questions or comments, please contact me at (626) 575-6807, or Ms. Annette Hebert, Chief, Heavy-Duty Diesel In-Use Strategies Branch, at (626) 575-6973.

Sincerely,

Robert H. Cross, Chief
Mobile Source Control Division

Attachments (1)

CC: Kevin Hallstrom, Engelhard
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