Winston H. Hickox
Agency Secretary

Air Resources Board

Alan C. Lloyd, Ph.D.
Chairman
9528 Telstar Avenue • P.O. Box 8001 • El Monte, California 91731 • www.arb.ca.gov

Gray Davis
Governor

May 14, 2003

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

Reference No. RAS-03-16

Dear Dr. Marc Rumminger:

Air Resources Board (ARB) previously verified that the Flash and Match™ system, which includes Cummins ReCon® replacement fuel injectors, and an engine reflash, reduces emissions of diesel particulate matter (PM) consistent with a Level 1 (greater than or equal to 25 percent reductions) device, and obtains a 25 percent oxides of nitrogen (NOx) reduction for long haul truck (steady state) applications using certain engines. ARB has now reviewed your request for extension of the verification of your Flash and Match™ oxidation catalyst based system to include 1993 Cummins M11 engines. Based on its evaluation and review of the engine in question, the ARB hereby extends the verification to include 1993 Cummins M11s with engine family PCE0661FZA2 and Control Parts List number 1856.

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

- The engine and Control Parts List number must be covered by the Cummins Consent Decree and have a corresponding low NOx recalibration supported by Cummins (Attachment 1).
- The engine's injectors must be replaced with reconditioned Cummins ReCon® fuel injectors (Table 1).
- The engine does not employ exhaust gas recirculation.
- The engine must be certified in California for on-road applications.
- The engine must be four-stroke.

The engine must be turbocharged.

- The engine should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
- The engine must be operated on CARB #2 diesel fuel or ultra low sulfur diesel fuel.
- The vehicle is used for predominantly long haul/steady state applications.
- The catalytic muffler must contain the catalyst specified in Cleaire's verification submittal, housed within a Fleetguard Nelson muffler, part numbers 29877A or 29890A, with the entire Flash and Match™ catalytic muffler having a Cleaire part number of 5101 or 5102, respectively.
- No changes are permitted to the device. The Air Resources Board must be notified in writing of any changes to any part of the Flash and Match™ system. Any changes to the device, applicable models, model-years, etc. must be evaluated and approved by the Air Resources Board.

Table 1. CPL and ReCon® Injector Combinations

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

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

The ARB granting verification to the Cleaire Flash and Match™ system is independent of the Consent Decree agreement between Cummins Engine Company and The United States of America. Verification of the Cleaire Flash and Match™ 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.

As specified in the Diesel Emission Control Strategy Verification Procedure, the ARB assigns each Diesel Emission Control Strategy a family name. The designated family name for the verification as outlined above is **CA/CLE/2002/PM1/N25/ON/SYS03**. This identification number should be used in reference to this verification as part of the system-labeling requirement.

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

Sincerely,

Robert H. Cross, Chief
Mobile Source Control Division

Attachments (1)

cc: Ms. Annette Hebert
Mobile Source Control Division
Air Resources Board

LOW NOx REBUILD CALIBRATION LISTING

Available From: March 1, 2000

CPL: 1855 Engine Model: M11

ENGINE POWER INFORMATION			ECM ELECTRONIC DATA PLATE INFORMATION		
HP	Torque (lb-ft)	Governed Speed	Original Software Calibration (SC) Options and Supercessions	Low NOx SC option	Notes
330	1250	2000	(2798), 2818, 2834, 2889, 2950, 2124, 2285,2474, 2542	20234	
330	1250	1800	2787, 2797, 2817, 2833, 2888, 2935, 2949, 2125, 2286, 2475, 2543	20235	
310	1150	2000	2785, (2796), 2816, 2832, 2887, 2923, 2954, 2129, 2287, 2476, 2544	20236	
310	1150	1800	2786, (2795), 2815, 2831, 2886, 2922, 2936, 2953, 2130, 2288, 2477, 2545	20237	
280	1050	2000	2784, 2794, 2814, 2830, 285, 2921, 2958, 2133, 2292, 2480, 2548	20238	
280	1050	1800	2829, 2884, 2920, 2957, 2134, 2293, 2481, 2550	20239	
280 ESP	1050	1800	(2792), 2883, 2928, 2961, 2181, 2298, 2391, 2485, 2556	20241	

CPL: 1856 Engine Model: M11

ENGINE POWER INFORMATION			ECM ELECTRONIC DATA PLATE INFORMATION		
HP	Torque (lb-ft)	Governed Speed	Original Software Calibration (SC) Options and Supercessions	Low NOx SC option	Notes
370	1350	2000	2791, 2804, 2825, 2841, 2896, 2943, 2117, 2278, 2465, 2529	20228	
370	1350	1800	2790, 2803, 2824, 2840, 2895, 2932, 2942, 2118, 2279, 2466, 2532	20229	
350	1350	2000	(2802), 2823, 2839, 2894, 2945, 2119, 2280, 2469, 2535	20230	
350	1350	1800	2789, 2801, 2822, 2838, 2893, 2933, 2944, 2120, 2281, 2470, 2537	20231	
330	1350	2000	(2800), 2821, 2837, 2892, 2947, 2122, 2283, 2472, 2539	20232	
330	1350	1800	2788, 2799, 2820, 2836, 2891, 2934, 2946, 2123, 2284, 2473, 2541	20233	

CPL: 1857 Engine Model: M11

ENGINE POWER INFORMATION			ECM ELECTRONIC DATA PLATE INFORMATION		
HP	Torque (lb-ft)	Governed Speed	Original Software Calibration (SC) Options and Supercessions	Low NOx SC option	Notes
310 ESP	1150	1800	2805, 2819, 2835, 2890, 2929, 2960, 2180, 2297, 2390, 2484, 2553	20240	