

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-669

Relating to Exemptions under
Section 27156 of the Vehicle Code

Green Fuel Laboratory, Inc.
GFL 110 Hydrogen Generator System

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-02-003;

IT IS ORDERED AND RESOLVED: That installation of the GFL 110 Hydrogen Generator System, manufactured by Green Fuel Laboratory, Inc. (8938 Monte Vista Ave., Montclair, California 91763), has been found not to reduce the effectiveness of the applicable vehicle pollution control systems, and therefore, the GFL 110 Hydrogen Generator System (GFL 110) is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on 1910-2009 model year passenger cars and light/medium-duty vehicles, up to 14,000 pounds Gross Vehicle Weight Rating, equipped with gasoline or diesel engines with an engine displacement up to 8.2 liters.

The GFL 110 device consists of a polypropylene water reservoir, stainless steel electrode tubes, various electrical components, electrical wiring and connectors, and polyethylene supply tubing for the hydrogen gas.

This Executive Order is based on Cold-Start CVS-75 Federal Test Procedure tests, Supplemental Federal Test Procedure tests, and On-Board Diagnostic II System tests conducted by Green Fuel Laboratory, Inc. with the GFL 110 Hydrogen Generator System.

If evidence provides the Air Resources Board with reasons to suspect that the GFL 110 device will affect the durability of the emission control system, Green Fuel Laboratory, Inc. shall be required to submit durability data to show that the durability of the vehicle emission control system is not, in fact, affected and/or that the add-on or modified parts demonstrate adequate durability.

This Executive Order is valid provided that installation instructions for the GFL 110 device do not recommend tuning the vehicles to specifications different from those of the vehicle manufacturer.

Changes made to the design or operating conditions of the GFL 110 device, as exempt by the Air Resources Board, which adversely affect the performance of the vehicle's emission control system, shall invalidate this Executive Order.

Marketing of the GFL 110 device using identification other than that shown in this Executive Order or for an application other than that listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board.

Exemption of the GFL 110 device shall not be construed as exemption to sell, offer for sale, or advertise any component of the kit as an individual device.

This Executive Order shall not apply to any GFL 110 device advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

This Executive Order does not constitute any opinion as to the effect the use of the GFL 110 device may have on any warranty either expressed or implied by the vehicle manufacturer.

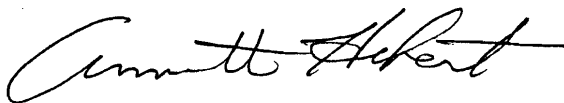
No claim of any kind, such as "Approved by the Air Resources Board," may be made with respect to the action taken herein in any advertising or other oral or written communication.

In addition to the foregoing, the Air Resources Board reserves the right in the future to review this Executive Order and the exemption provided herein to assure that the exempted add-on or modified part continues to meet the standards and procedures of California Code of Regulations, Title 13, Section 2222, et seq.

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 GREEN FUEL LABORATORY, INC.'S GFL 110 HYDROGEN GENERATOR SYSTEM.

Violation of any of the above conditions shall be grounds for revocation of this Executive Order. The Executive Order may be revoked only after a ten day written notice of intention to revoke the Executive Order, in which period the holder of the Executive Order may request in writing a hearing to contest the proposed revocation. If a hearing is requested, it shall be held within ten days of receipt of the request, and the Executive Order may not be revoked until a determination is made after the hearing that grounds for revocation exist.

Executed at El Monte, California, this 20 day of October 2009.



Annette Hebert, Chief
Mobile Source Operations Division

EVALUATION SUMMARY

Manufacturer Name: Green Fuel Laboratory, Inc.

Name of Device: GFL 110 Hydrogen Generator System

Background:

Green Fuel Laboratory, Inc. of 8938 Monte Vista Ave., Montclair, California 91763 has applied for exemption from the prohibitions in Section 27156 of the California Vehicle Code for its GFL 110 Hydrogen Generator System (GFL 110). The device is designed for use on 1910-2009 model year (MY) passenger cars and light/medium-duty vehicles, up to 14,000 pounds Gross Vehicle Weight Rating, equipped with gasoline or diesel engines with an engine displacement up to 8.2 liters.

Recommendation:

Grant exemption to Green Fuel Laboratory, Inc. as requested and issue Executive Order D-669.

Device Description:

The GFL 110 device produces hydrogen through an electrolysis process by supplying electricity from the vehicle's battery to stainless steel tubes submerged in a reservoir containing distilled water. The device is connected to the vehicle's battery through an Electronics Box so that hydrogen gas is only produced when the engine is operating. The device consists of a polypropylene water reservoir (which contains the stainless steel tubes), an Electronics Box, electrical wiring and connectors, and polyethylene supply hoses for the hydrogen gas.

Discussion/Basis for the Recommendation:

This exemption is based on: FTP, SFTP, and OBD II System tests conducted on a 2008 model year 1.8 liter Honda Civic LX coupe LEV II ULEV, a 2009 model year 3.6 liter Cadillac CTS LEV II LEV, and a 2008 model year 5.7 liter Dodge Ram 3500 truck LEV II LEV to evaluate the impact of the GFL 110 Hydrogen Generator System on emissions. Testing was conducted on these vehicles modified with Green Fuel Laboratory, Inc.'s GFL 110 device. Results are shown below:

FTP, SFTP, and OBD II System tests on a 2008 MY 1.8 liter Honda Civic LX coupe

	FTP Emissions (grams/mile)				SFTP Emissions (grams/mile)	
	NMOG	CO	NOx	HCHO	NMHC+NOx	CO
Test Results	0.026	0.461	0.013	0.000		
Test Results w/50K DF	0.029	0.472	0.018	0.000		
50K Standards	0.040	1.7	0.05	0.008		
Pass/Fail	Pass	Pass	Pass	Pass		
Test Results w/120K DF	0.036	0.510	0.031	0.000		
120K Standards	0.055	2.1	0.07	0.011		
Pass/Fail	Pass	Pass	Pass	Pass		
Test Results					0.03	5.5
4K Standards					0.14	8.0
Pass/Fail					Pass	Pass

	OBD II System Results	
	Readiness Indicator	Trouble Code
At vehicle receipt	All complete	None
After 1 st 50 mile drive	All complete except evaporative system	None
After Green Fuel Laboratory GFL 110 device FTP and SFTP tests	All complete except evaporative system	None
After additional drive sequence to complete EVAP monitor testing	All complete	None

FTP, SFTP, and OBD II System tests on a 2009 MY 3.6 liter Cadillac CTS

	FTP Emissions (grams/mile)				SFTP Emissions (grams/mile)	
	NMOG	CO	NOx	HCHO	NMHC+NOx	CO
Test Results	0.017	0.567	0.023	0.000		
Test Results w/50K DF	0.017	0.6	0.02	0.000		
50K Standards	0.075	3.4	0.05	0.015		
Pass/Fail	Pass	Pass	Pass	Pass		
Test Results w/120K DF	0.017	0.6	0.02	0.000		
150K Standards	0.090	4.2	0.07	0.018		
Pass/Fail	Pass	Pass	Pass	Pass		
Test Results					0.03	0.7
4K Standards					0.14	8.0
Pass/Fail					Pass	Pass

	OBD II System Results	
	Readiness Indicator	Trouble Code
At vehicle receipt	All complete	None
After 1 st 50 mile drive	All complete except catalyst and evaporative system	None
After Green Fuel Laboratory GFL 110 device FTP and SFTP tests	All complete except evaporative system	None
After GM EVAP Service Bay Procedure to complete EVAP monitor testing	All complete	None

FTP and OBD II System tests on a 2008 MY 5.7 liter Dodge Ram 3500 2WD

	FTP Emissions (grams/mile)			
	NMOG	CO	NOx	HCHO
Test Results	0.106	1.943	0.136	0.000
Test Results w/120K DF	0.106	1.9	0.14	0.000
120K Standards	0.230	7.3	0.4	0.040
Pass/Fail	Pass	Pass	Pass	Pass

	OBD II System Results	
	Readiness Indicator	Trouble Code
At vehicle receipt	All complete	None
After 1 st 50 mile drive	All complete except evaporative and O2 sensor system	None
After Green Fuel Laboratory GFL 110 device FTP test	All complete	None

Notes:

1. Honda Civic coupe test vehicle – Test group 8HNXV01.8LKR (LEV II ULEV); evaporative family 8HNXR0106BBY (LEV II evap.); odometer reading 25,589 miles.
Cadillac CTS test vehicle – Test group 9GMXV03.6053 (LEV II LEV); evaporative family 9GMXR0133810 (LEV II evap.); odometer reading 9,366 miles.
Dodge Ram 3500 test vehicle – Test group 8CRXK05.7TX0 (LEV II LEV); evaporative family 8CRXE0283GWH (LEV II evap.); odometer reading 5,125 miles.
2. Testing laboratory – Automotive Testing and Development Services, Inc. (ATDS) in Ontario, California.
3. Honda Civic OBD II System Results – One additional drive sequence was required to successfully complete EVAP monitor testing.
4. Cadillac CTS OBD II System Results – A GM EVAP Service Bay Procedure was required to successfully complete EVAP monitor testing.

FTP and SFTP emission results showed that the modified vehicles meet the exhaust emission standards. Testing also showed that the modification does not have any adverse impact on the vehicle's OBD II System. Similar results are expected when Green Fuel Laboratory, Inc.'s GFL 110 Hydrogen Generator System is used on the 1910-2009 model year passenger cars listed in this application.