State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-681

Relating to Exemptions under
Section 27156 of the Vehicle Code

Go Go Green World, Inc.
Generation Series

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 Generation Series (Models 12 and 22) hydrogen generator device, manufactured by Go Go Green World, Inc. (23100 S. Kasson Road, Tracy, CA 95304), has been found not to reduce the effectiveness of the applicable vehicle pollution control systems, and therefore, the Generation Series is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on 1960-2010 model year passenger cars and light-duty trucks with gasoline or diesel engines and 1960-2009 model year medium-duty trucks with gasoline or diesel engines and light/medium/heavy heavy-duty on-road diesel engines up to 20.0 liters.

The Generation Series device consists of either a 1-liter (Model 12) or 2-liter (Model 22) stainless steel water reservoir, various electrical components, electrical wiring and connectors, stainless steel braided hose, and a Teflon supply hose for the hydrogen gas.

This Executive Order is based on emission test results using Cold-Start CVS-75 Federal Test Procedure test, Supplemental Federal Test Procedure test, and On-Board Diagnostic II System test for the passenger cars and light-duty trucks and on emission test results using Heavy-Duty Federal Test Procedure (FTP) Transient Cycle test and Euro III European Stationary Cycle (ESC) test for the light/medium/heavy heavy-duty diesel engines submitted by Go Go Green World, Inc. with the Generation Series device.

If evidence provides the Air Resources Board with reasons to suspect that the Generation Series device will affect the durability of the emission control system, Go Go Green World, 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 Generation Series 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 Generation Series 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 Generation Series 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 Generation Series 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 Generation Series 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 Generation Series 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 GO GO GREEN WORLD, INC.'S GENERATION SERIES DEVICE.

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 4 day of November 2010.

Annette Hebert, Chief
Mobile Source Operations Divisio

GO GO GREEN WORLD, INC. – GENERATION SERIES - D-681

EVALUATION SUMMARY

Manufacturer Name: Go Go Green World, Inc.

Name of Device: Generation Series

Background:

Go Go Green World, Inc. of 23100 S. Kasson Road, Tracy, CA 95304 has applied for exemption from the prohibitions in Section 27156 of the California Vehicle Code for its Generation Series device. The device is designed for use on 1960-2010 model year passenger cars and light-duty trucks with gasoline or diesel engines and 1960-2009 model year medium-duty trucks with gasoline or diesel engines and light/medium/heavy heavy-duty on-road diesel engines up to 20.0 liters.

Recommendation:

Grant exemption to Go Go Green World, Inc. as requested and issue Executive Order D-681.

Device Description:

The Generation Series device produces hydrogen through an electrolysis process by supplying electricity from the vehicle's battery to stainless steel metal plates submerged in reservoirs containing distilled water and an activator (sodium hydroxide). The device consists of either a 1-liter (Model 12) or 2-liter (Model 22) stainless steel water reservoir (which contain the stainless steel anode and cathode metal plates), various electrical components, electrical wiring and connectors, stainless steel braided hose, and a Teflon supply hose for the hydrogen gas.

Discussion/Basis for the Recommendation:

This exemption is based on: FTP, SFTP, and OBD II System tests conducted on a 2010 model year 1.8 liter Honda Civic LX sedan LEV II ULEV and a 2009 model year 3.6 liter Cadillac CTS LEV II LEV for the passenger cars / light-duty trucks category. FTP transient cycle test on a 2004 MY Cummins ISM 10.8 liter diesel engine, and FTP transient cycle and Euro III ESC 13-mode steady-state tests on a 2007 MY Detroit Diesel Series 60 14.0 liter diesel engine for the light/medium/heavy heavy-duty diesel engine category. Testing was conducted on these vehicles and engines modified with the Generation Series device to evaluate the impact on emissions. Results are shown below:

FTP, SFTP, and OBD II System tests on a 2010 MY 1.8 liter Honda Civic LX sedan

	FTP Emissions (grams/mile)					
	NMOG	CO	NOx			
Test Results #1	0.025	0.370	0.005			
Test Results #2	0.023	0.298	0.003			
Average Test Results	0.024	0.334	0.004			
Average Test Results w/50K DF	0.029	0.4	0.01			
50K Standards	0.040	1.7	0.05			
Pass/Fail	Pass	Pass	Pass			
Average Test Results w/120K DF	0.037	0.4	0.03			
120K Standards	0.055	2.1	0.07			
Pass/Fail	Pass	Pass	Pass			

					SFTP Emissions (grams/mile)	
					NMHC+NOx	CO
Test Results					0.01	0.1
4K Standards					0.14	8.0
Pass/Fail					Pass	Pass

	OBD II System Results		
	Readiness Indicator	Trouble Code	MIL
At vehicle receipt	All complete	P0455	Off
After 177 mile drive	All complete except evaporative system	P0847	Off
After Generation Series device FTP and SFTP tests	All complete	P0847	Off

Notes: 1. DTC P0455 is for EVAP System Large Leak Detected
2. DTC P0847 is for Short in Transmission Fluid Pressure Switch B Circuit

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		NMHC+NOx	CO
Test Results #1	0.023	0.365	0.009			
Test Results #2	0.036	0.464	0.032			
Average Test Results	0.030	0.415	0.021			
Average Test Results w/50K DF	0.035	0.5	0.03			
50K Standards	0.075	3.4	0.05			
Pass/Fail	Pass	Pass	Pass			
Average Test Results w/150K DF	0.043	0.7	0.04			
150K Standards	0.090	4.2	0.07			
Pass/Fail	Pass	Pass	Pass			
Test Results					0.06	0.6
4K Standards					0.14	8.0
Pass/Fail					Pass	Pass

	OBD II System Results		
	Readiness Indicator	Trouble Code	MIL
At vehicle receipt	All complete	None	Off
After 108 mile drive	All complete except evaporative system	None	Off
After Generation Series device FTP and SFTP tests	All complete except evaporative system	None	Off

Notes: 1. The testing laboratory contacted GM Proving Grounds personnel and were told that the fuel tank is required to have over 50% of fuel and then conduct additional drive sequences to set the evaporative system to complete. The laboratory stated that after they drain the fuel tank they only refill 40% of the fuel for mileage accumulation and then redrain before preconditioning. Based on the procedure used by the laboratory to replace fuel in the fuel tank, staff feels that all indicators will eventually set to complete with additional drive sequences.

Hot-Start FTP Transient Cycle Emission Test
2004 MY Cummins ISM 10.8 liter Diesel Engine
Engine Family 4CEXH0661MAT

	FTP Transient Cycle Emissions (grams/bhp-hr)				
	NMHC	NOx	NMHC+NOx	CO	PM
FTP Emission Standards	0.5		2.4	15.5	0.10
Test Results w/Generation Series device Installed	0.1	2.3	2.4	0.6	0.02
Pass/Fail	Pass		Pass	Pass	Pass

Hot/Cold-Start FTP Transient Cycle Emission Test
2007 MY Detroit Diesel Series 60 14.0 liter Diesel Engine
Engine Family 7DDXH14.0ELY

	FTP Transient Cycle Emissions (grams/bhp-hr)				
	NMHC	NOx	NMHC+NOx	CO	PM
FTP Emission Standards	0.14	1.16	1.3	15.5	0.01
FTP Two Test Average w/Generation Series device Installed	0.021	0.563		0.005	0.002
FTP results with DF and UAF	0.06	0.59	0.65	0.02	0.005
Pass/Fail	Pass	Pass	Pass	Pass	Pass

Notes: 1. Deterioration factors (DF) are either multiplicative or additive.
2. Upward adjustment factors (UAF) are all additive.

Euro III ESC 13-Mode Steady-State Emission Test
2007 MY Detroit Diesel Series 60 14.0 liter Diesel Engine
Engine Family 7DDXH14.0ELY

	Euro III ESC Emissions (grams/bhp-hr)				
	NMHC	NOx	NMHC+NOx	CO	PM
ESC Emission Standards	0.14	1.16	1.3	15.5	0.01
ESC Test Results w/Generation Series device Installed	0.021	0.395		0.205	0.0078
ESC results with DF and UAF	0.04	0.40	0.44	0.25	0.009
Pass/Fail	Pass	Pass	Pass	Pass	Pass

Notes: 1. Deterioration factors (DF) are either multiplicative or additive.
2. Upward adjustment factors (UAF) are all additive.
3. Testing laboratory for all above tests – California Environmental Engineering in Santa Ana, California

FTP and SFTP exhaust emission results for the 2010 Honda and 2009 Cadillac 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. All exhaust emission test results for FTP transient cycle testing on the 1998 Cummins ISM engine showed

that the modified engine met the exhaust emission standards. All exhaust emission test results for FTP transient cycle testing and EURO III ESC emission testing, with the deterioration factors and upward adjustment factors included, on the 2007 Detroit Diesel Series 60 engine showed that the modified engine met the exhaust emission standards. Similar results are expected when Go Go Green World, Inc.'s Generation Series device is used on the 1960-2010 model year passenger cars and light-duty trucks with gasoline or diesel engines and 1960-2009 model year medium-duty trucks with gasoline or diesel engines and light/medium/heavy heavy-duty on-road diesel engines stated in this application.