

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-539

Relating to Exemptions under  
Section 27156 of the Vehicle Code

Home & Park Motorhomes  
Fuel Fill Pipe Assembly

Pursuant to the authority vested in the Air Resources Board (ARB) 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-45-9;

IT IS ORDERED AND RESOLVED: That installation of the fuel fill pipe assembly, part number 56204500, manufactured by Home & Park Motorhomes of 100 Shirley Avenue, Kitchener, Ontario, Canada N2B-2E1, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the fuel fill pipe assembly is exempt from the prohibitions of Section 27156 of the Vehicle Code for use on 2001 and 2002 model-year General Motors Corporation G2500/3500 Express vans.

This exemption is based on the On-Board Diagnostic II System testing conducted by Home & Park Motorhomes with the fuel fill pipe assembly and on the engineering evaluation of its impact on vehicle emissions.

This Executive Order is valid provided that installation instructions for the fuel fill pipe assembly 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 fuel fill pipe assembly, as exempt by the ARB, which adversely affect the performance of the vehicle's pollution control system, shall invalidate this Executive Order.

Marketing of the fuel fill pipe assembly 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 ARB.

Exemption of the fuel fill pipe assembly shall not be construed as an exemption to sell, offer for sale, or advertise any component of the assembly as individual devices.

This Executive Order shall not apply to any fuel fill pipe assembly 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 fuel fill pipe assembly 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 ARB 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 HOME & PARK MOTORHOMES' FUEL FILL PIPE ASSEMBLY.

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 a hearing that grounds for revocation exist.

Executed at El Monte, California, this 19<sup>th</sup> day of March 2002.



Allen Lyons, Chief  
New Vehicle/Engine Programs Branch

## EVALUATION SUMMARY

Manufacturer Name: Home & Park Motorhomes

Name of Device: Fuel Fill Pipe Assembly, Part Number 56204500

### Background:

Home & Park Motorhomes (HPM) of 100 Shirley Avenue, Kitchener, Ontario, Canada N2B-2E1 has applied for an exemption from the prohibitions in section 27156 of the California Vehicle Code (VC) for its fuel tank fill pipe assembly. The vehicle application includes 2001 and 2002 model-year General Motors Corporation (GM) G2500/3500 Express vans. The vehicles in this application are subject to the enhanced evaporative emission standards and the On-Board Diagnostic II (OBD II) System requirements. These vehicles are not subject to the on-board refueling vapor recovery emission standard.

### Recommendation:

Grant exemption to Home & Park Motorhomes as requested and issue Executive Order D-539.

### Device Description:

HPM converts the Express vans to make them suitable for motorhome use. The conversion includes lowering the van floor approximately two inches and installing auxiliary equipment such as a water heater and a propane stove. These conversions require removal and re-installation of the stock fuel tank one inch below the original location. All original GM parts are re-used in this modification, and no additional alteration is made to the original components. By equipping the vans with an auxiliary heater and/or a stove, HPM needs to move the fuel fill opening in order to meet safety standards with regards to minimum distance between an open flame and flammable liquids. To comply, the fuel fill opening is moved rearward approximately six feet from its original location, post the rear tire well. HPM's fuel fill pipe assembly provides the extension between the fuel fill neck and the fuel tank. The assembly consists of two HPM components—a 2-inch diameter aluminized steel tube and a fuel transfer hose (meets SAE J30R10 specifications) placed inside the steel tube. The steel tube acts as the vent tube between the fuel neck and the tank. In the installation, four original GM parts are re-used—the fuel fill neck (and gas cap), the plastic fuel transfer tube with a back flow prevention valve, and two 2-inch diameter connecting hoses. HPM's assembly is installed between the original fill neck and the fuel transfer tube using the connecting hoses. No other modifications to the stock emission control systems are made.

### Discussion/Basis for the Recommendation:

This exemption is based on engineering evaluation of the emission impact of the fuel fill pipe assembly on vehicle evaporative emissions. Installation of the assembly does not require any modification to the stock fuel and evaporative systems, including the emission carbon canister, canister purge system, and the fuel and vapor lines from the fuel tank to the engine and emission canister. The extension fuel transfer hose, which meets low vapor permeation standard, placed inside the steel tube is not expected to have any adverse impact on vehicle evaporative emissions. The lowering of the fuel tank is also not expected to have any negative impact on emissions.

The fill pipe is part of the vehicle's evaporative system monitored by the OBD II system. To show that HPM's assembly does not affect the operation of the vehicle's OBD II system, HPM tested a 2001 model-year 5.7 liter Express van (engine family 1GMXA06.0188; evaporative family 1GMXE0111909; testing was conducted by Transfer Flow, Inc.). The van was tested with a 0.030-inch diameter leak in its evaporative system to ensure that the leak is detected by the OBD II system. The leak was placed in two locations—the vehicle's fill pipe and the purge line between the purge solenoid and the emission canister. The tests showed that the vehicle's OBD II system is able to detect a 0.030-inch diameter leak (fault code P0442 for a small leak) in the fill pipe as well as in the purge line. HPM submitted the following results:

Leak Size	Fuel Level (%)	Leak Location		
		Fill Pipe	Purge Line	No Leak
0.030"	25-35	2 Fails (P0442) 1 Fail (P0440)*	1 Fail (P0442) 4 Aborts*	--
0.030"	47-48	2 Fails (P0442) 1 Fail (P0440)*	2 Fails (P0442) 2 Aborts*	Pass (Fill Pipe)*
0.030"	74-77	2 Fails (P0442)	2 Fails (P0442)	--
No Leak	48	--	--	Pass

\* No explanation was provided for the gross leak trouble code, aborted tests, or the false pass.

Results showed that the vehicle's diagnostic system was able to detect the small leak in the vehicle's fill pipe and in the purge line when the fuel level is between 25 and 77 percent capacity. At the lower fuel levels (25-48 percent), there were several aborted leak tests. A review of GM's certification records showed that the test vehicle was not certified with a 0.030-inch leak detection capability. It was certified with a 0.040-inch leak detection capability. The aborted tests may be attributed to the very low fuel levels and the fact that the vehicle's OBD II system was certified to detect a larger size leak. The results are consistent with the leak test enable conditions specified by GM. No other trouble codes were set during testing. It is concluded that the fuel fill pipe assembly does not diminish the effectiveness of the vehicle's OBD II system. The 2002 model-year Express vans are identical to the 2001 models, and similar results are expected when the assembly is used on the 2002 models.

Based on the above, the staff concludes that HPM's fuel fill pipe assembly meets the requirements for a VC 27156 exemption for the 2001 and 2002 model-year GM G2500/3500 Express vans.