

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-79-3  
Relating to Exemptions under Section 27156  
of the Vehicle Code

TECHIMPORT LIMITED  
"FILTER KING, MODEL NO. 4"  
"FILTER KING, MODEL NO. 5"

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-45-5;

IT IS ORDERED AND RESOLVED: That the installation of the Filter King Model No. 4 and Filter King Model No. 5 manufactured by Alberto Malpassi, Italy and marketed by Techimport Limited, 119 Glen Road, Toronto, Canada M4W 2W1, has been found not to reduce the effectiveness of required motor vehicle pollution control devices and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for installation on 1981 and older gasoline-powered, vehicles with conventional carburetor systems.

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different from those submitted by the device manufacturer.

Changes made to the design or operating conditions of the device, as exempted by the Air Resources Board, that adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this device using an identification other than that shown in this Executive Order or marketing of this device for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board. Exemption of a kit shall not be construed as an exemption to sell, offer for sale or advertise any component of a kit as an individual device.

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

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 THE "FILTER KING MODEL NO. 4" AND "FILTER KING MODEL NO. 5".

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

Section 17500 of the Business and Professions Code makes untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

Section 43644 of the Health and Safety Code provides as follows:

"43644. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor."

Any apparent violation of the conditions of this Executive Order will be submitted to the Attorney General of California for such action as he deems advisable.

Executive Orders D-79 dated April 17, 1978, D-79-1 dated January 12, 1979, and D-79-2 dated March 6, 1980 are superseded and of no further force and effect.

Executed at El Monte, California, this 2 day of <sup>April</sup>~~March~~, 1981.

  
K. D. Drachand, Chief  
Mobile source Control Division

Orig

State of California  
AIR RESOURCES BOARD

March 2, 1981

Evaluation of the Techimport Limited "Filter King Model No. 4" and "Filter King Model No. 5" for Compliance with the Requirement of Section 27156 of the Vehicle Code.

I. INTRODUCTION

Techimport Limited, of 119 Glen Road, Toronto, Canada M4W 2W1, has requested by letter dated January 31, 1981 (See Appendix A) an update to the existing Air Resources Board's Executive Order D-79-2. The applicant requested that the exemption from the prohibitions of Vehicle Code (V.C.) Section 27156 for their "Filter King Model No. 4" and "Filter King Model No. 5" fuel control device be updated to include all 1981 and older model year gasoline-powered vehicles with conventional carburetor systems.

Section 27156 of the V.C. prohibits the installation, sale, or advertisement of any device which alters the performance of the vehicle's emission control system. The Air Resources Board (ARB) is empowered to exempt any device from this prohibition if it can be shown that the installation of the device will not reduce the effectiveness of the existing emission control system.

II. SYSTEM DESCRIPTION AND OPERATION

The "Filter King" device is a fuel pressure regulator installed between the fuel pump and the carburetor. It is designed to maintain the fuel pressure in the carburetor at optimum levels. The applicant claims:

1. By regulating the fuel pressure to supply the engine with the required amount of fuel, the device eliminates most or all of the fuel pulsations emanating from the fuel pump.

2. The device also prevents excess gasoline from flowing into the float bowl during periods of heavy fuel bowl slosh.

3. As a result, the carburetor is able to maintain a more uniform level of fuel in the float bowl, thereby, reducing carburetor flooding and increasing fuel economy.

The device consists of an upper aluminum housing and a lower glass container. The aluminum housing contains a fuel inlet, a fuel outlet, a valve, and a spring loaded diaphragm that regulates the opening and closing of the valve. The lower glass container holds the fuel and a high capacity fuel filter. Figure I shows a cross-section of the device.

Initially, fuel from the fuel pump under pressure enters the glass compartment where the fuel is filtered. The amount of fuel that passes the valve and thence to the carburetor is metered by the action of the spring loaded diaphragm. When the fuel pressure under the diaphragm is high, the diaphragm moves up causing the valve to seat against the port thus reducing the output pressure. When the fuel pressure is low, the diaphragm moves down allowing the valve to open the port thus increasing the output pressure. The modulation of the diaphragm tends to smooth out the fuel pressure pulsation from the fuel pump. The pressure regulator output pressure can be adjusted by means of a screw located on the top of the aluminum housing.

### III. DEVICE EVALUATION

The applicant submitted emissions test data for the original application. The tests, conducted by AMC, were performed on a 1978 AMC vehicle. The data in Table 1 shows that the device has little effect on emissions at low outlet pressures of 1.2 and 1.7 psig.

The ARB evaluated the device during the original application. The evaluation consisted of parametric pressure tests at different speed and engine loading conditions on a typical 2 barrel carburetor. The results in Table 2 indicated that the amount of fuel delivered to the test carburetor and emissions were unaffected due to fuel pressure differences.

The Air Resources Board staff report titled "Evaluation of the F. K. Products Filter King Unit No. 5 Device in Accordance with Section 2222, Title 31 of the California Administrative Code", dated February 24, 1978, contains a detailed description of the tests performed.

#### IV. DISCUSSION

Based on the above data the Filter King does not seem to have any effect on fuel delivery and on exhaust emissions of an automobile engine equipped with a conventional carburetor. Since the "engine out" emissions are not changed, the operation and the efficiency of a three-way catalyst does not change either.

Also when the fuel delivery rate remains unchanged, the float level will not change. An air/fuel ratio feedback control system on late model year cars draws fuel from a bowl in the same way as a conventional carburetor, and should not be affected if the float level does not alter.

#### V. CONCLUSION AND RECOMMENDATION

The previous test data submitted by the applicant and generated by ARB showed that the use of the "Filter King" device did not have any effect on the exhaust emission control system of 1978 model year vehicles.

Based on the test data Techimport Limited was granted an exemption (Executive Order D-79 dated April 17, 1978) from V.C. 27156 for 1978 and older gasoline powered vehicles. The exemption was later updated to include 1979 model year gasoline-powered vehicles (Executive Order D-79-1, dated January 12, 1979) and for 1980 model year gasoline-powered vehicles (Executive Order D-79-2, dated March 6, 1980).

The staff found no significant difference between the 1981 and 1978 vehicle's fuel system design and the engine-out emissions are not affected by the use of the Filter-King device.

Based on the above, the staff concluded that the installation of the "Filter King Model No. 4" or "Filter King Model No. 5" fuel control device will have no effect on vehicle exhaust emissions. The staff recommends that Techimport's exemption, Executive Order No. D-79-2, be updated to include 1981 and older model year gasoline-powered vehicles with conventional carburetor systems. The staff, therefore, recommends that Executive Order D-79-3 be adopted

Table I - Filter King Back-to-Back CVS-75 Test  
 Data on a 1978 AMC I-3 Package (Test  
 conducted by AMC)

	Grams per Mile		
	<u>HC</u>	<u>CO</u>	<u>NOx</u>
Baseline @ 5 psig.	0.52	5.4	1.23
Filter King @ 1.7 psig	0.49	4.1	1.51
Filter King @ 1.2 psig	0.52	5.0	1.32

Engine Speed (RPM)		900	1000			1500			2000			2500		
% of Max. Torque		Idle	100%	50%	25%	100%	50%	25%	100%	50%	25%	100%	50%	25%
Filter King Output Pressure psig	Baseline	5.5	5.1	4.9	4.3	4.4	4.5	4.6	4.2	4.5	4.5	4.2	4.3	4.4
	Device (1)	5.6	5.2	5.5	5.5	3.5	4.2	4.3	4.2	4.4	4.5	4.0	4.3	4.4
	Device (2)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	Device (3)	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	1.9	2.0	2.0
	Device (4)	1.6	1.6	1.5	1.5	1.5	1.6	1.5	1.5	1.6	1.6	1.5	1.5	1.5
	Device (5)	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.1	1.0	1.1	1.1
Fuel Flow gm/sec	Baseline	0.9	2.7	1.4	1.1	4.2	2.1	1.4	5.8	2.9	1.9	7.2	3.8	2.4
	Device (1)	0.9	2.8	1.4	1.1	4.2	2.2	1.5	5.8	2.9	1.9	7.2	3.8	2.4
	Device (2)	0.8	2.9	1.4	1.1	4.2	2.1	1.4	5.7	2.9	1.8	7.1	3.7	2.4
	Device (3)	0.8	2.7	1.4	1.1	4.2	2.1	1.4	5.9	3.0	1.8	7.0	3.7	2.4
	Device (4)	0.8	2.7	1.4	1.1	4.1	2.1	1.4	5.7	2.9	1.8	6.9	3.7	2.1
	Device (5)	0.8	2.7	1.4	1.1	4.1	2.1	1.4	5.7	2.9	1.8	6.9	3.7	2.4
CO gm/min.	Baseline	0.70	*	1.4	0.8	*	4.1	1.4	*	9.7	2.9	*	21.6	6.7
	Device (1)	0.80	*	1.3	1.0	*	4.2	1.5	*	13.1	2.8	*	17.9	6.4
	Device (2)	0.65	*	1.2	0.9	*	4.7	1.5	*	11.2	2.4	*	17.6	5.0
	Device (3)	0.67	*	1.0	0.9	*	4.0	1.4	*	12.7	2.3	*	19.4	5.7
	Device (4)	0.7	*	0.9	0.8	*	3.2	1.3	*	10.7	2.1	*	16.8	5.5
	Device (5)	0.7	*	0.8	0.8	*	2.8	1.3	*	7.9	1.9	*	14.1	4.1
HC gm/min	Baseline	0.24	2.3	0.73	0.27	3.21	1.32	0.47	4.03	1.52	0.89	5.15	1.76	1.09
	Device (1)	0.26	2.36	0.81	0.28	3.33	1.40	0.51	4.46	1.91	0.98	5.36	1.83	1.12
	Device (2)	0.23	2.35	0.82	0.30	3.11	1.32	0.50	4.21	1.57	0.89	4.9	1.73	1.01
	Device (3)	0.22	2.18	0.79	0.33	3.29	1.38	0.56	4.58	1.84	0.96	4.9	2.07	1.26
	Device (4)	0.29	2.21	0.76	0.31	2.97	1.26	0.53	4.22	1.89	0.76	4.82	2.03	1.28
	Device (5)	0.22	2.10	0.72	0.32	3.13	1.26	0.80	4.16	1.74	0.94	4.74	1.92	1.18
NOx gm/min	Baseline	0.23	*	2.51	0.51	*	4.42	1.28	*	6.33	2.81	*	9.62	5.03
	Device (1)	0.25	*	2.57	0.48	*	4.40	1.36	*	7.34	3.03	*	9.96	5.13
	Device (2)	0.18	*	2.64	0.51	*	4.22	1.34	*	6.05	2.6	*	9.56	4.43
	Device (3)	0.14	*	2.71	0.50	*	2.94	1.96	*	7.44	2.65	*	10.75	4.97
	Device (4)	0.09	*	2.62	0.46	*	4.00	1.21	*	7.10	2.49	*	10.19	4.91
	Device (5)	0.08	*	2.39	0.30	*	4.11	1.08	*	7.51	2.22	*	10.84	4.78

Table - II Parametric Fuel Pressure Tests of Filter King Device on Ford 302 CID Engine Dyno

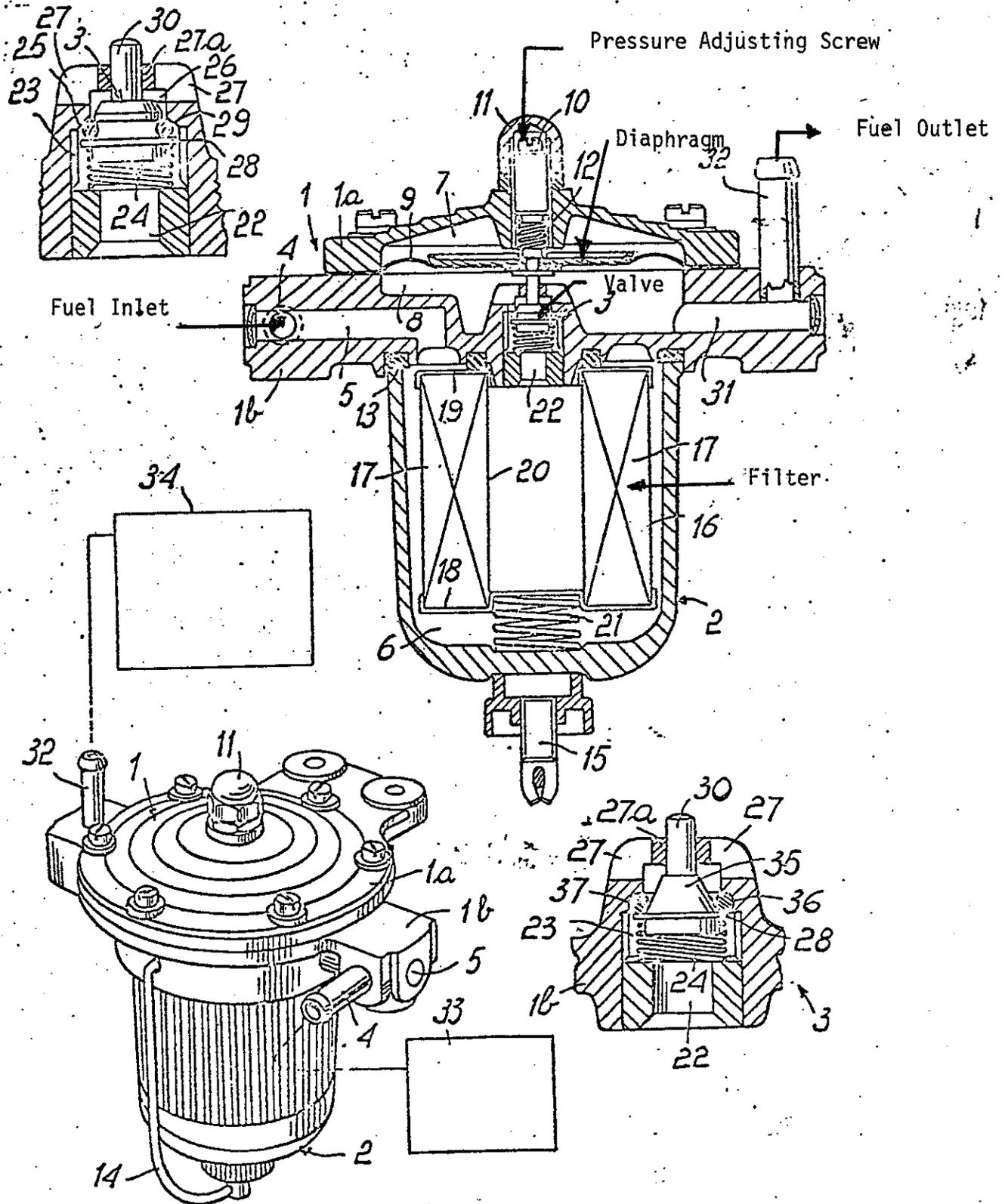


Fig. 1 - Filter King Pressure Regulator

# Techimport

January 30, 1981

Air Resources Board Laboratory  
9528 Telstar Avenue  
El Monte, California  
U.S.A. 91731

Attention: Mr. K.D. Drachand  
Chief,  
Mobile Source Control Division

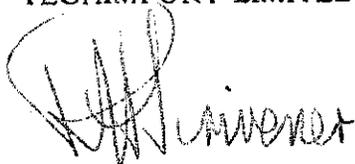
Dear Sirs:

Re: Malpassi Filter King  
Your Reference A-80-090

We wish to make application to have your Executive Order D-79-2, which covers Filter King Models 4 and 5, up-dated to apply to the 1981 and older motor vehicles used in California. The construction of the Filter King models 4 and 5 remains unchanged.

Yours truly,

TECHIMPORT LIMITED



R. H. Scrivener, P. Eng.  
President