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Evaluation of an Automobile Power  
and Deceleration Governor

\* the Smith

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Test and Evaluation Branch  
Emission Control Technology Division  
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16. ABSTRACT <p>Mr. Coye Conner, representing Mr. Edward Smith, inventor of the Power and Deceleration Governor, contacted the Mobile Source Air Pollution Control laboratory in Ann Arbor, Michigan, to request a laboratory and engineering evaluation of Mr. Smith's invention. Submitted with the request was a test report prepared by Automotive Research Associates, Inc. of San Antonio, Texas, indicating significant reductions of exhaust emissions. A confirmatory test program was conducted by the Test and Evaluation Branch of the Emission Control Technology Division.</p> <p>The Power and Deceleration Governor is a vacuum controlled throttle valve assembly installed between the carburetor and the engine intake manifold. The control mechanism of the device affects a carburetion cut-off during deceleration and limits throttling during acceleration. There are no parameter changes made to the engine's basic spark timing, idle CO setting, or idle rpm. <del>The exact nature of the device is classified.</del></p>				
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## Background

Mr. Coye Conner, representing Mr. Edward Smith, inventor of the Power and Deceleration Governor, contacted the Mobile Source Air Pollution Control laboratory in Ann Arbor, Michigan, to request a laboratory and engineering evaluation of Mr. Smith's invention. Submitted with the request was a test report prepared by Automotive Research Associates, Inc. of San Antonio, Texas, indicating significant reductions of exhaust emissions. A confirmatory test program was conducted by the Test and Evaluation Branch of the Emission Control Technology Division.

## Device Description

The Power and Deceleration Governor is a vacuum controlled throttle valve assembly installed between the carburetor and the engine intake manifold. The control mechanism of the device affects a carburetion cut-off during deceleration and limits throttling during acceleration. There are no parameter changes made to the engine's basic spark timing, idle CO setting, or idle rpm. The cost of the device is approximately \$50 and can be installed in about one hour.

## Test Program

A 1966 Chevrolet Impala, 283 CID, supplied by the inventor was used in the testing. Three tests were conducted, two with the device installed, and one with a standard carburetor. Two additional tests were run with the standard carburetor, but were invalid due to an exhaust system leak. All testing was performed in accordance with the 1975 Federal Test Procedure as outlined in the November 15, 1972, Federal Register. The tests were conducted using the standard dynamometer inertia loading of 4000 pounds and Indolene 30 as the test fuel.

## Test Results

The test results are presented in the Appendix of this report. These results are summarized as follows:

### Summary of Emission Results % Change from Baseline

	<u>PDG Device</u>
HC	18% increase
CO	23% decrease
CO <sub>2</sub>	13% increase
NO <sub>x</sub>	45% decrease
Fuel Economy	5% penalty

Conclusions

1. Significant penalties in hydrocarbon emissions and in fuel economy resulted from the device installation. Carbon monoxide and oxides of nitrogen were significantly reduced.
2. Vehicle driveability with the device was not evaluated, but would require analysis in any further development effort.

APPENDIX

Comparison of 1975 FTP Emission Results  
with and without the Power and Deceleration Governor

<u>Without Device</u>						
<u>Date</u>	<u>HC gm/mi</u>	<u>CO gm/mi</u>	<u>CO<sub>2</sub> gm/mi</u>	<u>NOx gm/mi</u>	<u>Fuel Economy</u>	
4-5	7.02	79.2	454.45	3.32	14.8	
<u>With Device</u>						
4-2	8.32	57.9	509.95	1.71	14.4	
4-3	8.22	61.2	513.40	1.82	14.1	
<u>% Emission Change</u>						
	-17.8%	22.7%	-12.9%	45.2%	-4.7%	

NOTE: a negative sign indicates an increase of emissions  
or fuel economy penalty.