

Evaluation of the Atom Auto Pecos, Ltda.
Variable Venturi Carburetor and the
Fuel Inlet Vaporizer

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Background

Atom Auto Pecos Ltda. of Brazil contacted the Office of Air and Water Programs and requested an evaluation of a variable venturi carburetor and a "fuel inlet vaporizer." Data was presented from Olsen Laboratories compiled using the 1973 FTP on a 1973 Duster (225 CID engine, automatic transmission) with the variable venturi carburetor and a 1972 Volkswagen (Beetle) with the "fuel inlet vaporizer." Based on the Olsen Laboratory results a test program on these devices was undertaken by the Test and Evaluation Branch. The variable venturi carburetor was of specific interest.

Device Description

Variable Venturi Carburetor: This type of carburetor supplies an essentially constant air velocity through the fuel delivery venturi section of the carburetor. This is done by varying the venturi cross-sectional area with engine load. At light load when engine air consumption is low, this type of carburetor allows for high venturi air velocity thus achieving higher turbulence and potentially better fuel atomization and distribution than is the case of the standard fixed venturi carburetor. Thus, there is a potential for lean operation with the variable venturi carburetor.

Fuel Inlet Vaporizer: This device incorporates modifications to the carburetor jets. The jet or jets are modified in such a way that an adjustable fuel venturi is used to control a primary air bleed into the jet. It also provides for some turbulence in delivery of this primary air/fuel mixture to the carburetor venturi.

Test Program

Two tests were run on the 1973 Duster with the variable venturi carburetor and one on the Volkswagen with the "fuel inlet vaporizer." All testing was conducted in accordance with the 1975 Federal Emission Test Procedure as described in the November 15, 1972, Federal Register.

Results

The results from the tests are reported in the attached table. The Duster variable venturi tests show potential for meeting 1975 interim standards. It should be noted that tests on the Duster were conducted with the EGR system disconnected. Test results of the "fuel inlet vaporizer" did not show any significant emission control.

Conclusions

1. The Atom Auto Pecos Ltda.'s variable venturi carburetor installed on a 1973 Duster (225 CID engine) showed potential for meeting the 1975 interim standards.
2. The Atom Auto Pecos, Ltda.'s "fuel inlet vaporizer" did not show any significant emission control potential.

Test Results

Atom Auto Pecos Ltda. variable venturi carburetor

Test car: 1973 Duster - 225 CID eng/auto. trans.

Comments: EGR was disconnected during testing, manual
choking was used.

HC	CO	NOx
1.51 gm/mi	7.03 gm/mi	3.28 gm/mi
1.68	5.79	2.33
1.5	15.0	3.1 '75 Interim Std.

Atom Auto Pecos Ltda. "fuel inlet vaporizer"

Test car: 1972 Volkswagon Beetle

Comments: Manual choking was used.

HC	CO	NOx
4.05 gm/mi	53.09 gm/mi	1.54 gm/mi