

Evaluation of a Renault Prototype Low Emission Vehicle

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Emission Control Technology Division
Office of Air and Water Programs
Environmental Protection Agency

Background

Laboratory correlation between the automobile manufacturers and EPA for device prototypes has been a continuing function of the Emission Control Technology Division. For this reason the ECTD agreed to test a prototype low emission vehicle from Renault which had recently been tested at their laboratory in France. Renault plans to use this system for the 1975 model year exclusively in California.

Vehicle Tested

The vehicle tested was a 1973 Renault 15 sedan with engine modifications, a Bosch air injection pump, and an Engelhard monolithic catalyst which was located a few feet downstream of the exhaust manifold in the exhaust system. Details of this system are included in the Vehicle Data Sheet at the end of this report. At the time of testing the vehicle system had accumulated about 5,000 miles.

Two emission tests were performed on the vehicle according to the 1975 Federal Test Procedure. Dynamometer inertia weight was set at 2750 lbs.

Test Results

The emission results are presented below along with fuel economy which was calculated by a carbon balance method.

<u>Test No.</u>	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>
16-681	.28	2.94	1.48	19.3
16-684	.29	3.50	1.48	18.9
Renault results	.38	1.93	1.56	---
'75 Cal. Standards	.90	9.00	2.00	---
'76 Fed. Int. Stds.	.40	3.40	2.00	---

The two tests at EPA were run differently. The idle CO was raised after the first test (with air pump disconnected) from about 2.3% to 3.3%. Also, the choke was operated differently on the tests. At the start the carburetor was fully choked on both tests. Then at about 25 seconds into the test the choke was let off about half way on the first test but not quite as far on the second. At about 170 seconds into the test the choke was pushed fully off on both tests. For about 145 seconds the choke was in different positions for the two tests.

Conclusions

At low mileage the Renault showed the capability of not only meeting the 1975 California standards, but also the 1976 Federal emissions interim standards.

VEHICLE DATA SHEET

Engine: 843 engine family (this engine is based on the 807 engine family; the bore has been increased from 3.032 to 3.110 inches).

Compression ratio has been reduced from 9 to 8 (to allow for use of non-leaded regular grade gasoline and because 1975 models feature a new camshaft design).

Intake valve opening advance at 21° instead of 40°.

Intake valve closing retard 59° instead of 72°.

Exhaust valve opening advance 59° instead of 72°.

Exhaust valve closing retard 21° instead of 40°.

Carburetor: Solex single barrel 32 EISA carburetor with manual choke and altitude compensator.

Distributor: Ducellier conventional R243 D59 set at 5° BTDC.

Bosch air injection pump and related components (as used on present and previous models): Drive ratio 1.14 times that of the engine.

Engelhard monolithic catalytic reactor: Type American Lava node-to-node No. 88.