

Exhaust Emissions from a Passenger Car Powered by
Marvel-Schebler LPG Conversion

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Vehicle Tested

The exhaust emission characteristics of a 1969 Ford LTD equipped with a Marvel-Schebler LPG conversion were desired to supplement this agency's information on gaseous fuel vehicles. The car was equipped with a 429 cubic inch displacement engine and automatic transmission. In addition to the equipment necessary for LPG operation the car had a decel-device which held the throttle partially open on deceleration.

Tests Conducted

Because the car was only available for three days, tests were limited to the following types:

1. Standard 1968 Federal test procedure for exhaust emissions (FTP).
2. A closed, constant volume sampling technique using 9 repeats of the Federal emissions test cycle (CVS).
3. Two closed, constant volume sampling technique using the LA4-S3 driving schedule as specified for 1972 and later testing. One test was performed with the decel-device, one without.

Closed cycle data were taken using a constant volume sampling technique. Bag samples were analyzed using non-dispersive infrared analysis for carbon monoxide and carbon dioxide with hydrocarbons measured using a flame ionization detector. The Whittaker "NOx Box" was used for determination of oxides of nitrogen in the CVS sample.

Emission Results

Table I shows the test results and indicates the comparison between the decel-device configuration and no device. As is shown by the CVS results the car in both configurations meets or surpasses the 1972 Federal emission standards of 2.9 grams per mile (gpm) hydrocarbon, 37.0 gpm carbon monoxide, 3.0 gpm oxides of nitrogen. With the decel-device removed hydrocarbons increased about twenty percent.

Conclusions

1. The Marvel-Schebler car demonstrated the attainment of 1972 Federal standards.
2. The decel-device attached decreases hydrocarbon levels.

Table I

Marvel-Schebler 429 CID LPG Ford

| | | | |
|-------------------------|--------|--------|--------|
| 1968 FTP | HC ppm | CO % | NO ppm |
| With decel device | 48.1 | .11 | 404.5 |
| 9 Cycle CVS | HC gpm | CO gpm | NO gpm |
| With decel device | .91 | 4.41 | 3.00 |
| 1972 FTP | | | |
| With decel device | 1.04 | 3.77 | 1.95 |
| Without decel device | 1.29 | 3.99 | 1.94 |