

Exhaust Emissions from a Diesel-powered
Nissan Passenger Car

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Background

The Emission Control Technology Division is currently conducting a technical feasibility study and evaluation of the light duty Diesel engine to determine its potential for low exhaust emissions in light duty passenger vehicle applications. As part of the experimental phase of this study we have tested several passenger vehicles powered by Diesel engines. One of the vehicles tested was a Nissan 220D supplied by the Nissan Motor Company of Japan.

Vehicle Description

The test vehicle is a four-door sedan. It is powered by a four-cylinder Diesel engine with a displacement of 132.1 CID. The engine produces 70 Bhp. The gearbox is a manual-type with four speeds.

The inertia weight at which the vehicle is tested is 3500 pounds.

Test Program

All tests were run in accordance with the 1975 Federal Test Procedure (FTP) for light duty Diesel-powered vehicles. When the vehicle was delivered it had accumulated less than 200 miles. Two emission tests were run on the vehicle at low mileage. After initial testing was completed, the vehicle was driven over the AMA Durability Driving Schedule (Federal Register, Vol. 35, No. 219, November 10, 1970) until 4000 miles had been accumulated.

Two emissions tests were run on the vehicle at the 4000-mile point.

Test Results

The vehicle achieved 1976 interim emission levels at both low mileage and at 4000 miles. Significant reductions in emissions occurred after 4000 miles were accumulated on the vehicle. HC and CO are about 50% of the specified limits and NOx is about 75% of the 1976 interim level.

Fuel economy at 4000 miles increased 17% over that at low mileage.

Conclusions

The vehicle easily met the interim 1976 standards. The car has adequate power for city and country driving, but there is little reserve power for passing situations. Fuel economy is well above the average for its weight class.

Nissan Diesel
Mass Emissions in
Grams/Mile

| | Hot <u>FID HC</u> | <u>CO</u> | <u>NOx</u> | <u>MPG</u> |
|---------------------------|----------------------|-----------|------------|------------|
| Low mileage | 0.39 | 1.59 | 1.65 | 24.5 |
| | 0.36 | 1.78 | 1.78 | 23.4 |
| 4000 miles | 0.19 | 1.41 | 1.44 | 27.9 |
| | 0.26 | 1.27 | 1.28 | 28.3 |
| 1976 Interim Standards | 0.41 | 3.4 | 2.0 | |