

Test Report

Lovato Autogas Pty Ltd

AS1425/2007 - ADR79/01

Holden Colorado Utility

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1. INTRODUCTION

The following report details the results achieved when a Holden Colorado, VIN Number MMTFS85HAH525431, was tested in accordance with Australian Design Rule 79/01 at Vipac's Port Melbourne laboratory during the period 12th-13th July 2010. The test was conducted in order to verify the conformance of an aftermarket Liquefied Petroleum Gas Vapour Injection Kit (LPG over Diesel), Part number "DGA (Diesel Gas Australia) Holden Colorado HB System" manufactured & installed by the client.

The testing was carried out in accordance with the procedures applicable to a light duty diesel vehicle as outlined within Australian Design Rule 79/01. The vehicle was tested using an equivalent inertia figure of 2040kg, with a road load power absorption figure at 80km/h of 11.18kW utilising the factors outlined within the table of paragraph 3.2.1 Annex 4-Appendix 2 with respect to an N₁(III) vehicle type.

Pre-conditioning was undertaken as per clause 5.3.1, Annex 4 of ADR79/01 with the vehicle being driven over three "Extra Urban" drive cycles prior to being soaked overnight under ambient conditions of between 20°C - 30°C. Oil and coolant temperatures were checked prior to the commencement of the single Type I test in order to verify that these parameters were each within 2°C of the current ambient air temperature.

The fuels used for the exhaust emission test were commercially available ultra low sulphur diesel fuel and commercially available Liquefied Petroleum Gas.

2. TEST VEHICLE SPECIFICATIONS

Parameter	Detail
Manufacturer	GM HOLDEN
Model	Colorado
Odometer	2242
Build date	2010
Vin number	MMTFS85HAH525431
Engine number	HB2404
Engine model & type	HB, 2.999Litre, Common Rail Compression Ignition, Turbocharged & Intercooled.
Transmission	4spd Automatic
Tyre sizes	245/70 R-16 M&S
Tyre pressure	280 kPa
Kerb mass (Heaviest Variant)	1925 kg
Reference mass	2025 kg
Equivalent inertia	2040 kg
Road load @ 80 kph	11.18 kW
Road load coefficient a	11.31 N
Road load coefficient b	0.07683 N/(km/h) ²

Table 1: Vehicle under test

3. TEST EQUIPMENT

Equipment	Manufacturer	Model	Serial Number	Last Calibrated
Carbon Monoxide (CO) Analyser	Signal Instruments	7100FM	17845	July 2010
Total Hydrocarbon (THC) Analyser	Signal Instruments	3000HM	15020	July 2010
Oxides Of Nitrogen (NOx) Analyser	Signal Instruments	4000VM	14946	July 2010
Carbon Dioxide (CO ₂) Analyser	Signal Instruments	7200FM	17844	July 2010
CVS (Constant Volume Sampling) System	Beckman Industries	Critical Flow Venturi	178	January 2010
Total System Verification	Horiba CFO (Constant Flow Orifice)	CFO-201	100202	April 2010

Table 2: Test Equipment

4. TEST RESULTS

Exhaust Emissions (g/km) ADR79/01 – N ₁ (III) vehicle				
	CO	NOx	THC & NOx	PM ₁₀
Limits	0.74	0.39	0.46	0.06
Test	0.04	0.28	0.31	0.04

Table 3: Exhaust Emissions Result

Fuel Consumption ADR81/01 – N ₁ (III) vehicle		
	CO ₂ (g/km)	Fuel Consumption (l/100km)
Urban	315.02	11.90
Extra Urban	184.33	6.96
Combined	232.4	8.8

Table 4: Fuel Consumption

5. CONCLUSION

The exhaust emission results (Average Tailpipe Emissions) of the vehicle when tested in accordance with the Type I test procedures incorporated within ADR79/01 were within the limits specified for Carbon Monoxide (CO), Oxides Of Nitrogen (NO_x), Total Hydrocarbons (THC) & Oxides Of Nitrogen (NO_x) combined & Particulate Matter (PM₁₀) for an N₁(III) vehicle of reference mass 2040kg. The published results do not include the relevant Deterioration Factors utilised in lieu of the Type V Test (Durability Of Anti-Pollution Devices).

The vehicle as presented conforms to the limits & criteria for an N₁(III) class vehicle as specified within ADR79/01.