



Emission report Honda accord/CU1

Comparing emissions petrol/LPG

Tested vehicle



Brand:	Honda
Type:	Accord/CU1
Model year:	2008
Motor code:	R20A3
Cylinder capacity:	2000cc
Fuel system:	Matsushita
Supplier LPG system:	Prins Autogassystemen B.V.
Type system:	VSI-LPG
LPG type approval:	R115
Emission norm:	Euro-5
Tested by:	TÜV-Rheinland



Prins VSI-LPG system



- ◆ VSI is an abbreviation for "Vapour Sequential Injection".
- ◆ The VSI-LPG system is the most advanced LPG system available on the market.
- ◆ With the VSI-LPG system there is no difference between drive-ability on petrol or LPG.

Euro-5 emissiontest



TÜVRheinland[®]

- ◆ LPG type approval R115 Honda Accord
- ◆ Emission test carried out by TÜV Rheinland
- ◆ Euro-5 emission test
- ◆ CO-2 emission and fuel consumption according to 80/1268/EWG
- ◆ 2 emission test reports:
 1. Emission test on petrol
 2. Emission test on LPG
- ◆ All two emission test reports are carried out under the same circumstances:
 - Vehicle weight
 - Rolling friction [70/220/EWG]
 - Temperature
 - Air pressure
 - Atmospheric humidity

Tested Data

The following emissions are tested:

CO: Carbon monoxide

- ◆ A colorless, odorless and very toxic gas that forms when carbon in fuel is not burnt completely.

HC: Hydrocarbon

- ◆ Hydrocarbons (HC) are released into the atmosphere as a result of incomplete combustion of fossil fuels, and is a major contributor to urban smog.

NMHC: Non-Methane Hydrocarbons

- ◆ Collective noun for hydrocarbons , excluding methane.

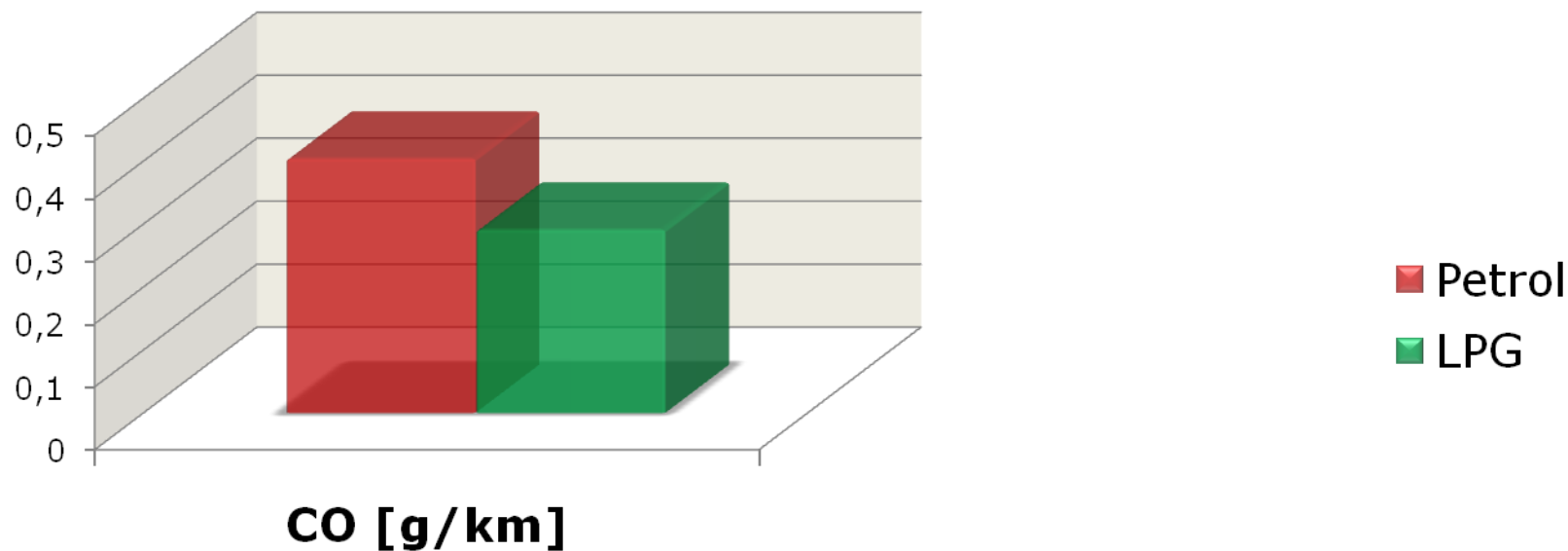
NO_x: Nitrogen Oxides

- ◆ NO_x is generated when nitrogen in the air reacts with oxygen under the high temperature and pressure conditions inside the engine. NO_x emissions contribute to both smog and acid rain.

CO₂: Carbon dioxide

- ◆ Is created by burning fuels and is the major cause of global warming.

CO-emission [28% less*]



* result of LPG compared to petrol

Max. value Euro-5 petrol:

1.000 [g/km] 100%

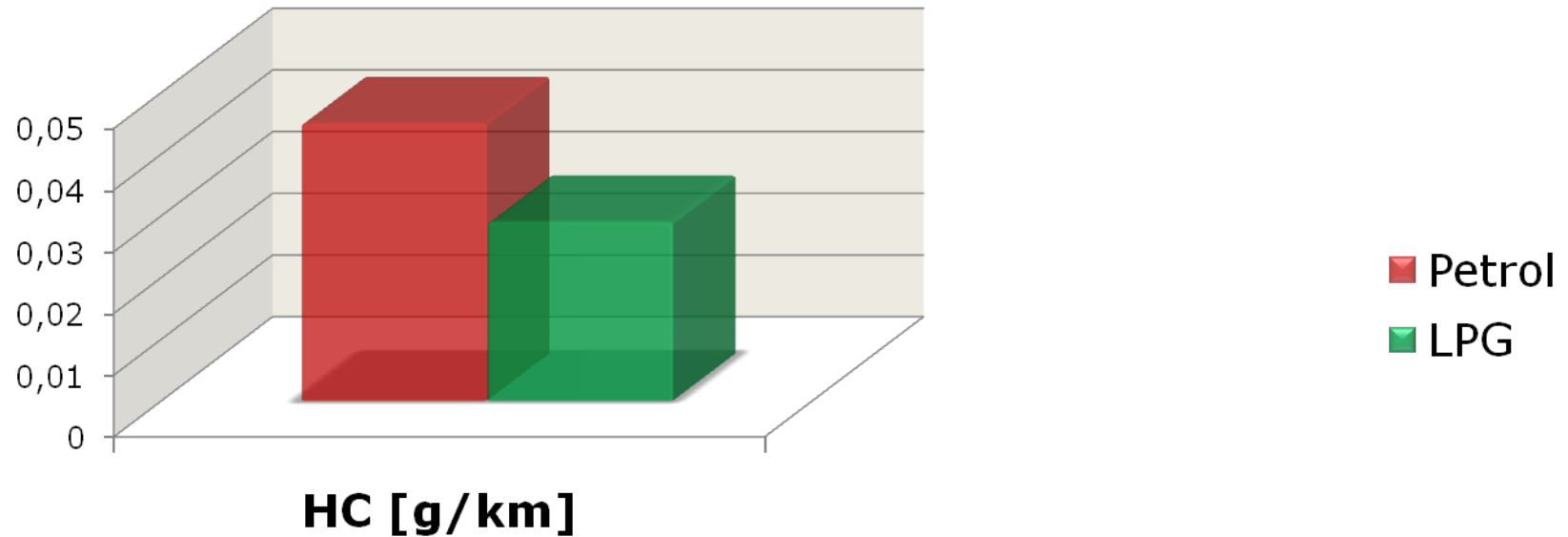
Petrol:

0.404 [g/km] 40,4%

LPG:

0.291 [g/km] 29,1%

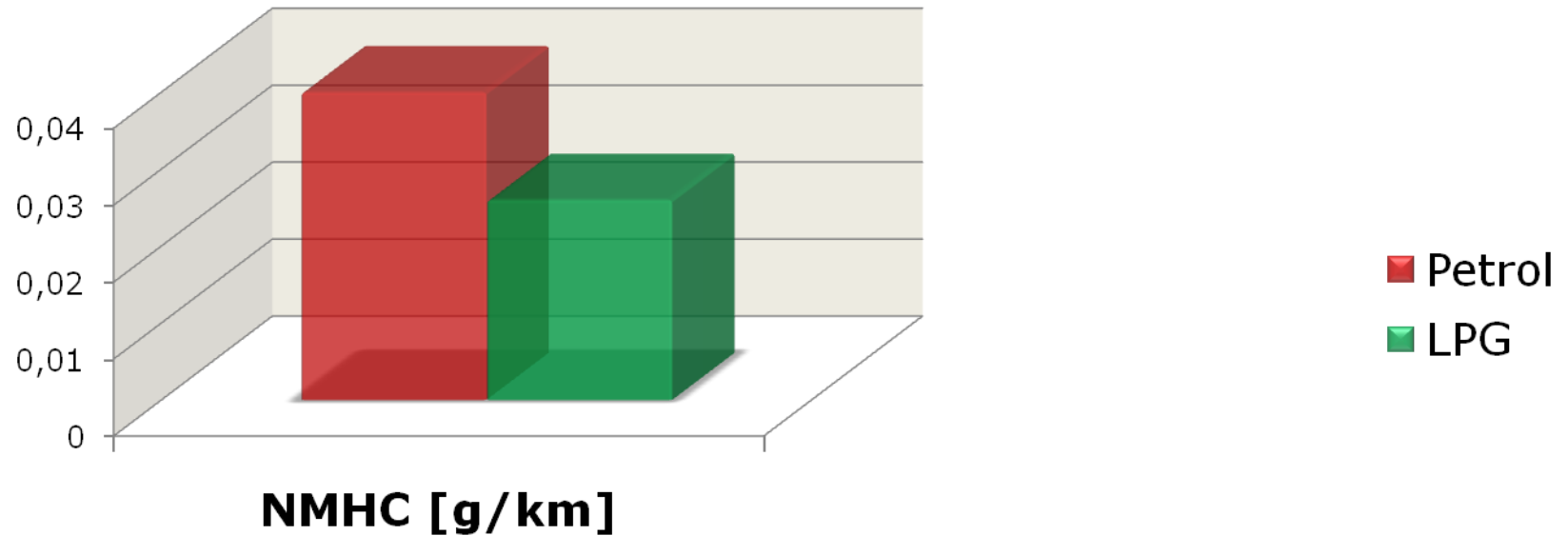
HC emission [35.6% less*]



* result of LPG compared to petrol

Max. value Euro-5 petrol:	0.100 [g/km]	100%
Petrol:	0.045 [g/km]	45%
LPG:	0.029 [g/km]	29%

NMHC-emission [35% less*]



* result of LPG compared to petrol

Max. value Euro-5 petrol:

0.068 [g/km] 100%

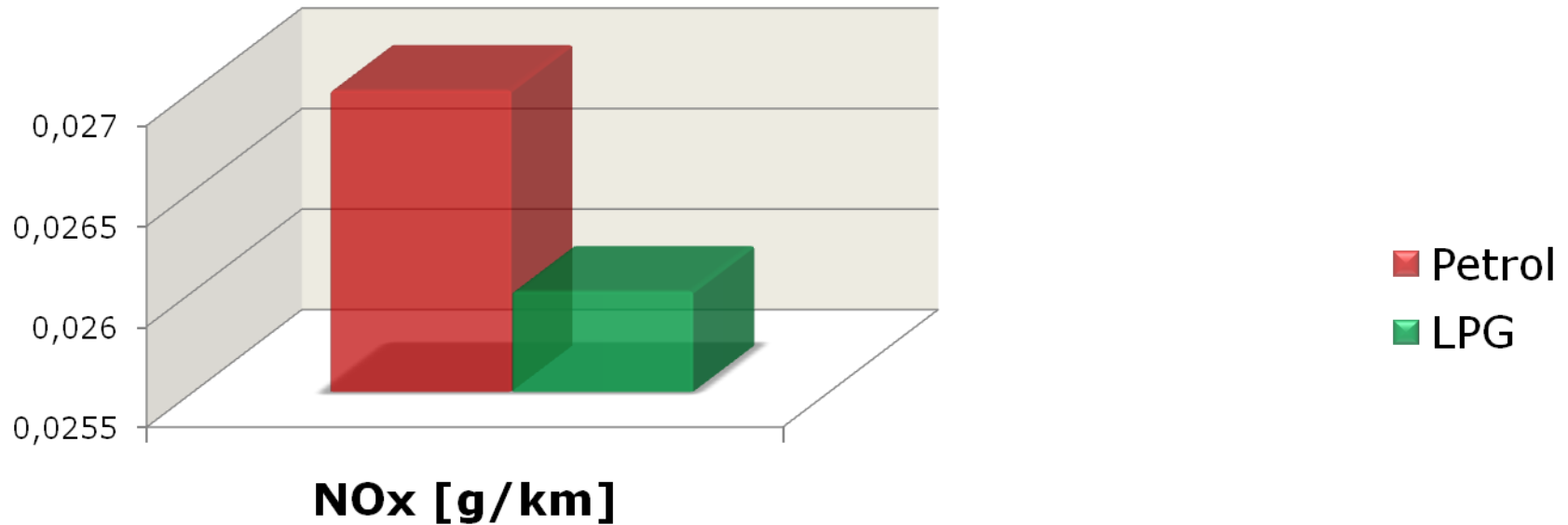
Petrol:

0.040 [g/km] 58.8%

LPG:

0.026 [g/km] 38.2%

NO_x emission [3.7% less*]



*result of LPG compared to petrol

Max. value Euro-5 petrol

0.060 [g/km] 100%

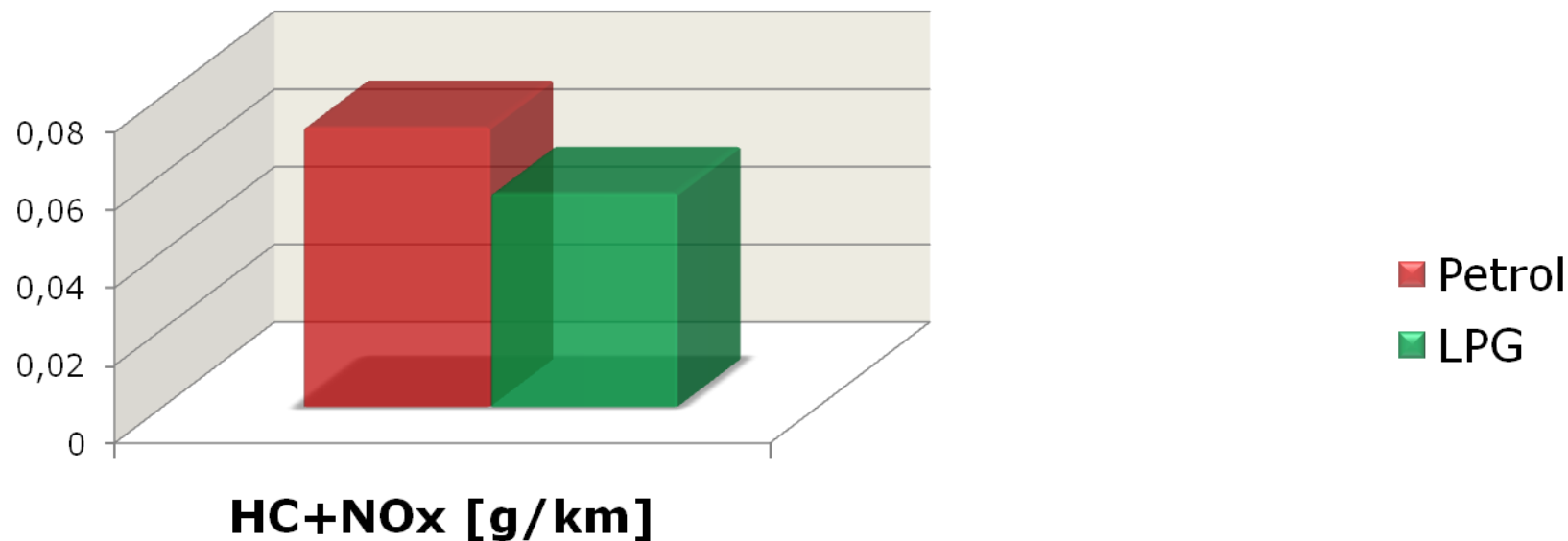
Petrol:

0.027 [g/km] 45%

LPG:

0.026 [g/km] 43.33%

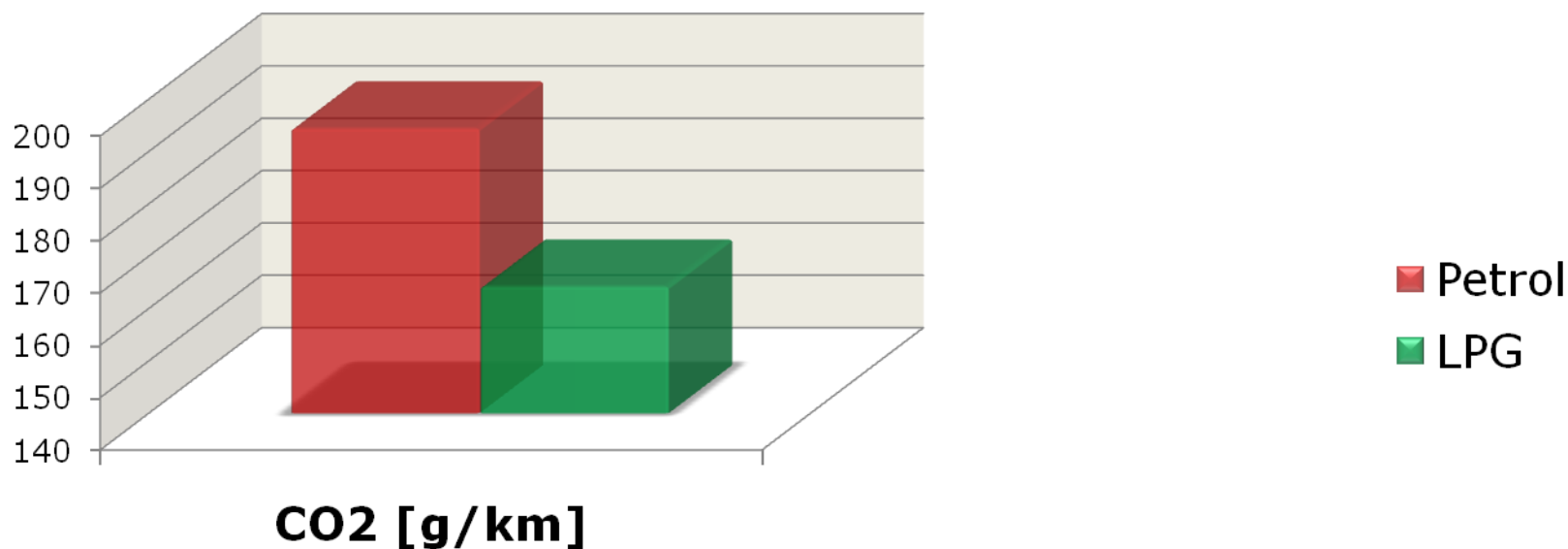
HC+NO_x [23.6% less*]



* result of LPG compared to petrol

Petrol:	0.072 [g/km]	100%
LPG:	0.055 [g/km]	76.38 %

CO₂ emission [15.5% less*]



* result of LPG compared to petrol

Petrol:	194.4 [g/km]	100%
LPG:	164.2 [g/km]	84.5%

Official TÜV test reports:

Abgasmessung nach 70/220/EWG i.d.F. 2003/76/EG CO2-Emissionen und Kraftstoffverbrauch nach 80/1268/EWG i.d.F. 2004/3/EG						
Teilbegleiddaten		TüV				
Testart:	EURO3-6	Gasoline	Datum:	28-10-2008		
Auftrags-Nr.:	8600		Fahrer:	Weißmann Skerra		
Versuchs-Nr.:	08102802		Messtechniker:			
Auftraggeber:	Prins		Anmerkungen: 1. Messung mit Benzin			
Fahrzeugdaten						
Hersteller:	Honda		Erstzulassung:	10.04.2008		
Typ:	Accord / CU1		Laufleistung [km]:	6.127		
Fahrz.-ident-Nr.:	JHMCU15809C200576		Reifendimension:	225/50 R17		
Motor / Typ:	R20A3		Reifendruck [bar]:	3		
Hubraum [cm³]:	1997		Getriebe / Typ:	6 H		
PS [kW] / n [1/min]:	115 / 6300		ECU / Datenstand:			
Kollisionsdaten						
Schwingungsmasse [kg]:	1470		Verluste:	F0 [N] 29.0		
Fahrtwiderstand:	F0 [N]	7.4	F1 [N/(kmh)]	0.185		
(Strasse / Tabelle 70/220/EWG)	F1 [N/(kmh)]	0.000	F2 [N/(kmh)]	0.0026		
	F2 [N/(kmh)]	0.0502				
Umgebungsdaten						
Temperatur [°C]	21.7					
Luftdruck [hPa]	1,004.9					
Relative Luftfeuchte [%]	55.8					
Absolute Luftfeuchte [gH2O/kgAr]	9.07					
NOx-Korrekturfaktor	0.949					
Testdaten						
Verdünnungsfaktor	Phase 1	Phase 2	Gesamt			
CVS Volumen bei 0°C [m³]	21.40	10.08	132.22			
Vsp [m³]	87.53	44.38	11.003			
Wegstrecke [km]	0.0162	0.0083	0.02			
	4.044	6.958	11.002			
Konzentration im Abgas						
CO [ppm]	35.340	11.740				
HC [ppmC3]	4.190	1.090				
NOx [ppm]	0.820	1.890				
CH4 [ppmC]	2.390	1.620				
CO2 [%]	0.621	1.328				
Partikel (Filterbelastung) [mg]	0.000	0.000				
Konzentration in Umgebungsluft						
CO [ppm]	0.540	0.510				
HC [ppmC3]	1.240	1.210				
NOx [ppm]	0.090	0.070				
CH4 [ppmC]	1.910	1.890				
CO2 [%]	0.038	0.037				
Massenemission						
CO [g]	3.823	0.626	4.449			
HC [g]	0.491	0.000	0.491			
NOx [g]	0.132	0.165	0.298			
CH4 [g]	0.048	-0.002	0.045			
CO2 [g]	1,009.854	1,128.398	2,138.3			
Partikel [mg]	0.00	0.00	0.00			
Kraftstoffverbrauch / CO2-Emissionen						
Kraftstoffverbrauch [l/100km]	innerorts	ausserorts	kombiniert			
CO2-Emissionen [g/km]	10.50	6.77	8.14			
	249.7	162.2	194.4			
Massenemission / Strecke						
	Ergebnis	DF	Ergebnis mit DF	Grenzwert EUROS BENZIN	% von Grenzwert	
CO [g/km]	0.494	1.5	0.607	1.000	60.66	
HC [g/km]	0.045	1.3	0.058	0.100	57.97	
NMHC [g/km]	0.040	1.3	0.053	0.068	77.36	
NOx [g/km]	0.027	1.6	0.043	0.060	72.11	
HC+NOx [g/km]	0.072	1.0	0.093	0.000	0.00	
CO2 [g/km]	194.4					
Partikel [g/km]	0.00000	1.0	0.00000	0.000	0.00	

FB-055 Rev.4

Abgasmessung nach 70/220/EWG i.d.F. 2003/76/EG CO2-Emissionen und Kraftstoffverbrauch nach 80/1268/EWG i.d.F. Accord / CU1						
Teilbegleiddaten		TüV				
Testart:	EURO3-6	Lpg	Datum:	28-10-2008		
Auftrags-Nr.:	8600		Fahrer:	Gies Vejada		
Versuchs-Nr.:	08102807		Messtechniker:			
Auftraggeber:	Prins		Anmerkungen: 1. Messung mit Gas B (Umschaltung nach 100 sek.)			
Fahrzeugdaten						
Hersteller:	Honda		Erstzulassung:	10.04.2008		
Typ:	Accord / CU1		Laufleistung [km]:	6.138		
Fahrz.-ident-Nr.:	JHMCU15809C200576		Reifendimension:	225/50 R17		
Motor / Typ:	R20A3		Reifendruck [bar]:	3		
Hubraum [cm³]:	1997		Getriebe / Typ:	6 H		
PS [kW] / n [1/min]:	115 / 6300		ECU / Datenstand:			
Kollisionsdaten						
Schwingungsmasse [kg]:	1470		Verluste:	F0 [N] 29.0		
Fahrtwiderstand:	F0 [N]	7.4	F1 [N/(kmh)]	0.185		
(Strasse / Tabelle 70/220/EWG)	F1 [N/(kmh)]	0.000	F2 [N/(kmh)]	0.0026		
	F2 [N/(kmh)]	0.0502				
Umgebungsdaten						
Temperatur [°C]	22.0					
Luftdruck [hPa]	1,004.2					
Relative Luftfeuchte [%]	56.1					
Absolute Luftfeuchte [gH2O/kgAr]	9.29					
NOx-Korrekturfaktor	0.955					
Testdaten						
Verdünnungsfaktor	Phase 1	Phase 2	Gesamt			
CVS Volumen bei 0°C [m³]	22.26	10.40	131.85			
Vsp [m³]	87.58	44.26	11.003			
Wegstrecke [km]	0.0174	0.0089	0.03			
	4.087	6.916	11.003			
Konzentration im Abgas						
CO [ppm]	28.720	1.730				
HC [ppmC3]	3.320	1.170				
NOx [ppm]	0.430	2.470				
CH4 [ppmC]	2.230	1.460				
CO2 [%]	0.531	1.144				
Partikel (Filterbelastung) [mg]	0.000	0.000				
Konzentration in Umgebungsluft						
CO [ppm]	0.270	0.160				
HC [ppmC3]	1.420	1.310				
NOx [ppm]	0.080	0.050				
CH4 [ppmC]	1.690	1.690				
CO2 [%]	0.043	0.039				
Massenemission						
CO [g]	3.116	0.088	3.204			
HC [g]	0.319	-0.001	0.318			
NOx [g]	0.063	0.220	0.284			
CH4 [g]	0.039	-0.002	0.036			
CO2 [g]	842.923	963.642	1,806.6			
Partikel [mg]	0.00	0.00	0.00			
Kraftstoffverbrauch / CO2-Emissionen						
Kraftstoffverbrauch [l/100km]	innerorts	ausserorts	kombiniert			
CO2-Emissionen [g/km]	12.16	8.16	9.65			
	295.2	139.3	164.2			
Massenemission / Strecke						
	Ergebnis	DF	Ergebnis mit DF	Grenzwert EUROS BENZIN	% von Grenzwert	
CO [g/km]	0.291	1.5	0.437	1.000	43.68	
HC [g/km]	0.029	1.3	0.038	0.100	37.50	
NMHC [g/km]	0.026	1.3	0.033	0.068	48.57	
NOx [g/km]	0.026	1.6	0.041	0.060	68.71	
HC+NOx [g/km]	0.055	1.0	0.071	0.000	0.00	
CO2 [g/km]	164.2					
Partikel [g/km]	0.00000	1.0	0.00000	0.000	0.00	

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Conclusion

This emission test proves that driving on LPG contributes to a cleaner environment.

Overview of the test results:

- ◆ 28% less CO-emission
- ◆ 35.6% less HC-emission
- ◆ 35% less NMHC-emission
- ◆ 3.7% less NO_x emission
- ◆ 15.5% less CO₂-emission

- ◆ **Particulates**, alternatively referred to as **particulate matter (PM)** or **fine particles**, are tiny particles of solid or liquid suspended in a gas or liquid.
- ◆ **Fine Particulate Matter (PM)**
Is emitted by both diesel and spark ignition engines, though diesel sources tend to dominate. In 1998 the California Air Resources Board (CARB) determined diesel particulates to be a Toxic Air Contaminant. In 2002, after much research, the US EPA concluded that PM in diesel exhaust causes acute throat and bronchial irritation, poses a chronic respiratory hazard to humans, and is a likely carcinogen. Particles may also adsorb potentially health-threatening organic air toxic's found in engine exhaust.
- ◆ Present day health concerns associated with motor vehicle emissions are predominantly focused on particulate matter (PM₁₀, PM_{2.5}, PM₁). LPG (third generation) vehicles have the lowest tailpipe emissions of PM₁₀, but on a life-cycle basis the PM₁₀ emissions from LPG and CNG are comparable, and are less than those from diesel, petrol or even hybrid vehicles.