INTRODUCTION

Climate Change, often referred to as Global Warming, is considered to be one of the greatest environmental threats facing the World today. When petrol, diesel or certain alternative fuels are burnt for energy in an engine the main by-products are water and Carbon Dioxide (CO_2). CO_2, although not directly harmful to human health, is the most significant of the greenhouse gases contributing to Climate Change. Cars make a significant contribution to overall emissions of CO_2 in the UK. Additionally, and especially in urban areas, road transport is also one of the major sources of emissions which are harmful to human health.

The purpose of this booklet is to aid consumers in making an informed choice when buying a new car. It lists the fuel consumption, CO_2, and other emissions performance figures of NEW cars, currently on the market in the UK. It also seeks to advise on key environmental issues as well as giving guidance on ways of reducing the impact of cars on the environment. The figures shown are obtained during official tests, which are required before a model of car can be offered for sale. Figures are listed for most new petrol and diesel cars on sale in the UK as well as for some cars powered by alternative fuels (Liquid Petroleum Gas/Compressed Natural Gas) and some hybrid vehicles, which use both electric motors and internal combustion engines.

Important Note
Several different specifications (variants/versions) of a given model may be grouped together in the list. These figures are therefore indicative only. A definitive figure for a given specification will be available at the point of sale. It should also be noted that as the fuel consumption figures quoted are obtained under specific test conditions, they may not be achieved under 'real life' driving conditions. However the figures serve as a means of comparing models.

A searchable version of the data is available through the VCA website www.vcacarfueldata.org.uk, as is some historic information. It should be noted that the web version of this booklet is updated between publications so will contain the most up to date information.

CARS AND CARBON DIOXIDE

As mentioned above, CO_2 is the most important of the greenhouse gases which are contributing to Climate Change. Unless action is taken to reduce greenhouse gas emissions, such as CO_2, the whole pattern of the World's weather could change, increasing the frequency and intensity of heatwaves, floods, droughts and storms.

Compared to improvements in the emissions of toxic pollutants, there has been less progress on reducing CO_2 from cars. For a given type of fuel the CO_2 emissions of a car are directly proportional to the quantity of fuel consumed. Until recently the average fuel consumption of new cars was unchanged relative to that in the mid 1980's. This was because while engines had become more efficient over this period, average vehicle mass had increased due to additional features to meet crash safety requirements and the widespread addition of features such as power assisted steering and air conditioning. However, there are signs that in the last few years, average fuel consumption has begun to drop in response to voluntary agreements by vehicle manufacturers to reduce CO_2 emissions.

At the Kyoto Conference on Climate Change in December 1997 most developed countries agreed to legally binding targets to reduce their greenhouse gas emissions in response to warnings over global climate change. Following this the European Commission and the European Automobile Manufacturers Association (ACEA) came to an agreement in July 1998 that committed ACEA to reduce the CO_2 emissions from new passenger cars by over 25% to an average CO_2 emission figure of 140 g/km by 2008. This is one of the most significant industry agreements on reducing greenhouse gas emissions and it has led to more fuel efficient vehicles being brought to the market. Similar voluntary agreements have now been reached with Japanese and Korean motor manufacturers.

In the UK, a number of steps have been taken to promote the purchase and use of more fuel efficient vehicles:

- **In the March 2001 Budget the Chancellor announced the extension of the lower rate of Vehicle Excise Duty (VED) to cover cars in the Private and Light Goods (PLG) taxation class with an engine size of 1549cc or less.**
- **Since March 2001, a system of Graduated VED has been in operation for new cars based primarily on their level of CO_2 emissions.**
- **Since April 2002, Company Car Tax has been based on the CO_2 emissions of the vehicle provided to an employee for their private use.**
- **In the March 2006 Budget, the Chancellor introduced a zero rate for cars with the lowest carbon emissions and a new top band for the most polluting cars.**

ACT ON CO_2 COMMUNICATIONS CAMPAIGN

In March 2007 the Department for Transport launched the ACT ON CO_2 communications campaign to give advice on how you can help to reduce CO_2, providing tips on 'smarter', more fuel efficient driving and purchasing a more fuel efficient vehicle. You can search online for ACT ON CO_2 for more information and the Best on CO_2 rankings in association with What Car? which show the top ten most fuel efficient cars in each class.

There are a number of simple ways that you can reduce the emissions when you drive:

Pump up to cut down

Under-inflated tyres create more resistance when your car is moving, which means your engine has to work harder, so more fuel is used and more CO_2 emissions are produced. Simply check and adjust your tyre pressures regularly and also before long journeys. This will also help to increase the life of your tyres.

Less clutter in your car means less CO_2

Clutter in your boot is extra weight your engine has to lug around. By removing it, you could reduce your engine's workload. This will burn less fuel and cut your CO_2 emissions, so unload any items you won't need for your journey before you set out.

Less stopping and starting means less CO_2

Every time you stop then start again in a traffic queue, the engine uses more fuel and therefore produces more CO_2. Keep an eye on the traffic ahead and slow down early by gently lifting your foot off the accelerator while keeping the car in gear. In this way, the traffic may have started moving again by the time you approach the vehicle in front, so you can then change gear and be on your way.

Over revving accelerates emissions

Modern car engines are designed to be efficient from the moment they are switched on, so revving up like a Formula 1 car in pole position only wastes fuel and increases engine wear. Using your gears wisely by changing up a gear a little earlier can also reduce revs. If you drive a diesel car try changing up a gear when the rev counter reaches 2000rpm. For a petrol car try changing up at 2500rpm.

Idling is wasting fuel
When the engine is idling you're wasting fuel and adding to CO_2 emissions. If you're likely to be at a standstill for more than 3 minutes, simply switch off the engine.

There is no easy technical way to deal with CO_2. The best way to reduce it and the other emissions is to use the car only when it is necessary and to walk or use public transport where possible. When you are choosing a vehicle and you have selected the most appropriate class of vehicle for your needs, choose the most fuel-efficient vehicle in that group using the Best On CO_2 rankings developed in association with What Car?. The fuel consumption of similar size cars can vary as much as 45% and by choosing the most fuel efficient car in their class, rather than the average emissions, can be reduced by up to 24%.

CARS AND AIR POLLUTION

The other pollutants from petrol, diesel and alternative fuel engines are mainly Carbon Monoxide, Oxides of Nitrogen, un-burnt Hydrocarbons and fine particles. The first three are gases and are invisible. Fine particles are usually invisible although in certain operating conditions diesels will produce visible particles, appearing as smoke. Petrol engines will also produce visible particles if they are burning engine oil or running rich, for example, following a cold start. Unlike CO_2, emissions of these pollutants are not directly linked to fuel consumption. Pollutant levels are more dependent on vehicle technology and the state of maintenance of the vehicle. Other factors, such as driving style, driving conditions and ambient temperature also affect emission of pollutants. However, as a starting point new passenger cars must meet minimum EU emissions standards.

The main exhaust gas pollutants and their effects are described in more detail below:

CO - Carbon Monoxide reduces the blood’s Oxygen carrying capacity which can reduce availability of Oxygen to key organs. Extreme levels of exposure, such as might occur due to blocked flues in domestic boilers, can be fatal. At lower concentrations CO may pose a health risk, particularly to those suffering from heart disease.

NOx - Oxides of Nitrogen react in the atmosphere to form Nitrogen Dioxide (NO_2) which can have adverse effects on health, particularly among people with respiratory illness. High levels of exposure have been linked with increased hospital admissions due to respiratory problems, while long term exposure may affect lung function and increase the response to allergens in sensitive people. NOx also contributes to smog formation, acid rain, can damage vegetation, contributes to ground level Ozone formation and can react in the atmosphere to form fine particles (‘secondary particles’).

Particles - Fine particles can have an adverse effect on human health, particularly among those with existing respiratory disorders. Particles have been associated with increased hospital admissions due to respiratory and cardiovascular problems, bringing forward the deaths of those suffering from respiratory illnesses and a reduction in life expectancy.

HC - Hydrocarbons, contribute to ground level Ozone formation leading to risk of damage to the human respiratory system. In addition, some kinds of HCs are carcinogenic and they are also indirect greenhouse gases.

The Government is convinced that action to reduce harmful emissions must continue. Its approach to tackling air pollution is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland. This sets health based standards for eight main air pollutants, from which air quality objectives are derived, together with a timescale for their achievement. The Strategy identifies the action required at a national and international level, and the contribution industry, transport and local government can make to ensure objectives are met. Achieving the air quality standards for Nitrogen Dioxide and fine particles presents the greatest challenge, especially in urban areas and close to busy roads.

Emissions of the above pollutants are being reduced by improving the quality of fuels and by setting increasingly stringent emission limits for new vehicles. As an example, it would take 50 new cars to produce the same emissions per kilometre as a vehicle made in 1970. For the last twenty years emission limits have been set at a European level and are quoted in grams of pollutant per kilometre travelled.

In 1993 exhaust emission limits (generally referred to as the Euro 1 standards) were introduced for new cars, which resulted in the adoption of advanced emission control techniques, such as catalysts. More stringent emission limits came into effect in 1997 (Euro 2), 2001 (Euro 3) and 1st January 2005 (Euro 4). Euro 4 came fully into force on 1st January 2007. (Further details at Tables 1-3). Information on the level of pollutants recorded for new models of cars at their type approval test is listed in the data table, alongside the CO_2 and fuel consumption figures.

CARS AND NOISE

The external noise emitted by passenger cars has been controlled since 1929 when the Motor Cars (Excessive Noise) regulations were introduced. New cars are now required to meet Europe-wide noise limits. These have been progressively reduced from 82 decibels (dB(A)) in 1978 to the current limit of 74 dB(A) established in 1996. This means it would take 7 new vehicles to make the same amount of noise as a vehicle that just meets the pre-1978 limits. Information on the level of noise recorded for new models of cars at their type approval test is also listed in the data table.

When looking at this information it should be noted that off-road vehicles are allowed to be 1dB(A) louder, as are direct injection diesels and these are cumulative i.e. the limit for an off-road vehicle with a direct injection diesel is 76 dB(A).

CARS AND FUEL OPTIONS

This booklet contains data on vehicles running on petrol and diesel, as well as ‘alternative’ fuel Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG) and hybrid vehicles.

The different fuels have different merits from an environmental perspective. Compared to petrol, diesel vehicles have significantly lower CO_2 emissions per kilometre travelled because of the higher efficiency of diesel engines, and hence have a lower impact on climate change. Diesel vehicles also emit lower levels of CO and HC than equivalent petrol vehicles. However, diesel engines emit greater levels of NOx and Particles than new petrol vehicles.

As mentioned earlier, emissions of such pollutants are an air quality issue, particularly in urban areas.

LPG and CNG cars are generally converted from petrol fuelled cars, either by the original manufacturer or an aftermarket converter. For practicality, CNG and LPG vehicles tend to be bi-fuel, meaning they can run on either petrol or the gaseous fuel. LPG vehicles tend to fall between petrol and diesel in CO_2 performance. This is due to the lower carbon and higher energy content by mass of the fuel. CNG offers even lower CO_2 emissions than LPG, typically comparable with diesels. Local pollutant (CO, HC, NOx and Particles) emissions performance of well-engineered LPG and CNG vehicles is similar to a petrol vehicle, or slightly better.

Hybrid vehicles combine an internal combustion engine with an electric motor and battery. There are various ways in which hybrid vehicles can operate. For example, the electric motor can be used to provide additional power during acceleration and high load conditions. The battery can then be recharged by the internal combustion engine or from energy absorbed during braking, or, in some cases, from an external electrical supply. Hybrid vehicles offer reduced fuel consumption and CO_2 with potentially some reduction in emissions of local pollutants.

Biofuels also offer a way to reduce vehicles' impacts on climate change. The fuels are not entirely CO_2 neutral because of the energy used to grow and process crops, but they can offer substantial CO_2 savings over fossil petrol and diesel. Today most biofuels are sold in blends of up to 5% with fossil petrol and diesel . These are suitable for use in all vehicles. Fuel standards may be extended in the future to allow more than 5% if it is concluded that this is compatible with existing vehicles. Some manufacturers offer 'flexi-fuel' vehicles that can run on bioethanol blends up to E85 - a blend of 85% bioethanol and 15% petrol, as well as fossil petrol. There are currently a limited number of fuel retailing sites that offer this fuel, but the number is set to grow in the future. Some manufacturers also allow the use of higher blends of biodiesel in their vehicles (check with your vehicle manufacturer). It is important that only high quality biodiesel meeting the EU quality standard - EN 14214 is used. Information on retail sites selling biofuels is available from http://www.est.org.uk/fleet/technology/refuelling stations

FURTHER HINTS FOR LESS ENVIRONMENTAL IMPACT

- Try to avoid using your car for short journeys - use public transport, ride a bicycle or walk.
- Plan ahead - choose uncongested routes, combine trips, car share.
- Cold starts - drive off as soon as possible after starting.
- Drive smoothly and efficiently - harsh acceleration and heavy braking have a very significant effect on fuel consumption. Driving more smoothly saves fuel.
- Slow down - driving at high speeds significantly increases fuel consumption.
- Use higher gears as soon as traffic conditions allow.
- Switch off - sitting stationary is zero miles per gallon. Switch off the engine whenever it is safe to do so.
- Lose weight - don’t carry unnecessary weight. Remove roof racks when not in use.

- Regular servicing helps keep the engine at best efficiency.
- Keep the pressure up - make sure the tyres are inflated to the correct pressure for the vehicle.
- Do not compromise safety, but be aware that the use of onboard electrical devices increases fuel consumption.
- Check your fuel consumption - it will help you get the most from the car. Changes in overall fuel consumption may indicate a fault.
- Use air-conditioning sparingly - running air-conditioning continuously will increase fuel consumption significantly.

HOW TO USE THE DATA TABLE

Vehicles that meet Euro 4 Emission Limits (Current Standard)

In using the table of information, it may be helpful to note the following:

- Models are listed under the name of the manufacturer or importer.
- The figures are obtained by running an example of the listed vehicle over a fixed route in a laboratory on a rolling road under closely controlled conditions. The test cycle is described later in the booklet.
- The results of the fuel consumption tests are shown both in litres per 100 kilometres (l/100km) and in miles per gallon (mpg). A conversion chart and conversion factors are given at the end of the booklet.
- CO_2 emissions and the results of the exhaust emissions test are shown in grammes per kilometre (g/km).
- The fuel cost of driving 12000 miles is calculated using the combined fuel consumption figure and an average fuel price which is assessed each year. Currently it is 106p/litre for petrol, and 113p/litre for diesel and 56p/litre for LPG.
- The external noise emitted by a car is shown in decibels as measured on the A scale of a noise meter (dB(A)). The A scale was devised to ‘weight’ the reading of a noise meter so it more closely represented what is heard by the human ear. The noise test is described in more detail later in the booklet.
- **It is important to note that figures shown in the booklet are for comparison of different models and will not necessarily be the same as the fuel consumption, emissions levels, or noise levels actually achieved on the road. For this reason it is not advisable to rank a number of vehicles for which very similar figures are quoted.**
- **The test to test variability in type approval local pollutant emission figures (on the far right of the tables) means they are of only limited value in comparing vehicles and caution should be exercised when considering these figures. More detail is given later in the booklet.**

- CO_2 Information - The CO_2 figures shown are representative of the vehicle tested and may vary between specifications (variants/versions) of a given model. As such the figures are indicative only. A definitive figure for a given specification (variant/version) will be available at the point of sale.

OTHER RELEVANT ISSUES

Vehicle Excise Duty (VED) - For vehicles registered since 1st March 2001, the CO_2 shown on the V5 (Registration Document) is used as the basis for applying VED, or "Road Tax" rates for new passenger cars.

Road Tax as at March 2008:

		Diesel Car TC 49		Petrol Car TC 48		Alternative Fuel Car TC 59	
Bands	CO_2 emissions figure (g/km)	12 Month Rate (£)	6 Month Rate (£)	12 Month Rate (£)	6 Month Rate (£)	12 Month Rate (£)	6 Month Rate (£)
Band A	Up to 100	0.00	-	0.00		0.00	
Band B	101 – 120	35.00	-	35.00		15.00	
Band C	121 – 150	120.00	66.00	120.00	66.00	100.00	55.00
Band D	151 – 165	145.00	79.75	145.00	79.75	125.00	68.75
Band E	166 – 185	170.00	93.50	170.00	93.50	150.00	82.50
Band F	Over 185	210.00	115.50	210.00	115.50	195.00	107.25

For cars registered on or after 23rd March 2006

Band G	Over 225	400.00	220.00	400.00	220.00	385.00	211.75

Further information about taxing your vehicle can be found on the DirectGov website: http://www.direct.gov.uk/en/Motoring/OwningAVehicle/HowToTaxYourVehicle/. A VED calculator is available on the VCA website www.vcacarfueldata.org.uk . The purpose of this calculator is to provide an indicative view of the VED that may be payable on a given NEW car.

Company Car Tax – From April 2002 the benefit-in-kind tax charged for company cars has been based on the CO_2 emissions of a vehicle. This applies to all company cars registered from January 1998 onwards. Further details can be found on the HM Revenue & Customs website http://www.hmrc.gov.uk/cars/. For cars registered from March 2001, the CO_2 figure used to calculate company car tax will be that shown on the car's V5 (Registration Document). An arrangement has been made with the Society of Motor Manufacturers & Traders (SMMT) to supply historic CO_2 information for cars registered between January 1998 and March 2001. This data can be accessed through the SMMT website at http://www.smmt.co.uk/co2/co2intro.cfm

To give a comparison and to show what is achievable, the following tables show petrol and diesel cars which have CO_2 emissions of 120g/km or less and therefore fall into Vehicle Excise Duty Bands A and B. All the models shown are selected from the full list. The fuel cost is given for comparison purposes, for any given vehicle it will depend on the actual fuel consumption achieved and the price you pay for fuel. The purpose of the tables is to provide a representative sample. Consequently where there are several specifications of a vehicle model with similar fuel consumption figures, only a single entry is given.

PETROL VEHICLES WITH 120g/km CO_2 OR LESS

Make	Model	Engine Capacity cc	Transmission	CO_2 g/km	Fuel Consumption (mpg)	Fuel Cost of driving 12000 miles
TOYOTA	Prius	1497	E-CVT	104	65.7	880
CITROEN	C1	998	M5	108	61.4	942
PEUGEOT	107	998	M5 or A5	108	61.4	942
HONDA	Civic Hybrid	1339	CVT	109	61.4	942
PEUGEOT	107	998	A5	109	61.4	942
TOYOTA	Aygo	998	Multi5	109	61.4	942
SMART	fortwo coupé	999	A5	112	60.1	962
SMART	fortwo coupé	698	SM6	113	60.1	962
SMART	fortwo cabrio	698	SM6	113	60.1	962
DAIHATSU	Charade	989	M5	114	58.9	982
MITSUBISHI	i	658	A4	114	54.6	1059
SMART	fortwo coupé	698	A6	116	58.8	983
SMART	fortwo coupé	999	A5	116	57.6	1004
SMART	fortwo cabrio	698	A6	116	58.8	983
SMART	fortwo cabrio	999	A5	116	57.6	1004
KIA	Picanto	999	5MT	117	57.6	1004
DAIHATSU	Sirion	998	M5	118	56.5	1023
FIAT	500	1242	SAT5	118	56.5	1023
SMART	fortwo coupé	698	SM6	118	57.6	1004
SMART	fortwo cabrio	698	SM6	118	57.6	1004
SUBARU	Justy	998	M5	118	56.5	1023
CHEVROLET	Matiz	796	M5	119	54.3	1065
FIAT	500	1242	M5	119	55.4	1044
HYUNDAI	i10	1086	M5	119	56.5	1023
SMART	fortwo coupé	698	SM6	120	56.5	1023
SMART	fortwo cabrio	698	SM6	120	56.5	1023

DIESEL VEHICLES WITH 120g/km CO_2 OR LESS

Make	Model	Engine Capacity cc	Trans-mission	CO_2 g/km	Fuel Consumption (mpg)	Fuel Cost of driving 12000 miles
SEAT	Ibiza	1422	M5	99	74.3	830
VOLKSWAGEN	Polo 3 / 5 Door	1422	M5	99	74.3	830
MINI	MINI Hatchback	1560	M6	104	72.4	851
VOLKSWAGEN	Polo 3 / 5 Door	1422	M5	104	70.6	873
CITROEN	C1	1398	M5	109	68.9	895
MINI	MINI Clubman	1560	M6	109	68.9	895
SKODA	New Fabia Estate	1422	M5	109	68.9	895
FIAT	500	1248	M5	110	67.3	916
PEUGEOT	206	1398	M5	112	65.6	940
CITROEN	C2	1398	M5	113	65.7	938
FIAT	Panda	1248	M5	114	65.7	938
FORD	Focus	1560	M5	114	65.7	938

MAZDA	Mazda2	1399	M5	114	65.7	938
CITROEN	C3	1398	M5	115	64.2	960
CITROEN	C3	1560	M5	115	65.7	938
FORD	Focus	1560	M5	115	65.7	938
RENAULT	Clio Campus	1461	M5	115	65.7	938
FORD	Fiesta	1560	M5	116	64.2	960
PEUGEOT	207	1398	M5	117	64.1	962
PEUGEOT	207	1560	M5	117	64.1	962
RENAULT	Clio	1461	M5	117	64.2	960
RENAULT	Mégane	1461	M5	117	64.5	956
FORD	Focus	1560	M5	118	62.8	982
HYUNDAI	Getz	1493	M5	118	62.8	982
RENAULT	Clio	1461	M5/s	118	64.2	960
AUDI	A3	1896	M5	119	62.8	982
BMW	1 Series	1995	M6	119	62.8	982
CITROEN	C2	1560	M5	119	64.2	960
FIAT	Grande Punto	1248	M5	119	62.8	982
FIAT	Bravo	1598	M6	119	62.8	982
FORD	Fiesta	1399	M5	119	62.8	982
FORD	Fusion	1560	M5	119	62.8	982
FORD	Focus	1560	M5	119	62.8	982
HYUNDAI	i30	1582	M5	119	62.8	982
KIA	Rio	1493	M5	119	62.8	982
PEUGEOT	207 SW	1560	M5	119	62.7	983
RENAULT	Clio Campus	1461	M5	119	63.1	977
RENAULT	Modus	1461	M5 or A5	119	63.0	978
SEAT	Ibiza	1422	M5	119	61.4	1004
SUZUKI	Swift	1248	5MT	119	62.8	982
TOYOTA	Yaris	1364	M5 or Multi5	119	62.8	982
VAUXHALL	Corsa,	1248	M5	119	62.8	982
VOLKSWAGEN	Polo 3 / 5 Door	1422	M5	119	62.8	982
VOLKSWAGEN	Golf 3 / 5 Door	1896	M5	119	62.8	982
CITROEN	C3	1560	M5	120	62.8	982
CITROEN	C4	1560	M5 or A6	120	62.8	982
FORD	Fusion	1399	M5	120	62.8	982
NISSAN	Micra	1461	M5	120	61.4	1004
PEUGEOT	308	1560	M5 or A6	120	62.7	983
RENAULT	Clio	1461	M5	120	62.8	982
RENAULT	Mégane	1461	M6	120	62.8	982
SKODA	New Fabia	1422	M5	120	61.4	1004
SUZUKI	Splash	1248	5MT	120	62.4	988

PART A

Vehicles approved to Euro 4 limits

THE FUEL CONSUMPTION TESTING SCHEME

The fuel consumption testing scheme is intended to give car buyers comparative information about the fuel consumption of different models in standard tests.

Nearly all new car models which are type approved for sale in Europe have to undergo the standard tests to determine their fuel consumption. This booklet contains the results of those tests supplied to the DfT for new cars expected to be on sale after May 2008.

WHAT ARE THE STANDARD TESTS?

Official fuel consumption test procedures have been in use since the 1970's. EU Directive 80/1268/EEC (as last amended by 2004/3/EC) describes the tests which all new cars on sale after 1 January 2001 have been required to take.

FUEL CONSUMPTION TEST (Directive 80/1268/EEC as amended by 2004/3/EC)

The new test has been agreed internationally and provides results that are more representative of actual average on-road fuel consumption than previous tests. There are two parts: an urban and an extra-urban cycle. The test cycle is the same as that used to determine the official exhaust emission classification for the model of vehicle in question.

The cars tested have to be run-in and must have been driven for at least 1,800 miles (3,000 kilometres) before testing.

Urban cycle

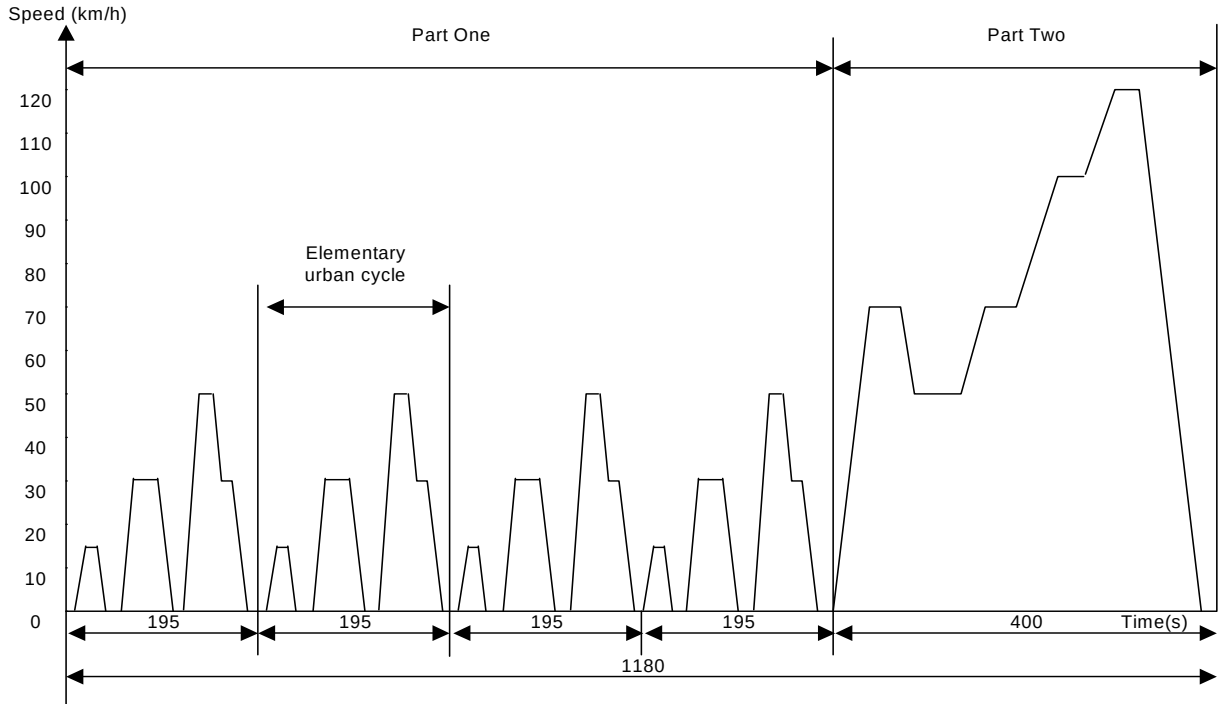
The urban test cycle is carried out in a laboratory at an ambient temperature of 20°C to 30°C on a rolling road from a cold start, i.e. the engine has not run for several hours. The cycle consists of a series of accelerations, steady speeds, decelerations and idling. Maximum speed is 31 mph (50 km/h), average speed 12 mph (19 km/h) and the distance covered is 2.5 miles (4 km). The cycle is shown as Part One in the diagram below.

Extra-urban cycle

This cycle is conducted immediately following the urban cycle and consists of roughly half steady-speed driving and the remainder accelerations, decelerations, and some idling. Maximum speed is 75 mph (120 km/h), average speed is 39 mph (63 km/h) and the distance covered is 4.3 miles (7 km). The cycle is shown as Part Two in the diagram below.

Combined Fuel Consumption Figure

The combined figure presented is for the urban and the extra-urban cycle together. It is therefore an average of the two parts of the test, weighted by the distances covered in each part.



BI-FUELLED VEHICLES

Vehicles which are designed to run on LPG or CNG and Petrol are required to be tested on both fuels. In view of this, two sets of figures will be shown for a given bi-fuel vehicle, one set for the vehicle running on petrol and another for the vehicle running on gas.

HOW REPRESENTATIVE OF REAL LIFE DRIVING ARE THE STANDARD TESTS?

Because of the need to maintain strict comparability of results achieved by the standard tests they cannot be fully representative of real-life driving conditions. Firstly, it is obviously not practicable to test each individual new car; thus only one production car is tested as being representative of the model and may therefore produce a better or worse result than another similar vehicle. Secondly, there are infinite variations in driving styles and in road, car and weather conditions, all of which can have a bearing on the results achieved. For these reasons the fuel consumption achieved on the road is unlikely to be the same as the official test results.

WHO DOES THE TESTING?

The testing is carried out either by independent test organisations, by the manufacturers or importers themselves at their own test facilities. Before the results are officially recognised, the DfT:

* inspects the test laboratories and witnesses some tests being carried out; or

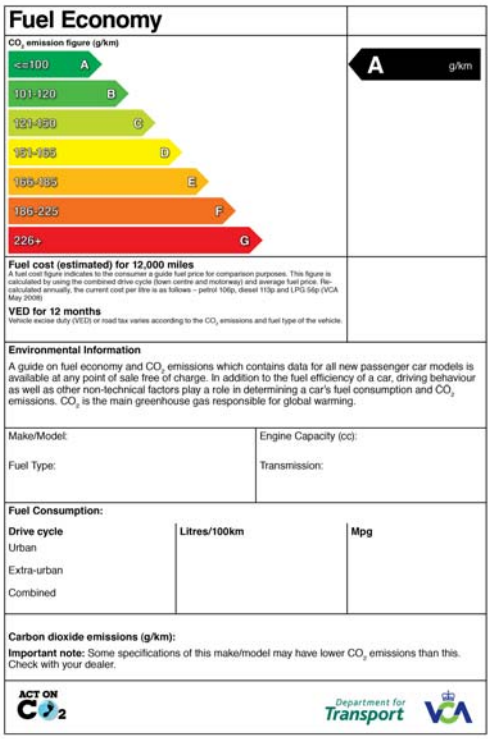
* checks that the figures have been certified by a European government under the agreed arrangements for mutual recognition of test results.

ARE ALL MODELS INCLUDED IN THE LIST?

Almost all types of new passenger cars have to be tested. However, several models which do not differ significantly in certain technical characteristics important in determining fuel consumption may be grouped together into a ‘class’. Only one representative car of the class needs to be tested. Certain types of vehicles are excluded from the fuel consumption testing scheme; these are cars manufactured in low volume, cars adapted to carry more than eight passengers (excluding the driver), three-wheelers, invalid carriages, van-derived passenger cars and cars built specially for export. These vehicles will not, therefore, be labelled in the showrooms. New cars whose engines run on liquid petroleum gas or compressed natural gas have been required to undergo fuel consumption tests since 1st January 2001. Lorries, buses, vans and motorcycles are also excluded from these tests,.

RESPONSIBILITIES OF MANUFACTURERS, IMPORTERS AND DEALERS

EU Directive 1999/94/EC (as amended by 2003/73/EC) requires new car fuel consumption and CO_2 emissions data to be made freely available to consumers. Car dealers are required to have a label showing the fuel consumption and CO_2 emissions of each different model on display, either on or near the vehicle. Fuel consumption figures will be expressed both in litres per 100 kilometres (l/100 km) and in miles per gallon (mpg). The label will list the figures achieved in urban, extra-urban and combined conditions separately (see section headed ‘Fuel Consumption Test’ for more details on test conditions). From September 2005, dealers had the option to produce a new “comparative” label. The new label shows the mandatory Fuel Consumption and CO_2 figures mentioned previously, alongside information about the appropriate VED band for the vehicle. The new label is similar in design to the energy efficiency labels that appear on many 'white goods', such as fridge freezers (an example can be seen below). Please note that this new label format is not mandatory and is unlikely to become so in the immediate future.



A sample of the label is available on the VCA fuel consumption and emission figures website under the download section. Other labels may be used but they must conform to the requirements outlined in The Passenger Car (Fuel Consumption and CO_2 Emissions Information) Regulations 2001.

Dealers are also required to display a poster – in paper or as an electronic display, in a prominent position, showing the fuel consumption and CO_2 emissions for all new passenger car models displayed, or offered for sale through that particular showroom. In addition to the above, the directive also requires manufacturers to include fuel consumption and CO_2 emissions data in all brochures and printed advertisements, provided that the literature relates to a specific model of car. These requirements were implemented into UK law by The Passenger Car (Fuel Consumption and CO_2 emissions Information) Regulations 2001, which came into force on the 21st of November 2001. These requirements do not apply in the Channel Islands or the Isle of Man.

PENALTIES

Failure to show fuel consumption labels on new cars on display, or to make available to potential buyers the results of the fuel consumption tests as listed in this booklet, render dealers liable on conviction to a fine of up to £5,000. The same penalty exists for anyone who does not include all the appropriate test results in promotional literature. Trading Standards enforce point of sale information and should be contacted if you have concerns in this area. The Vehicle Certification Agency are responsible for enforcing the provision of information in advertising and promotional literature. If you have concerns in this area please e-mail them to fuel@vca.gov.uk, or telephone 01179 515151.

EXHAUST EMISSIONS TESTING

Before passenger cars can be type approved for sale in the European Union they must meet certain standards for exhaust emissions. The more stringent Euro 4 limits specified in Directive 98/69, were introduced on 1st January 2005 and became fully effective on 1st January 2007. The test was modified for Euro 3 and 4 to include measurement of pollutants from the moment the engine starts. In the previous test, measurement commenced after the engine had started and idled for 40 seconds. The new limits, shown below, represent a 30% reduction over the earlier Euro 2 limits, although this is not obvious from the figures due to the more severe test. As with the fuel consumption tests a single vehicle representative of a particular version is tested.

Because of the nature of testing procedures the type approval emission figures listed in the tables should be treated with caution and specifically should not be used to rank a number of vehicles for which similar figures are quoted.

Tables of Emission Limits relating to vehicles listed in this booklet

Table 1 Cars not exceeding 2.5 tonnes laden

	Number of seats	Fuel	Directive	Limit values (gm/km)					Implementation Dates	
				CO	HC	NOx	HC+NOx	PM	Type Approval	In-use
Euro 4	up to 9	P	98/69/EC	1.00	0.10	0.08	-	-	01/01/05	01/01/06
	up to 9	D	98/69/EC	0.50	-	0.25	0.30	0.025	01/01/05	01/01/06

Table 2 Heavy motor car (more than 2.5 tonnes laden or more than 6 seats). Unladen weight between 1151 and 1600kg

	Number of seats	Fuel	Directive	Limit values (gm/km)					Implementation Dates	
				CO	HC	NOx	HC+NOx	PM	Type Approval	In-use
Euro 4	up to 9	P	98/69/EC	1.81	0.13	0.10	-	-	01/01/06	01/01/07
	up to 9	D	98/69/EC	0.63	-	0.33	0.39	0.04	01/01/06	01/01/07

Table 3 Heavy motor car (more than 2.5 tonnes fully laden or more than 6 seats). Unladen weight over 1600kg

	Number of seats	Fuel	Directive	Limit values (gm/km)					Implementation Dates	
				CO	HC	NOx	HC+NOx	PM	Type Approval	In-use
Euro 4	up to 9	P	98/69/EC	2.27	0.16	0.11	-	-	01/01/06	01/01/07
	up to 9	D	98/69/EC	0.74	-	0.39	0.46	0.06	01/01/06	01/01/07

Key P- Petrol, D – Diesel, CO – Carbon Monoxide, HC – Hydrocarbons, NOx – Oxides of Nitrogen, PM – Particulate mass

Note: The test procedure for Euro 3 and Euro 4 is more severe than that for Euro 1 and Euro 2. This results in some emission levels having an apparent increase when in fact they are more tightly controlled.

NOISE

Since joining the EU the UK has joined with other Member States in introducing stricter noise limits which by 1996 had halved perceived noise levels of individual vehicles over the previous 15 years.

At low speeds, similar to the speed used for vehicle noise testing, the noise from the engine, gearbox and exhaust will generally predominate over the noise associated with the tyre/road surface. On dry roads and at a constant speed engine noise generally predominates for speeds up to 50km/hr. Above this speed tyre noise becomes the dominant source of noise.

The current noise test for passenger cars, as detailed in EU Directive 92/97 (as last amended by 2007/34/EC), consists of driving the vehicle into the test area at a speed of 50 km/hr and then accelerating at full throttle through the test area. A microphone at a set distance from the line of travel measures the maximum level of noise reached which is then compared to the limit value to determine pass or fail.

The test area is surrounded by an open area to avoid sound reflections and the road surface is carefully constructed to a set standard to ensure consistency of results.

FURTHER COPIES

Further copies of this booklet are available from:-
Vehicle Certification Agency,
1 The Eastgate Office Centre,
Eastgate Road,
Bristol
BS5 6XX.

A Welsh language version of this publication is also available, requests should be sent to the above address.

Mae fersiwn Cymraeg o'r cyhoeddiad hwn hefyd ar gael – cyfeirier ceisiadau i'r cyfeiriad uchod.

The data in this publication was compiled by the Vehicle Certification Agency, an Executive Agency of the Department for Transport. Whilst every effort is made to ensure that the information contained in this booklet is accurate, the Vehicle Certification Agency cannot accept liability for its accuracy. Readers who rely entirely on the information do so at their own risk.

The Fuel Consumption and Emissions data is also available for viewing and downloading from the Vehicle Certification Agency web site which can be found at: **www.vca.gov.uk**

This publication is printed on recycled paper comprising 75% post consumer waste and 25% ECF pulp.

Did you find this guide useful? The Department for Transport would welcome any comments on how the guide could be made more user-friendly. Please send your comments to VCA at the above address or email them to fuel@vca.gov.uk

Produced for the Department for Transport

KEY

A	automatic
A4	automatic 4-speed
4Atx2	ditto, high and low range gearing
A7	automatic 7-speed
A/SAT5	automatic / semi automatic transmission 5 speed
ASM	automatic shift manual
AWD	all wheel drive
bhp	brake horsepower
CVT	continuously variable transmission
D	diesel engined vehicle
D6	direct shift 6-speed
DCT7	Double-Clutch Transmission 7 speed
Di	direct injection diesel engine
DOHC	dual overhead camshaft
DPF(S)	diesel particulate filter (system)
FAP	particulate filter
FDR	final drive ratio
Hybrid	combined internal combustion engine and electric motor and battery
i	fuel injection
km/h	kilometres per hour
kW	kilowatt
LWB	long wheelbase
l/100km	litres per 100 kilometres
mpg	miles per gallon
mph	miles per hour
M	manual
M5	manual 5-speed
5MTx2	ditto, high and low range gearing
MTA	Manual Transmission with Automatic Changing
M6/S6	manual 6 speed / sequential 6 speed
MULTI5	multimode 5 speed
PAS	power assisted steering
QA5	4-wheel drive, Auto 5-speed
QD6	4-wheel drive, direct shift 6 speed
QM5	4-wheel drive, Manual 5-speed
SAT5	semi automatic transmission 5-speed
SMG7	sequential manual gearshift 7 speed
SOHC	single overhead camshaft
SWB	short wheelbase
TD	turbo diesel
TDdi	turbo diesel direct injection
TDi	turbo charged direct injection diesel
TDI	turbo diesel with intercooler
TOD	Torque on Demand
4WD	4-wheel drive
4 x 4	4 wheeled vehicle with 4-wheel drive

CONVERSION TABLE

l/100km miles/gallon