

**Best-seller -  
over 200,000  
copies printed**



# Fuel Saving Tips

Your essential  
pocket guide  
to saving fuel  
and money

Department for  
**Transport**

transportenergy >  
BestPractice

**T**his booklet can save you money..... by helping you cut your fuel costs.

Saving fuel makes sense for everyone, but having the right advice to hand can sometimes be difficult when you're out on the road.

This guide has been designed so you can carry it in your jacket pocket or cab.

It is aimed **in particular** at small-fleet operators and owner-drivers.

It includes **top tips** from fellow professionals on how to save fuel.

So keep it handy, use the information provided.....  
and cut down your fuel bill.



This guide was compiled and edited by:  
Aztec Media Services Ltd, 11 Highview, High Street, Bordon, Hampshire GU35 0AX

# Contents

Section 1	Know your costs	<b>4</b>
Section 2	Where does the fuel go?	<b>7</b>
Section 3	Why drivers are VIPs	<b>10</b>
Section 4	Who cares wins	<b>12</b>
Section 5	Vehicle specification: get it right first time	<b>14</b>
Section 6	Work that body: saving fuel by smarter loading	<b>16</b>
Section 7	Making every drop count: fuel management systems	<b>18</b>
Section 8	Chips with everything: on-board computers, telematics and fleet-management systems	<b>20</b>
Section 9	The fuel champion	<b>22</b>
Contact points: Addresses, telephone numbers and websites		<b>23</b>
Useful conversion factors		<b>24</b>

 Look out for this symbol—it indicates **free** TEBP publications that are available from the TransportEnergy Hotline on 0845 602 1425 or from [www.transportenergy.org.uk](http://www.transportenergy.org.uk).

# Section 1

## KNOW YOUR COSTS

**W**e all want to cut our costs. Whether you drive a 7.5 tonnes gvw boxvan, own and drive a 40 tonnes gcw artic, or run of a fleet of 30 eight-wheeler tippers, the first step is to know exactly what your costs are right now. Sounds obvious doesn't it? But you would be surprised at how many professional truck operators and drivers can only guess at how much they spend per month per vehicle on maintenance, tyres, insurance and, crucially, fuel.

Setting a target to cut your fuel costs by 5% would be a good place to start.

For many truck operators even this small saving could easily mean £1,000 less spent each year on fuel. And that saving is going to be magnified in the bottom-line profit.



**DO THE SUMS TO WORK OUT EXACTLY WHAT YOUR TRUCKS COST TO RUN. THEN YOU'LL BE READY TO START SAVING FUEL AND MONEY.**

**i** See **Fuel Management Guide**

4

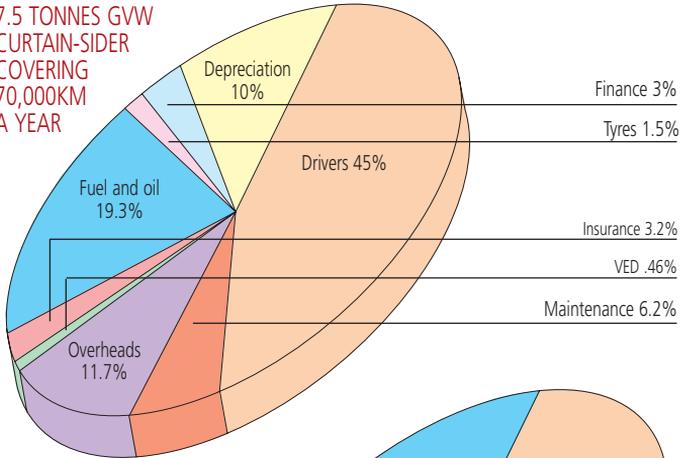
### CONSIDER THIS EXAMPLE

Total fleet costs	£500,000
Fuel costs (30% of total)	£150,000
<b>Profit</b>	<b>£ 25,000</b>
5% saving in fuel costs	£ 7,500
<b>Profit after fuel saving</b>	<b>£ 32,500</b>

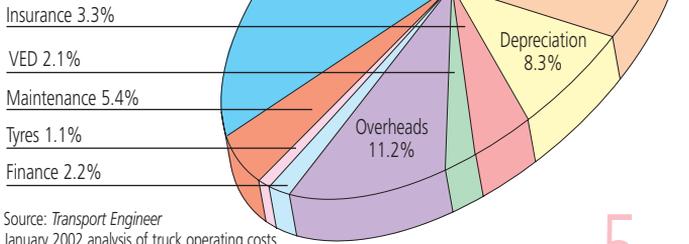
Source: Energy Efficiency Best Practice Programme 1998 survey

### EASY AS PIE: THESE CHARTS SHOW HOW OPERATING COSTS VARY WITH TRUCK WEIGHT AND ANNUAL MILEAGE

7.5 TONNES GVW  
CURTAIN-SIDER  
COVERING  
70,000KM  
A YEAR



40 TONNES GCW ARTIC  
TRACTOR, COVERING  
160,000KM  
A YEAR



Source: Transport Engineer  
January 2002 analysis of truck operating costs

**FILL IN YOUR TRUCK OPERATING COST RECORDS**

<b>STANDING COSTS</b>	<b>£</b>	<b>RUNNING COSTS</b>	<b>£</b>
overheads		fuel (and oil)	
vehicle excise duty		tyres	
insurance		maintenance	
depreciation		<b>total</b>	
finance			
driver			
<b>total</b>			

You cannot manage what you cannot measure

Time spent gathering accurate information on fuel consumption will pay handsomely later

Be systematic - keep accurate records of all costs

Use a checklist to ensure all costs are properly accounted for (see above)

Sources of useful information on truck operating costs

**i Fuel Management Guide** (Section 1)

Freight Transport Association

Road Haulage Association

*Transport Engineer* (monthly magazine)

*Motor Transport* (weekly newspaper)

*Commercial Motor* (weekly magazine)

**See page 23 for more useful contact names, telephone numbers and websites.**



## Section 2

### WHERE DOES THE FUEL GO?

**E**xactly how much of the diesel you put into your truck's fuel tank ends up earning you money? Probably nothing like as much as you imagine. Only about **one third** of the energy in a tank of fuel is translated into useful mechanical effort at the wheels.

**So it surely makes sense to do all you can to avoid wasting any more.**

There's not much drivers and operators can do about the fundamental efficiency of truck engines (except to ask manufacturers and dealers to provide fuel consumption figures and then to take these into account when making purchasing decisions).



## RESISTANCE MOVEMENT

The total resistance to a truck's forward motion comes from rolling resistance, air resistance, and gradient. The only influence you can have on the last of these is to choose less hilly routes wherever possible, but there is plenty more you can do to keep rolling resistance and air resistance to a minimum.

**Aerodynamics is a complex subject but you certainly don't need to be a high-flying aeronautical engineer to improve the efficiency of your truck and make worthwhile fuel savings.**



- i** Read the **TEBP Good Practice Guide to Truck Aerodynamic Styling** to find out exactly how and why rolling resistance and aerodynamic drag vary with speed.

**DID YOU KNOW?**

- as much as 80% of the fuel economy benefits of an arctic tractor's air-management equipment comes from just three components: the roof-mounted air deflector, side collars at rear of cab, and under-bumper air dam
- assessment of individual aerodynamic aids by the University of Huddersfield has shown that most drag reduction (nearly half the total) comes from a cab roof-mounted air deflector
- sheeting tipper bodies even when empty can produce significant fuel savings. Tests show a 7.5% improvement at 50mph and a 9.3% improvement at 56mph (BTAC/IRTE technical trials June 1999)
- a 10% variation in fuel economy can be expected from one season of the year to another (the wet roads and high winds of winter will take their toll in fuel economy)
- a typical 420hp heavy-duty truck engine consumes fuel at the rate of around two litres an hour when the truck is stationary and the engine idling

speed (mph)	distance (km)	fuel used (litres)	fuel consumption (mpg)
0 (idling at 480rpm)	0	1.9 per hour	
37	22.2	4.1	15.2
50	22.2	6.6	9.5
56	22.2	8.4	7.4

Source: BTAC/IRTE technical trials of June 2000

**DID YOU KNOW?**

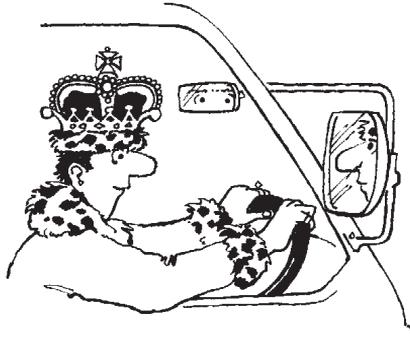
- a complete set of the latest low-rolling-resistance tyres can give fuel economy gains of up to 6% on long-haul work
- check all tyre pressures regularly (including trailers). If pressure falls below recommended figures, rolling resistance increases and fuel is wasted. A 10 psi (lb/square inch) fall in tyre pressure is likely to result in a 1% fall in fuel economy

 See **Fuel Management Guide** (sections 6 and 9)

## Section 3

### WHY DRIVERS ARE VIPs

**W**hen it comes to delivering fuel economy, the driver is king. For the vehicle operator the benefits of fuel-efficient driving style are not just lower fuel bills but also lower maintenance costs and lower insurance costs. The best way to illustrate this is with real-life examples.



#### DRIVING DOWN FUEL COSTS

- A driver training programme at BOC Gases resulted in a 4% improvement in the fleet's average fuel economy that amounted to an annual cost saving of £240,000.
- One Norfolk-based tanker operator spent £9,500 on monitoring all drivers' fuel consumption figures and then implementing a driver training programme. The fuel cost saving in the first year alone was £46,000. The insurance premium saving was £8,000.
- A Watford operator simply recorded each driver's average fuel economy figures and posted the results on the company's notice board, ensuring that every driver was given a copy. This exercise cost the company only £80, but the effect was an across-the-board fuel economy improvement of 6%, saving £6,400 a year.



## CHECK IT OUT

### CHECKLIST FOR DRIVERS

- Always be ready to learn, no matter how experienced you are
- Know your average mpg
- Follow vehicle manufacturer recommendations
- Read vehicle handbook
- Use tachometer green zone
- Skip-shift (block-shift) gears where it is safe to do so
- Systematic pre-driving and daily checks
- Prompt defect reporting
- Take care filling fuel tanks, not to brim
- Park up to avoid early-morning manoeuvring with cold engine – this wastes fuel
- Pull away in the right gear
- Use cruise control
- Use the engine's "sweet spot" (the speed at which fuel economy is at its best)
- Never leave a fuel nozzle unattended

 See **Fuel Management Guide** (sections 6 and 11), **Safe and Fuel Efficient Driving Guide**, and **Save It** video/CD ROM

### CHECKLIST FOR FLEET MANAGERS

- Assess fuel efficiency as part of driver recruitment process
- Run continuous professional development programme
- Consider bonus scheme based on fuel efficiency
- Request up-to-date training from vehicle manufacturers
- Communicate effectively with drivers
- Run driver league tables based on fuel economy averages
- Use on-board computers
- Appoint fuel champion
- Apply agency driver training policy

 See **Fuel Management Guide** (section 11), **Safe and Fuel Efficient Driving Guide**, and **Save It** video/CD ROM

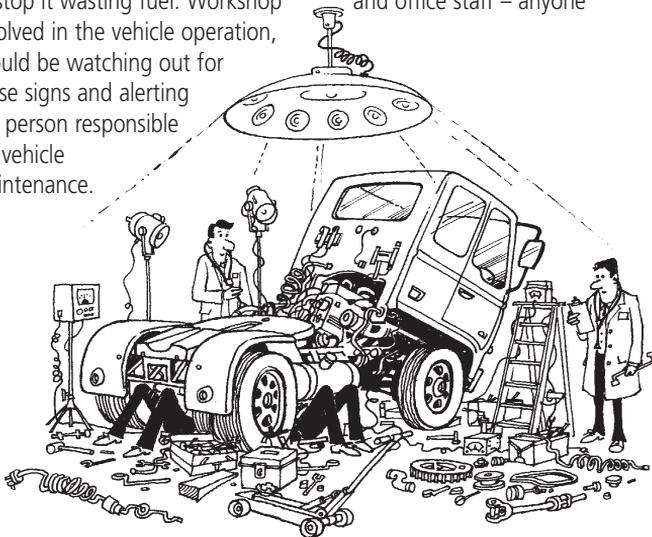
## Section 4

### WHO CARES WINS

**W**here does vehicle maintenance fit in? It's pretty obvious that a well-maintained truck is certain to be more fuel-efficient than a neglected one. But there is more to this than simply booking your truck into the workshop on time for routine services and safety inspections.

- Once again, drivers have a crucial role since they are likely to be first to spot tell-tale signs of trouble and cost ahead.
- For example, a driver is likely to be the first to notice dragging brakes because of their immediate effect on vehicle performance.
- But we're not suggesting that drivers need the same level of understanding of vehicle engineering as technicians to be able to see problems.
- Much of this is to do with common sense and being alert.

On the page opposite is a checklist (by no means exhaustive) of tell-tale signs that a commercial vehicle needs workshop attention to stop it wasting fuel. Workshop and office staff – anyone involved in the vehicle operation, should be watching out for these signs and alerting the person responsible for vehicle maintenance.



## MAINTENANCE CHECKLIST. CHECK FOR:

- Any fuel or oil leaks
- Missing seal in fuel tank cap or signs of fuel spills around filler neck
- Low tyre pressure (twinned tyres kissing)
- Tyre wear suggesting faulty steering or axle alignment (such as feathering of tread in tyre shoulder area)
- Missing tyre valve caps
- Steel caps are much better than plastic ones, providing an effective second line of defence against leaking valves
- Maintenance records showing rapid wear of clutch or brake friction material
- Traces of black smoke in exhaust suggesting fault with engine's air-intake and/or fuel injection system
- Tears in body curtains
- Any body damage
- Missing or damaged air-management equipment
- Excessive engine oil consumption (no leaks) suggesting oil is being burnt as a result of internal wear

**REMEMBER: EFFECTIVE PREVENTIVE MAINTENANCE PROCEDURES DON'T COST YOU, THEY PAY YOU.**

**i** See **Fuel Management Guide** (section 10), and **Save It** video/CD ROM



## Section 5

### VEHICLE SPECIFICATION: GET IT RIGHT FIRST TIME

There's no such thing as a bad truck any more, they say. Maybe so, but it's not hard to find examples of badly-specified trucks that are wasting fuel and costing more to operate than necessary. Time and effort spent deciding on the right vehicle and body specification before the vehicle goes into service will pay off handsomely throughout the vehicle's life.



No operator should simply accept an off-the-shelf truck and body without first ensuring that the specification really does suit the operation.

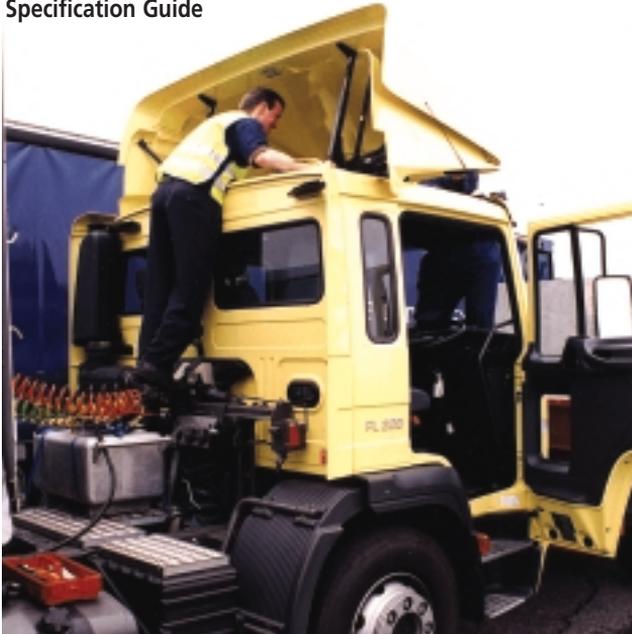
#### **PRACTICAL EXAMPLES**

- BOC Gases found that a 10% loss of fuel economy could result from gearing that makes a truck engine run 200rpm faster at 56mph.
- By setting cruise control speed to correspond to the best specific fuel consumption speed of an 11-litre Cummins engine, BOC Gases raised the average fuel economy of an ERF artic tanker from 7.9 to 9.7mpg.
- Business Post replaced the standard vehicle manufacturer's roof-mounted air deflector on a tractive unit with one built to its own specification and raised average fuel economy from 8.5 to 9.3mpg.

## VEHICLE SPECIFICATION CHECKLIST

- Make your choice based on whole-life costs, not simply initial cost
- Have you considered all available cab, engine and driveline options?
- Is the fuel tank size and position right for your operation?
- Have you asked the dealer and/or manufacturer to advise on gearing based on computer simulation of your operation?
- Have you and/or your drivers tried demonstrator vehicles?
- Have you thought carefully enough about tyre specification, including tread patterns, aspect ratio and low-rolling-resistance options?
- Have you considered self-steering/lifting axles?
- Have you run the fuel-saving software that comes free with the **TEBP Good Practice Guide to Truck Aerodynamic Styling?**
- Is your new sleeper-cabbed truck fitted with a night heater as standard? If not, why don't you specify one?

**i** See **Fuel Management Guide** (section 9) and **Vehicle Specification Guide**



## Section 6

### WORK THAT BODY: SAVING FUEL BY SMARTER LOADING

Just a little more thought in the specification and use of truck bodywork by operators and drivers can make a big difference to fuel consumption.

Flat platform bodies for loads that require roping and sheeting are no longer common, but are still needed from time to time on some operations. Some loose cargo lends itself to neat, low-profile loading on a flat rigid body or semi-trailer. With others it is more difficult but it is definitely worth putting effort into arranging the load so that aerodynamic drag is kept to a minimum, especially before setting out on a long motorway journey.

#### **REMEMBER: THE HIGHER THE SPEED, THE GREATER THE EFFECT OF AERODYNAMIC DRAG ON FUEL ECONOMY.**

Do not just accept the body or trailer specification suggested by a bodybuilder without first questioning whether it could be optimised to improve fuel economy without compromising operational and load-carrying requirement. Check what height of body you really need.

#### **PRACTICAL EXAMPLES**

- Montgomery Transport's Preston-based European operations manager found that the fuel economy of tractors pulling 13.6-metre semi-trailers was between 1.3 and 7.6% better than that of tractors pulling 12.2-metre trailers, simply as a result of the smaller cab-gap with the longer semi-trailers.

- When overall trailer height was changed from 4.0 metres to 4.2 metres fuel consumption worsened by between 4.4 and 11.4%.

- Montgomery's comparison of tractors working at 32.5 and 38 tonnes gcw showed that they were between 2.9 and 4.9% more fuel efficient at the lower weight.

- An Oxfordshire-based operator uses tail-lifts on his box-bodied trucks. Power for the tail-lifts used to come from the vehicle's standard electrical system, driven by the engine. Then someone came up with the bright idea of fitting separate batteries to power

the tail-lifts. This allowed engine running time to be reduced by 27 hours a week. The cost of the battery system was £700 but the annual fuel saving amounted to over £4,000, even before lower maintenance costs were taken into account.

**Remember - take care when specifying vehicle and body dimensions, gross weights and load-handling equipment and your rewards will be better fuel efficiency and bigger profit margins.**

## DO

- Think about aerodynamics in specifying bodywork
- Keep overall body height as low as possible
- Fit air-management equipment where it is cost-effective (see **The Streamlined Guide to Truck Aerodynamic Styling**)
- Sheet empty tipper bodies
- Ensure that curtain straps and buckles are kept taut
- Get any body damage, especially nicks and tears in curtains, repaired promptly
- Adjust sliding fifth-wheel couplings to keep the tractor/trailergap as small as possible (but take care that axle weight limits are not exceeded)
- Adjust a tractor's roof-mounted air deflectors to suit the particular trailer being pulled

## DO NOT

- Specify a taller body than is really needed
- Fit additional lights, air horns or other ornamental accessories where they are going to spoil smooth airflow over the cab and body and add to fuel consumption
- Ignore small tears in curtains
- Specify heavily-ribbed bodywork where it can be avoided



## Section 7

### MAKE EVERY DROP COUNT: FUEL MANAGEMENT SYSTEMS

**W**hat exactly is a fuel management system? You might be surprised to hear that it can be based on anything from manual records to sophisticated computer software. So we're not only talking about posh and expensive computer systems that only the biggest fleets can afford.



#### **A GOOD FUEL MANAGEMENT SYSTEM WILL ALLOW YOU TO MONITOR FUEL CONSUMPTION EFFECTIVELY IN LESS THAN ONE MINUTE A DAY PER VEHICLE.**

In every case the essential ingredient is accurate raw data. You will need a means of identifying errors, such as inaccurate odometer readings, and correcting them at source. This is always much easier than trying to find and correct inaccurate basic information later on.

- Being alert to the risks of leaks, fraud, theft and fuel spillage can result in worthwhile savings.
- BOC Gases cut £100,000 from its annual fuel bill simply by better stock control.
- A small leak around the fuel filler neck of a truck's fuel tank could easily result in the loss of a litre a day, or about £120 worth of fuel a year wasted.
- Diesel leaking from tanks onto the road poses a serious road-safety risk to motorcyclists.

■ One fundamental decision with any fuel management system is whether to hold your own bulk stocks or to rely on fuel cards, bunkering, or perhaps a simple arrangement with a local filling station.

**Before deciding which of these routes to follow, you will need to think about :-**

- convenience of refuelling trucks at their home base
- supply availability
- reliability and quality of supply
- cost per litre of bulk supplies
- cost of on-site equipment
- environmental and security management

**DO**

- Collect and retain raw data, not just averages such as miles per gallon, in a computer database or spreadsheet
- Think about better ways of collecting this information
- Check the accuracy of odometer readings
- Take tyre wear and rolling circumference into account to improve the accuracy of your fuel consumption calculations
- Encourage drivers to calculate mpg figures for their own vehicles and make use of any on-board computers
- Think about using fuel cards and management systems provided by oil companies and others

**i** See **Fuel Management Guide** (sections 7 and 8)

**DO NOT**

- Average mpg figures instead of basing your calculations on fuel used and distance travelled
- Overfill tanks, on vehicles or bulk tanks at refuelling sites (because fuel needs room to expand as it warms up)
- Rush into choosing a fuel-management system by buying the first one you see
- Forget to change fuel filters (on vehicles and bulk tanks) at recommended intervals
- Make the excuse that you do not have time to operate any complex fuel-management system: it should take less than one minute per day per vehicle to monitor fuel consumption effectively

## Section 8

### CHIPS WITH EVERYTHING: ON-BOARD COMPUTERS, TELEMATICS AND FLEET MANAGEMENT SYSTEMS

**D**on't be put off by all the fancy acronyms and high-tech terminology littering the world of on-board computers. You really don't need to understand how any of this equipment works to be able to use it to good effect in improving truck fuel economy. The list of ways in which information technology can help you save fuel is almost endless, but here are a few practical examples.

■ Armitage Shanks, the sanitary-ware manufacturer, switched from manual planning to computer-assisted load planning and vehicle routing for its truck fleet, cutting mileage by no less than 25%.

■ Queens Motors, a Croydon, south London-based vehicle recovery company, not only saved fuel and improved fleet management control of its 60 vehicles but improved response time to call-outs by 25% with an on-board satellite navigation system from Siemens VDO.

■ A Taunton-based own-account operator released management time to spend on fuel-saving by using an internet-based tachograph chart analysis service.





## DO

- Try to exploit the latest computer technology to run your vehicles as fuel-efficiently as possible
- Read annex 3 to the *Fuel Management Guide* on the seven basic elements of an on-board computer system
- Ask vehicle manufacturers and independent suppliers to demonstrate what their systems can do for your truck's fuel economy

**i** See **Telematics Guide** and **Fuel Management Guide**

## DO NOT

- Develop technophobia when presented with an on-board computer system or telematics
- Assume that simply fitting the latest satellite tracking or remote condition-monitoring system will automatically result in lower mpg (you have to actually **use** the data provided by such systems)
- Ignore what on-board computers can tell you about fuel economy while you are driving

## Section nine

### THE FUEL CHAMPION

**T**he best of intentions on fuel saving can easily get forgotten when truck drivers and fleet operators are under pressure. Which happens all the time. No matter how big or small your firm, without a fuel champion to act as a focal point, your fuel-saving programme will stand less chance of being successful.



#### **WHO MAKES A GOOD FUEL CHAMPION? HERE'S WHAT THEY NEED TO BE ABLE TO DO:**

- Understand how fuel consumption figures are generated, how errors occur and how to correct them
- Recognise the potential for fuel saving and how to fulfil it
- Understand how on-board fuel-monitoring equipment can be used to encourage fuel saving
- Communicate freely and easily with everyone involved in the fuel-saving programme, which probably means everyone in the company

And when the fuel champion's job is done well, everyone shares in the success that follows, saving fuel and money.

**i** See **Fuel Management Guide** (section 4)

## CONTACT POINTS – USEFUL TELEPHONE NUMBERS AND WEBSITES

---

### Transport Energy Hotline

Tel: 0845 602 1425  
[www.transportenergy.org.uk](http://www.transportenergy.org.uk)

### Society of Operations Engineers

Tel: 020 7630 1111  
[www.soe.org.uk](http://www.soe.org.uk)

### Freight Transport Association

Tel: 01892 526171  
[www.fta.co.uk](http://www.fta.co.uk)

### Road Haulage Association

Tel: 01932 841515  
[www.rha.net](http://www.rha.net)

### Simon Management Limited

Tel: 0800 783 7434  
[www.simontraining.com](http://www.simontraining.com)

### Transport Research Laboratory (TRL)

Tel: 0800 056 5005  
[www.trl.co.uk/fea](http://www.trl.co.uk/fea)

### CSDF -

(focusing on food and retail/wholesale distribution)  
Tel: 01344 869533  
[www.csdf.org.uk](http://www.csdf.org.uk)

### Careers in Logistics

Tel: 0870 774 8648  
[www.careersinlogistics.co.uk](http://www.careersinlogistics.co.uk)

### Respect for People

Tel: 01737 358455  
[www.respectforpeople.org](http://www.respectforpeople.org)

### Skills for Logistics

Tel: 0870 242 7314  
[www.skillsforlogistics.org](http://www.skillsforlogistics.org)

### Chartered Institute of Logistics and Transport (UK)

Tel: 01536 740104  
[www.ciltuk.org.uk](http://www.ciltuk.org.uk)

### SAFED

Tel: 0870 190 6354  
[www.safed.org.uk](http://www.safed.org.uk)

## CONVERSION FACTORS

TO CONVERT	TO	MULTIPLY BY
miles	kilometres	1.609344
kilometres	miles	0.621371
litres	gallons (UK)	0.21997
gallons (UK)	litres	4.54609
gallons (US)	gallons (UK)	0.83268
gallons (UK)	gallons (US)	1.20094
horsepower (James Watt) – abbreviated to hp	kilowatts (kW)	0.746
kilowatts	horsepower (hp)	1.341
horsepower (hp)	metric horsepower (PS)	1.0139
metric horsepower (PS)	horsepower (hp)	0.9863
tons (imperial)	tonnes (metric)	1.016
tonnes (metric)	tons (imperial)	0.984

To convert fuel consumption expressed in miles per gallon (mpg) to litres per 100 kilometres (lit/100km) divide 282.5 by the mpg figure. To convert the other way divide 282.5 by the lit/100km figure to find the mpg figure.