

anti-idling technology





MAYOR **OF LONDON** 



# 02. Idling gets you nowhere: a procurement guide for



Transport for London

# Idling gets you nowhere – switch off to save fuel, save money and help reduce emissions

This guide is designed to inform you about the technology available to help reduce engine idling and how to procure it in order to ensure it's both beneficial to your business as well as the environment.

Idling is leaving your engine running when stationary and parked. "Idling can use up to 2 litres of fuel per hour, emitting over 5.26kg of CO<sub>2</sub>." (Source: DfT Freight Best Practice)

Idling, in respect to fumes and noise created can be considered an offence under Section 80 of the Environmental Protection Act 1990. The Highway Code also states 'If you have to stop on the roadside you must switch off the engine, headlights and fog lights'. Some Local Authorities have even implemented penalties of up to £80 for excessive vehicle idling, especially where an AQMA (Air Quality Management Area) is in place.



As well as one of the main sources of fuel wastage, engine idling also generates a number of emissions, such as Particulate Matter (PM), which are harmful to health. Elevated levels of PM are a major concern in many areas of London especially as PM is linked with increased risk of

asthma and heart disease. The London Low Emission Zone (LEZ) has been implemented to reduce these emissions and alongside that, measures that encourage a reduction in idling are now a major focus for Transport for London.

Managing fuel to reduce the amount consumed can have fantastic benefits for both the environment and your wallet, with diesel prices at record highs, it's more important than ever to minimise fuel use.

There are a wide number of options to reduce fuel usage and before you do anything else you should make sure you record exactly how much fuel you are using so you can see how successful any reduction measures are.

An effective and simple to implement fuel saving technique is to eliminate unnecessary engine idling - the time the engine spends running when the vehicle is not in use.

# Engine idling myth busting

In order to reduce fuel consumption and air pollution from idling, it is important to understand why drivers let their engine idle excessively. There are certainly some misconceptions around the need to keep engines running. These six points show how idling is unnecessary and bad for your vehicle, your business and the environment.

- Turning the engine on and off wears it out. Wrong, frequently restarting the engine has little impact on components such as the battery and starter motor.
- Idling keeps an engine in better condition. Wrong. Idling means incomplete combustion, leading to a build up of residues in an engine, increasing wear and tear.
- 5. Switching engines off isn't beneficial. Actually, research on a number of different sized engines commissioned by TfL confirmed that if you expect to be stationary for more than one minute it is better, for the environment and your pocket, to switch your engine off.

One of the most common drivers' excuses for idling, especially drivers of larger vehicles, is to maintain an ideal cab temperature; however for the duration of short break meal breaks and loading/unloading the cab will retain an ideal temperature while the engine is off. For longer stops, an auxiliary heater is a more efficient way to heat the cab. Some only use around one tenth of the fuel of an idle engine.

- Catalytic converters need to be hot to work properly. Yes, but an idling engine does not keep a catalytic converter warm. They retain their heat for about 25 minutes after an engine is switched off anyway.
- Starting an engine uses more fuel than idling. In fact, an idling van uses more fuel in 10 seconds than stopping and restarting the motor.
- 6. Vehicles with powered equipment like hydraulic lifts and cranes can't avoid idling. Whilst it's true the engine needs to be running to operate certain types of equipment, anti-engine idling systems can distinguish between unnecessary idling and when gear is in use.

Although the specific length of time for which it is beneficial to switch an engine off varies for each individual vehicle and its state of repair, a good general principle to apply is that drivers who anticipate that they will be stopped for one minute or more should switch off. This rule of thumb is easily understood and is applicable to most vehicles to help reduce harmful emissions.

# Anti-idling technology – what's available

Anti-idling technology is designed to help you to monitor and manage levels of idling in your operation and to prevent drivers from leaving the engine to idle whilst stationary.

Anti-idling technology primarily comes in three types:

- Factory fitted engine cut out systems
- Retro-fitted engine cut out systems
- Telematics monitoring and cut out systems

#### Anti-idling technology key features

Technology type	Key Features					
	Retrofit	One off or ongoing cost	Monitor idling levels	Engine auto cut off	Adjustable Change timings & parameters	Fitment – at depot or at Manufacturer
Factory fitted engine cut out system	×	N/A	×	V	V	Manufacturer (0 hours)
Retrofitted engine cut out system	~	One off	×	V	V	Manufacturer
Telematics 3rd party	~	Ongoing	<b>~</b>	×	×	Depot
Telematics manufacturer	~	Ongoing	~	×	×	Depot

## **Factory fitted**

Many manufacturers are fitting new vehicles with stop start systems enabling engines to automatically cut out and restart whilst standing in traffic – usually operated via the clutch. The time is usually pre-set at around 2 minutes but can be adjusted. The engine ignites as soon as the clutch begins to be depressed, therefore it is unnoticeable to the driver.

## Motor Stop Start (MSS) technology

Many manual fleet vehicles, including trucks over 3.5t, are fitted with an MSS system. Some manufacturers embed the technology as standard in all new vehicles. The system switches your engine off when the vehicle is stationary, automatically switching it back on again the moment you want to get going.

The system is activated by a switch on the instrument panel. MSS will switch the engine off if the vehicle is stationary for three seconds and all of the following conditions are met:

- The engine speed is below 660 rpm
- The gearbox is in neutral
- The clutch pedal is not depressed
- The coolant temperature is between 60°C and 96°C
- The outside temperature is above 0°C

The engine restarts the moment you begin to depress the clutch pedal to put the vehicle in gear, so you get underway exactly when you want to.

If one of these conditions is not met, the MSS light on the display panel will flash. This informs you that the engine has not cut out for a reason and there may be something you can do (e.g. remove your foot from the clutch pedal to make the engine cut out).

You should contact your commercial vehicle dealer or leasing company if you wish to explore this option further

## **Retro-fitted**

If you are not looking to replace your vehicles, there are options for retrofitting anti-idling devices that can stop-start your engine and can be configured to meet operational requirements. Fitting times can vary but are normally limited to a few hours. The key aspect to check is that the device is compatible with your vehicle's engine and will not invalidate the warranty. Companies providing retro fit solutions are limited but a couple of options are outlined below.

#### Auto Stop/Start Device

This practical device eliminates unwanted idling by safely switching off the engine when the vehicle is stationary for a user defined period time, usually 1 or 2 minutes. The device cuts the engine when the handbrake is applied and the vehicle is stationary for a user defined period of time. This device can be fitted to any vehicle.

#### Manual Stop/Start Device

This device allows the driver to stop and restart the engine at the push of the button. Their response times are quick enough to be used in traffic and they are available for a variety of vehicle and engine types.

#### **Telematics**

Telematics is equipment fitted to a vehicle to monitor its location and operational status. Telematics equipment is widely used and available from a number of companies, many of which offer the ability to monitor, and sometimes control, the idle time of your vehicles.

Telematics calculate your Miles Per Gallon (MPG) automatically and can assist with many aspects of fuel management. Other benefits of telematics beyond helping to reduce idling include; driver behaviour monitoring (braking, acceleration, time spent in the green band); speed monitoring and efficiency analysis. It is possible to generate bespoke reports detailing a number of Key Performance Indicators (KPI), making it much easier to monitor fuel performance.

Telematics systems can be as basic or as detailed as you wish; some will be able to tap in your vehicle's CANBus data to provide detailed engine information, whilst others will involve the installation of an accelerometer to measure movement, speed and braking performance. Some just simply allow you to track your assets. Note that CANBus lead system may require your vehicle's FMS to be switched on (which can be quite expensive). CANBus is a multiplexed wiring system used to connect intelligent devices such as Electronic Control Units (ECU's) on vehicles, allowing data to be transferred in a low-cost and reliable manner.

Some telematics even provide dashboard mounted displays to provide instantaneous audio-visual corrective prompts to the driver.

Importantly you should look to ensure the telematics system is compatible with your vehicle and does not invalidate the warranty. Always check with the manufacturer.

More recently, newer vehicles tend to have telematics capabilities as standard and the engine management systems themselves can provide a wealth of data.

The majority of telematics systems' reporting tools are now web-based meaning that lengthy installations of software onto your inhouse systems are no longer required and that you can access the data from any terminal you use. Telematics device Installation usually takes between I and 2 hours meaning vehicle downtime is minimal.



### Case study – East Yorkshire Motor Services Limited

Company:	East Yorkshire Motor Services Ltd (
Fleet Size:	290 (buses and coaches)
Company:	EYMS is a privately owned local compared running buses in East Yorkshire since 19 employment for around 800 people and investing in new buses to make travel end The company operates from 9 depots and Piding of Yorkshire, the North Yorkshire

Idling detection was introduced to the EYMS fleet in April 2011 as an enhancement to their Driver Performance and Safety Management system. The fuel consumption figures for the entire fleet were monitored for a period of 2 weeks prior to idling performance being monitored.

#### Following the monitoring period the following figures were revealed:

Percentage Idling reduction:	From 9% down to 2%
Diesel saved:	60,000 lts
Cost saving:	£66000 gross £38000
CO2 saved:	158 tonnes

"What we really like about the idling solution is that it minimizes the time and effort required to assess and sustain improvements in idling performance as it eliminates the need for manual effort or data download procedures. It allows us to quickly identify specific drivers, vehicles, or trips that have unnecessary idling and negatively impact fuel performance" said Dave Heptinstall, Chief Engineer, EYMS Ltd

The list below shows some of the features available on different telematic systems. Consider these questions when thinking about what system might work best for you:

- Is it CANbus connected/FMS?
- Is it Accelerometer/gyroscope/GPS based?
- Does it give instant driver feedback?
- Is it web based?
- Does it offer driver based feedback?
- Is it modular?
- Will it track performance over time?

#### EYMS)

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investing in new buses to make travel easier and more pleasant for its passengers. The company operates from 9 depots servicing Kingston-upon-Hull, the East Riding of Yorkshire, the North Yorkshire Coast and the North Yorkshire Moors.

at year end

) net of Bus Service Operators Grant

#### Accelerometer based telematics systems

Using gyroscope technology, accelerometers can accurately measure acceleration, speed and the tilt of a vehicle. This functionality allows a number of key driver behaviours to be measured, which include levels of acceleration, severity of braking, speeding occurrences and risky manoeuvres such as the extent to which the vehicle is tilted whilst travelling.

The accelerometer alone will not enable the measurement of fuel consumption or idling. This is achieved via other means, for example via CANbus data or flowmeters.

The driver behaviour data is automatically fed back in real time and can be accessed via online portals. Many systems provide the functionality to create league tables from the driver behaviour data. This can help create some healthy competition and can aid you if you wish to consider introducing incentives related to good driving performance.

Once areas for improvement or concern are highlighted to the driver some systems provide interactive training sessions for the drivers specific to the poor driving style exhibited. These training sessions must then be completed to show that the driver is aware of the problems and has received some corrective training – the benefit of this is that this refresher training can be delivered by the online system rather than by a driving instructor/trainer.

#### CANbus based telematics systems

There are a large number of suppliers that provide telematics systems that are linked directly to the Engine Control Unit (ECU), collecting information electronically about vehicle and engine activity. This can be fed into a fleet management system and also to the driver through an LED display, which alerts the driver to bad driving practices. This means that improvements can be made instantly on the road and also through training. Systems are available that alert the driver, via an audible 'beep', to excessive idling.

Key performance Indicators (KPIs) of particular interest to the vehicle operator, for example idle time, speeding and acceleration can be selected. Simple debrief reports are produced to recognise where superior driving skills already exist, and where further training may be required. These reports can produce an energy efficient driving index or use colour coding, for example red, amber and green to indicate performance. The threshold values for each banding are set by the operator to reflect acceptable levels to the company.

In addition to systems that are connected directly to the CANbus, modules are also available that use contactless technology. This allows detailed information about fuel consumption and engine idling to be collected, without making a direct connection to the CANbus. In conjunction with data from other systems, such as vehicle tracking, these modules can provide valuable information on driving style and behaviour.

#### Plug in devices and add-ons

There a number of suppliers of simple plug in devices. These range from standard Satellite Navigation (Sat Nav) devices that can dynamically route drivers onto the optimum routes for fuel efficiency to devices that can highlight when the vehicle is speeding and when it is stationary to prompt the driver to slow down or turn the engine off. There are also simple devices that display of indicative fuel usage/MPG based on speed, time and distance travelled.

These devices can be used in conjunction with a number of other telematics or routing systems to aid drivers to improve their fuel efficiency and to ensure appropriate routes are taken. For example if you use a routing system to plan the most effective route the Sat Nav device can then be linked to ensuring the driver actually follows the prescribed route.



#### Manufacturers' telematics systems

As well as providing automatic engine cut off systems, a number of major vehicle manufacturers have developed their own bespoke CANbus based telematics solutions that include monitoring and reporting of excessive engine idling. Information is reported back to an on-line portal and performance reports across a wide range of KPIs can be produced. Depending on manufacturer, the telematic systems can be offered as an optional extra or as standard for vehicles supplied on service and maintenance contracts and may be suitable for fitment to vehicle from other manufacturers.

#### Case study – Jeffreys Haulage

Jeffreys haulage operate a modern fleet of 40 Tractor Units and 80 Trailers – all working on a UK wide distribution of palletised and non-palletised goods. Regular products carried include food, beverages, packaging, paper and electrical equipment.

By utilising the idling report functionality of their telematics system Jeffreys Haulage transport management team was able to identify inefficiencies due to stationary vehicles running their engines unnecessarily.

Steve Batkin, Group Operations and Customer Services Manager, Jeffreys Haulage Company Limited, says: "Even seasoned drivers were shocked by the number of hours they were letting their vehicles idle. On average this was as much as 8 hours in a week. Considering drivers are working an average of 240 shifts a year, then this idling time can have big implications to fuel costs and emissions.

#### Idle time

- 8 hours per week ≈ 1.6 hours per shift
- 1.6 hours per shift x 240 shifts per year = 384 hours per year
- Assuming 2 litres used per idle hour
- 384 hours per year x 2 litres per hour = 768 litres per year

Jeffreys haulage are now looking to implement anti-idling measures in its operations to help reduce harmful emissions and reduce its fuel costs.

Diesel price excluding VAT =  $\pounds$ 1.19/litre Meaning they were wasting £913 per driver each year!

## Procuring anti-idling technology

There are a wide range of options to suit all budgets and requirements and different technology may work better in some sectors more than others. Many systems are modular so the more functionality you choose the more expensive the product is think carefully about what you need and whether you will use all the functionality and data.

There is a growing choice of anti-idling technology available and the market place is very competitive, as such, it is important to choose the right solution for you and at the right price.

The flow chart opposite shows the key steps you should go through when procuring technology.

- Identify the need
- Select the right system for your operation
- Trial and implement across fleet
- Monitor, feedback and improve systems and performance

Previous experience shows that technology is often most successful when supported by driver training, league tables and incentives.

Reducing your fleet idling time is one way to reduce your fuel usage and costs. A reduction in fuel use can also be achieved through some of the following:

- Specifying your vehicles appropriately
- Making sure your vehicles are as full as possible can you fit two drops on the same vehicle?
- Reducing the air resistance of your vehicle (aerodynamics)
- Monitoring driver behaviour and training them in economic driving techniques

Improve your fleet efficiency, save money and help reduce your emissions: cut out idling!

A managers' anti-idling toolkit is available to assist commercial vehicle operators to implement successful antiidling campaigns and to assist with selection of appropriate technology. You can access the toolkit at www.fors-online.org.uk

Included in this toolkit is a Payback calculator that will provide you with indicative payback periods on a range of anti-idling focussed technology, aiding you in choosing the most appropriate equipment for your business.

Review your fleet requirements

Create your business case inc. payback time

Inform your drivers and workforce

Arrange a trial

Reveal trial performance and findings

Agree schedule and arrange fitting

Train out new equipment

Monitor performance and feedback regularly

