

Improving Fuel Efficiency



IRTE

engineering success



SOE (Society of Operations Engineers) is a professional membership organisation representing some 17,000 individuals and companies in engineering. It supports and encourages members throughout their careers and is committed to their ongoing growth and personal development.

Through a network of trustees, industry partners and members, SOE promotes best practice in operational and health and safety initiatives. SOE offers members Continuing Professional Development and support throughout their careers, providing definitive recognition for both achievement and status. The organisation is a Licensed Member of the Engineering Council and can nominate members for Engineering Council registration at EngTech, IEng and CEng levels.

SOE represents the Professional Sectors IRTE, IPlantE and BES and developed the technician-licensing scheme, irtec.

IRTE

IRTE (Institute of Road Transport Engineers), one of the most respected names in UK transport, has always been recognised as an impartial voice of the industry.

IRTE publishes an industry-leading technical journal, *Transport Engineer*, every month. Now online, www.transportengineer.org.uk contains daily online news updates, a news and feature archive, a supplier directory, e-zine newsletter, jobs, events, whitepapers and much more.

IRTE also hosts regular technical seminars and forums and works alongside the DfT to promote efficiency and best practice. Recent events include trips and falls from vehicles, truck operation, fuel efficiency and the Road Safety Act. IRTE's technical committee also produces regular industry guidance on key topics.

Recent published guides include *A Best Practice Guide towards Tachograph Systems Compliance*, *Roadworthiness: Industry Best Practice, Coupling or Uncoupling & Parking of Large Goods Vehicle Trailers* and *Tail Lift – Specification Guide for Road Vehicles*.

IRTE members come from a wide variety of transport-related roles. These include workshop managers, fleet engineers, transport managers, company directors, apprentices and technicians in the light and heavy goods vehicle and bus and coach sectors.

www.soe.org.uk/irte

This publication is a result of work conducted by the IRTE Technical, Publications and Government Liaison Committee. If you are interested in becoming involved with the committee, please contact Ian Chisholm, Head of Operations & Communications on 020 7630 1111 or email ian.chisholm@soe.org.uk.

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Preface

All manufacturers of interventions, whether in mechanical, electrical, additive or design form, claim to improve fuel economy, decrease fuel costs and in some cases, reduce exhaust emissions.

Not all interventions relate to engines or fuel fitments. They can be additives to oils, claiming reduced friction and therefore use less fuel, or vehicle design, such as teardrop trailer design.

All interventions should receive consideration, but it is particularly important a suitable process is in place to prove that the purchase and fitment of an intervention is justified and delivers all the seller's claims.

There are a number of points that need to be taken into account, and certain questions asked of the intervention's supplier/manufacture, before purchase and/or fitment.

The following simple guidance can be used to prepare the groundwork needed for a proper evaluation to take place.

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Warranty

A major point to consider when choosing an intervention device is the affect it will have on a vehicle's warranty. Below are some important factors to take into account:

- Does the intervention's manufacturer provide a warranty against any OEM system failure and/or damage caused by the intervention?
- Is there an agreement in place between the intervention's manufacturer and the vehicle/engine manufacturer with regard to fitment?
- What is the vehicle/engine manufacturer's view of the intervention, if appropriate? Have they carried out any evaluation on the device? If so, what were the results?
- How long is the warranty valid?
- If there is a failure to the engine or fuel system, will the intervention's supplier/manufacturer underwrite the failure/repair?
- Does the device have any adverse effect on the lubricating qualities of the injection equipment or component oils?



Photo supplied by Don-Bur

Tests

For an intervention to be seriously considered, it must have undergone up-to-date and accurate testing. Below are some important points that need to be verified:

Supplier/manufacturer testing:

- What evaluation has been carried out to date?
- What data is available?
- Are the tests and data reliable?
- Where were the tests carried out?
- Under what conditions were the tests performed?
- Were the tests carried out on the vehicle or the component in isolation?
- Was the test equipment calibrated before and after the test, to prove the standard and validity of calibration (e.g. fuel measuring, quality of fuel, temperatures, density, etc)?
- Who carried out the evaluation/test?
- Who was present?
- Is the test procedure recognised as a standard test and result process?
- Were the conditions strictly controlled?
- Were all of the 'variables' taken into consideration?
- Were any adjustments made between tests?

In the case of 'vehicle testing':

- Was it the same vehicle?
- Was it the same driver?
- Was it two vehicles (back to back)?
- Was it on-road testing or rolling road/vehicle dynamometer?
- Were the weather conditions the same?
- Was it the same weight and load profile?
- Was the same oil used (engine, gearbox, transmission)?
- Were the filters the same age?
- Was the same fuel used?
- Were the drivers aware of the device on either, or both, vehicles?

In the case of 'engine testing':

- Was the same load used?
- Was the same speed adhered to?
- Were the same fuels used?
- Were the same filters used?
- Was the same engine used (pre and post-intervention)?
- Were any adjustments made?
- Were temperatures controlled?
- Were all other components on the engine isolated (alternator, ac pump, cooling fan, hydraulic pump, compressor etc)?

Tests

Any factor that may have an affect on the test, such as additives (other than the intervention) or bolt-ons, must be excluded during testing.

Variables that can have an affect on a rolling road are:

- Tyres (type, pressures)
- Brake bind
- Transmission drag
- Pull down tension
- Driver.

When determining validity of testing, it is important to consider the following points:

- Test track trials should be under controlled conditions. Therefore, they should be at the same time/same days and, where possible, under the same conditions. All data should be supported with an accurate means of measurement, with calibrated equipment
- Recordings must be accurate and verified, such as including distance and warm-up period/process
- Weigh equipment must be accurate and reliable
- All tests must be witnessed and confirmed as true and accurate
- Were the tests carried out on current European vehicles/engines that have been tested and are currently in service?
- Some vehicle manufacturers have fuel systems that do not function with the standard test tank 'pick-up and return' system. In these cases, the manufacturer should be contacted to ensure the use of the test tank system
- When check-weighing the test tanks, each weigh must include the same components
- Before any test is carried out, the vehicle must be roadworthy, safe, in good running order and legal.

Once a suitable intervention has been researched (using the points mentioned above), it is important to plan a trial of the intervention on your own vehicle/fleet.

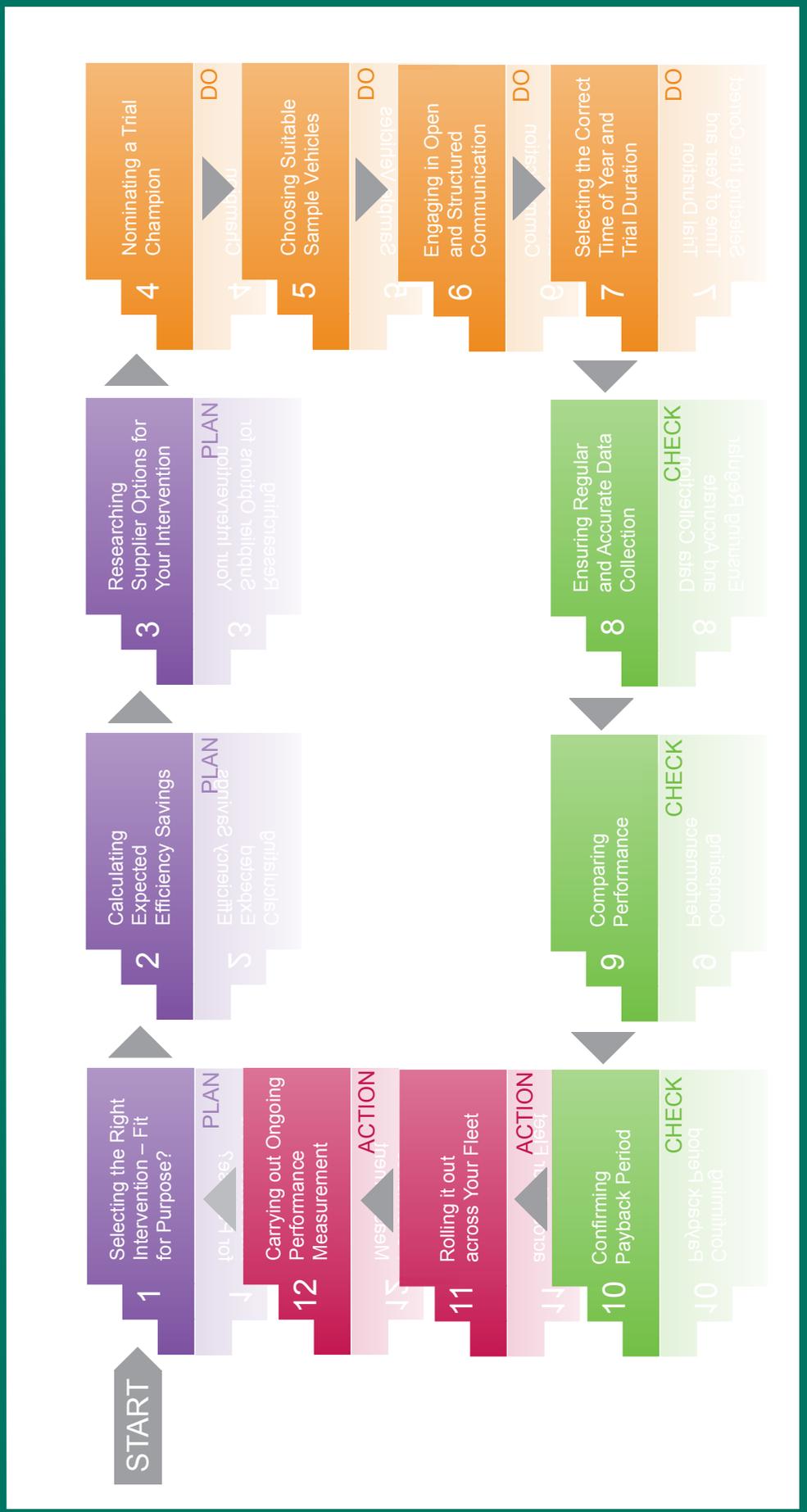
Freight Best Practice has devised a 12-step methodology process to help make planning as smooth as possible. The following image is a simple diagram outlining the process.

After undertaking each step, it is important to determine whether it is worthwhile continuing to the next step. If the trial is not going according to plan, it may be best to revert to Step 1, and test other interventions.

For more information on this process, we recommend the Freight Best Practice guide, Fuel Efficiency Intervention Trials – How to Test and Save (ISBN 978-1-848640-20-7).

12 Step Methodology for Conducting an Intervention Trial

Appendix 2 from the Fuel Efficiency Intervention Trials Guide



12 Step Methodology for Conducting an Intervention Trial

1. Selecting the right intervention – is it fit for purpose?

It is important to understand which efficiency intervention will most benefit your fleet.

2. Calculating expected efficiency savings

Once an appropriate efficiency intervention has been selected, calculate the expected efficiency savings it will bring.

3. Researching supplier options

There are several suppliers for each type of efficiency interventions. It is important to evaluate the relevant suppliers, determine a shortlist and choose which is best.

4. Nominating a trial champion

For a fuel efficiency trial to have the greatest chance of success, a 'trial owner' should be nominated to manage the process.

5. Choosing suitable sample vehicles

It is sensible to trial an efficiency intervention on a sample of your fleet, especially for larger fleets and those with different vehicle types.

6. Engaging in open and structured communication

A trial is more likely to succeed with the positive co-operation of all employees within the company. Open and structured communication can help achieve this.

7. Selecting the correct time of year and trial duration

The weather can play a significant role in the efficiency of a vehicle. It is widely accepted the winter months adversely affect vehicle fuel efficiency.

8. Ensuring regular and accurate data collection

A trial can only be judged successful if adequate data is obtained and analysed.

9. Comparing performance

An intervention cannot be judged successful if there is nothing with which to compare it.

10. Confirming payback period

Once initial results have been obtained from an intervention trial, the payback period should be confirmed for that intervention.

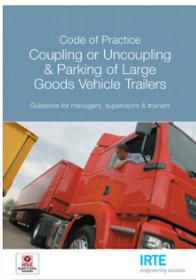
11. Rolling it out across your fleet

Following a sample trial, you should consider rolling out an intervention onto the fleet's other vehicles.

12. Carrying out ongoing performance measurement

Once an intervention has been rolled out across your fleet, it is important to continue to evaluate its performance.

IRTE publications



Coupling or Uncoupling and Parking of Large Goods Vehicle Trailers

The IRTE code of practice is aimed at managers, supervisors and trainers but has good advice for everyone who has responsibility for the safety of large goods vehicle and drivers.



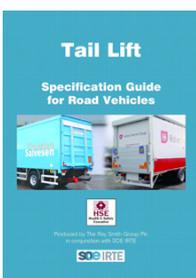
Wheel Security - A best practice guide

This guide explains the mechanisms of wheel loss and provides helpful best practice guidance to assist those specifying and maintaining commercial vehicles to reduce wheel loss incidents.



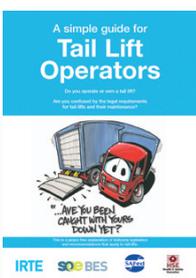
Maintenance Supplier Assessment

The IRTE's maintenance supplier assessment guide is aimed at those who contract out the maintenance of their fleet. It advises on best practice procedures to ensure the maintenance facilities of workshops used are adequate for the type and number of vehicles undergoing work.



Tail Lift - Specification Guide for Road Vehicles

Guidance for manufacturers, specifiers, installers, suppliers and users of tail lifts as to the safety issues associated with tail lift installations.

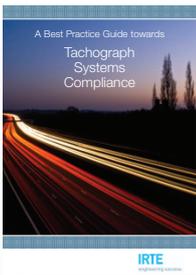


A simple guide for Tail Lift Operators

This guide provides some basic information and highlights the user's legal responsibilities in the use, maintenance and examination of tail lifts.

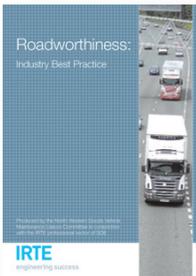
To order any of these publications, visit www.soe.org.uk to download a copy or contact the Technical Services Department on technical@soe.org.uk or 020 7630 1111.

IRTE publications



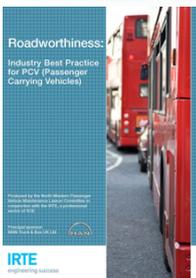
Tachograph Systems Compliance

In this indispensable guide, Senior Tachograph Consultant, Gordon J F Humphreys, explains what firms need to do to protect their Operator's Licence.



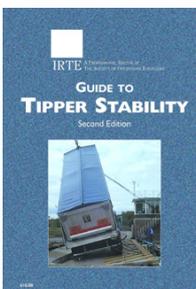
Roadworthiness Guide

This guide is intended to assist vehicle operators and managers, regardless of fleet size to improve their vehicle maintenance controls and standards.



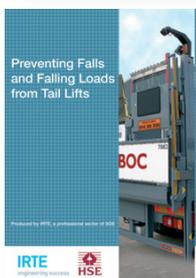
Roadworthiness: Industry Best Practice for PCV (Passenger Carrying Vehicles)

Produced with leading industry bodies, this guide gives advice on best practice so all passenger carrying vehicle operators can improve their vehicle maintenance controls and standards.



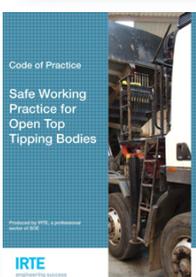
IRTE Guide to Tipper Stability

Essential guidance for those wishing to implement best practice when operating tipping vehicles or tipper trailers.



Preventing Falls and Falling Loads from Tail Lifts

Produced by the members of a Tail Lift Users Group, which included tail lift operators, manufacturers and HSE, to provide guidance for the prevention of falls and falling loads from tail lifts.



Safe Working Practice for Open Top Tipping Bodies

This Code of Practice provides guidance on the law, explains why accidents occur, and illustrates the need for procedures to ensure accidents involving tipping vehicles do not occur.

Sponsors

The SOE and IRTE professional sector thanks the following companies for their support in publishing this guide.



DON-BUR are the market champions for the design and manufacture of the complete range of commercial vehicle trailers and rigid bodywork. Their innovative and flexible approach to engineering and manufacture provides cost-effective distribution solutions to maximise operational efficiency and profitability.

The development of the Teardrop trailer (and now also Teardrop rigid bodywork) marked the beginning of a new era in commercial vehicle design. Driven by ever-increasing fuel prices and the need to reduce CO₂ emissions, the Teardrop provides a viable solution.

The streamline shape mimics that of the perfect aerodynamic lines of a water teardrop. With an optimised, full curve roof shape, drag is significantly reduced both on the roof and, more importantly, at the rear.

For more information, visit www.donbur.co.uk.

→ FreightBestPractice

Freight Best Practice is funded by the Department for Transport (DfT) to promote operational efficiency, safety, journey time reliability and CO₂ reductions within freight operations – road, rail and waterways. The programme identifies and disseminates best practice and offers FREE impartial information, support material and guidance.

For more information, visit www.businesslink.gov.uk/freightbestpractice or call the Hotline on 0300 123 1250

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