

# COMMON CENTS

## 75 TIPS TO MINIMIZE FUEL COSTS

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**W**ith the “new norm” cost of diesel at \$4 per gallon, fleets should look at every possible opportunity to lower fuel consumption. Like no other time in the trucking industry, every drop counts.

A tractor-trailer combo or driver able to improve fuel economy by a mile per gallon gained is huge in savings terms. The difference between 6 and 7 mpg on a power unit operating 120,000 miles annually is nearly \$12,000. Multiply that for a fleet with 100 trucks, and the savings come to \$1.2 million per year.

Unfortunately, there is no silver bullet or overnight solution when it comes to improving fuel economy. But by paying close attention to a number of small gains, fleets can find incremental ways to lower fuel costs effectively.

Understand that every aspect of a fleet’s organization can impact fuel costs – not just the driver. With that in mind, here are 75 useful tips that fleet managers, company drivers, maintenance managers and equipment purchasers can use to lower fuel costs.

### TIPS FOR FLEET MANAGERS

Fleet managers – including IT professionals, safety directors and operations managers – all can put pencil to paper and contribute to lowering fuel consumption by employing any number of strategies and technologies.

**1** **Investigate traffic problems, and plan around them.** Slow traffic not only sucks hours from a driver's on-duty time, it also requires more deceleration and acceleration, which requires more fuel. Check state U.S.

Department of Transportation Websites for potential construction projects and traffic on a route.

**2** **Use route-planning software or a GPS unit.**

Choosing the shortest, most practical truck route can save hundreds of dollars a year in fuel. Spoken turn-by-turn directions will take you directly to street-level addresses. With navigation, savings of 10 or 15 miles a week are possible by eliminating out-of-route miles.

**3** **Plan fuel stops carefully.**

Some in-cab navigation systems and smartphone apps include real-time information in their point-of-interest features to help drivers search for the nearest fuel locations and cheapest prices on their route.

## 4 CONSOLIDATE FUEL PURCHASES.

Fuel card providers have negotiated discounts with truckstops, but just as importantly, drivers and fleets can use the data they collect to compare and consolidate fuel purchases to negotiate more savings.



## 5 Renegotiate fuel surcharge agreements.

Technology enables carriers to create surcharge programs using lane-specific fuel prices and a daily reset.



## 6 BYPASS WEIGH STATIONS AND TOLL BOOTHS.

**Enrolling in programs such as PrePass and electronic toll collection systems can help drivers avoid burning extra fuel by stopping and then accelerating back to speed.**

**7 Analyze fuel consumption trends.** When mpg falls, try to determine why. Did you encounter more urban driving? Did your length of haul change? As a general rule, drops of more than 0.5 mpg are due to maintenance problems. ECMs can be wildly optimistic, so your actual mileage may be lower than indicated. Validate ECM readings with your own calculations based on the odometer and gallons purchased at fillup.

## 8 Isolate data and look for correlations.

ECMs record many things that can affect fuel economy. Look for noticeable changes in average speed, top gear time, diesel particulate filter regenerations, shifting and idling. Compare those trends with fuel economy during the same period.

**9 Check your fuel consumption by route.** If you have dedicated runs that can be made via either interstate or a shorter route with a lot of stop-and-go traffic, run trials for fuel usage and time to see which is the most efficient.

**10 Use fuel incentive programs.** Capture data to compare drivers against their peers based on mpg, idle time and other fuel metrics, and offer cash rebates and rewards for performance. Consider taking a team approach to encourage top-performing drivers to mentor less-efficient drivers. Don't rely solely on mpg as a measuring stick, as there are too many variables outside the driver's control.

**11 Be efficient across the board.** Fill trailers to capacity to haul more freight while burning less fuel and driving fewer miles.

**12 Consider trailer size and weight.** Are you getting the most out of 53-foot trailers? Or can you get by with a smaller trailer? Why burn fuel to haul a heavier trailer around if it's not needed?

## 13 Fuel efficiency may be a better calculation for your fleet instead of fuel economy.

Hauling 40,000 pounds at 6 mpg day in and day out may be better for your bottom line than hauling 30,000 pounds at 7 mpg.

**14 Consider other calculations to determine fuel efficiency.** Hours on the road per gallon instead of mpg may be a better measurement in some applications.

**15 Use reefer monitoring systems.** An often-overlooked expense is burning excess fuel to cool trailers.

Trailer monitoring systems capture the vital information needed to use no more fuel than necessary.

**16 Eliminate fuel theft.** Truckstops and fleets are beginning to use cardless systems with infrared technology and/or radio frequency identification that prevent fuel purchases from going into the wrong tank.

**17 Employ telematics.** To influence drivers, you need data points, which is why telematics have become so important in boosting fuel economy.

**18 Create driver scorecards.** Onboard computers capture a range of information on how drivers are performing. This information can be presented to managers and drivers in an easy-to-use scorecard format.

## FUEL TIPS

**19** **Locate trailers.** Have you ever spent time and fuel looking for a trailer in a parking lot? Trailer-tracking systems provide the trailer's precise location to remove all uncertainty.

**20** **Minimize distractions in the cab.** Lock out all in-cab interactive devices, including cell phones, to keep the focus on driving and fuel economy.

**21** **Use speed governors.** But recognize that they are unpopular with drivers, so take the time to communicate your reasons and objectives for spec'ing them.

**22** **Look for exceptions.** Set up instant alert notifications when any action is out of bounds. This strategy will ensure you have the information when you need it – now – rather than days or weeks after the fact.



### TIPS FOR DRIVERS

**Of all the factors affecting fuel economy, including aerodynamics and tire maintenance, more than a third are attributable to driver skills.**

**23** **Turn off the engine.** Drivers should avoid excessive warm-up times when starting the truck, even for a short time. Look for other times when drivers have a habit of idling.

**25** **Avoid revving the engine between shifts.** Ease into each new gear, and don't be in a hurry to climb through them.

**26** **Run in your engine's sweet spot.** Once you reach cruising speed, operating in the peak torque zone gives you optimum horsepower so that the engine runs most efficiently. It takes only about 200 horsepower to maintain 65 mph.

**27** **Minimize air-conditioning use.** Running the A/C delivers a 2/10- to 4/10-mpg hit.

**28** **Anticipate traffic lights.** If you can approach slowly and avoid a complete stop, it saves fuel and reduces equipment wear.

**30** **Lower your average highway speed.** Every mph over 55 equals a 0.1-mpg drop in fuel economy.

**31** **Don't punch the throttle.** Gradually put your foot into it, pretending there's an egg between the pedal and the floorboard. Use smooth, steady accelerator inputs to avoid fuel burn spikes.

**32** **Maximize use of cruise control.** That enables you to avoid wasteful throttle use to climb hills.

**33** **Use truckstops atop hills.** Driving uphill toward the truckstop allows natural deceleration, and going downhill to re-enter the highway requires less fuel.



### MAINTAIN AN EXTENDED FOLLOWING DISTANCE.

**It helps to prevent unnecessary acceleration due to frequent braking.**



### USE SHOREPOWER WHEN IT'S AVAILABLE.

Many inverters and auxiliary power units come with a plug-in option that converts incoming current to DC to charge the batteries, using AC to power climate-control units and/or in-cab accessories. The truckstop electrification movement to help eliminate idling has gained steam in the last year, with plug-in options available at many more parking spaces.

**34** **Avoid needless acceleration when not on cruise.** Don't hit the throttle too much when approaching the hill's crest. Instead, lay off the throttle and let the truck's momentum carry it over. Watch the boost gauge for an exact read of what you're doing.



### TIPS FOR MAINTENANCE MANAGERS

Next to driver behavior, a fleet's maintenance program has the next-biggest net effect on fuel economy. Routinely check systems and components that can affect fuel usage. Get your technicians and drivers on board by making sure they understand the value of their efforts, and give them the tools they need to do their jobs right.



### ADJUST SHIFTING PATTERNS.

Download engine data to compare shifting behaviors – rpms at shift point – to the optimal rpm "torque bands" for your engine. Adjusting your shifting to fit the engine's make and model can make a big difference. Every 1,000-rpm reduction in engine speed delivers a 1 percent fuel economy gain.

**36** **Keep up with oil and oil filter changes.** A well-maintained engine not only lasts longer, it also has a fuel efficiency edge.

**43** **Monitor tire pressure.** Each 10 psi that tires are underinflated reduces fuel economy by 1 percent. Check tire pressure during pretrip. Tire pressure monitoring systems can monitor the pressure of each tire and, through wireless communications, provide instant alerts through an in-cab display the instant a tire is underinflated.

**37** **Keep belts at proper tension.** Even slight slipping creates parasitic horsepower loss. Make sure all belts are tightened properly and in good condition.

**38** **Maintain fuel filters.** Clogged filters make the engine run rough and work harder. Replace according to the manufacturer's recommendation.

**39** **Maintain DPFs.** A plugged DPF hampers exhaust flow, which can lead to compression or combustion problems if left untreated.

**40** **Adjust the fifth wheel to narrow the truck-trailer gap.**

The ideal gap should be about 30 inches. Every 10-inch increase increases drag by 2 percent.



**41** **Use low rolling-resistance tires.** Deeper-lug tires usually last longer, but their extended tread has slight movement – enough to decrease fuel economy. Shallower lugs decrease rolling resistance and help improve fuel economy.

**45** **Match tires to your application.** If you're running long-haul routes and using tires designed for any other application, your fuel economy will suffer.

**46** **Get oil analysis.** The main value of routine analysis is identifying engine problems before they become serious, but some of those problems also can affect fuel usage.

### TIPS FOR EQUIPMENT PURCHASERS

While the initial investment may be steep, savvy equipment purchasers are proving every day that aerodynamic devices and sharp attention to tractor-trailer spec'ing can produce real savings when it comes to fuel consumption.

**47** **Buy a diesel-powered APU.** While your truck's engine can use a gallon of diesel an hour idling, recent estimates indicate a diesel APU burns only about a fifth of that.

**42** **RUN WIDE-BASE TIRES.** They have been proven to deliver better fuel economy than duals.



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## FUEL TIPS

**48** **Get an electric APU.** These systems typically use electric power from a bank of high-capacity absorbed glass mat batteries to power climate-control units and in-cab accessories. The systems currently on the market cost roughly half to two-thirds of most diesel APUs. They won't cover your power needs over a 34-hour restart, but for drivers getting home once a week, they could be more appropriate.

**49** **Purchase a diesel-powered heater.** Operators in northern climates may not need to shell out up to \$9,000 for a full-function diesel APU because a less expensive diesel-fired heater can keep the cab plenty warm while burning about a quarter of the fuel an APU uses.

**50** **Use a DC air-conditioner.** If your need for cooling when resting is low, battery-powered air conditioners can be paired with high-capacity batteries and a fuel-fired heater for a comprehensive cab climate-control alternative to idling.

**51** **Get an engine block heater.** If you find yourself operating in colder climates often and you idle a lot to warm your engine, you might save in the long run by getting a block heater.

**52** **Use an inverter.** It will convert direct current from your batteries to alternating current to power in-cab accessories. If your idle time needs are limited, an inverter can supply adequate electricity.



**53** **Use your reefer for climate control.** Some solutions allow you to harness the reefer unit's power capacity to function much as a diesel APU would – running cab accessories and climate-control devices when the truck is idle, as well as charging truck batteries.

**54** **Install an automatic engine start-stop system.** These can be set up to shut down the engine after a certain amount of idle time or, tied to a thermostat, to turn on when the cab goes above or below a certain temperature.

**55** **Switch to a daycab, and use motels.** If your operation doesn't require too many over-the-road overnight stays, not only would you save on the cost of a tractor by buying a daycab instead of a sleeper, the lower weight and reduced idling also could save fuel costs.

**56** **Add a roof fairing.** If you're running a flat-top or midroof tractor in a van or reefer application, an aftermarket roof fairing can smooth the airflow over the trailer, improving fuel efficiency. Some tests indicate that a full roof fairing, combined with side shields/extenders, can deliver up to a 15 percent improvement in fuel economy.

**57** **Install side skirts.** Many fleets have installed these on van and reefer trailers to minimize the drag produced by air swirling under the trailer. Side skirts can deliver a savings of 7.4 percent, according to U.S. Environmental Protection Agency-verified SAE Type II testing.

**ADD A TRAILER TAIL.** Aerodynamic trailer add-ons can reduce aerodynamic drag and help stability in crosswinds. The tail reduces the drag created by the vacuum at the back of a fast-moving tractor-trailer. Some fleets report a full 1 mpg boost from using a trailer tail combined with side skirts.

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### Shell ROTELLA® Energized Protection

#### Will low viscosity engine oils provide benefits for my engine and my bottom line?



By Dan Arcy  
Shell Lubricants

The reasons to switch to using lower viscosity, full synthetic or synthetic blend motor oils continue to build. The tried and true SAE 15W-40 conventional motor oils that many use has competition from lower viscosity grade oils that promote better fuel economy and other benefits.

A number of diesel engine manufacturers recommend lower viscosity lubricants in their newest engines, and the move to lower viscosity lubricants is reinforced by the recent announcement that one of the focus areas for the next generation of heavy-duty diesel engine oils will be fuel economy savings, which lower viscosity oils have demonstrated the ability to provide. This is particularly important as the first-ever fuel economy regulations for heavy trucks will begin in 2014.

Less energy is consumed when starting a cold engine when it is lubricated by a synthetic SAE 5W-40 than is consumed with a conventional SAE 15W-40. Lower viscosity oils also help reduce friction in an engine, which can result in fuel savings.

Anti-idling laws mean the days of 40 percent idle time are over. Idle times of 10 percent or less are now common, meaning more start-ups. The better cold temperature flow of a lower viscosity oil such as SAE 5W-40 full synthetic or SAE 10W-30 synthetic blend versus SAE 15W-40 will provide easier starting and faster lubrication in colder weather.

Low viscosity oils, Shell Rotella® T6 Full Synthetic SAE 5W-40 or Shell Rotella® T5 Synthetic Blend SAE 10W-30 have been shown to deliver fuel-economy savings, extended-drain capability, enhanced engine cleanliness, and excellent wear protection.



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The term "Shell Lubricants" refers to the various Shell Group companies engaged in the lubricants business.

## FUEL TIPS

### 59 Choose a lower sleeper roof.

The stand-up sleeper with a full roof fairing is not always the most fuel-efficient choice when it's not paired with a dry van or reefer. In liquid bulk operations, spec'ing a midroof sleeper or searching the used lots for one is going to be your best bet for aerodynamics. In most flatbed applications, loads are unlikely to rise above the height of a midroof setup. For some high-density-load haulers, a flattop may be the best choice.

### 60 Use rounder mirror backs.

If you're using old-style flat West Coast mirrors for the side views, consider moving to mirrors with a more rounded back to further enhance airflow.

### 61 Dress your tanks with aero steps.

Fuel tank fairings paired with steps that smooth airflow over the tractor's lower side can improve fuel performance by 2 to 3 percent.

### 62 Use dry van gap fairings.

At the front of dry vans, gap fairings ease airflow over the tractor-trailer gap. This can boost fuel efficiency by 1 percent when paired with a highly aerodynamic tractor with a tight truck-trailer gap length.

### 64 Use cab side extenders.

For tractors not already optimized for aerodynamics, installation of cab side extenders can create a smoother airflow around the tractor-trailer gap. Makers estimate a fuel efficiency improvement of 1 to 3 percent.

### 65 Add a nose cone fairing.

For flat-top or midroof tractor owners pulling dry vans, nose cone fairing technology combines the vertical fairing of more standard tractor-trailer gap technology with an outsize fairing at the top to direct air both over the trailer and down and around the sides.

### 66 Install airtabs on the hood, along the sides and at the top rear of the tractor and/or trailer.

Each one creates vortices that combine to reduce the suction and drag at the rear of vehicles traveling at speeds above about 35 mph. Based on a study involving Britain's Institute of Road Transport Engineers, the technology can produce fuel savings of 2 to 4 percent.

### 67 Choose aero or porous mudflaps.

These can help reduce drag.



### 63 COVER WHEEL HUBS.

Hub manufacturers estimate 1.5 to 3 percent in fuel savings when all outside-facing wheels are outfitted with the devices, which smooth airflow across the wheels.

## FUEL TIPS

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**68** **Use aluminum wheels.** The weight reduction relative to steel brings better fuel economy and also can mean a payload increase.

**69** **Choose a 13-liter engine over a 15-liter.** Unless your application absolutely needs the extra muscle, there is a considerable fuel savings with the smaller engine.

**70** **Choose trucks with lighter specs.** Having 2,000 extra pounds results in a 0.1-mpg hit.

**71** **Use a hybrid in city operations.** They can cut fuel consumption as much as 50 percent in pickup-and-delivery applications. Return on investment is about 12 to 13 years, but federal and state incentive programs can reduce that. California offers a \$25,000 incentive for the first hybrid purchased and \$20,000 for each hybrid thereafter.

**72** **Choose a truck with smaller fuel tanks.** Fuel weighs 7 pounds per gallon, so a smaller tank can cut weight significantly.

**73** **Spec the optimal gear ratio.** Gear ratios can be optimized for a variety of applications. For most trucks, 3:08 is a highly efficient highway ratio, says the American Trucking Associations' Technology & Maintenance Council.

**74** **Use an automated manual transmission.** Don't let acquisition costs scare you off. These transmissions have been

proven to deliver vastly better fuel economy than manual transmissions, especially for novice drivers.

**75** **Standardize powertrains to increase driver efficiency.** If your drivers always are driving the same kinds of trucks with the same kinds of powertrains, they will be more efficient because you're removing variables that can impact fuel economy.

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