



Press information

Major test reveals that simple measures can cut fuel consumption by almost 15 per cent

A truck rig can cut its fuel costs by EUR 8,000 annually if it is run with optimised wheel alignment and the correct tyres and correct tyre pressures. This was shown in a test that tyre manufacturer Michelin carried out together with Volvo Trucks.

Fuel accounts for one-third of a truck's operating cost. If we assume that the average European long-haul truck covers 160,000 kilometres a year and consumes 30 litres of fuel per 100 kilometres at a diesel price of EUR 1.1 per litre, the annual cost for fuel is more than EUR 50,000. Fortunately, it does not take any scientific revolution to make a significant cut in this cost.

"When we visit customers we often notice uneven tyre wear on trucks and trailers. This is a sure sign of incorrect wheel alignment," says Arne-Helge Andreassen, business area manager for tyres and wheel alignment at Volvo Trucks' Aftermarket department.

The fact is that two-thirds of Europe's truck rigs are driving around with incorrect wheel alignment. This together with inappropriate tyre type and incorrect tyre pressure results in significantly higher fuel consumption.

In order to obtain factual data on just how much these factors affect fuel consumption, Volvo Trucks worked together with tyre manufacturer Michelin to carry out a large-scale test at Hällered, Volvo's test circuit in Sweden.

"We have a responsibility for the truck's cost throughout its lifetime. It's not enough to just build fuel-efficient engines, at Volvo Trucks we work consistently and in different ways to reduce our vehicles' fuel consumption – even after they have been delivered to the customer. The aim of these tests was to give haulage firms reliable evidence of just how much money they can save," explains Arne-Helge Andreassen.

The tests used two identical Volvo FH 4x2 trucks, each equipped with a 500 hp 13-litre Euro 5 engine and hauling a three-axle fully loaded van-bodied trailer. The rigs each weighed 40 tonnes gross.



Over a two-week period, the trucks underwent a wide range of tests. One rig was driven with various incorrect wheel alignment settings.

“If a trailer’s rear wheel points towards the kerb, this means the front of the trailer is being pushed out towards the middle of the road. This in turn means that the trailer is moving ahead diagonally and acting like a massive sail, capturing the wind. Just look at the roads, one can see plenty of truck rigs crabbing along diagonally,” says Per Nilsson from TruckCam, the company that provided the measurement and calibration equipment used in the test.

“For instance, both wheels should have a 1 millimetre toe-in, that is to say they should point slightly inwards at the front in a somewhat pigeon-toed stance,” he explains. “As the truck picks up speed and cruises along at 80 kilometres an hour, the wheels are pressed outward until they are precisely parallel.”

The rig was also run with different tyres and different tyre pressures.

The second rig served as reference vehicle and was consistently run with optimally aligned wheels.

“One-third of fuel consumption stems from the tyres’ rolling resistance. Having the right tyres is of paramount importance. And checking tyre pressure – which has a significant effect on fuel consumption – is also important,” says Jacques de Giancomoni, Technical Account Manager at Michelin.

The trucks were not only equipped with fuel gauges but also with special instruments that monitored exact speed, tyre wear, tyre pressure, rolling resistance and so on.

Prior to each test cycle the two rigs were first driven for one hour on the track to warm up the engine, transmission and rear axles in order for the tests to be as reliable as possible.

The total mileage for the test cycles was just over 1,000 kilometres. Analysis of the vast amount of data gathered reveals that there can be a fuel consumption difference of as much as 14.5 per cent depending on how the wheels are aligned and equipped. Choice of tyre can cut consumption by as much as 11 per cent, correct tyre pressure brings a reduction of 1 per cent, while adjusting wheel alignment can cut fuel consumption by 2.5 per cent.

This means that some rigs have the potential for reducing their fuel consumption by almost 15 per cent. Which, in cash terms and based on the example above, means a



reduction of EUR 8,000 in the truck's annual fuel bill.

“There is every reason for all haulage firms to take a closer look at this. Volvo Trucks has 1,100 workshops throughout Europe. We're now going to see to it that they all receive this information. When a customer comes in to us with a truck and trailer they will get the very best help imaginable,” says Arne-Helge Andreassen.

Mats Lidbeck from SP (the Technical Research Institute of Sweden) was on location to ensure that the tests strictly adhered to scientific protocol.

“We serve as a guaranteed neutral third party in this type of test procedure. This means that we review all the measurement methods and ensure that the engineers have taken account of all the important parameters. For example, that the instruments used are suitable and correctly calibrated, that the test methods are duly followed, that sufficient numbers of correct parameters are measured,” he explains.

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Captions:

T2010_1278

Jacques de Giancomoni, Technical Account Manager at Michelin.

T2010_1286

Mats Lidbeck of SP, the Technical Research Institute of Sweden

T2010_1287

Arne-Helge Andreassen, business area manager for tyres and wheel alignment at Volvo Trucks' Aftermarket department.

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The tests were carried out over a two-week period at Volvo's proving ground in Hällered, Sweden.

T2010_1289, T2010_1290, T2010_1291

The test programme used two Volvo FH 4x2 trucks, each equipped with a 500 hp 13-litre Euro 5 engine, and each hauling a fully loaded van-bodied trailer. The rigs each weighed 40 tonnes gross. One rig served as a reference vehicle. In order to provide comparative data the second vehicle was driven with different tyres, different tyre pressures and varying wheel alignment settings.

T2010_1283, T2010_1284, T2010_1288



Different combinations were tested. Between the test cycles, the engineers replaced the tyres and adjusted tyre pressures and wheel alignment.

T2010_1285

Per Nilsson From TruckCam.

Link to pictures:

http://icp.llr.se/CumulusE_Z/VTC_ImageGallery/Login2.jsp?assets=T2010_1287;T2010_1278;T2010_1286;T2010_1279;T2010_1289;T2010_1290;T2010_1291;T2010_1283;T2010_1284;T2010_1288;T2010_1285.tif

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