

Aerodynamic Test Methods

Wind tunnel tests when using a smoke wand can create an instant visual indicator of exactly how air is flowing over an object and can be very useful when comparing a non aerodynamic counterpart side by side, but this test does not establish a fuel consumption differential.

Very technical fluid dynamic modeling through software can establish very accurate drag coefficients and fancy animated computer graphics. These models when done scientifically can establish very accurate technical data. We have seen beautiful animated graphics that unfortunately are not backed by true scientific formulas.

We understand that fleets have many different configurations of equipment, geographical terrain, prevailing winds, and large temperature changes. These factors can alter the efficiencies that maybe realized in our products, however we have been able to establish significant measurable fuel consumption savings using a fuel test procedure described below.

The Society of Automotive Engineers (SAE) Document number J1321 is an industry standard test for measuring fuel efficiencies attributed to aerodynamics. An independent third party company conducted this test procedure following strict protocols to help us establish a test result of 2.33 percent reduction in fuel consumption when using the Aerotech Caps on tractor and trailer tandems.

The SAE test requires that two identical trucks must be used and run one entire leg to establish a base line differential, which must be less than two percent. Through the remainder of the test procedure several more runs were made with one modified truck and one unmodified truck. The purpose of the unmodified truck is to establish environmental changes through out the test. The changes in the unmodified truck were used to correct the actual fuel savings from the Aerotech Caps due to environmental changes such as wind and temperature. At the end of each leg the fuel was weighed to a fraction of an ounce, from a closed loop removable fuel tank from each truck. At the conclusion of the test, which must be completed in the same day, all of the fuel consumption data was compiled to derive the 2.33 percent savings in fuel consumption by weight.

For comparison purposes the ECM data from the engines of each truck was downloaded it showed a difference of 2.44 percent over the four test legs.

The test was performed in Southwest Michigan on a light wind day with temperatures between seventy and eighty degrees Fahrenheit. The test trucks were Freightliner tractors with fifty three foot dry vans. All the tires were super singles, cruise control was set at 65 mph after standard shift practices. The course was 53 miles long with a total of six legs. Great care was taken to avoid any drafting, or engine breaking. Additionally hub temperatures were measured on the truck with and without caps. The hubs with caps were consistently five degrees warmer, than hubs without. This is a negligible number with regard to any performance or safety concerns.

The SAE protocol established a 2.33 percent average for the test. The ECM data differential from the two trucks was 2.44 percent. These are real numbers from real trucks on real highways.

We invite you to conservatively use 2 percent when calculating your fuel savings, you will see a return on investment faster than any aerodynamic device available on the market today.