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Reducing  
Aerodynamic  
Drag And Fuel  
Consumption

# **Reducing Aerodynamic Drag And Fuel Consumption**

Technologies and  
Approaches to Reducing  
the Fuel Consumption  
of Medium- and Heavy-  
Duty Vehicles Methods  
for reducing the  
aerodynamic drag of

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vehicles The  
Aerodynamics of Heavy  
Vehicles: Trucks,  
Buses, and Trains The  
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of Aerodynamic Drag  
Reduction on a Full-  
scale Tractor-trailer.  
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Effectiveness, and  
Deployment of Fuel  
Economy Technologies  
for Light-Duty Vehicles  
A Method for the  
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Aerodynamics Drag

Optimization of Light

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Dynamics Assessment

of Fuel Economy

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Road Car Review of the  
21st Century Truck  
Partnership  
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Emissions of Medium-  
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Vehicles, Phase Two

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Vehicle Aerodynamics  
How to reduce your  
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*Understanding  
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Drag Formula* Two new  
patents on front-end car  
airflow Five ways to  
reduce your car's drag  
Aerodynamic drag and

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~~lift of different car body shapes Measuring aerodynamic drag on the road Testing a box~~

*cavity to reduce drag*

*Designing aerodynamic undertrays for reduced lift and drag*

*Aerodynamic Drag - Explained Reducing wake size*

*Understanding drag coefficient and frontal area in cars Reducing*

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lift on sedans Improving  
intercooler flow using  
turning vanes

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How do Vortex  
Generators Work? How  
do Vortex Generators  
Work? Improving  
airflow through engine  
bay intercoolers Car  
Aerodynamics in a  
Wind Tunnel

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Avoiding aero  
modification BS! Why  
**many aero diffusers**



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~~Aerodynamic~~  
~~How~~

~~Effective is a Flat~~  
~~Floor? (on cars) The~~  
~~Beginners Guide to~~

~~Aero Modifications for~~

~~your Car~~ *Air curtains to*

*reduce aerodynamic*

*drag in cars Making*

*aerodynamic undertrays*

*to reduce lift and drag*

HPC in Action: Navistar

~~Aerodynamic Drag~~ *The*

*simplest, most effective*

*aero modification you*

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*can make - just do it!*

## **How Does Weight Loss Effect Aerodynamic drag?**

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Using a roof extension  
to reduce aerodynamic  
drag *Types of*

*aerodynamic drag in a  
road vehicle* **Reducing**

**Aerodynamic Drag  
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Reducing Aerodynamic  
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sufficiently close spacing—less than one vehicle length in the case of a car, or one vehicle height in the case of a truck—the interaction is stronger. Pressure is higher in the “cavity” than would be experienced by a vehicle in isolation.

## **Reducing Aerodynamic Drag**

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## **Reducing Aerodynamic Drag And Fuel Consumption**

Aerodynamic drag is the force that opposes the direction of motion of the vehicle. In order to incorporate inverted wings onto race cars

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without the sacrifice of too much induced drag, engineers devised methods of decreasing drag, thereby decreasing the engine power needed to maintain the vehicle at a certain speed. By reducing the drag on a car, the corresponding fuel economy would increase.

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## **Drag Reduction: The Pursuit of Better Fuel Economy – USC ...**

A reduction of 26% in vehicle aerodynamic drag factor can be obtained by installing a full-size rear fairing. A rear fairing having half the length of its vehicle model can reduce the drag factor by up to 22.6% and quarter the length will provide a

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16.1% reduction. of air.

## **Methods for Reducing Aerodynamic Drag in Vehicles and thus ...**

The overall aerodynamic drag force is reduced by eliminating wake region at the rear. side of the car and reducing pressure in the front region of the car by delaying the flow



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separation. This improves the overall aerodynamic performance of the car thereby reducing fuel consumption, as well as.

## **Reduction of Aerodynamic Drag Force for Reducing Fuel ...**

2) Gap Seals. The gaps between flight control surfaces and a wing are

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perfect spots for drag creation. Airflow moves from areas of high pressure to low pressure through these small gaps, making airflow turbulent, and increasing drag. Some manufacturers install gap seals on their aircraft to counter this problem.

## **6 Design**

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## **Improvements That Reduce Aircraft Drag | Boldmethod**

When an 18-wheeler travels on the highway, more than 50% of its fuel use goes toward reducing aerodynamic “drag.” Cutting the drag on trucks will also cut down fuel consumption. Lawrence Livermore National Laboratory in California is studying

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## **How Better Aerodynamics Lead to Fuel Savings**

You can reduce your vehicle's aerodynamics by: Lifting it — "an inch of increased ride height degrades the coefficient of drag by about 10 drag counts [.01]," says

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Wegryn. Adding wider  
tires

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**Improving  
Aerodynamics to Boost  
Fuel Economy |  
Edmunds**

Recently, Wabash  
National Corp. unveiled  
three new solutions  
designed to significantly  
improve trailer  
aerodynamics and fuel  
economy: the Ventix

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DRS (drag reduction system) utilizes a patent-pending segmented design to manage air flow across the entire length of the trailer and eliminate drag points; an aerodynamic tail device, named the AeroFin, manages airflow across the rear of the trailer to reduce aerodynamic drag; and the lightweight AeroSkirt

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CX, a trailer side skirt  
that provides up ...

**Investing in  
aerodynamics to  
improve your fuel  
efficiency**

If you reduce drag, you  
can maintain the same  
speed for less fuel or use  
the same amount of fuel  
but travel faster. And a  
more streamlined rig is  
safer and has more

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stability at all speeds  
above 55 km/h or 35  
mph. Where to get the  
best payback when you  
streamline your RV

There are three key  
areas for drag:

## **How to: Streamline your RV and Save Fuel**

Aerodynamic drag is  
mainly ensuring such  
things as proper door



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gaps, etc. Other possibilities are wheel pants or STC mods that can smooth out your aerodynamic posture. And, of course, speed is the biggest consideration. I know we fly to get someplace quickly. But running at 65% power will reduce fuel burn significantly over 70%.

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## **Tips to improve fuel efficiency in your airplane — General ...**

The reduction of aerodynamic drag allows not only increasing profit margin of vehicle operation but also reduces energy consumption and greenhouse gas emissions. In order to minimise aerodynamic drag and thereby fuel

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Reducing  
consumption,  
streamlining the body  
shape and minimising  
flow separations are  
paramount.

**[PDF] Implication of  
Vehicle Aerodynamics  
on Fuel Savings ...**

For passenger cars this  
means that  
aerodynamics is  
responsible for a much  
higher proportion of the

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fuel used in the highway cycle than the city cycle: 50% for highway; versus 20% for city.

This means that if you make a 10% reduction in aerodynamic drag your highway fuel economy will improve by approximately 5%, and your city fuel economy by approximately 2%.

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## **The Effect of Aerodynamic Drag on Fuel Economy | ARC**

But with gas soaring past \$4 a gallon in the United States, a new type of hot rodding has taken hold with the growing cognoscenti of aeromodders. Instead of tuning for quicker quarter-mile time...

### **5 Real DIY**

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## **Aerodynamic Mods Detroit Can Add for MPGs in '09**

Designed to fill the area between the tractor and the front of a dry trailer, helping to shield from crosswinds and reduce drag on the front of the trailer. Wheel covers and mudflaps. Help reduce turbulence and drag around the wheels, which helps improve

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fuel efficiency. Often, different types of aerodynamic devices will complement each other.

**Improve efficiency  
with trailer  
aerodynamics | Vehicle**

...

Put simply, aerodynamic drag is a force on your truck that requires your truck to

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Aerodynamic devices use energy to overcome it. That energy means unnecessary fuel use for your tractor trailer.

Aerodynamic devices that promote tractor trailer aerodynamic drag reduction, then, can provide greater fuel efficiency for your trucks. What Is Aerodynamic Drag?

**Understanding**

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## **Aerodynamic Drag & How It Impacts Your Truck**

The 21st Century Truck Program, an industry-government collaboration, has established an aerodynamic drag reduction goal of 20% for Class 8 tractor-trailer combinations. With assistance from DOE's Inventions and

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Innovation Program,  
SOLUS Solutions and  
Technologies LLC has  
developed several low-  
cost aerodynamic  
devices that reduce drag  
and improve fuel  
economy for tractor-  
trailer trucks.

**Advanced  
Aerodynamic  
Technologies for  
Improving Fuel ...**

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It is the highway where the car experiences the maximum amount of the drag, and in the city, the effect is marginal. In other terms, when the aerodynamic drag is reduced by 10% the fuel economy experiences a 5% increase out on the highway. But in the city, the gain is of about 2%.

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