

MAN Concept S Advanced Aerodynamic Tractor-Trailer

Peter Lobner, 2 April 2020

German heavy truck and bus manufacturer MAN unveiled its Concept S aerodynamic tractor-trailer at the IAA (Association of the Automotive Industry) 2010 exposition in Hanover, Germany. This concept truck had a claimed drag coefficient (C_D) of 0.29, which is a great improvement over a conventional 40-tonne European tractor-trailer with a C_D of more than 0.6. The extremely low drag coefficient was achieved with an aerodynamic tractor and an irregularly-shaped cargo trailer that offers the same interior volume as a conventional rectangular trailer. Based solely on its aerodynamic refinements, the Concept S offered a 25% improvement in fuel efficiency over a conventional tractor-trailer.

While the Concept S design showed what could be achieved in drag reduction, the irregular trailer shape ran counter to industry-wide logistics practices that expect standard size, rectangular cargo compartments on heavy trucks.



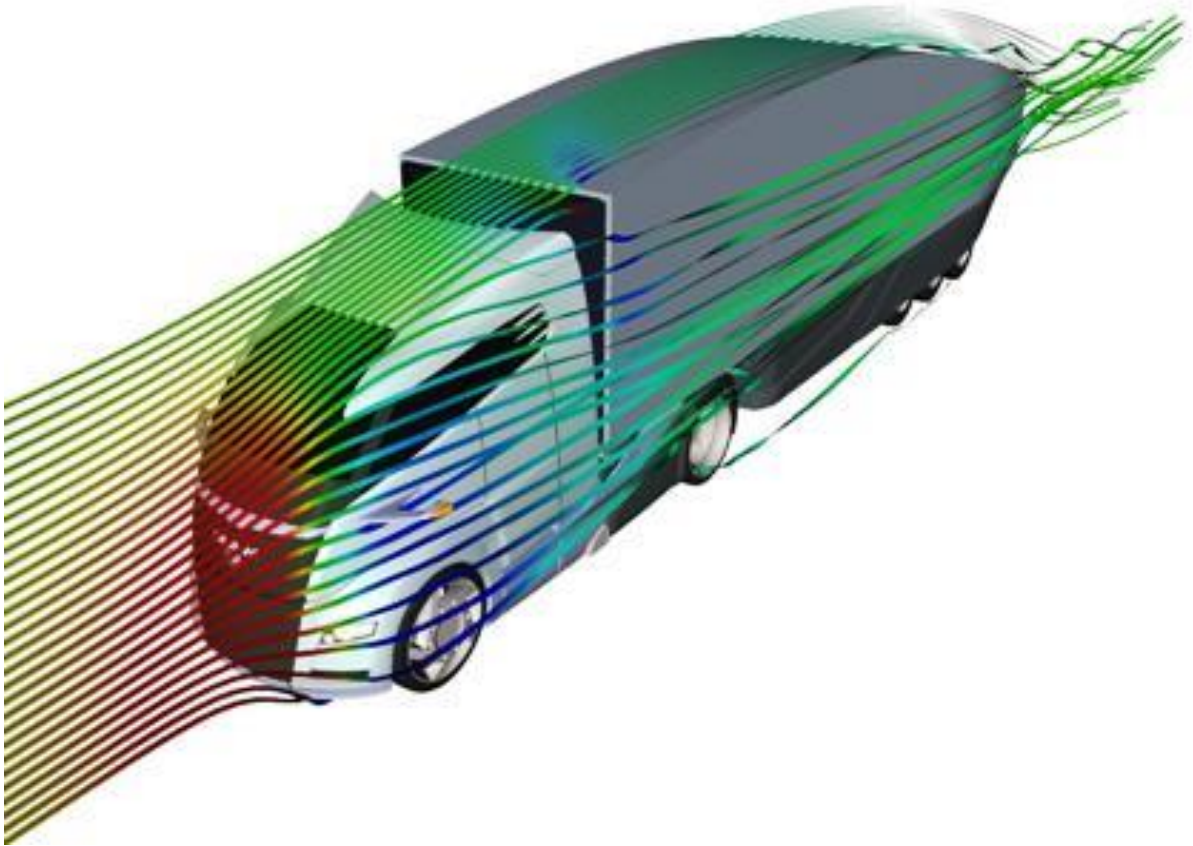
*MAN Concept S aerodynamic tractor-trailer design concept.
Source: MAN via The Truth About Cars, 5 Dec 2009*



*MAN Concept S tractor, side view.
Source: Truckplanet.com, 2010*

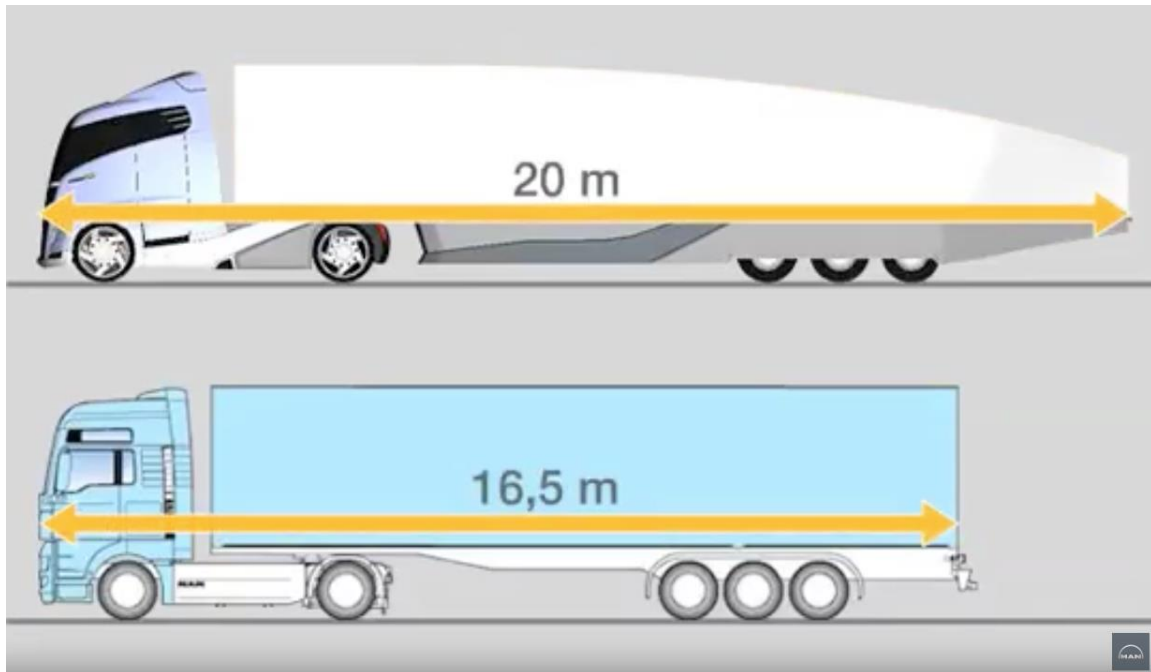


*MAN Concept S tractor, rear quarter view.
Source: Source: Truckplanet.com, 2010*



*MAN 2009 Concept S aerodynamic tractor-trailer design concept illustrating airflow optimized for minimum drag.
Source: MAN via The Truth About Cars, 5 Dec 2009*

At 20.3 meters (66.6 ft) in length, the MAN tractor-trailer (dubbed the “Spacetruck”) exceeded the 18.75 meters (61.5 ft) maximum overall length allowed by EU Directive 96/53/EU, thereby prohibiting its use on the road (same issue as the Mercedes-Benz Aero Truck and Trailer). In 2010, TruckPlanet.com reported: “In order to realize the efficiency potential proven by the Concept S, tractors and trailers will have to become longer if they are going to provide the accustomed amount of interior space and loading volume. Changes to the road infrastructure for this purpose will not be necessary.”



*Comparison of MAN Concept S and a conventional European tractor-trailer. The EU legal length limit is 18.75 meters (61.5 ft).
Source: Screenshot from MAN video.*



*MAN aerodynamic comparison of the Concept S and a conventional European tractor-trailer, which has a large, low-pressure area (blue area) behind the rectangular trailer.
Source: Screenshot from MAN video*

The completed MAN Concept S truck was unveiled at the IAA's 2012 exhibition in Hanover with a less extreme, but still highly aerodynamic trailer developed by Fahrzeugwerk Bernard Krone GMBH (Krone).

The Krone trailer was designed to meet all the requirements for loading and unloading at ramps and was equipped with a tailgate that could be raised during cargo handling.

You can watch the unveiling at the IAA 2012 exposition here (narrated in German):

- “MAN Concept S und Krone AeroLiner” (2:04, in German), October 2012:
<https://www.youtube.com/watch?v=a8Kw1ZPe4Ho>

After the unveiling, *Trucks and Trailers Magazine* declared that “the designers at MAN have made perhaps the most beautiful truck ever built.”

MAN did not continue development of an EU street-legal prototype.



MAN Concept S tractor with Krone AeroLiner trailer at the IAA 2012 exhibition in Hanover, Germany. Source: Spielvogel via Wikipedia



MAN Concept S tractor with Krone AeroLiner trailer at the IAA 2012 exhibition. Note the rear-facing video cameras replacing the side-view mirrors. Source, both photos: Spielvogel via Wikipedia



*MAN Concept S tractor with Krone AeroLiner trailer
at the IAA 2012 exhibition.*

Source, both photos: Spielvogel via Wikipedia

More information on the MAN Concept S truck and Krone Aero Liner trailer is available at the following links:

- “Aero Liner + Concept S – Future already starts today,” Fahrzeugwerk Bernard Krone GMBH: http://int.krone-trailer.com/fileadmin/contentmedia/pdf/prospekte/aero_liner_en.pdf
- “MAN Concept S”, Truckplanet.com, 2010: <https://www.trucksplanet.com/catalog/model.php?id=701>

The following short YouTube videos also provide more information on the MAN Concept S truck and Krone Aero Liner trailer:

- “The future of the semitrailer tractor: MAN Concept S” (1:54 minutes), 2011: <https://www.youtube.com/watch?v=akUvpkQtep4>
- MAN Concept S truck with Krone AeroLiner” (0:26 minutes), 2014: <https://www.youtube.com/watch?v=s71baGQPSrk>
- “KRONE Aero Liner” (4:53), 2014: <https://www.youtube.com/watch?v=eKAS5V8NUyI>
- “MAN Aerodynamics” (2:56 minutes), 2016: <https://www.youtube.com/watch?v=NPNiyR5cWo>