Blade cuts fuel bill

AN ENGINE cooling fan can save fuel? Who knew?

A fan maker believes it can and that its approach will help off-highway diesel engine makers in the US and Europe meet tighter emission standards.

A group of Multi-Wing engineers have designed an engine cooling fan that creates 20% more static pressure and delivers 5-7% better efficiency than a standard airfoil fan.

This means fuel and horsepower savings.

Called Pressuremax, the fan is designed to fit tight spaces.

It has a low-noise airfoil blade design with virtually zero blade deflection.

Looming emissions standards call for stringent reductions in particulate matter and polluting gases such as nitrogen oxides. This has created unprecedented challenges.

In answer to this Multi-Wing set out to develop a better engine cooling package.

Its engineers had to face challenging tasks such as higher heat rejection requirements and higher ambient temperatures, as well as emissions treatment technologies that occupy up to 25% of the engine bay.

This led them to develop a narrow-profile axial fan that generates higher static pressure in a limited cooling envelope.

Multi-Wing's engineers started their pursuit in 2010 after receiving entreaties from the company's diesel engine partners.

The aim was to gain maximum static pressure, maximum efficiency and zero blade deflection – all while limiting the amount of noise the fan made.

They had to move beyond conventional fan design and came up with a three-step iterative design process. This used technologies such as optimisation and computational fluid dynamics.

Multi-Wing R&D engineer Toni Stannov said the first step was to adapt an existing blade design of a low-noise airfoil profile.

The team then used an advanced optimisation algorithm to create the new blade.

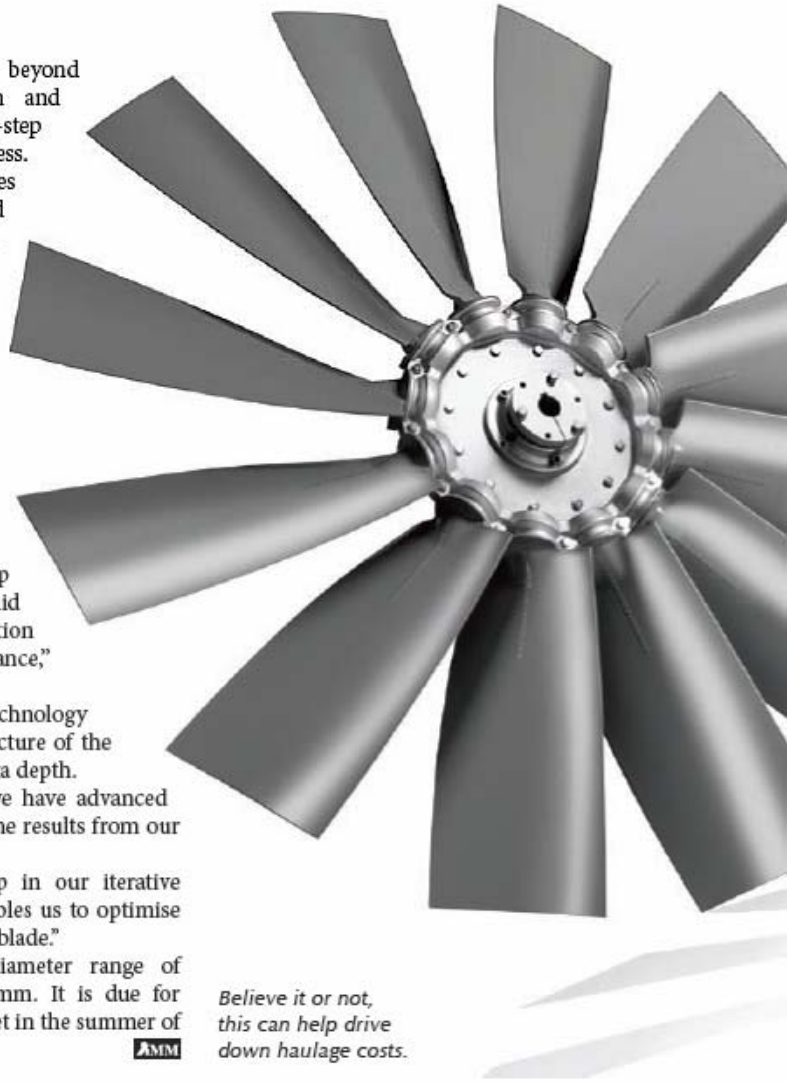
"The second step involved computational fluid dynamics pre-qualification of the blade performance," Stannov said.

"Our advanced technology gave us a very detailed picture of the performance and great data depth.

"In our wind tunnel we have advanced test equipment to verify the results from our CFD calculations.

"This is the third step in our iterative design process and it enables us to optimise on specific sections of the blade."

Pressuremax has a diameter range of 627 millimetres to 1295mm. It is due for release to the global market in the summer of 2011-12. AMM



Believe it or not, this can help drive down haulage costs.