Charge Air Cooler

REDESIGNED FOR IMPROVED DURABILITY

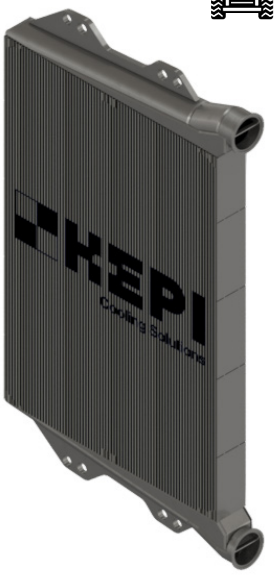
CASE STUDY

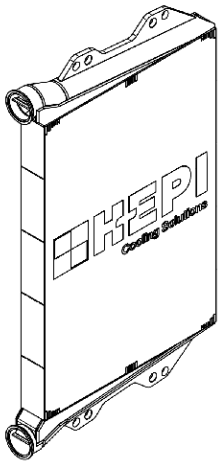
Location | Queensland, Australia

Application | CAT 793F

Product | Charge Air Cooler (Aftercooler)

HEPI Cooling Solutions





OVERVIEW

HEPI's Cooling Division Engineering team has successfully redesigned a problematic OEM charge air cooler to significantly improve crack resistance and extend product life in demanding applications. This engineering revision is not only a technical breakthrough but a strategic step in expanding HEPI's presence in the North American market with a high-performance alternative for mining fleets.

SITUATION

The original charge air cooler installed on early Cat 793F Haul Trucks was prone to premature failure due to cracking in the cast tanks, particularly in severe operating conditions. Although later models featured improved components, high failure rates persisted — often before the end of a single engine life cycle. This continued performance issue presented a clear opportunity for HEPI to deliver a more reliable solution.

SOLUTION

Using advanced design tools, the HEPI Engineering team conducted detailed CAD modelling, finite element analysis (FEA), and fluid flow simulations to understand and address the root causes of failure. The result is a fully redesigned cooler with several key structural and performance improvements, including a proprietary manifold design.

- Fully fabricated manifolds in high tensile alloy
- Heat treatment of manifolds
- "Back bone" added between mounting points
- Modified air flow through the manifold
- Core corner and centre reinforcing
- Core expansion control

RESULTS

This product exemplifies HEPI's core commitment to innovation, addressing complex field challenges through engineering excellence.

UP TO 60%

REDUCTION
in stress concentration zones, based on FEA analysis

EXTENDED COOLER LIFESPAN

EXCEEDING
one full engine life in high-demand applications

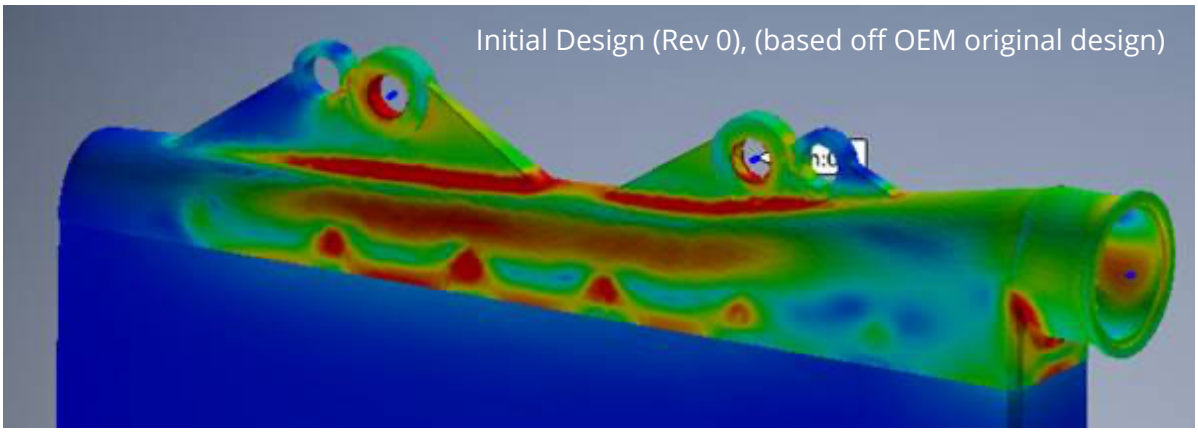
REDUCED TCO

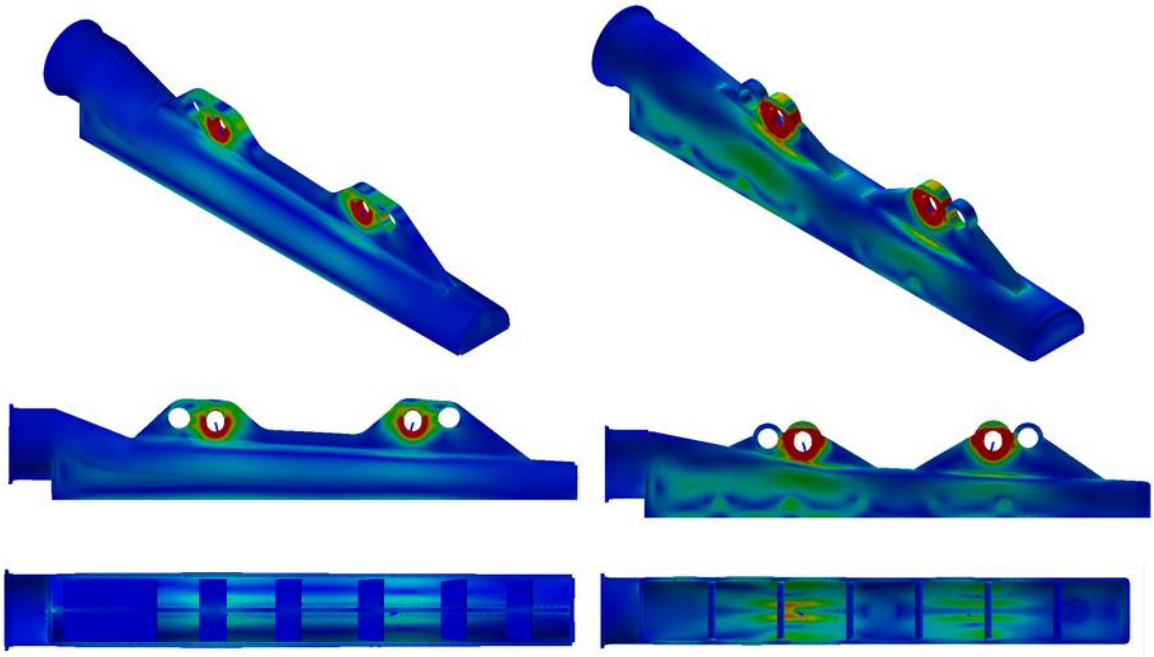
COST-EFFECTIVE
design delivering reduced lifecycle costs

Charge Air Cooler

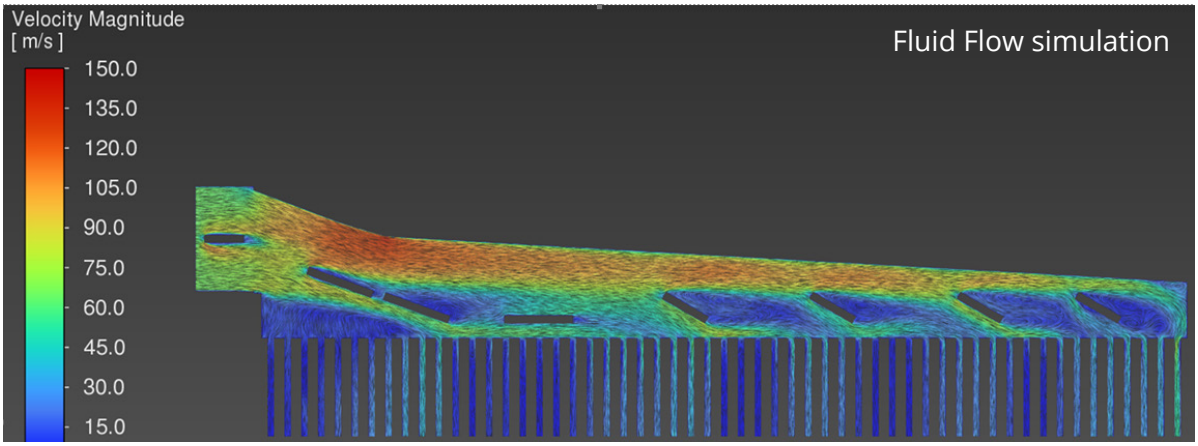
REDESIGNED FOR IMPROVED DURABILITY

Cooling Solutions





Current Design Rev 2 | Rev 0



Web : www.hepi.com

LinkedIn : linkedin.com/company/h-epartsinternational

Facebook : https://www.facebook.com/hepartsinternational