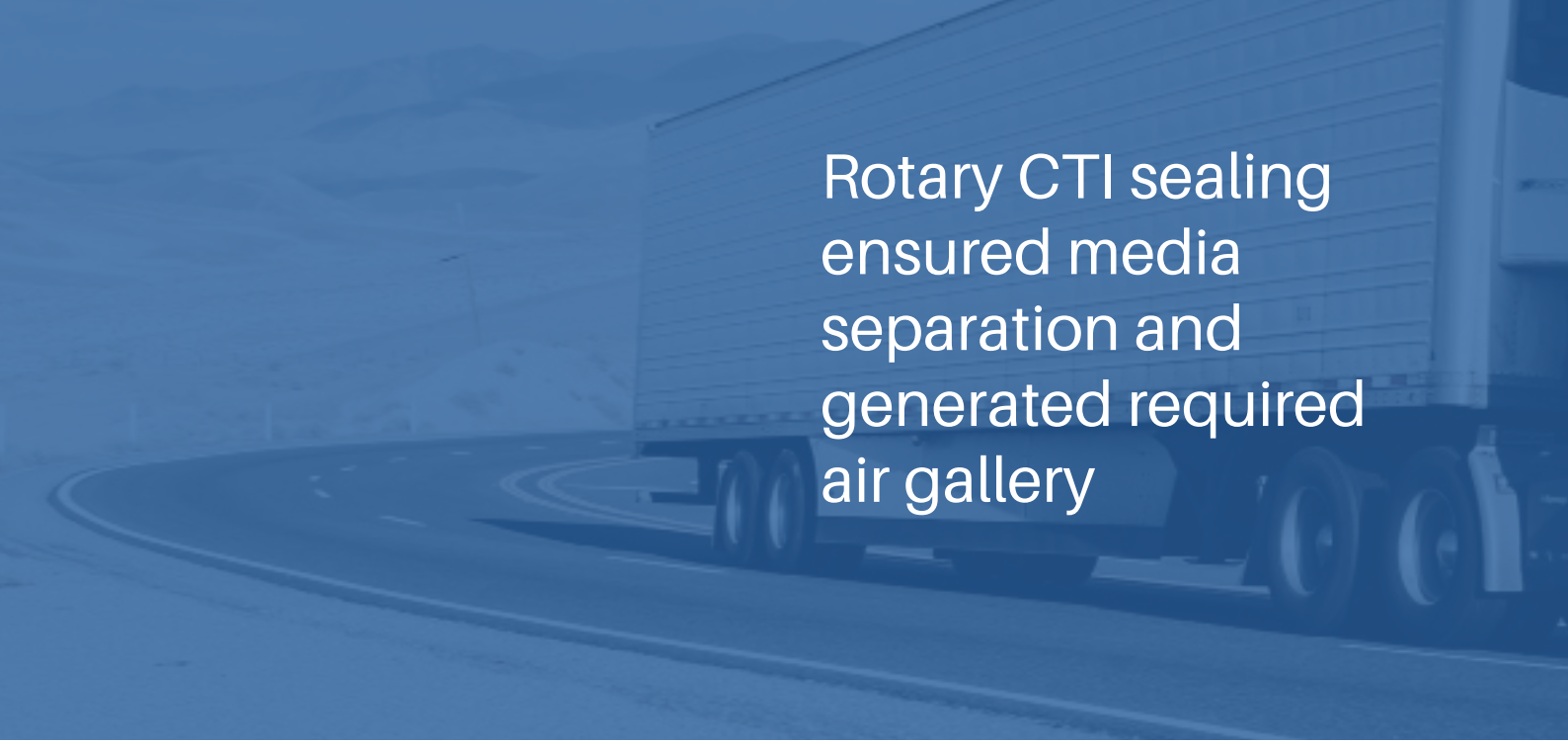
Driveline

Case Study

FTL seals achieve 2.6 million miles during client testing, exceeding acceptance criteria by 5x



Rotary CTI sealing ensured media separation and generated required air gallery

About CTIS

Central Tyre Inflation (CTI) seals are precision rotary seal systems which are used exclusively in the axles and wheel drive systems on equipment in the transport industry.

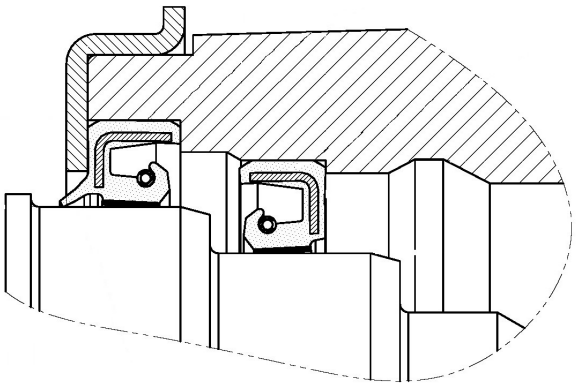
These specialist seals are used in pairs to transfer compressed air from a fixed stub shaft to a rotating hub for the purposes of tyre inflation and deflation.

CTI seals perform a critical function to ensure the reliability of modern internal CTI systems.

FTL's CTI seals push the performance barriers of efficiency and reliability to new limits, with all seals rigorously tested in-house to confirm their performance and long-term endurance.

The Client

A major North American corporation with over 115 years of experience in the design, development and manufacture of axles, driveshafts and transmissions for commercial vehicle and off-highway applications.



High performance CTI sealing system

FTL seals succesfully completed aggressive in-house testing on multiple test heads

The Challenge

A dynamic tyre pressure optimisation technology, to be used for commercial truck applications.

With the application being the commercial truck market, FTL's sealing specialists were presented with a number of unique challenges. These included:

- Minimum operational life requirement of 500,000 miles
- High contamination risk, with seals open to brake dust and highway debris
- Required temperature range of –40°C to +185°C
- Marginal lubrication
- Maximum pressure up to 150psi, normal operational range being 80psi to 120psi
- Limited seal installation envelope

In addition, the developed solution also had to address the criteria for high volume manufacture, as well as commercial requirements for this very price-sensitive market.

The Solution

Once all the engineering and commercial requirements on this exacting application were fully understood, FTL's team of sealing specialists began to develop a solution.

The end solution, derived from FTL's bespoke and in-service proven CTI rotary sealing technology for defence applications, ensured media separation and generated the required air gallery to facilitate transfer of air from the static to the rotating elements of the axle.

Although different sealing lip geometries for the two seals were required, each seal had the capability to run dry and unlubricated while subjected to maximum air pressure for a prolonged period of time.

FTL seals achieve 2.6 million miles surpassing 500,000 miles acceptance criteria

The Benefit

The client conducted an aggressive in-house test program on multiple test heads. The testing cycled the seals through a range of speeds and directions with regular pressure cycles. One of the tests was suspended at 954,000 completed miles—well above the 500,000 mile acceptance criteria.

Endurance testing was continued and ultimately a seal installation achieved 2.6 million miles when suspended. On inspection, the seals were found to be in good condition and did not exhibit any significant wear, and could have continued to function for longer.

The testing clearly demonstrated the inherent reliability of the CTI sealing solution developed by FTL.

In-depth Solutions

For more in-depth solutions

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