



Driveline

Case Study

Suspension and mobility upgrading of the Challenger main battle tank

Improved damage resistance, enhanced vehicle stability and greater driver control

Total functionality and reliability in service

About Suspension Sealing

Suspension seals encompass a range of rotary, mechanical face and high pressure reciprocating seals that are vital parts of a vehicle's suspension system.

These specialist seals are critical elements in mobility, and are of particular importance to vehicles that have a routine need to navigate tough terrain. Military vehicles are a noteworthy example.

Effective suspension sealing has a significant impact on operational efficiency and reliability, with improved resistance to tire and brake damage, enhancing vehicle stability and giving the driver greater control.

FTL's suspension sealing solutions 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

On this project, FTL is working in close partnership with a leading defence OEM in support of the British Army and the Ministry of Defence.

The British Army is comprised of over 120,000 personnel, tasked with protecting the United Kingdom and its dependent territories, preventing conflict and dealing with disaster at home and overseas.

The British Army is currently deployed in over 80 countries, upholding a reputation as one of the most highly regarded and best equipped armies in the world.



Render of a driveline mechanical face seal

The Challenge

The Challenger 2 tank is the British Army's main battle tank. However, having been in service since 1994, certain components of the Challenger 2 were due for an upgrade. The British Army required a solution which would 'future-proof' the battle tank, and extend the Challenger platform's out of service date to 2040.

The three key aspects of any fighting vehicle are firepower, protection and mobility. The decade-long program to upgrade 148 Challenger 2 tanks to Challenger 3 specification would involve significant upgrades to all three aspects.

Critical parameters were placed on the upgraded mobility solution, based on the operating environment of the tanks.

These included:

- Required temperature range to -46°C.
- Exceptional resilience to external contamination, including submergence and contact with mud, sand and gravel.
- Contact with aggressive fluids.
- Total functionality and reliability in service.

The Solution

Providing critical functionality and critical performance under exacting applications is a central concern for operators of wheeled and tracked military applications.

FTL and their team of sealing specialists would play a central role in improving the mobility of Challenger battle tanks through the development of innovative suspension sealing components.

Following extensive testing of proposed materials and seal profiles, FTL components were specified in the programme, and as such FTL is delivering a key element of the Heavy Armour Automotive Improvement Programme and the Challenger 3 Upgrade.

FTL's involvement with this prestigious high profile project is a reflection of the proficiency of our work developing sealing solutions for critical applications, and the international reputation FTL has earned for its work with key partners across the military sector.

Exceptional sealing support for the highest profile upgrade programmes

The Benefit

The proposed FTL solution for driveline and suspension sealing improvements was evaluated and approved by the defence OEM, for incorporation into the British Army's Challenger 2 upgrade programme.

With skilled implementation of the solution by FTL engineers, the client can expect outstanding in-service functionality and reliability, with significantly improved vehicle mobility across any and all operating conditions.

With more responsive and reliable combat vehicles at their disposal, much less prone to mechanical failure in service situations, the fundamental beneficiary of the solution is British Army personnel. Over the lifespan of the tank upgrade programme, members of the armed forces will be able to complete their critical work in a much safer working environment.

The Challenger upgrade programme is an ongoing project as of May 2022.

**In-depth
Solutions** 

For more in-depth solutions

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