Case study

Vehicle growth potential

THE CHALLENGE

Many British Army vehicles have been modified or upgraded since first entering service. As User Requirements evolve and Urgent Operational Requirements emerge, many of the vehicles' key sub-systems have to be modified or replaced to meet operational demands.

Most modifications introduce weight or complexity and result in a vehicle that differs significantly from the original design intent. This means the original performance and reliability assumptions for the vehicle are no longer valid. To address these issues on the troop carrier '*Bulldog*', Frazer-Nash was asked to undertake a study to baseline the vehicle and examine its growth potential.

OUR SOLUTION

We began by identifying the key sub-systems which impact on the performance of the vehicle. We then constructed analytical models which baselined the performance of the vehicle, establishing the impact of each sub-system on delivering overall vehicle capability. This predicted the performance limits and breakpoints of each of the sub-systems.

We then liaised with suppliers and the vehicle's design authority to explore a range of potential upgrades for each sub-system. We used our models to assess the impact of the upgrades on the growth potential of the vehicle, noting the interdependent relationships between sub-system upgrades.

We then evaluated the upgrade options in the broader context of capability and proposed logical upgrade packages, drawing together a number of sub-system upgrades into a set of potential upgrade paths.

Finally, we explored and illustrated the trade-offs associated with the various upgrade packages, plotting relationships between weight, cost and performance.

BENEFITS

Despite the complexities of this requirement, Frazer-Nash managed to complete the assessment well within the given timeframe and budget. In undertaking the work:

- The baseline performance of the vehicle is now fully understood and documented
- The range of potential upgrades is explored and assessed
- The potential for future growth of the vehicle is established
- Upgrade option paths are developed to inform decision making

The process is applicable to other vehicles and a range of performance metrics can be used. Indeed we have now conducted such studies for a total of four vehicle fleets ranging from tracked Armoured Fighting Vehicles to small wheeled logistics vehicles.

Client

BAE Systems

Business need

To understand the growth potential of the 'Bulldog' military vehicle.

Why Frazer-Nash?

Frazer-Nash's independence and expertise in vehicle engineering and systems studies.

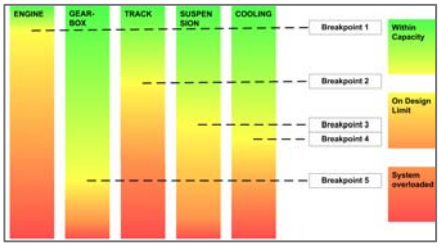

Figure 1: breakpoints in a typical vehicle's key sub-systems

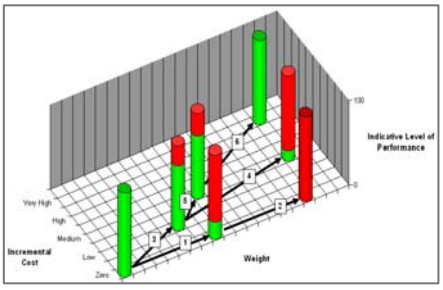

Figure 2: illustration of upgrade option paths and trade-offs

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