

## Engineered Solutions – From Concept to Completion

### Power-Pack Hose Replacement Project

Working with Bombardier Transportation at Central Rivers Depot, Flowonics Limited undertook the re-engineering of power-pack hoses fitted to Cummins QSK19 engines on Class 220 'Voyager' and Class 221 'Super Voyager' units. This covered all hoses for both engine coolant and lubrication oil systems.

As part of this process, Flowonics analysed the significant number of component failures to establish the root-causes for the unreliability of the original hoses and system design.



Working from this, higher specification steel braided PTFE

hoses were identified as being necessary to achieve resistance to actual operating conditions not anticipated in the original design.

Having resolved the fundamental issues with hose construction, Flowonics then undertook a full redesign of the pipework systems. This focused on reducing the number of separate components, simplifying the overall system and reducing the number of individual points of failure.

Once the new design had been finalised, Flowonics produced a new bill of materials and supplied complete hose kits to enable power units to be modified quickly. This was carried out as part of an intensive modification programme, for which Flowonics excellence in logistics management was highly valued.

The new power-pack hoses have enabled the Class 220 and Class 221 fleets achieve increased levels of reliability and availability. The development of this innovative solution demonstrates the application of the Flowonics expertise in Engineered Solutions for the rail industry.

For further information regarding this and other Flowonics solutions, please contact:

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