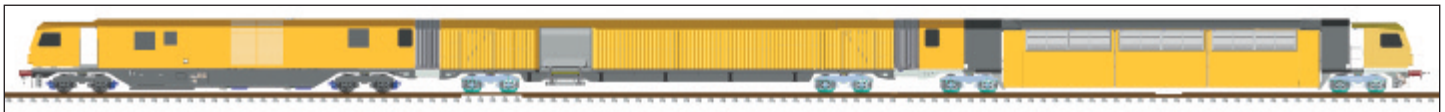
A maintenance revolution for the UK

Plasser UK's Mark Simmons details the Robel mobile maintenance system 69.70/4-UK for Network Rail.



69.40/4-UK TSU **69.45/4-UK IC** **69.60/4-UK MMU**

As announced on page 9 of this issue, Robel has signed an agreement with Network Rail to supply eight 69.70/4-UK mobile maintenance systems. Four will go to the London North Eastern Route and four to the London and South East Route. The concept follows the principles explained in previous issues of *Rail Infrastructure* when describing the European versions though, of course, with some specific alterations to fit inside UK's much narrower and lower w6a gauge profile.

The principle

The basic idea is to bring the personnel, materials and equipment safely, swiftly and directly to the worksite where the work begins within minutes of arrival in a safe and productive manner with the adjacent line still open to traffic. Staff, tools and materials access the track through the middle of the system without ever leaving the safety of the unit.

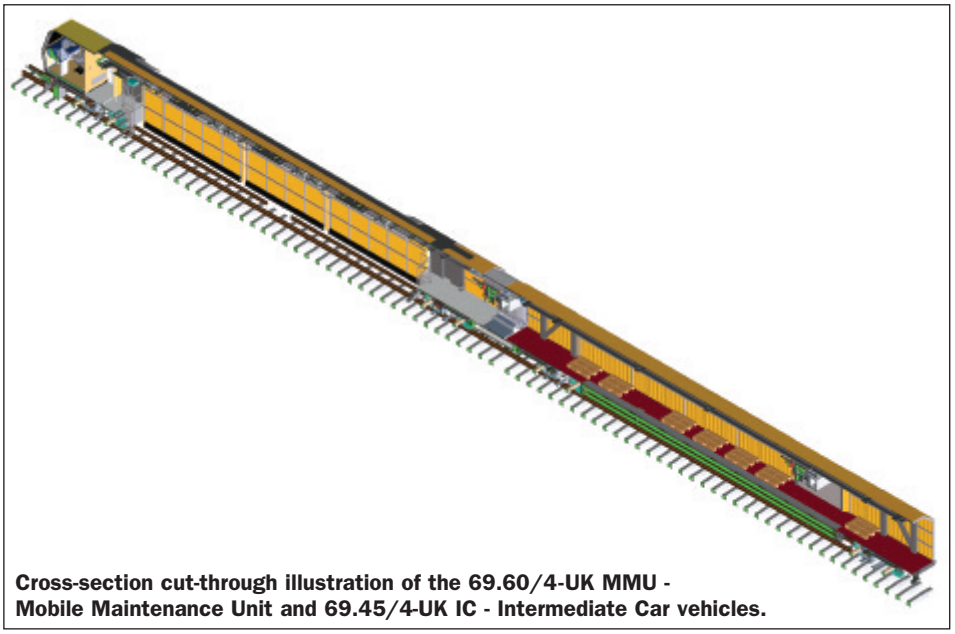
They have clean efficient power, lighting and ventilation immediately to hand - allowing them to carry out a quality job in a factory type production line environment, independent of weather conditions with reduced disruption to the neighbours and the railway. When they are finished, everything, including old material, is packed up and taken away leaving the job complete and the worksite clean and clear - stealth maintenance at its most efficient.

Formation

The system consists of a train of three semi-permanently coupled parts:

- 69.40/4-UK TSU - Traction and Supply Unit (TSU).
- 69.45/4-UK IC - Intermediate Car (IC).
- 69.60/4-UK MMU - Mobile Maintenance Unit (MMU).

As the name suggests, the leading vehicle in working direction, the TSU, provides the tractive power to move the unit at 60mph around the network. It consists of a driving cab with a driving desk and seating for a driver and assistant. Similarly to existing UK OTMs, this is accessed via a cross gangway behind the cabin, rather than the European front access via door in the centre of the cab. The reason for this is the narrow W6a profile which means there is simply not the width.



Cross-section cut-through illustration of the 69.60/4-UK MMU - Mobile Maintenance Unit and 69.45/4-UK IC - Intermediate Car vehicles.

Proceeding across the gangway from the cabin leads into the seating and messing area for the crew - up to 11 people. They have access to a microwave, fridge, water and flushable toilets. From this position, they walk directly down the middle of the TSU and cross into the IC and finally through into the MMU and onto the track. On the way, they walk over the underfloor traction power supplied via two-stage IIIB 500kw Deutz engines. These drive all four axles hydrostatically. For 'supply' in working mode, a generator of 140kw is installed on one side of the corridor - supplying electrical, pneumatic and hydraulic power in working mode. At the end of the TSU is a small work area with a workbench.

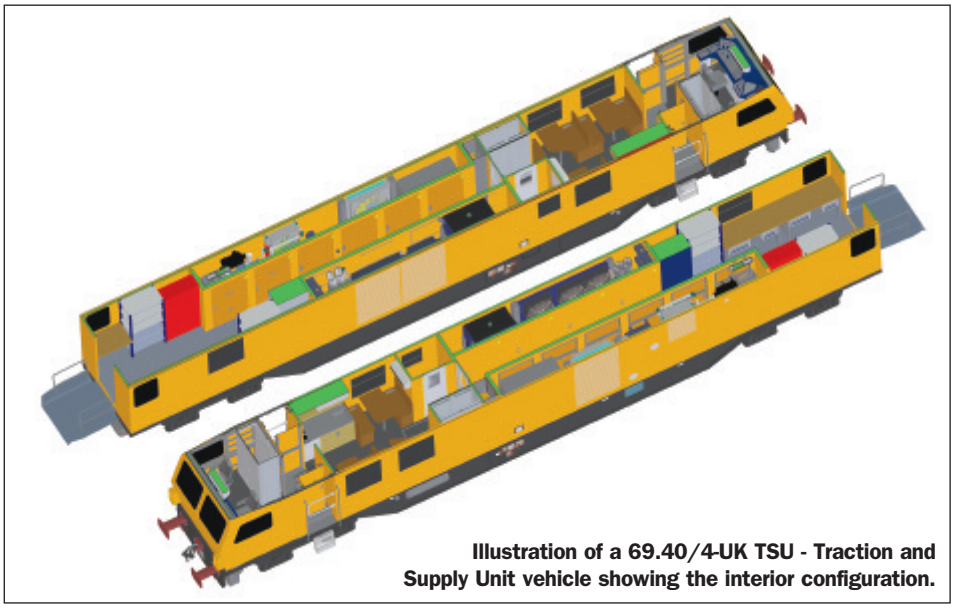
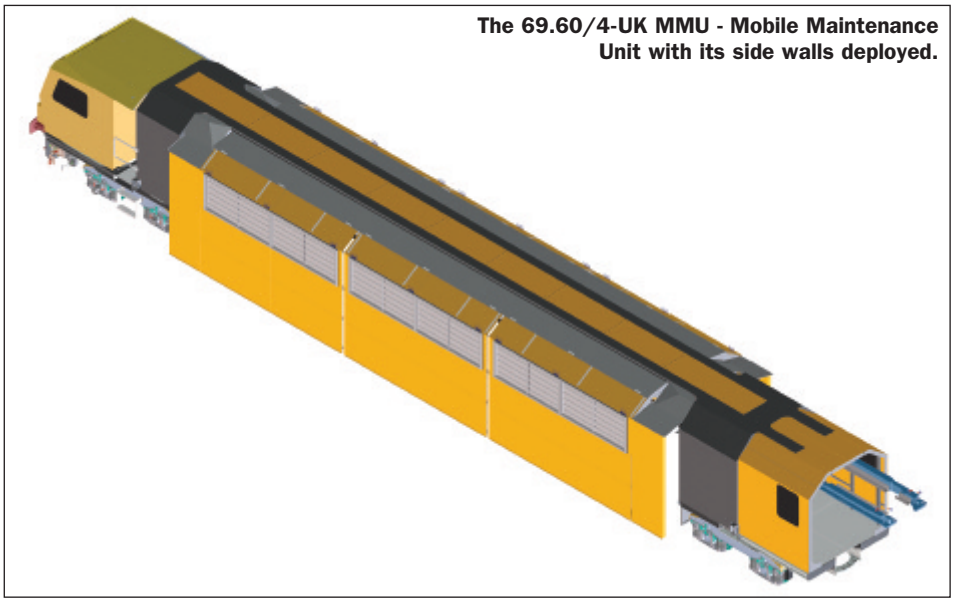


Illustration of a 69.40/4-UK TSU - Traction and Supply Unit vehicle showing the interior configuration.

Crossing through brings you into the IC, with 38m² of storage space for tools, equipment and materials as well as specialised space in the well under the walkway to store six 45ft rails. For handling, there are a pair of two tonne cranes running longitudinally through the IC and passing over bridging rails into the MMU. This allows you to move the rails and other materials and equipment from the IC down onto the track and to return the materials removed from the worksite back into the IC to be disposed of back at the depot after the job is complete. The cranes can be operated synchronously from a single control allowing safe handling of the 45ft lengths of rail. They also travel laterally - providing full reach in the storage and working areas. A tail-lift is provided on each side of the IC allowing equipment to be loaded into the IC from both platform and rail levels. Additionally, suitable storage is provided for gas bottles for welding activities.

The heart of the system is the MMU, which you enter from the end of the IC onto a small platform. Angled steps take you directly onto the track where there is approximately 15.5 metres of track that can be worked on. This is constrained by UK signalling requirements, which allow no more than 17.5 metres between the inner axles of a vehicle to ensure it is not possible to straddle a track circuit block. In transit mode, the width of track exposed between the side walls is 2,016mm. Depending on the actual six foot distance to the neighbouring track it is possible to move each side wall out independently in 100mm increments to 600mm, giving a total working space of 3,216mm.

Electric, hydraulic and pneumatic



The 69.60/4-UK MMU - Mobile Maintenance Unit with its side walls deployed.

power is available and the area is brightly lit to ensure the best quality of work is achievable. At the far end, steps lead up to another small platform from where the work supervisor has a good view of and control of the worksite. From this position, the systems creep speed drive can be controlled - allowing movement at up to 1.25mph (2kph). This allows not only a factory environment, but a rolling worksite bringing maximum productivity to the system. Behind the platform is the mirror of the front of the TSU - a cross gangway for entry and exit and the entrance to a driving cab.

Other equipment

The systems will be kitted out with hand tools from the Robel range suited to specified activities for the systems. Over the build period for the systems, joint teams from Network Rail and Robel will develop lean production methods for planning, equipping and executing various track maintenance tasks smoothly and productively at a very high level of quality. The opportunity of having electric, hydraulic and pneumatic power available at the MMU allows the use of non-petrol or diesel powered tools - with all the attendant noise, vibration and air-quality improvements for the crew.

The detailed design and build phase for the systems will run through 2014, with acceptance and functional testing in early 2015 and entry into service of the first system in the UK around the end of July 2015.