

# Class 323

## IGBT Traction modernisation

The British Rail Class 323 electric multiple units were built between 1992 and 1995 by Hunslet Transportation Projects Limited. The traction electrical equipment was supplied by Holec who became a part of Alstom in 2001.

The traction system modernization will ensure long term performance and reliability of the fleet.



**Country**..... United Kingdom

**Context**..... The Class 323 IGBT Traction upgrade is a project to supply a turnkey package to the 43 Class 323 EMU, owned by Porterbrook. The fleet is split between: 17 trainsets operated by Arriva Rail North (operator changed last April) out of Longsight Depot in Manchester and 26 trainsets, operated by London Midland out of Soho Depot in Birmingham. These trainsets are supplied by 25kV overhead.

**Solution**..... The Gate Turn-Off (GTO) Freon Tanks were replaced by Isolated Gate Bipolar Transistor (IGBT) Heat Pipe Technology with an upgrade of electronics of components subject to obsolescence. The new IGBT module and in particular the heat pipe is of a proven technology but modified to fit into the existing space envelope.

One major feature of the new semiconductor modules is that they use more eco-friendly heat-pipes and not the previous freon tanks that are not good for the ozone layer and that are difficult to repair and handle. In addition to the semi-conductor upgrade old, life-expired components are being replaced. The new IGBT traction system extends the lease of life of the train.

Installation Works were undertaken at Alstom’s Manchester Traincare Centre, Longsight the “Home Depot” for the Arriva Rail North Class 323 fleet. All components were delivered in kits to the Manchester Traincare Centre and installed, tested and commissioned in less than a week per train. Other Alstom units involved are Alstom Preston (lead engineering and project management), Alstom Ridderkerk (OEM, systems engineers, supplier of power modules and modification of electronics).

### KEY BENEFITS

- **Addresses obsolescence** and end of component life issues
- **Improvement in reliability:** replacement of GTO Freon modules by IGBT Heat Pipe modules, upgrading of Control Electronics, replacement of active transducers and primary and secondary overload relays.
- **Reduces maintenance and repair costs**

**SUPPLY SCOPE**

▪ **Quantity of trains to be upgraded**

Total fleet of 43 trains

▪ **Project Management**

Project Board set up, Project structure established, Joint working group meetings on a monthly base

▪ **Engineering design**

Design, system integration, safety analysis, specifications, modification instructions, test requirements, validations, engineering change control, updated maintenance manual.

▪ **Approvals (UK Safety Case)**

Testing, documentation, technical validation and certification.

▪ **Equipment supply**

All materials necessary for the upgrade, initial spares

▪ **Installation**

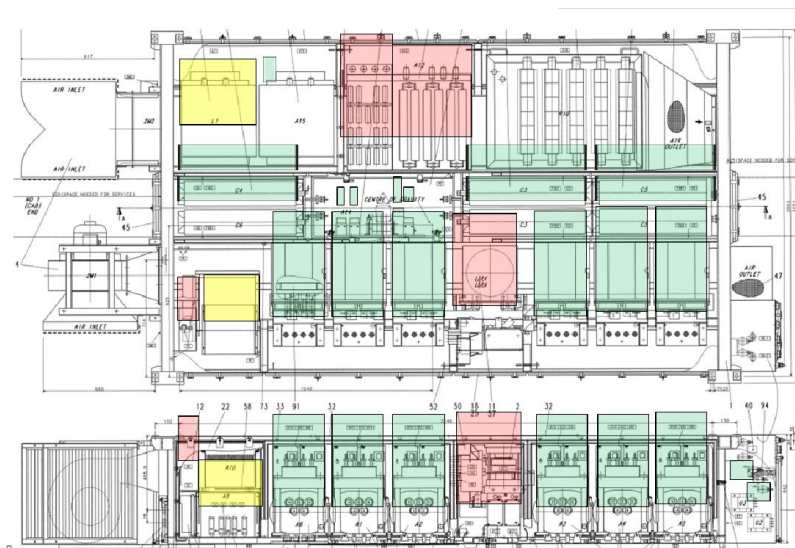
Removal of existing equipment / safe disposal, installation of new equipment at Alstom's Manchester Traincare Centre, test and commissioning.

▪ **Training**

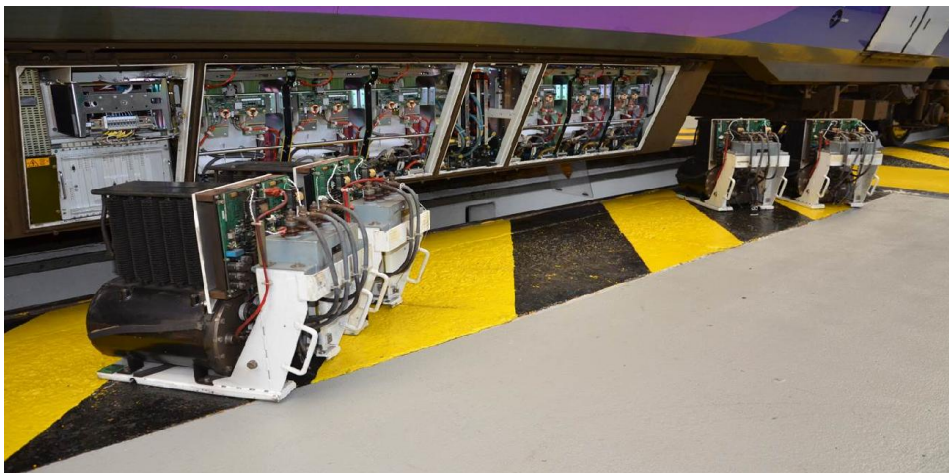
Training of London Midland and Longsight Maintenance Staff

▪ **Train Movements**

To and from Manchester Traincare Centre included for all trains.



- Remove
- Upgrade
- Replace



For more information please contact Alstom:

Alstom  
48, rue Albert Dhalenne  
93842 Saint-Ouen, Cedex France

Phone: +33 1 57 06 90 00

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