

Science and Technology Group, visit to Bombardier, a train maker – A grandchild's dream
A party of 14 eager retirees travelled to Derby to see trains being made. For most of us, had it been 60 odd years ago we would have been, very excited. We weren't disappointed.



Science and Technology Group visit to Bombardier

We were met by Kathryn, our tour guide for the morning, who gave us a brief description of the company and conducted us very competently around some of the many production buildings.

Bombardier is a Canadian Company, with headquarters in Montreal, and is the world's leading manufacturer of both planes and trains. Their Transportation product range includes trains, trams, people movers, rail equipment and control solutions for all market segments. The company was established following a tragic story.

Joseph-Armand Bombardier (April 16, 1907 – February 18, 1964) was a French Canadian inventor and businessman, and was the founder of Bombardier. His most famous invention was the snow mobile.

Born in Valcourt Quebec, Joseph-Armand Bombardier dabbled in mechanics from an early age. He acquired experience by reading, taking notes and repairing what he found until he opened his own garage at age 19, where he would repair cars and sell gasoline in the summertime.

During wintertime, he worked on developing a vehicle able to travel on snow. At that time, the Quebec government didn't clear snow from secondary roads, so residents of these areas stored their cars for the winter season. The idea to build a winter vehicle came to Bombardier after a blizzard in which his young son fell ill and died because he couldn't be brought to hospital.



Joseph-Armand Bombardier's first attempt at a snowmobile

The manufacturing base at Derby has been there since 1876 under the ownership of several organisations, prior to being purchased by Bombardier.

They currently manufacture and maintain trains for many regional and national routes in the UK, as well as South Africa. They have just completed a huge contract for 1,395 cars for London's Sub-Surface lines (Circle, District, Hammersmith & City and Metropolitan) and are currently making trains for London's new Crossrail line. I think we were told that one of their fleet of trains for London Underground's Victoria Line currently holds the world record for the distance travelled without a delaying fault in service. (A distance equal to twice around the world).

We were first taken to the Industrial Design department, full of personnel sat at computers displaying complex Computer Aided Design (CAD) images and others displaying lists of component requirements. It was explained that initial concept design evolves from discussions with the customer with the aid of hand drawn graphic images, which were displayed at the entrance. The process of translating from verbal description of requirements to a visual image was fundamental to the manufacture of the finished product, with many scale models made in the process. They emphasized their commitment to remaining faithful to the appearance of the final design, when manufacturing the train.

We were shown the construction process for their passenger carriages. The roof and the floor chassis are constructed separately. The floor is assembled from long lengths of aluminum extrusions which are welded to form a rigid base. Attached to the underside of the chassis are light weight service items such as looming, cabling, piping systems and air reservoir cylinders. The roof is assembled upside down to enable attachment of ducting, insulation, ceiling panels and the lighting system, before being rotated 180 degrees for the air conditioning and pantograph units to be installed. At stage 2 the floor is placed onto stands with the roof suspended over the top in a vertical jig to enable the side panels to be bolted in place. The pre-constructed and painted side panels are made of extruded aluminum sections with smooth external surfaces and internal rib bracing, which makes them lightweight, but very strong. Once the 'tube' is bolted together the cab and intermediate ends are bolted into place. The carbody is then lowered to the ground for the doors to be fitted and a water test takes place. Then the whole structure is placed up onto 6' stands for a

team to work beneath the car fixing heavy equipment whilst a team work inside fitting remaining interior panels, grabs rails, luggage racks, etc. Once the car has been lowered and connected to the bogies (wheels) the seats are fitted then testing commences. The whole carriage assembly was described as a large “meccano set”; however on completion, there was not a hole to be seen, only carefully crafted smooth surfaces.



A completed carriage being lifted through the workshop and placed on two sets of wheels.

We also had a sneak preview of the assembly lines for the new Crossrail system. A nine-car set with 3 sets of doors on either side per car and wide walk-through gangways between carriages, inward facing seats and lots of standing room.



A finished District line underground train ready for despatch

Kathryn proved to be an excellent tour guide, who gave us a clear explanation of the processes we were viewing, enabling us to understand what was happening in large buildings where technicians were quietly assembling the biggest “meccano sets” costing 1 to 2 million Pounds, I had ever seen.

We enjoyed a very pleasant meal on completion of our thoroughly enjoyable visit.

Alan Paul.