

**Aircraft construction:**

# Above the Clouds – An Aviation Milestone

**The new A380 Airbus should manage to square the circle: Carrying more passengers over a greater distance yet quieter and more economical on fuel. An ambitious goal. Realized with the support of Rexroth technology.**

The huge sliding doors open. A large, white nose cautiously peeps out for the first time into the new, damp-cold world of Central Europe. The new machine is still being towed. She still needs the final coat of paint and some fine details of the luxury interior fittings still have to be completed. But soon she will be disappearing for the first test flight, saying farewell to the gray of the clouds. There is always a hint of wistfulness when a completely assembled aircraft leaves the huge hangar. Anyone who has had the chance of seeing an aircraft grow and take shape will not fail to be moved when the moment of departure comes. The aircraft hangar is simply a fascinating sight.

There is soon to be a special moment of departure in the Airbus hangar in Toulouse, France. The most modern passenger airliner in the world – the A380 Airbus – will be leaving the hangar. The A380 was designed by Airbus in collaboration with leading airlines, airports and aviation authorities and it should manage to square the circle: large, quiet, more favorably priced and ecologically friendly. This was made possible by new generation engineering, by savings on weight, by outstanding landing gear and state-of-the-art wing design.

## Gigantic production plant

These wings will be produced at the Airbus manufacturing facility in Broughton in North Wales (GB) and then transported by ship to Toulouse. In the first phase large aluminum panels, over 35 meters long, are clamped into a huge processing station, fitted with spars and ribs, painted and equipped with electrohydraulic systems. These so-called wing assembly jigs, manufactured by US company Electroimpact, are over 60 meters long, 30 meters wide and twelve meters high, and have more than 170 electrohydraulically driven working platforms or flip floors. "Every flip floor is moved hydraulically in a horizontal direction along the wing area. The individual working platforms each have pivot points and can thus be controlled to the required angle along the wing. This way the fitters have easy access to the various parts of the wing," says Rexroth Project Manager Gary Livesey.

*The most modern passenger airliner in the world – the A380 Airbus.*



Technology from Rexroth is also used in the wing assembly panel. Here the aluminum panels are processed to form wings...



*Rexroth technology is used at various stages of wing production for the A380.*



4 WE6



A10VSO\_31

## ►► Industrial hydraulics from Rexroth

Rexroth installed their own hydraulic cylinders, valve control packs and zinc-plated pipework mains, developed specifically for this application. The 170 flip floors on each jig are supplied via these pipes. The centralized hydraulic power unit is also supplied by Rexroth. 288 hydraulic cylinders, each with a valve assembly, are used to drive the flip floors. Each assembly consists of two Rexroth 4 WE6 control valves and special control modules, which control weight compensation and speed of the flip floors.

Four axial piston pumps and motors from Rexroth are used for the centralized hydraulic power supply, realizing a particularly large output volume. At a pressure of 210 bar the hydraulic pumps output 110 liters hydraulic fluid per minute towards the working platforms. The dimensions are huge: for the first fill alone more than 8,000 liters of fire-resistant oil is required. Even the so-called HAWDE lifts, used for

transporting tools and operating materials, are supplied by Rexroth pumps of the Type A10VSO. These ensure an output of 290 liters per minute at 80 bar pressure and constant force, and guarantee safe operation. The pressure controllers on the pumps "recognize" a demand within the whole system: if the platforms are not required, the pump line will unload at no pressure into the reservoir. After a further 20 minutes the system will automatically revert to stand-by mode. Operational safety and economy – made by Rexroth.

Rexroth technology is used at various stages of wing production for the A380. Virtually branch-wide participation in this project, coupled with the remarkable response from the market, shows that Rexroth is on the right road: even at this early stage ten airlines have agreed to purchase more than one hundred machines. All those involved have a major goal in mind: the maiden flight in 2006, which will be a milestone in aviation history. Project Manager Livesey commented, "Every member of the team, whether design engineer, project manager or fitter, is looking forward to this moment." And this is understandable – even if it means that there first has to be another farewell. ■



... and then removed by heavy cranes to the processing station, the so-called wing assembly jig.



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