Dennis Dufbäck - dendu933
Tobias Lundgren - toblu933

Lab 4 - Integration Testing

First attempt

Our group was in charge of the wing assembly. In our first integration testing plan we had made some assumptions:

- The area of the wing was the same as the wings depicted in the instructions, with 286 knobs^2
- The wings would cover three pairs of girders
- The back of the wings should be aligned with the girders rear-most pair of girders.

Our assumptions all turned out to be correct, and we therefore didn't have any problems with our internal tests stated in our integration test plan.

The underside of the wing had two vertical parts that lead to us having to change the design of our wing attachment a bit to fit under the wings, since we figured that we cannot build over these vertical parts.

We got information from the Steering Systems group about the relative positioning of the girders, and we used parts as drivers to mark the positioning of where the girders later would go. The drivers were however the same colour as the wing attachment, which made assembly a bit confusing.
Apart from that, we felt that everything went smoothly and according to plan.

We had put pretty much time on the test plan which really helped, and we had good communication within the team.

Second attempt

For our second assembly, we revised our integration test plan based on our observations from the first assembly. We decided that it would help to attach the wing prior to attaching the rear fuselage. As part of integration testing, we also decided that a dry fit of the wing with the front and rear fuselage modules would be useful to help us making sure all modules were aligned properly.

During the second assembly, we borrowed pieces from our team members to use as placeholders for the girders, and this made the assembly of the wing attachments easier. We didn't need information about the spacing of the girders, since it was the same from the first assembly.

The entire plane assembly went a lot quicker since we all had learned the constraints of the different modules and we had assembled the plane in about 5 minutes.

The review didn't pass however since we had interpreted the requirements of the wing attachment incorrectly. We had made assumptions about the design of the wing attachments into the rear fuselage that we had presumed were correct. We didn't realise that the design had been incorrect even from the first assembly. A better approach would have been to communicate with the stakeholder (Mr. Saab) during the first assembly to ensure that our design had met the requirements, even if we thought that we had interpreted the specification correctly.
Instead, we had to rebuild the wing attachment on the fly as we communicated with Mr. Saab, who ensured us that we had understood the feedback.

To facilitate the rebuild, we put back our placeholder girders and disassembled the part of the wing attachments that were incorrect. The two of us then decided to distribute our work and build on one side of the wing each, making sure that each side met the new and more clear requirements. After the rebuild, we again made sure the internal and integration tests passed and were able to complete the assignment.

Despite the rebuild of the wing attachment, all groups improved greatly on their assembly as we had a better understanding of the process.