

A-ARMS CONCEPTION AND MANUFACTURING

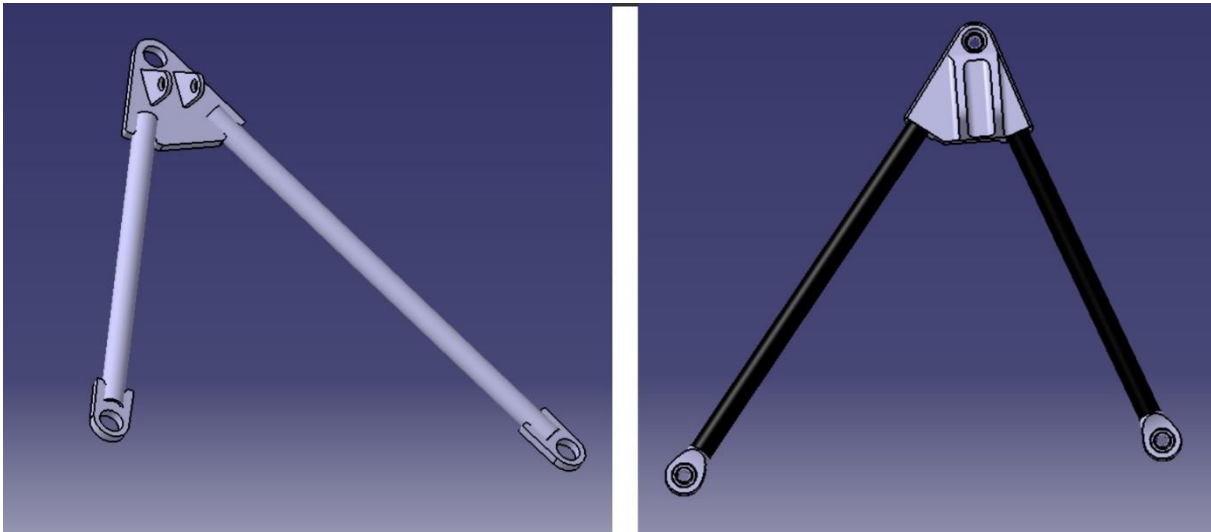


Figure 1: 2 solutions: steel design (left) carbon design (right)

Design	Steel design	Carbon design
Mass	6 Kg	3 Kg
Cost estimation (based on cost report)	600 \$	900 \$
Main advantage	Reliable	Light

Gluing specifications

Gluing surface	1,70E-03
Theoretical maximum shear stress of epoxy structural adhesive used (from datasheet, for a contact between two plates)	30.2 MPa
Worst load case (obtained with MecaMaster)	5,12 kN
Minimal tensile strength to reach for our process (with a security coefficient of 3)	15 kN

Test



Figure 2: Test tube



Figure 3: Test tube before and after traction test

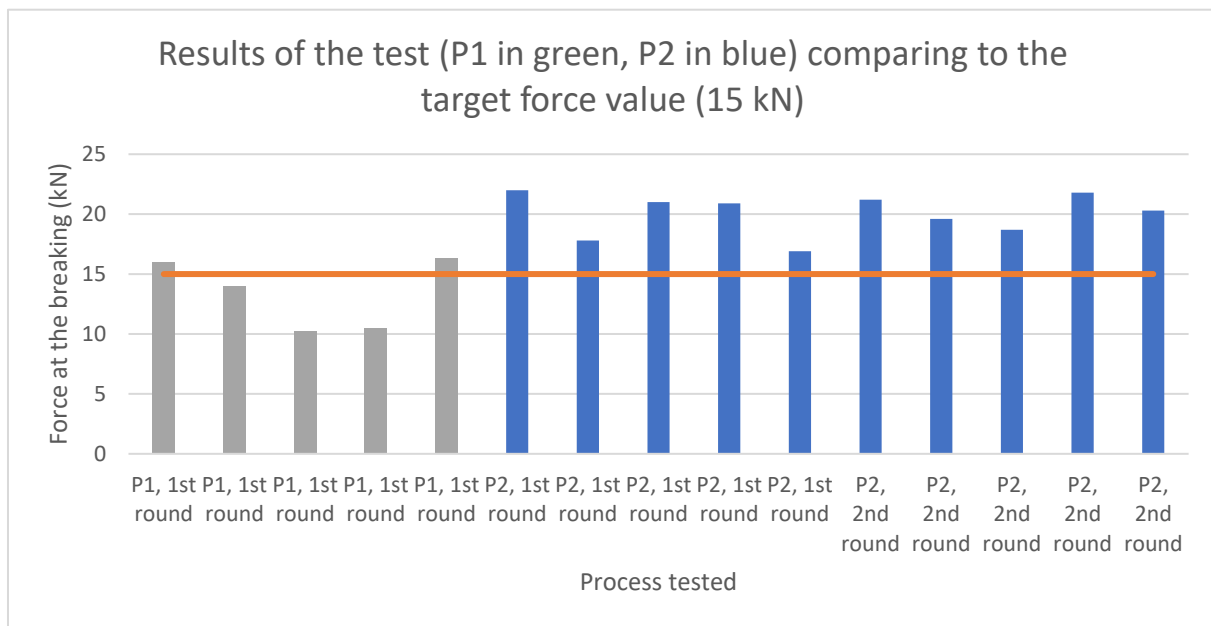


Figure 4: Test results of 2 different processes for the sanding operation : with a Dremel (P1) or manually (P2)

Process flow

Step 1: sanding

- ⇒ Sanding of the aluminium parts with sandpaper P180
- ⇒ Sanding of the carbon tubes with sandpaper P180
 - 3 times on a length of 30 mm
 - Visual control

Step 2: cleaning with acetone

- ⇒ 2 times for aluminium parts and carbon tubes
- ⇒ Let evaporate after

Step 3: Gluing

- ⇒ Application of the epoxy structural adhesive on the inserts parts all along the surface
- ⇒ Insert it by turning
- ⇒ Place it on the template

Step 4: Drying

- ⇒ Let it dry for 7 days



Figure 5: A-Arms on is mounting template

Verification of current A-Arms

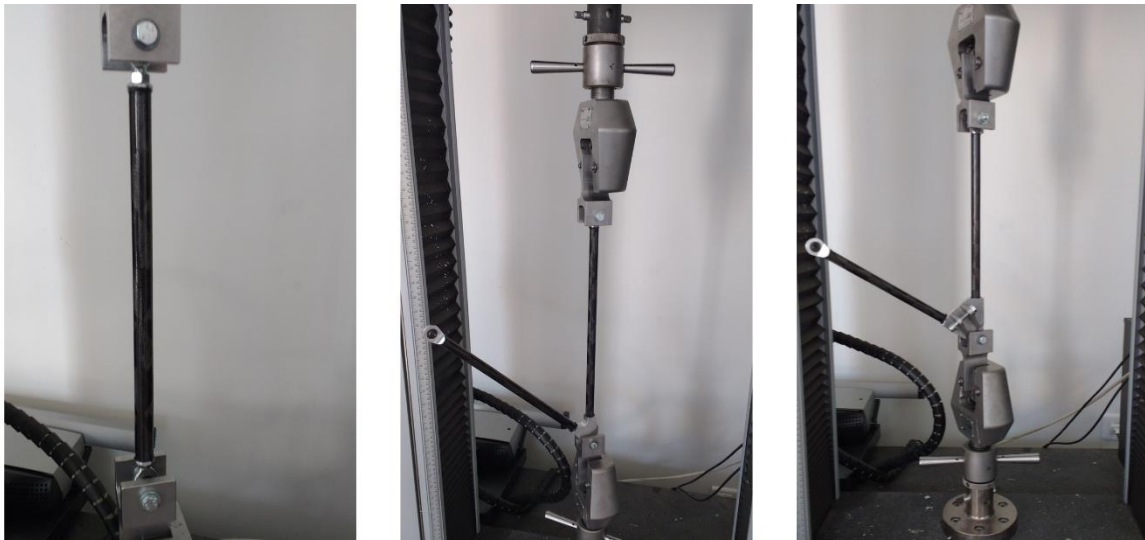


Figure 6: Left to right: Tie rod, front lower left A-Arm and front upper left A-Arm

Traction log

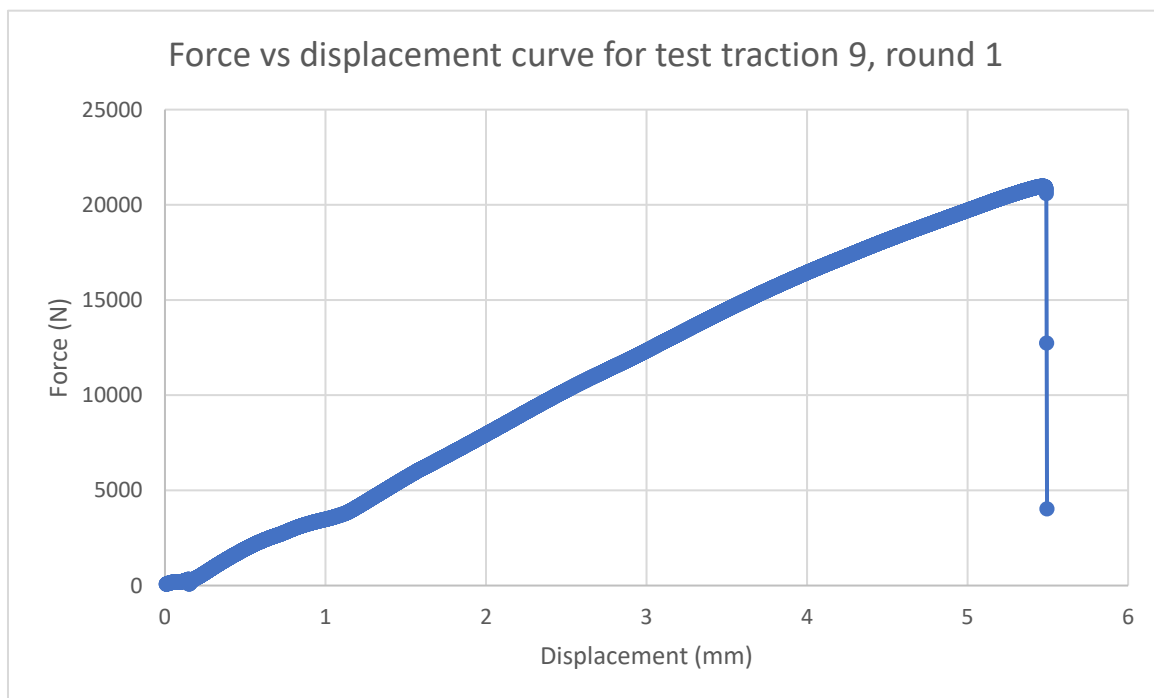


Figure 7: Example of traction curve during firsts test

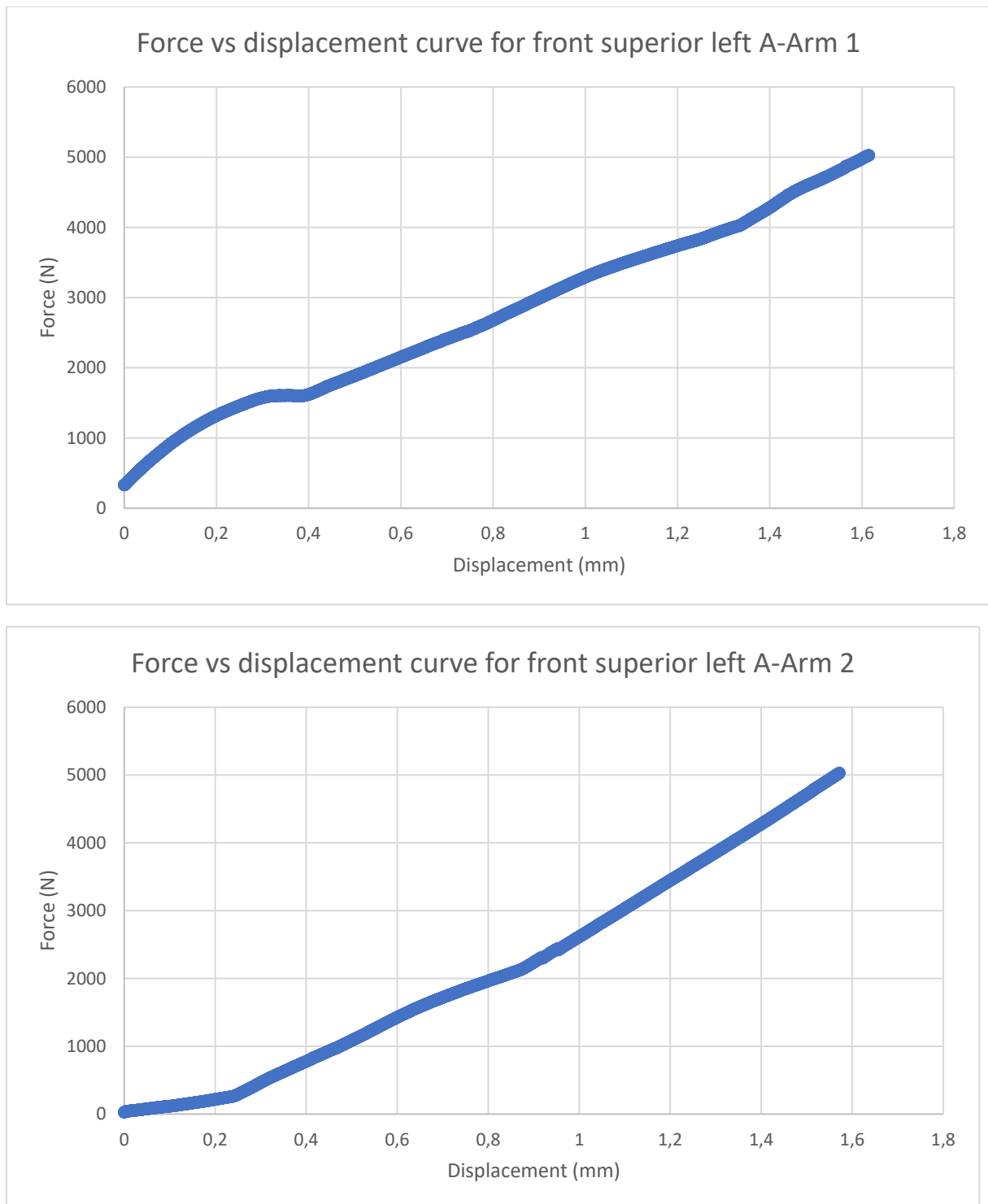


Figure 8: Example of traction curve for A-Arms on car