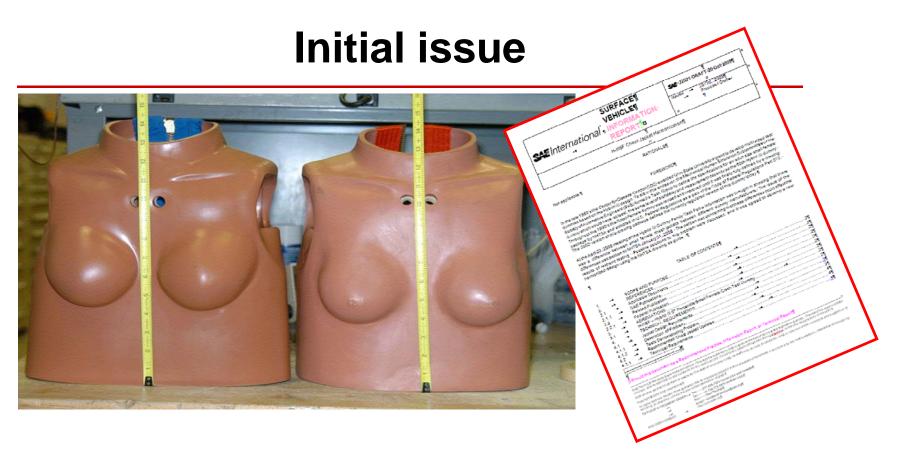
Small Female Harmonized Jacket

October 2009

Joe Bastian Roderick Verschut Paul Lemmen Sjim Jansen





SAE Task Force reviewed and examined the results from a 2006 study presented at the 50th STAPP conference:

"The Effect of Breast Anthropometry On The Hybrid III 5th Female Chest Response"

By Suzanne Tylko, Dominique Charlebois (TC), Alain Bussieres, Dainiaus Dalmotas (PMG)

This study showed the dimensional differences as well as differences in performing of jackets in certification and crash testing. This clearly showed the need for harmonization.

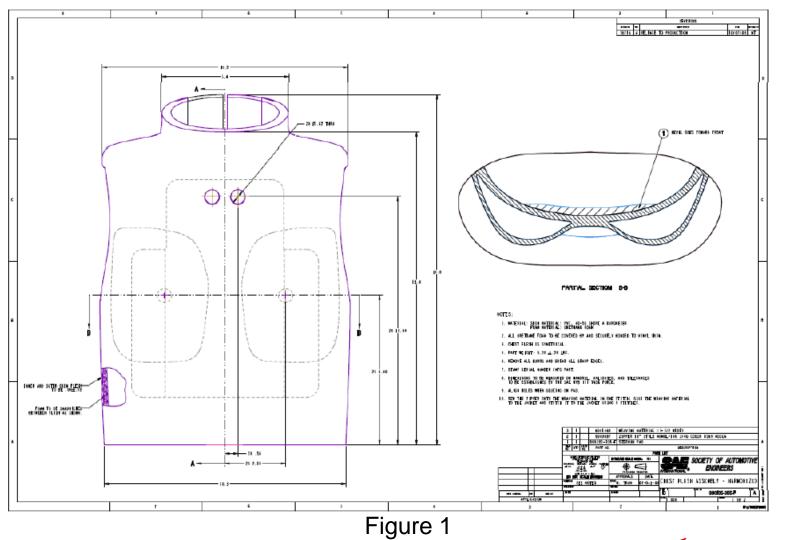
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Small Female Jacket Harmonization Project

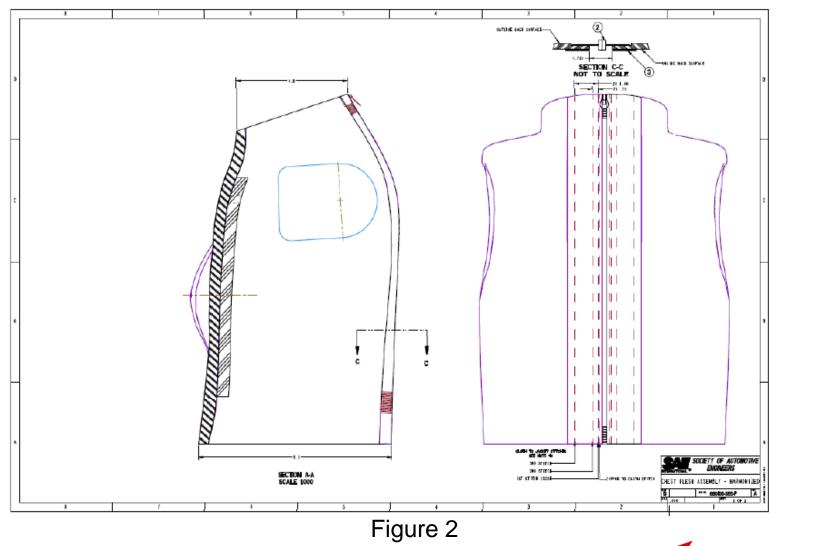
- FTSS & Denton created 2D SAE drawings of the harmonized jacket
 - These drawings were used to manufacture molds at both manufacturers. The drawings are an update of the official NHTSA drawing to correct errors and lack of information (see figure 1&2)
- FTSS & Denton ran a round-robin test matrix on 6 harmonized jackets (3 FTSS and 3 Denton) on their respective dummies. Testing also included an old jacket from each manufacturer as a baseline.
 - FTSS/Denton used their own dummy, instrumentation, DAS, and laboratory equipment





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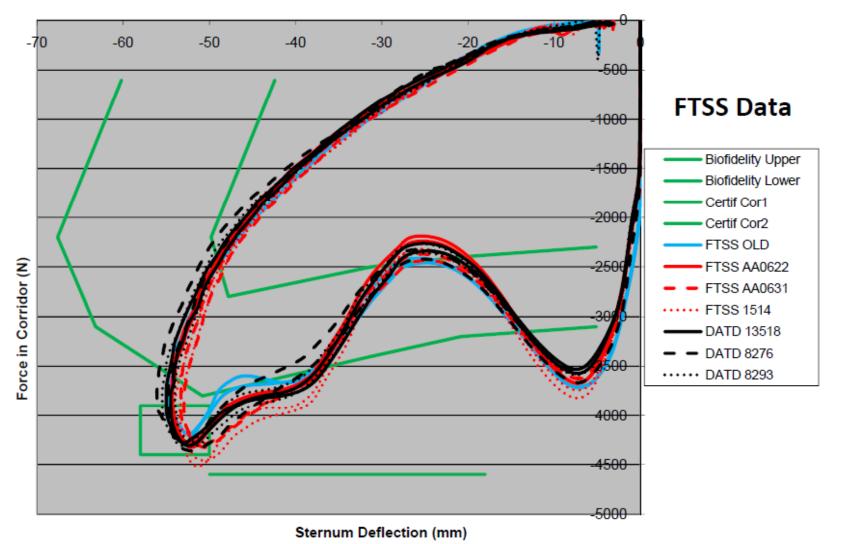
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- In order to ensure robust testing process FTSS used the following testing protocol:
 - Multiple test series were run to check reproducibility
 - Dummy ribs were checked thoroughly between each test series
 - All testing within a test series was carried out
 - by the same technician
 - within the same day to eliminate environmental effects
 - Each test series was started with a baseline test, using an old production jacket, to show contrast within the test series
 - Used randomized test sequence on the jackets to eliminate bias results and to offset the effect of rib fatigue



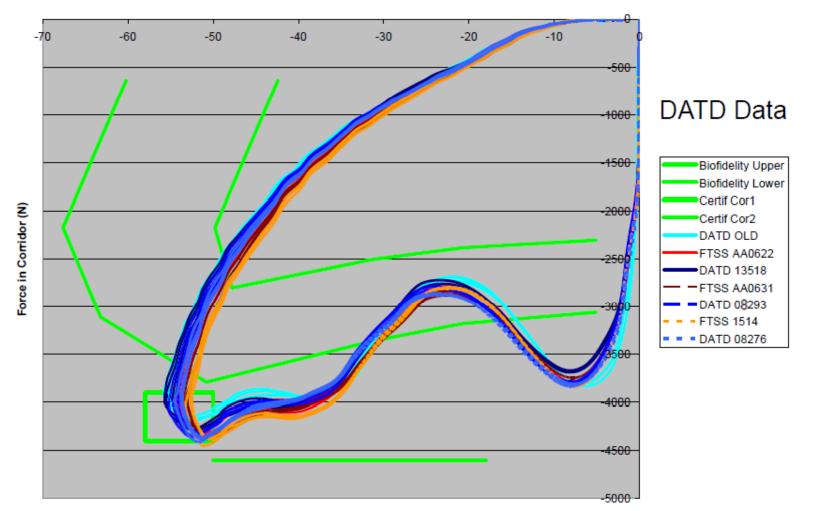
Round-robin Test Results



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Round-robin Test Results

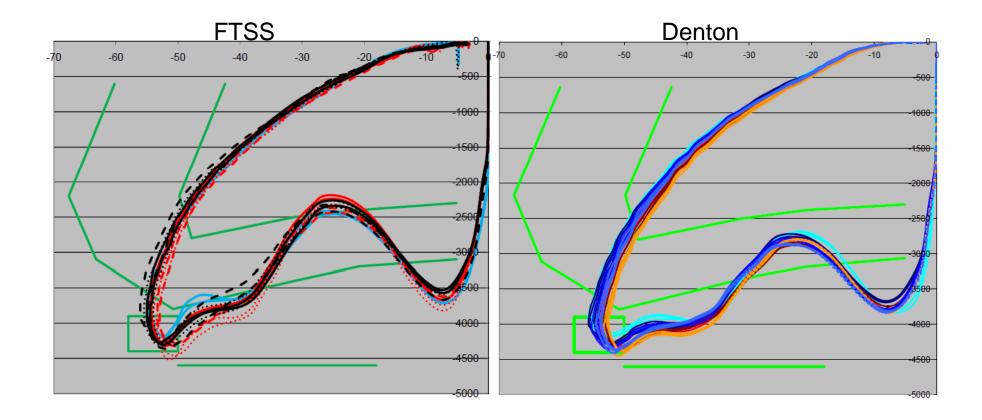


Sternum Deflection (mm)



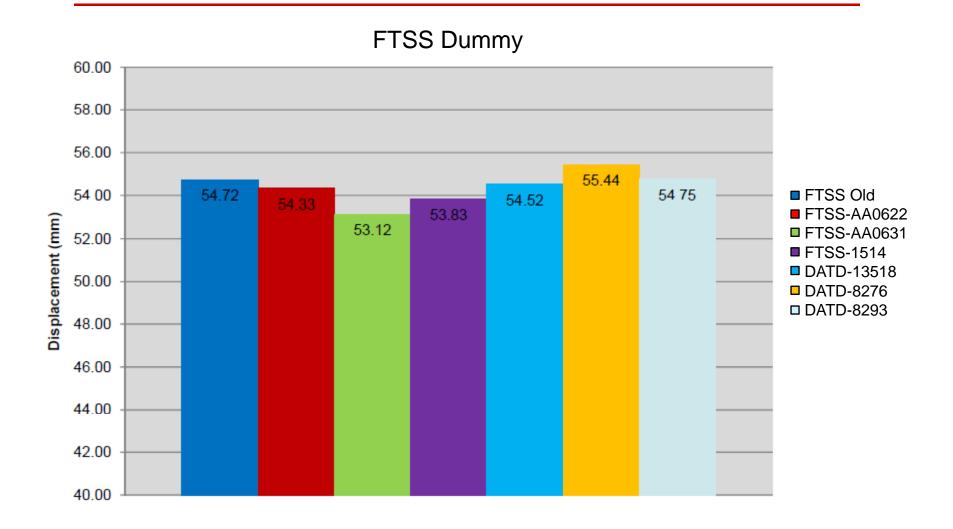
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Round-robin Test Results





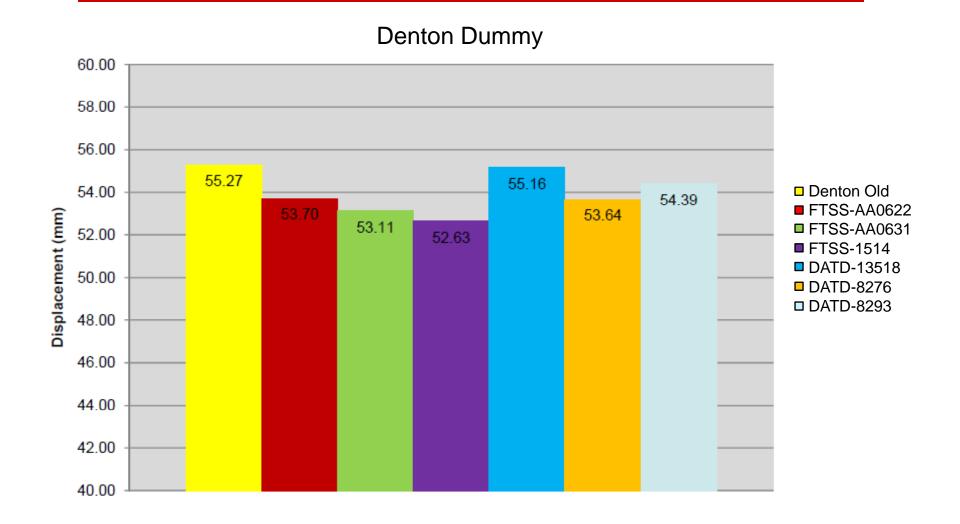
FTSS Test Result Summary





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Denton Test Result Summary

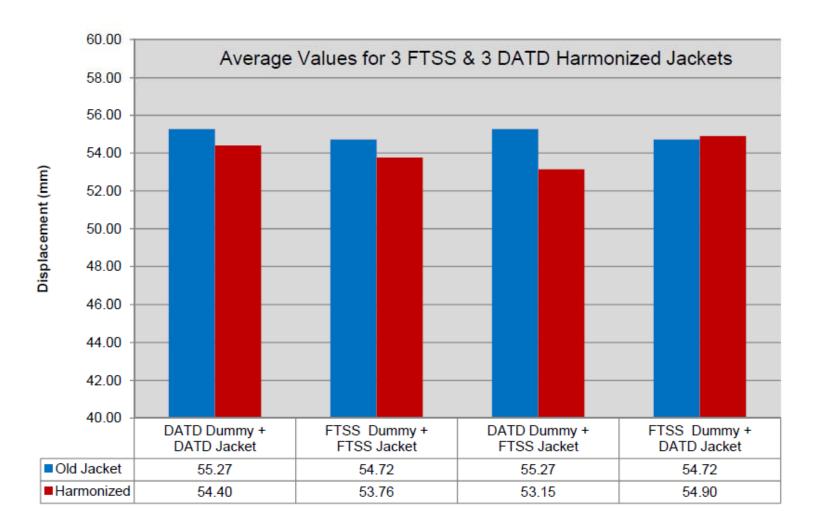




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Old Jacket versus Harmonized Jacket comparison



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Round-robin Test Summary

- In total 35 thorax certification tests were executed during the round-robin test at FTSS en Denton
- Average FTSS rib displacement on:
 - Old FTSS Jacket: 54.72 mm
 - FTSS harmonized jacket: 53.76 mm
 - Denton harmonized jacket: 54.90 mm
- Average Denton rib displacement on:
 - Old Denton Jacket: 55.27mm
 FTSS harmonized jacket: 53.15 mm
 - Denton harmonized jacket: 54.40 mm
- FTSS old jacket results are 0.96 mm more than the FTSS harmonized jacket
- Denton old jacket results are 0.87 mm more than the Denton harmonized jacket



Small Female Jacket Harmonization Summary

- FTSS and Denton are preparing SAE informational report (J-DOC) to outline the work executed:
 - Final document (J-DOC) to made generally available after Hybrid III family committee's approval
- Petition to be drafted to NHTSA to update drawing package to correct errors found

