Results of Structural Testing for FCS Common Chassis Prototype Concept

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### Results of Structural Testing for FCS Common Chassis Prototype Concept

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12. **DISTRIBUTION/AVAILABILITY STATEMENT**
   
   Approved for public release, distribution unlimited

13. **SUPPLEMENTARY NOTES**
   
Briefing Outline

- Program Description
- Conclusions
- Recommendations/Path Forward
- FCS benefits
Program Description

BEAM TESTING

SYSTEM TESTING

CORRELATION

MODELING & SIMULATION (M&S)
X-2 Test Structure

Composite/ceramic monocoque upper hull

Aluminum alloy externally stiffened skin top plate using friction stir welding (FSW).

Composite/ceramic skin plates

Aluminum alloy nodes and struts

1-inch titanium lower glacis included in lower hull

Welded titanium monocoque lower hull with ceramic tiles. Different architecture on each vehicle side.
Structural Tests Performed

Racking/Vertical

Horizontal

Maximum test loads were considered most severe
Conclusions

- Correlation was successful

- Still issues of concern
Conclusions (cont’)

- Vehicle testing was successful
  - Structure withstood loads
  - Overall vehicle structure was still linear and elastic
  - Local failures occurred
Recommendations

- More materials testing
  - Developmental tests needed for better characterization
- Further racking tests
  - Stiffen support structure
- Build/Test different structures
  - Space-frame structure
Benefits to FCS

- Helps validate state of M&S technology on a vehicle hull structure
  - Tells the level of reliability that can be anticipated
- Testers working with Analyzers
  - Data exchange protocols can be established and refined
More Information

- Hodges, Bogetti, Meldrum, and Smith, "FCS X-2 TEST SECTION: FINAL REPORT", TARDEC, 2004

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