

BioRIDII New Sled Evaluation

Data Observations
from
Ford Safety Lab Tests



Test Matrix

- 2 BioRIDII-G dummies tested – SN45, 70
 - Both passing current cert pre- and post-test
- Evaluation 1: Are the tests repeatable?
- Evaluation 2: Are the new tests with and without Head Restraint able to discriminate between...?
 - Dummy 45 vs. 70
 - New vs. Old vs. Repaired Jackets
 - New vs. Old Teflon Pad
 - Bolts @ base plate loose vs. tight (common mistake)
 - With vs. Without Chest Stop

Repeatability

- Mass only tests show good repeatability ([link](#))
 - Foam impactor repeats after many runs
 - Strange sled accel on a few of tests, unknown cause, but likely due to settling at initial setup
- 6+ tests with each dummy appear to have good repeatability (plots in shown in eval 2)
 - Peaks and data traces for dummy responses
 - Peaks and data traces for pots/sled data
 - However, Pot D had 2 issues
 - Data loss due do damaged wire
 - Data variability due to pot rod contacting shoulder (also Pot C)
 - Improved mounting is recommended

Tests With Head Restraint

- SN 70 (red) vs. SN 45 (blues)
 - Curve differences seen in Head Az, Upper Neck LC, T1 LC/Accel, Lumbar LC/Accel, Head Cap LC ([link](#))
- New (blue/turq) vs. Old style jacket (red/drk turq)
 - Curve differences seen in Head Az, Upper Neck LC, T1 LC/Accel, Lumbar LC/Accel
- Some curve shapes distinguish a difference between dummies, some distinguish the jacket type
- Differences are often revealed during rebound

Tests Without Head Restraint

- SN 70 (reds) vs. SN 45 (other)
 - Curve differences seen in Head Az, Upper Neck Fx, Fz, My, Mz, T1 Fx, Fz, My, Lumbar Fx, Fz, Mz, Pots A, B, C ([link](#))
- Jacket: New (blue) vs Old (pink/turq) vs Repaired (drk turq)
 - Upper Neck Fx, My, Mz, T1 Fx, Fz, My, Lumbar Mz, Pot A, B, C

Tests Without Head Restraint

- Teflon Pad: New (turq) vs Old (pink)
 - No significant curve differences
- Loose bolts @ base plate (drk blue vs yellow)
 - Only Lumbar shows differences
 - Indicates that issues in the lower spine are not evaluated in this certification test
- Chest Stop (blue vs drk blue)
 - Lumbar MY shows large differences as the sled stops
 - Recommend addition of chest stop as standard to prevent damage to the dummy vertebrae

Observations

- Foam impactor reusability seems very good – pulse overlays well after many runs
- Repeatability for a single dummy is better than previous cert test
- 2 New tests show promise in distinguishing differences between dummies and jackets
- New test does not reveal issues in lower spine
- Additional channels should be included in the certification to distinguish issues
 - Upper Neck LC, T1 LC, Lumbar LC
- Chest Stop should be added to all tests
- Alignment of the rod between Pots C and D can be difficult

Next Step Recommendations

- Investigate the causes of dummy to dummy differences and how they can be fixed
 - Create test corridors with additional promising channels
 - Investigate how to characterize the lower spine dynamically
 - Characterize the jacket for better manufacturing repeatability
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