BioRID II Drawing Harmonization

Head Restraints Systems GTR Phase II Informal Meeting

JASIC, Tokyo, Japan

February 2, 2010
Drawing Harmonization Goals

- Bring the expertise from automotive industry into the dummy design to create the best tool for head restraint development.
- Combine the best engineering excellence from both dummy manufacturers.
- Create the best dummy in the world for head restraint systems development.
Drawing Harmonization Process

• Both dummy manufacturers review both drawing packages independently.
• The dummy manufacturers meet to discuss the discrepancies between the drawings packages and work collaboratively to harmonize the drawings.
• Guidelines for harmonization
  – Engineering design merit
  – Durability and reproducibility
  – Serviceability in field
  – Spare parts
  – Handling and user’s friendliness
  – Original Chalmers design intent
  – Manufacturability and cost
Drawing Harmonization Flow Chart

FTSS Review → Denton Review

Follow the Guidelines for Drawing Harmonization

FTSS & Denton Discussion

Yes → Harmonized Drawings

No → Further Review

No → TEG Discussion and Direction
Current Status

• Jan 15
  – Both manufacturers reviewed the drawings to identify the differences.
  – Exchanged drawing package at the end of the day.
• Jan 25
  – The manufacturers reviewed the dimensions/tolerance, and reached agreement for the drawings reviewed with few exceptions that need investigation for further discussion.
  – The manufacturers will meet again after GTR meeting to continue until the completion.
### Comparison Summary Spreadsheet

(Separate Excel File Available)

<table>
<thead>
<tr>
<th>FTSS Harmonized Part No.</th>
<th>FTSS Part No.</th>
<th>Nominal (mm)</th>
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<th>Dim Locat</th>
<th>Differences</th>
<th>Chalmers Drawing</th>
<th>Harmonized Dim</th>
<th>Harmonized Material</th>
<th>comments and resolutions</th>
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**FTSS Denton**

- **Harmonized Part No.**
- **FTSS Part No.**
- **Nominal (mm)**
- **Description**
- **Tol**
- **dim by limit**
- **Dim Locat**
- **Denton Part No.**
- **Nominal (in)**
- **conversion**
- **Tol (in)**
- **conversion**
- **Dim Locat**
- **Differences**
- **Chalmers Drawing**
- **Harmonized Dim**
- **Harmonized Material**
- **comments and resolutions**

**Material comments and resolutions**

- **Material**: FTSS: AL 7075-T6, Denton AL 6061-T6
- **guidance feature for the**
  - **Feature**
  - **Dimensions**
Drawings Format

- Title Block
- Part numbers
- Metric/Imperial
  - Hybrid III (Imperial refer to NHTSA drawings?)
  - Parts unique to BioRID II (metric)
- Material Specification
  - Generic specs vs trade name (i.e. Delrin)
  - Performance specification (i.e. 180MPa yield stress vs 4140 Steel with RC 45).
Deliverables

• 2D drawings – all components
  – PDF format
• 3D CAD – complex geometry
  – STEP format
• User’s Manual
  – Assembly/Disassembly/Performance Adjustment procedures
  – Calibration procedure specifications
Proposed Schedule

• Feb 26, 2010
  – Drawing review completion.
  – Harmonize the drawings as much as we can between the manufacturers.

• March 15
  – Bring any unresolved issues if any to the TEG for discussion and seek resolutions

• March 31, Harmonization completion

• April 30, Draft drawing package submission
  – Both company will share the workload for final drawing package preparation.
  – Submit complete drawing package to GTR/TEG.