

ATD Harmonization Meeting - ATD Brand Consolidation Task Group HYIII 50th Male, HYIII 5th Female, EuroSID-2

MINUTES SUMMARY-APRIL 28th, 2011

6:00am- 10:00am EST

Humanetics Headquarters in Plymouth, Michigan

16 members attended in person and via *WebEx*.

In Person:

Guy Marshall (General Motors)
Steve Rouhana (Ford)
Hollie Pietsch (Ford)
Michael Jarouche (Humanetics)
Michael Beebe (Humanetics)
Joe Bastian (Humanetics)
Mark Brown (Humanetics)

Via WebEx:

Marvin Hatchett (IIHS)
Hiroyuki Asada (Mitsubishi)
Mitsutoshi Masuda (Toyota)
Keiji Hatano (Nissan)
Akihiko Akiyama (Honda)
Yuji Okuda (Humanetics)
Joe McFadden (VRTC)
Brian Grenke (Chrysler)
Paul Depinet (Humanetics)

Introductions

Introductions of members in person and *WebEx* were conducted.

Meeting agenda:

- 50th Update
- 95th Update
- 10YO Update
- HIII 5th Female Overview
- EuroSID-2 Overview
- Tasks for next meeting

The April 28th meeting was a continuation of the 50th and 95th review, and the beginning of the general Hybrid III 5th Female and EuroSID-2 discussions. An expanded in-person harmonization meeting is scheduled for Thursday May 12th.

Mr. Musada and some members of JAMA will be visiting the Humanetics Huron dummy manufacturing plant on May 9 and 10th for discussions in preparation for the May 12th harmonization meeting. The purpose of the visit is to review topics from the previous meetings and to conduct a plant tour.

HIII 50th Male Update

Mike Beebe presented the HIII 50th update on the task items from the previous meetings. GM provided the original abdomen and chest jacket patterns used for mold design. Mike presented photos of each

brand's finished product to highlight any differences between the parts and the patterns. Both abdomens are similar. The chest jackets have slightly different sized arm holes, while both deviate slightly from the pattern. The FTSS brand jacket had more similarities with the original GM pattern.

The pelvis bone castings were discussed. Photos of each brand's bone were displayed. Differences in the lilac wing thickness and the end knobs were noticed. The knobs on the FTSS brand were likely flattened for flesh durability. The original human bone used to create the pattern was not symmetrical, resulting in pelvis castings with non-symmetrical shapes.

The 50th discussion will continue during the next meeting once additional information is presented based on the following task items:

- Dimension measurements of molded abdomens
- Dimension measurements of chest jackets
- Side view photos and dimensional measurements of the pelvis bones.

HIII 95th Large Male Update

Mike Beebe announced that Humanetics has begun creating the bill of materials parts list for the 95th Harmonized ATD. We will discuss effective release dates at the next meeting.

HIII 10YO Child Update

Mike Beebe announced that Humanetics has met with NHTSA and the updates to the neck bushing and revisions for the shoulder clearance are in process. Once complete, there will be discussions concerning the availability of upgrade kits.

HIII 5th Female Overview

Mike Beebe presented slides outlining the 5th female beginning with a brief design history and a brand population chart. The original dummy drawings were produced by FTSS. The Denton version was created from scans of a NHTSA FTSS dummy and the released NHTSA drawing package.

Both head and neck assemblies meet the drawing package and should be similar. No durability issues or concerns were immediately raised by attending members. The head skins should be interchangeable, but an analysis will be conducted. Mold recommendations will be given at the next meeting.

The thorax was discussed, centering on the previous work NHTSA commissioned to harmonize the chest jackets. The concern raised is that there are three 5th female chest jackets available. Joe McFadden from VRTC provided torso flexion test data for the harmonized jacket and said they could not get the test to consistently pass using the new jacket. NHTSA does not yet allow the harmonized jacket for regulation testing. The torso flexion data will be reviewed further. The chest potentiometer provided by each manufacturer is similar, but a specification comparison will be completed. An IRTACC comparison will also be reviewed.

The pelvis and lower torso assembly differences of each brand were discussed. Both lower torsos meet weigh and cg requirements, but there are different load cell openings and the individual weights of the

molded pelvis differ for each brand. The FTSS brand upper femurs are heavier, resulting in a lighter molded pelvis weight which creates interchangeability issues with Denton brand parts. The distribution of the lower torso mass may affect how the pelvis rotates and the effect of submarining during testing. A further investigation will be conducted.

Paul Depinet provided abdomen photos from the two brands. The abdomens have slightly different shapes, especially around the pocket and stepped area. The drawing is deficient in giving enough information for the correct shape and specification for the step location. Further discussion will be required.

Different leg cg lines in the 5th versus the SIDII's drawing packages were noticed despite the fact that both dummies use the same leg assemblies. Joe McFadden presented drawings for each leg showing the difference in position of the cg line relative to the x-axis. A review of the drawings will be considered.

Hollie Pietsch brought up the topic of the lower leg flesh clevis flap, which gets dislodged when the flesh is adjusted to align the bolt holes with the leg bolts. Further investigation into options will need to be conducted.

The arm assemblies were reviewed, highlighting the differences in the FTSS and Denton brands. The Denton brand is solid vinyl while the FTSS brand is foam filled. A discussion on how hand placement and finger pliability affects test results ensued. The drawing shows a solid vinyl hand. Samples and measurements will be provided during the next meeting. The lower arm foam fill may be similar to the differences shown for the 50th. More information will be provided.

HIII 5th Female task items for the next meeting:

- Head assembly interchangeability analysis
- Mold recommendations
- Torso Flexion investigation
- Chest potentiometer specification comparison
- IRTRACC comparison
- Abdomen measurements and comparison
- Pelvis and lower torso measurements and comparison
- Leg assembly drawing comparison for cg line
- Lower leg flesh options for clevis flap
- Hand measurements and comparison
- Lower arm flesh and wrist comparison

EuroSID-2 Overview

Mike Beebe presented slides outlining the EuroSID-2 ATD and the RE version. There are no 3D patterns or pattern call-outs within the EuroSID-2 head skin drawing and only a few dimensions are shown. Both FTSS and Denton use the same HIII 50th head skin mold for the ES-2, likely creating the same head assembly interchangeability issues. A comparison will be provided for the next meeting.

The neck was discussed and the nodding buffer rules questioned. It was found that the EuroNCAP protocol specifies the blue designated durometer buffer, but the NHTSA RE regulations allow any of the three varieties. Joe McFadden stated that they found more wobble in Denton brand neck assemblies. Paul Depinet expressed that Denton had made some updates to the neck buffer shape when the NHSTA drawing package was released in 2006. Paul found a wide range of wobble and fit over both brands during previous rules. Today, the Denton and FTSS brand fits should be consistent.

The thorax was briefly discussed. Some users noticed issues with shoulder pad stiffness between brands and commented that FTSS arm bones have shown more durability. Users agreed that the full body NHTSA thorax certification test was responsible for the shorter lifespan of foam ribs. Paul Depinet referenced a study that concluded both brands of rib foams deteriorate faster when subjected to the NHTSA certification test.

The abdomens provided by both brands have been problematic for users trying to re-certify them. Each brand has had many problems with the manufacturability of the abdomens because of the specified design and long obsolete foam composition. FTSS and Denton have both experienced high scrap rates and certification challenges. Humanetics is reviewing which abdomen brand they would like to recommend to the group.

The iliac wing material has faced the same obsolete problems as other Ureol based products. The Ureol brand polyurethane hardening agent has been banned by the European REACH regulation body because of environmental reasons. Subsequently, the Denton brand wing has been manufactured using thermal set plastic. The FT brand will also be manufactured from this same material in the near future. Joe Bastian pointed out that the thermal plastics are durable and that much testing has already been completed using them on the Q3s ribs.

No Leg issues were presented by attending members during this meeting.

EuroSID-2 task items for the next meeting:

- Head assembly interchangeability analysis – compare head skins
- Shoulder foam comparison
- Arm bone comparison
- Abdomen brand recommendation from Humanetics

May 12th Meeting Agenda:

- Review the HIII 50th, 5th Female, ES-2 task items and open questions
- Vote on the HIII 50th, 5th Female, and ES-2.

**The May 12th harmonization meeting will be an expanded face-to-face meeting as members of JAMA, Europe, and the U.S. will all attend in person.

We encourage everyone's participation in the May 12th meeting for this important milestone in the Harmonization Task Group's year-long efforts.

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