

ATD Harmonization Meeting - ATD Brand Consolidation Task Group Phase-in Discussions, Previous Work Updates, HIII 6YO Child, CRABI 12

Sept 8th, 2011

6:00am- 11:00am EST

Humanetics Headquarters in Plymouth, Michigan

Attachments: None

14 members attended in person and via *WebEx*.

In Person:

Jack Jensen (General Motors)
Brian Grenke (Chrysler)
Hollie Pietsch (Ford)
Steve Rouhana (Ford)
Leo Ferdinand (Porsche) (ACEA)
Joe McFadden (VRTC)
Michael Jarouche (Humanetics)
Paul Depinet (Humanetics)
Michael Beebe (Humanetics)
Joe Bastian (Humanetics)
Mark Brown (Humanetics)

Via WebEx:

Marvin Hatchett (IIHS)
Jason Stammen (VRTC)
Yuji Okuda (Humanetics Japan)

**Voting members or their designees must attend the meetings in order to cast a vote on that day's topics.*

**One single member of JAMA and ACEA represents all four voting members of each group.*

Introductions

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

Yuji Okuda attended via *WebEx* and took notes for the JAMA members not present. Japan has been alternating days of operation for businesses throughout the summer months to help alleviate power demand on the region's electrical grid. The automotive members were not working on Thursday and Friday. The group agreed to allow them to submit their votes at a later time.

This Meeting's Agenda

- HIII Damping Material Update
- Black Nickel Plating
- Metal Surface Preparations
- 10YO NHTSA Update
- Head Skin Testing Update
- Phase-in Discussion Update
- Customer Communication
- HIII Shoes
- HIII 6YO Child
- CRABI 12 Month

HIII Damping Material Update

Both FTSS and Denton have historically used a common rib damping material provided by a single supplier. This supplier discontinued the product last year, leaving Humanetics with the task of finding a suitable replacement material.

Mike Beebe stated that a new trial material produced by a new vendor is made from the same formula used by the previous manufacturer. The formula is owned by the US Navy, who put the material out to bid. They eventually chose a west coast supplier. The material samples are testing closer to the original Lorde damping material first used to spec the HIII 50th ribs during the original design phase. The most noticeable difference seen thus far has been in hysteresis numbers testing closer to 80 percent rather than the current 70 percent.

Ford is in the process of testing two 50th rib sets manufactured with the new damping material. Hollie stated that their testing should be completed within a week. Humanetics reported having approximately a 1 month supply of the current production material left, so manufacturing will need to begin using the new batches. A technical bulletin will be released by Humanetics at a later date.

Black Nickel Plating

During the May, 2011 harmonization meeting, the global task group agreed to harmonize to black nickel plating for steel components across all models of ATDs. Black nickel previously replaced the black oxide coating on the FTSS brand of dummies in September of 2010. Denton brand parts are also nickel plated, but the silver color of the nickel is maintained.

Mike Beebe stated that during the normal course of production, Humanetics has discovered that the surface thickness and finish of the black nickel version of this coating process can be a challenge to control. The method used to produce the black shade of nickel creates a buildup of coating that can be in excess of acceptable tolerances, especially in threaded holes. The thicker coating creates extra production and quality related steps to ensure that the black nickel parts are functional. These extra processes add unnecessary cost and can create longer lead times.

Mike asked the group whether it was absolutely necessary to maintain a black color to the nickel plating. Humanetics would like to recommend the standard silver color nickel plating.

Hollie stated that they have had no issues with the silver color of nickel other than the black oxide callout on some of the NHTSA drawings. But as a self certifying vendor, they can make their own choice if it's deemed better.

Michael asked what issues NHTSA would have with this choice.

Joe responded that they currently have silver nickel dummy parts from Denton in use at NHTSA and haven't had any problems. The only consideration would be the drawing package specifications.

Mike Beebe noted that the newer dummy drawings have been specifying 'black oxide or *equivalent*'

Paul reminded the group that the load cells have used nickel plating since their inception.

Michael asked Yuji to bring feedback from JAMA. Mike Beebe will also further investigate the black nickel process and composition for clarity.

Metal Surface Preparations

Mike Beebe asked the group if there are any preferences to the surface finish of metal components; specifically the tumbling process (shiny) versus sand blasting (not as shiny).

Tumble finishing for metals is the process of smoothing, cleaning, de-burring and polishing rough surfaces. Within Humanetics this technique is mainly used on casted metal surfaces such as aluminum skulls and clavicle components. Originally used on the Denton brand, Humanetics recommends that tumbling be incorporated throughout the harmonized product line to reduce this type of surface variation.

There are no regulated drawing callouts specifying the process method to use for minimum surface finishes. No preference was voiced by the group.

Over the course of the remaining months of 2011, customers may see a part mix of coatings and surface finishes as the transition takes place. Humanetics does not anticipate any performance, fit, or function concerns with the product mix. All parts adhere to the specified tolerances and performance corridors.

10YO NHTSA Update

Jason Stammen of VRTC presented a progress update on the HIII 10YO issues previously detailed during the harmonization meetings. These include shoulder contact, neck noise, and chin stiffness. VRTC conducted full system evaluations in 3 booster seat types under FMVSS 213 conditions using 24 different neck combinations of existing and revised parts. Little difference in kinematics was observed.

Jason began by showing the revisions to the shoulder that will eliminate clavicle contact with the shoulder supports. The clavicle changes include a deeper counter bore, rounded corners, a straight cut instead of a curve on the top ridge, and a reduction in the shoulder support thickness.

The revised shoulder did prevent contact as expected, but Mike Beebe pointed out that these proposed shoulder revisions will now affect the previous decision to harmonize to the FTSS brand load cell. The new modifications to increase clearance are not possible on the FTSS version because it will affect the interior strain gage beams too much. We would have to reverse this earlier decision and go with the Denton version. This change will also require a dedicated yoke and load cell package and a separate yoke and structural replacement package that must be kept together as pairs.

To try and remedy the neck cable snap previously noticed, Jason experimented with a smaller cable bushing ID, a larger bushing OD, and a thicker flange, but still found neck noise to be prevalent in the flexion and extension transitions. By covering the cable end with tape, they were able to finally remove this noise. They also noticed that the washer can slide on the bushing and contact the counter bore edge in the lower neck load cell and structural replacement.

The three solutions proposed to remedy the neck noise are to use an isolating sleeve over the full length of the portion of the cable that runs through the lower neck load cell or structural replacement, use a smaller ID on the washer to prevent sliding, and widen the thru-hole diameter.

Jason continued his presentation with data comparing the chin areas of the two brands of 10YO head skins. Hard chin to chest contacts in the HIII 10YO can sometimes cause high head accelerations. VRTC's physical measurements of the two chins concluded that the Denton brand has a higher durometer and a thinner vinyl chin thickness, whereas the FTSS brand has a lower durometer and a thicker vinyl chin. Based on test results and the scaled PMHS biofidelity data, VRTC believes the FTSS version of the chin produces a biofidelic response closer to their requirements when chin to chest contact occurs.

VRTC's recommendations are to add durometer and thickness specifications to the chin portion of the HIII 10YO head skin based upon the FTSS version. The goals are to increase biofidelity, reduce the high head accelerations, and to achieve a more consistent chin thickness and stiffness. The current harmonization decision is with the Denton brand of the 10YO head skin.

Both head skin versions pass head drop certification, but Paul questioned the durometer measurements as reported by VRTC. Durometer measurements are difficult to achieve accurately even with a flat sample, much less a curved contour such as seen in the chin area.

Joe Bastian stated that durometer is a poor measurement for consistency and it is only a gross indication of the material stiffness. Pendulum or compression tests are much better options.

Mike Beebe noted that the vinyl pour hole on the FTSS brand head skin is in the chin and causes consistency problems because each one is hand sanded and cleaned in that area. The Denton brand pour hole is on the other end of the head skin and doesn't affect the chin. Mike suggested that a chin insert may be necessary to ultimately hit the biofidelic corridors with any consistency.

Mike suggested that we not re-visit the previous harmonization decision, but instead Humanetics will revise the chin thickness on the Denton version of the head skin and develop a test with VRTC to help improve the consistency in this area.

The group also suggested that Jason should present this information to the SAE HIII Family Subcommittee. The reason for presenting this information first within the Harmonization Task Group is to understand how the harmonization decisions could be affected.

Head Skin Testing Update

Steve Rouhana of Ford reported that they have recently completed a round of curtain and frontal airbag tests on the Denton, FTSS, and the harmonized versions of the 5th female head skins. The goal is to compare accelerations, rotations, and neck forces between the three versions and to see if any frictional characteristics can be ascertained. Steve showed short video clips of the testing. No ASTM static friction tests have been performed.

The analysis of the data has not been completed, but will be available shortly. Steve stated that he will report the findings at the next meeting.

Phase-in Discussion Update

Mike Beebe began by presenting a time table summary showing the order in which harmonized parts and ATDs will be processed through manufacturing, and how stock depletion of specific brands would happen. Tentatively, the skeletal parts would be seen first by customers, followed by the rubber parts, then the vinyl components, and lastly, the complete dummy.

Michael Jarouche anticipates that there would be a 20 week window from now until the end of the year to wind down the current stock and begin shipping harmonized parts for the HIII 50th. He pointed out that scraping any brand specific parts would hinder current deliveries and be a problem for customer needs.

To further outline the specific characteristics of the harmonized parts, Mike Beebe presented a draft white paper for the HIII 50th ATD. Committee members received a copy a few days prior to today's meeting. The group agreed that the paper's language and the manner in which the 'new' product offerings and the subsequent interchangeability were presented was important.

Leo Ferdinand stated that EuroNCAP will take their time in updating their dummies because of budget constraints. Part 572 based testing will not be an issue since all products meet the standard. From his experience, much of the purchasing decisions in the past were based on price. Interchangeability has not been an outstanding issue in recent times.

Joe McFadden stated that they have interchanged dummies regularly and they have no specific issues in this regard. NHTSA's contract houses use the NHTSA owned dummies for their tests and have had frequent exposure to interchanging brands. Joe also asked to run the final version of the white paper through their legal counsel for review.

Mike suggested we add bullet points and matrixes to specifically outline any differences in the parts affected the most, i.e., head skins, chest jackets, ribs, abdomens, etc.

Jack stressed that we need to add language in the white paper to reaffirm that the harmonized ATDs are still within the current band of variation and that a third band is not being introduced. He suggested we also outline both a manufacturing transition and a separate customer transition process.

Michael asked to set specific offset dates to the harmonized ATDs, such as January for the 50th, February for the 5th, etc.

The group also agreed Humanetics should not allow customers to order old brands of parts after an allotted time frame. We should communicate to customers what the cut-offs are and after current stock is depleted, or after a certain date, the old brands will not be available.

Mike Beebe stated that the harmonized part numbering structure will eventually reflect the drawing package numbers without any brand specific or harmonized suffixes. In the interim, Humanetics may employ a -H suffix to indicate the harmonized product.

Beginning the Customer Communication

Three types of communication tools were presented and previously discussed in the last harmonization meeting: white papers, technical bulletins, and face to face meetings.

The group agreed that it would be ideal if the first face to face presentation of the harmonization work could be made at this year's STAPP conference in November. It would allow an international audience to participate. After the STAPP introduction, a series of regional global meetings would be held for those who could not attend.

Jack agreed to open this first harmonization meeting with customers. Other group members may also provide some public comments on the harmonization efforts.

Leo suggested that a joint meeting of the ACEA and AK5 groups in Germany could be organized when we are ready.

Task: Humanetics will explore the possibility of a STAPP meeting and work out a time with the conference organizers. We will report on the outcome at the next meeting.

HIII Shoes

During a previous harmonization meeting, the Task Group agreed to harmonize the HIII shoe to the FTSS CAPPS brand. Jack noticed that the part number for the CAPPS shoe is exclusive to Humanetics and isn't sold by CAPPS to any other customers.

Joe Bastian explained that the reason for the exclusive contract was because FTSS originally put forth the effort to develop and finance the molds for CAPPS to produce a shoe that meets the MIL-Spec and the Euro foot impact requirements.

Michael agreed to look into this to see if the agreement can be opened for customers who want to buy direct from the manufacturer. Humanetics will check on the details of the agreement and inform if this can be made non-exclusive.

HIII 6YO Child

Mike Beebe began the HIII 6YO review with a population slide showing the two brands of dummies. 66 Denton ATDs were sold versus 213 FTSS brand versions.

Head and Neck

Mike presented an attribute slide of the head assembly. Mold characteristics were listed including older FT brand head skin and cap skin molds that require sealant when used. Humanetics recommends the newer Denton molds since they may have more usable years left in their life cycle.

No other concerns were raised with either the head or neck. No mold preferences were discussed for the neck.

A vote was taken. 2x FT brand, 2x Denton brand and 3x no preference votes were cast for the head. The FTSS brand neck was recommended.

Torso and Limbs

Mike Beebe presented attributes slides and mold recommendations for the torso and limbs of the HIII 6YO. Most of the Denton vinyl molds are newer and recommended by the molding group within Humanetics. The leg molds of both brands are equally good with high yield rates.

Joe McFadden asked if there are any known torso flexion or abdomen differences between the two brands. No issues were voiced during this meeting.

Paul stated that he was still trying to make contact with UMTRI about a study they did on the 6YO jacket and belt fit. They may have included a recommendation on the preferred brand of jacket. Paul suggested that we review the study before voting on the chest jacket.

Jack brought up the population disparity as reported in Mike's presentation. The number of complete dummies sold is overwhelmingly that of the FTSS brand. His argument suggests that we should side with the greater population to reduce the variation band quicker instead of prolonging it by injecting more of the minority brand into the mix.

Hollie countered that although her 6YO dummies started out as the FTSS brand, she has since replaced many of the main tested components with Denton brand parts. There may be many more users who have dummies composed of a mixture of components rather than solely of one brand. Therefore, Mike's population chart may not be an accurate representation of what's actually in the field.

The group decided that a review of the major vinyl and rubber spare part components should be done to help determine if Jack's original population stance should be weighted more heavily into the harmonization decisions.

Task: Humanetics will furnish the spare part sales data from the last 10-12 years for the next meeting.

The voting on the 6YO was suspended until this information could be presented and reviewed.

CRABI 12 Month

Mike began the review of the CRABI 12 with a population slide showing 54 Denton versions compared to 141 FTSS dummies.

Mold recommendations from the Humanetics molding department were presented. The Denton molds for the head skin, chest jacket, and abdomen were recommended. The FTSS molds for the skull, legs, and arms were recommended.

Paul stated that the Denton brand urethane is the only material now available and Humanetics will have to harmonize to it for the CRABI dummies and the HYIII 3YO as previously discussed.

Paul also stated that the FTSS brand of CRABI neck uses the HIII 3YO mold and then machines to size. This introduces more variation and process time. Humanetics recommends the Denton brand mold for the neck and lumbar of the CRABI.

The group agreed that since the population difference is large, a review of the critical spare part sales for the last 10-12 years should take place before the final decisions are made.

Task: Humanetics will furnish the spare part sales data for the next meeting.

The voting on the CRABI 12 was suspended until this information could be presented and reviewed.

DOT Side Impact Dummy (SID)

The group has decided to remove the DOT SID ATD from the review schedule due to its infrequency of use and removal from regulation.

Tasks for the Next Meeting

- Update phase-in
- Review UMTRI 6YO report
- Create STAPP presentation for Harmonization
- Gather information for the HIII 6YO and CRABI 12 spare parts population

October 4th Meeting Agenda

Review Phase-in
Review STAPP presentation proposal
HIII 6YO Child / CRABI Updates and voting
FMH review

The current harmonization schedule

January 13th – HYIII 95th Large Male
February 10th – HYIII 10YO Child
March 14th – HYIII 50th Male
April 21st / April 28th – HYIII 50th Male
May 12th – 5th Small Female/50th Male
June 21st – EuroSID-2, Phase-in Discussions
July – No Meeting
August 2nd - 3YO Child, Phase-in Discussions
September 8th - HYIII 6YO/Updates to Previous Work/Phase-in Discussions
October 4th - HYIII 6YO/CRABI/FMH/Misc.

Meetings are generally held the 2nd Thursday of each month barring any conflicts. Locations to be determined.

**Please comment on the previous meeting minutes during the beginning of each meeting.*

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