GTR7-02-09

BioRID II Drawing Harmonization

Head Restraints Systems GTR Phase II Informal Meeting

JASIC, Tokyo, Japan

February 2, 2010

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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

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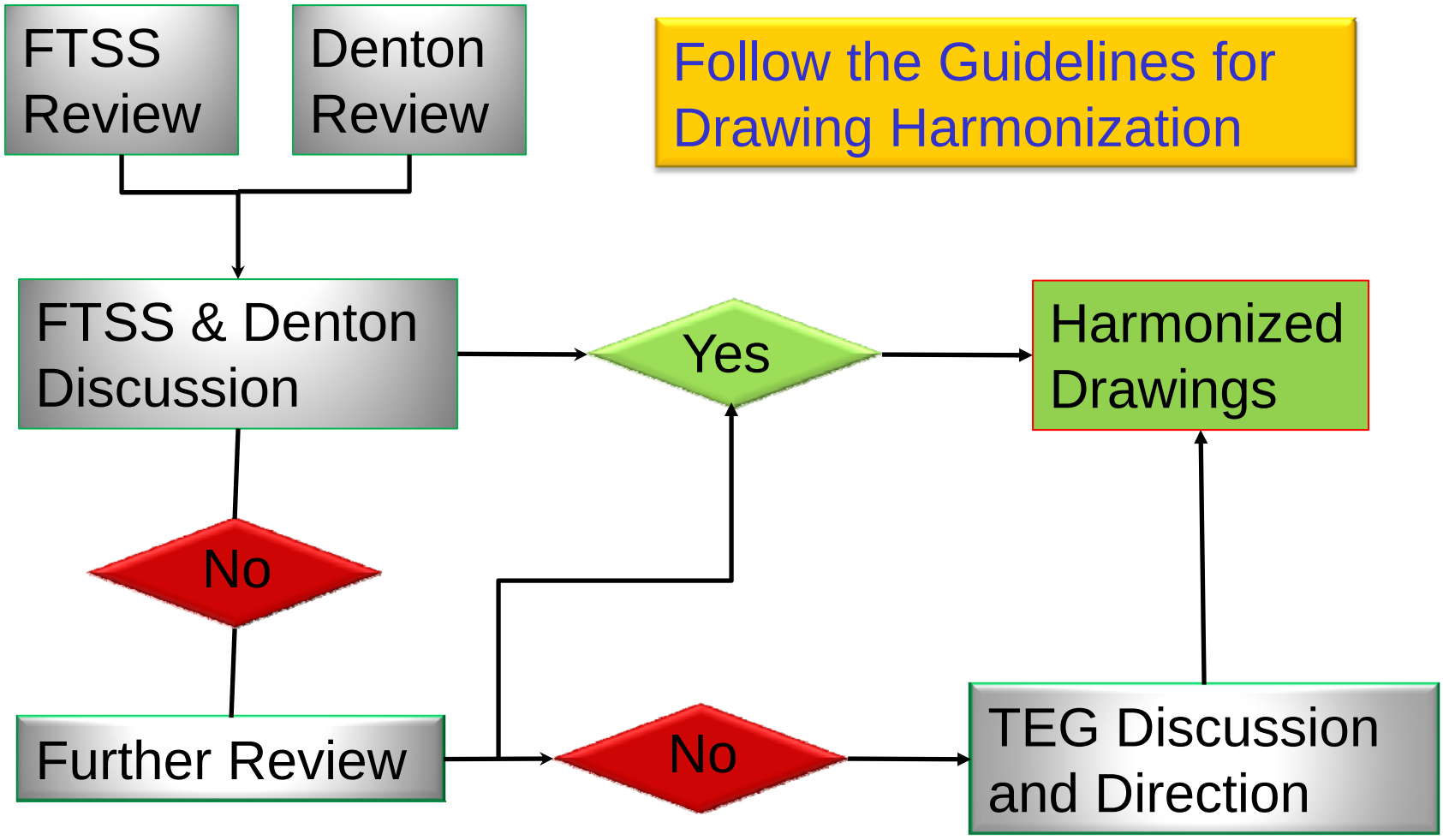
Drawing Harmonization Flow Chart



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.

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Comparison Summary Spreadsheet

(Separate Excel File Available)

		FTSS							Denton									
Harmonized Part No.	FTSS Part No.	Nominal (mm)	Description	Tol	dim by limit	Dim Location	Denton Part No.	Nominal (in)	conversion	Tol (in)	conversion	dim by limit	Dim Location	Differences	Chalmers Drawing	Harmonized Dim	Harmonized Material	comments and resolutions
	590-0000						ARA-001											
	NONE						ARA-002											
	590-1010	20.20		±0.1		B2	AR-100	0.807	20.50	±0.005	0.127		B3	Material: FTSS: AL 7075-T6, Denton AL 6061-T6	B2			
		64.50		±0.1		B6		2.559	65.00	±0.005			D3					
		8.75				B3												
	590-1000						ARA-103											
	590-1003						ARA-104											
	590-1020						ARA-105											
	590-1004						ARA-106											
	590-1015						ARA-107											
	590-1005						ARA-108											
	590-1006						ARA-110											
	NONE						ARA-120											
	NONE						ARA-121											
	NONE						ARA-138											
	590-3000						ARA-200											
	590-3100						"											
	590-2001						ARA-201											
	590-2002	15.00		0,-.05			ARA-203	0.589	14.96	0,-.003	0,-.076							
		15.050		.025,-0				0.593	15.06	.003,-0	.076,-0							
		8.000		±0.025				0.315	8.00	.001,-0	.025,-0							
	590-2003	15.00		0,-.05			ARA-206	0.589	14.96	0,-.003	0,-.076							
		15.050		.025,-0				0.593	15.06	.003,-0	.076,-0							
		8.000		±0.025				0.315	8.00	.001,-0	.025,-0							
	590-2004	15.00		0,-.05			ARA-207	0.589	14.96	0,-.003	0,-.076							
		15.050		.025,-0				0.593	15.06	.003,-0	.076,-0							
		8.000		±0.025				0.315	8.00	.001,-0	.025,-0							
	590-2005	15.00		0,-.05			ARA-208	0.589	14.96	0,-.003	0,-.076							
		15.050		.025,-0				0.593	15.06	.003,-0	.076,-0							
		20.050		.025,-0				0.787	20.05	.003,-0	.076,-0							
		8.000		±0.025				0.315	8.00	.001,-0	.025,-0							
	590-2006	8.000		±0.025			ARA-209		8.000	±0.025	±0.025					8.000±.025	SS 303	
	590-2007	12.40					ARA-210		15.00							15±3 deg		
		10.50							10.00							10±1		
	590-2008	8.000		±0.025			ARA-212		8.000		±0.025					8.000±.025	SS 303	
	590-2009						ARA-213	c'sink Ø.154								c'sink 4±1.0		guidance feature for the
	590-2010						ARA-220											
	590-2011						ARA-221											
	590-2026						ARA-222											

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.

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