New HPM and HRMD Standards

1. Initial Situation
2. Deviations and Variations
3. Activities
4. Benefits
5. Feedback
The backset and H-Pt. affect whiplash test results for IIHS, Thatcham, EuroNCAP and FMVSS202a by:

1. the seat
2. the equipment (HPM and HRMD)
3. the procedure
4. the measuring technicians

Interim status presented to IIHS, D. Zuby and Thatcham, M. Avery
November 2008
New HPM and HRMD Standards

1. Initial Situation

HPM
1. Several suppliers for HPM’s, unknown copies are existing
2. Actual standards for measuring devices are not fulfilled

HRMD
1. developed in the 90’s as extension for the HPM to measure backset
2. One supplier, RONA
3. Two versions and copies are existing
4. Actual standards for measuring devices are not fulfilled

HPM weight difference up to 3 kg!
Differences in shape (> 9 mm) and position (> 4 mm) of the cushion and back!
H-Pt. markings are not in line with the rotation axis.

Up to 40 mm Variation in backset!
New HPM and HRMD Standards

2. Deviations and Variations

Contact surfaces of HRMD differs more than 9 mm!
several mm in every direction and of angle more than 0,5°

New HPM compared with older version: No vertical mounting of back shell!

Black back shell is smaller over all compared to the white version

6mm difference in weight hanger position in X-direction
New HPM and HRMD Standards
2. Deviations and Variations

Thatcham defined the calibration device GLORIA to reduce variation.
„A first step in the right direction! But more improvement is necessary.“ (ADAC, Mr. Sandner)

But:
There are only four GLORIA's existing without any documentation.
The GLORIA calibration allows too much variation, for example a cushion height difference in Y direction.
Supplied „GLORIA-ready“ HPM's failed in GLORIA calibration!
AA calibrates HPM's, but the modifications are unknown which results in unknown consequences for running programs.
=> less improvement!

After a deeper look into it, we found out there is more potential to reduce variation.
New HPM and HRMD Standards

3. Activities

OEM’s and seat manufacturers want to reduce the measuring variations of the H-point and backset results to get clear information about the actual seat quality/safety. To achieve improvement, the following is necessary:

1. Calibration
A proper calibration device and procedure to ensure quality over time for HPM and HRMD.

2. Precise Equipment
HPM and HRMD need a rework to reduce tolerances in shape, dimensions and positions.

In addition came the new SAE J826 Rev MAR2008 which demands several tighter tolerances and has new measures listed.
New HPM and HRMD Standards

3. Activities

1. Calibration

LEAR developed its own calibration device the DILEMMA. In cooperation with GO-Design it was refined for SAE J826 MAR2008, finished and after some experiences with HRMD checks, an HRMD calibration device (HCD) was added.

DILEMMA

over 40 checks!

HCD
New HPM and HRMD Standards

3. Activities

2. Precise Equipment

HPM:
✓ CAD
✓ Moulds
✓ Parts
✓ Rework of metal parts to fulfil DILEMMA specifications
✓ New reference HPM mounted and ready for measuring
✓ Additional clones ready

Not a new HPM, but modified to fulfil specifications with reduced tolerances!
New HPM and HRMD Standards

4. Benefits

Precise Equipment
HPM and HRMD need a rework to reduce tolerances in shape, dimensions and positions.

Calibration
A proper calibration device and procedure to ensure quality over time.

HPM and HRMD that fulfil DILEMMA/HCD and SAE J826

DILEMMA/HCD Standard
New HPM and HRMD Standards

4. Benefits

Two new HPM’s calibrated with new shells:

Before: maximum deviation $> 9$ mm over all and $> 6$ mm for the shells only!

With three different HPM’s of old design up to 40 mm variation in backset

After: max. deviation $< 1.5$ mm over all and $< 1$ mm for the shells only!

With three different red HPM’s 4 mm variation in backset
### New HPM and HRMD Standards

#### 5. Feedback

<table>
<thead>
<tr>
<th>Company</th>
<th>Feedback</th>
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</thead>
<tbody>
<tr>
<td><strong>VDA (German Automotive Industry):</strong></td>
<td>„We will release this as a VDA standard soon.“</td>
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<tr>
<td><strong>ADAC:</strong></td>
<td>„We want a red HPM.“</td>
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<tr>
<td><strong>Thatcham:</strong></td>
<td>„The DILEMMA calibration could be the GLORIA II.“</td>
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<tr>
<td><strong>GO-Design:</strong></td>
<td>„Every big seat manufacturer wants reworked HPM’s and they are impressed about the quality. 17 HPM’s changed until end of 2009“</td>
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<tr>
<td><strong>AZT Allianz:</strong></td>
<td>„We want this calibration and the new shells.“</td>
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<tr>
<td><strong>Audi:</strong></td>
<td>„We are impressed about the tight tolerances.“</td>
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<tr>
<td><strong>VW/Audi/Seat/Skoda:</strong></td>
<td>„This will be our new group standard.“</td>
</tr>
<tr>
<td></td>
<td>Audi: complete changed; VW: changed until end of 2009</td>
</tr>
<tr>
<td><strong>LEAR:</strong></td>
<td>„European plants almost complete changed.“</td>
</tr>
<tr>
<td><strong>Faurecia:</strong></td>
<td>„We compared two red HPM’s and measured only 0,5 mm diff., changed until end of 2009“</td>
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