

**Biomechanical Responses of
HY-III and BioRID II
Presented by Japan**

Part 2

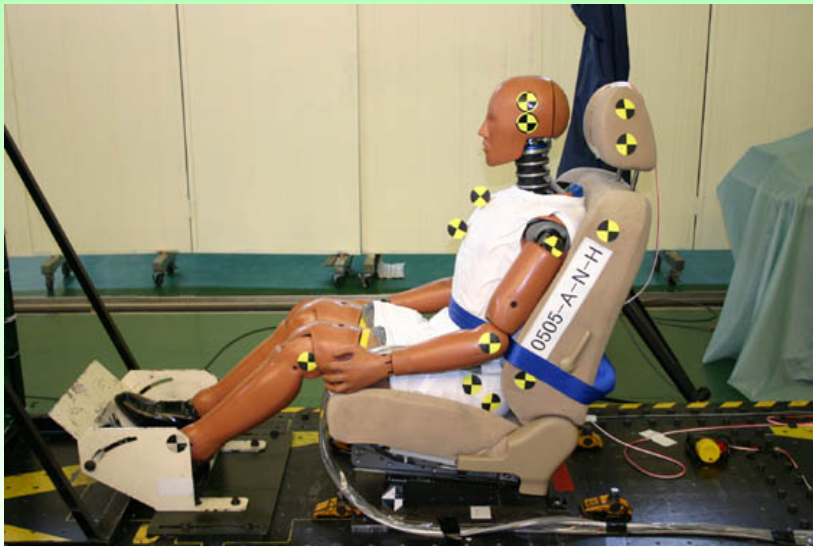
**Informal GTR Meeting
at NHTSA (Washington DC, USA)**

Part 2

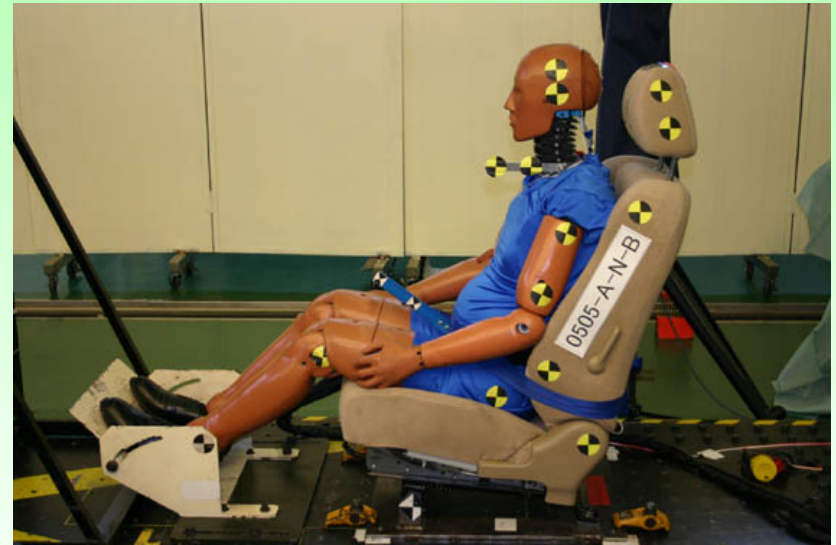
**Influences for Evaluation of Seat
Performance with or without Active
Headrest Based on Different
Dummy Responses**

Objective

To verify the different biomechanical responses of HY-III and BioRID II due to different seat characteristics



HY-III

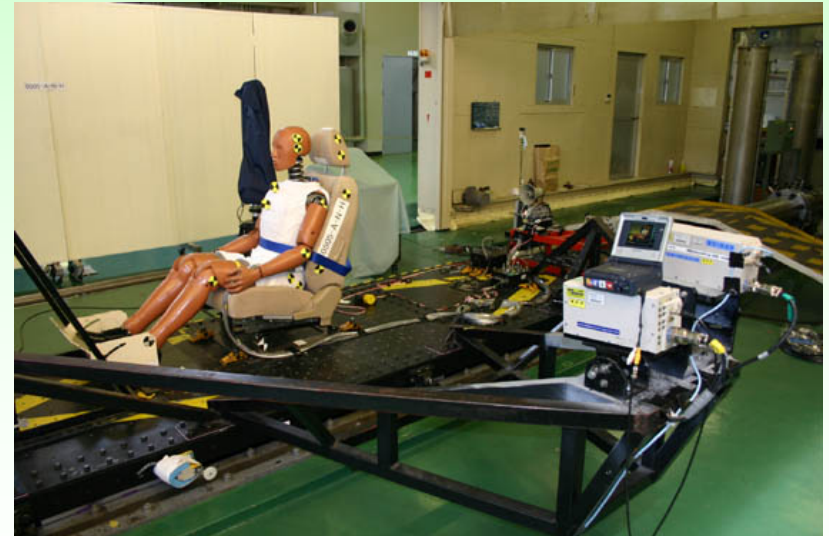


BioRID II

Test Conditions

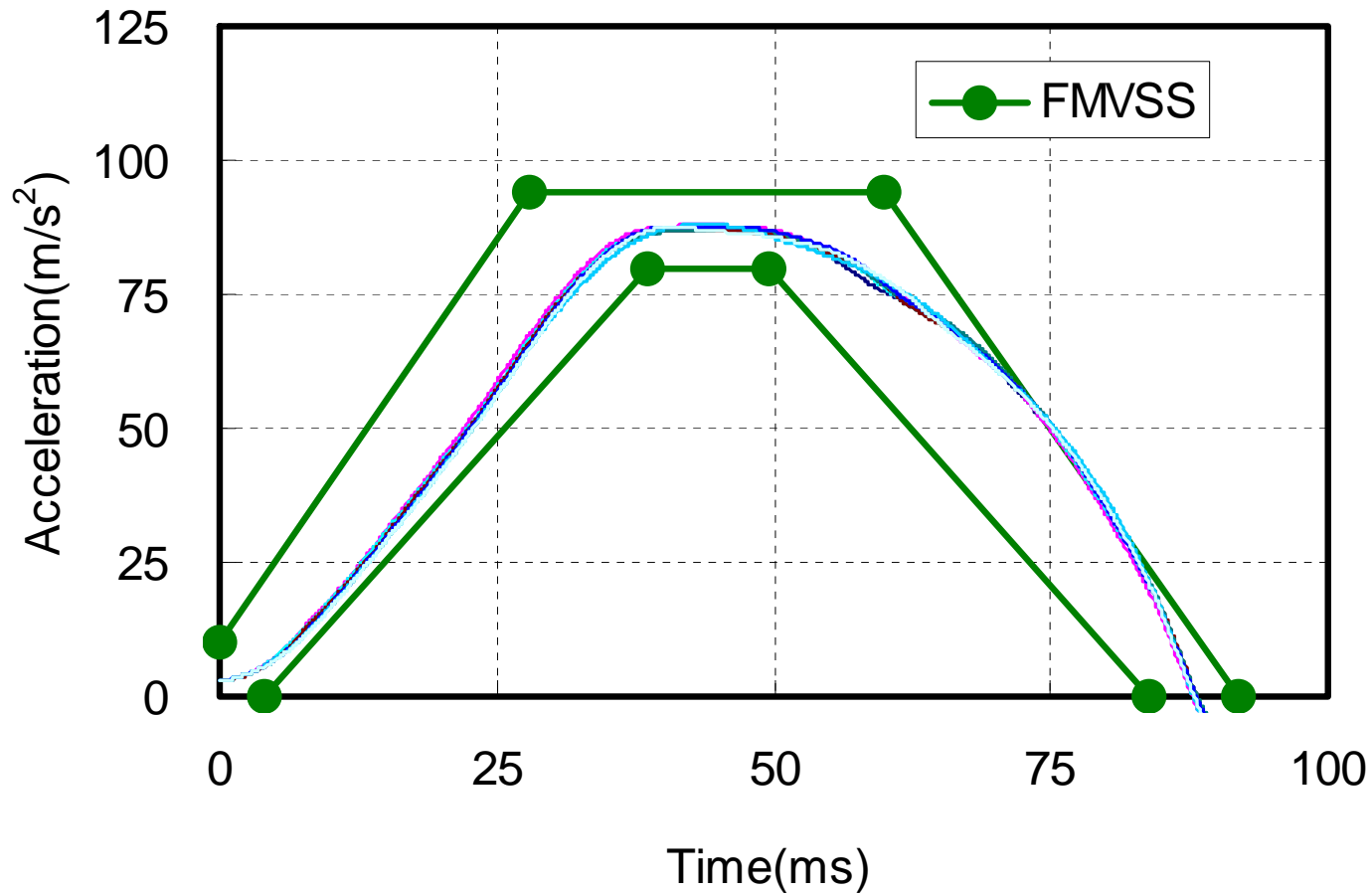
- **Simulated rear-end impact tests using HYGE Sled**
- **Crash pulse : FMVSS 202a**
- **Measurements : Sled acceleration ,
Head, T1, Chest, and Pelvis
acceleration

Neck forces**
- **High speed video : Kinematics**
- **Seat : Normal HR - 2 types
Active HR - 2 types**



Sled Acceleration

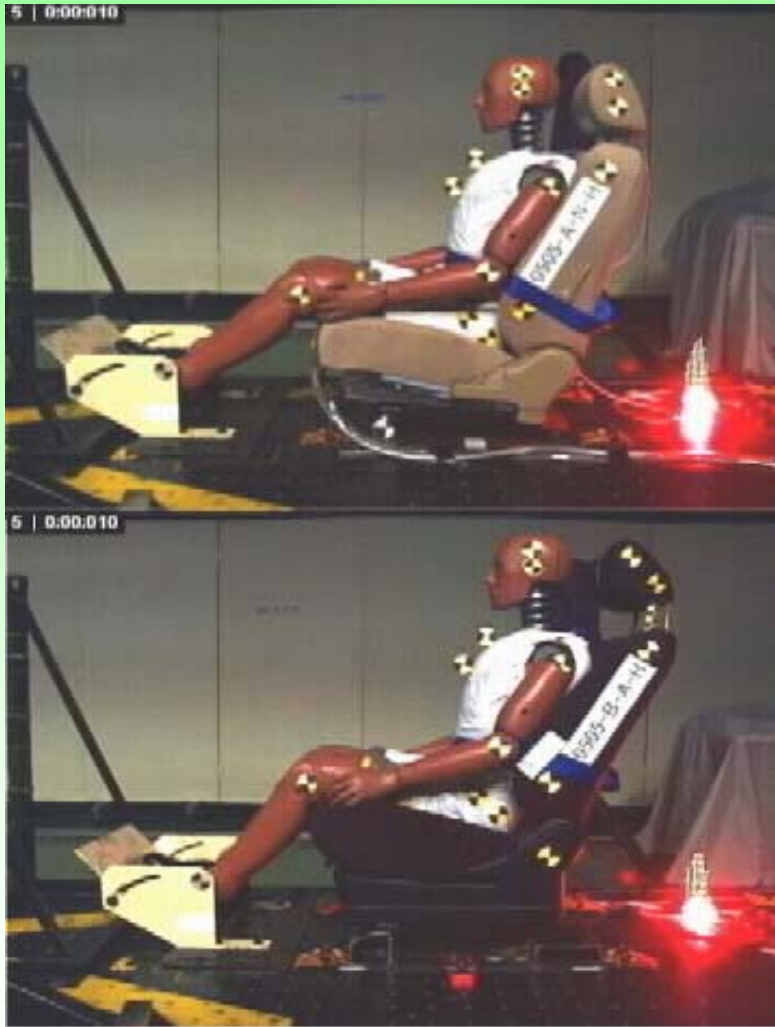
➤ FMVSS202a and TEST Sled Acceleration



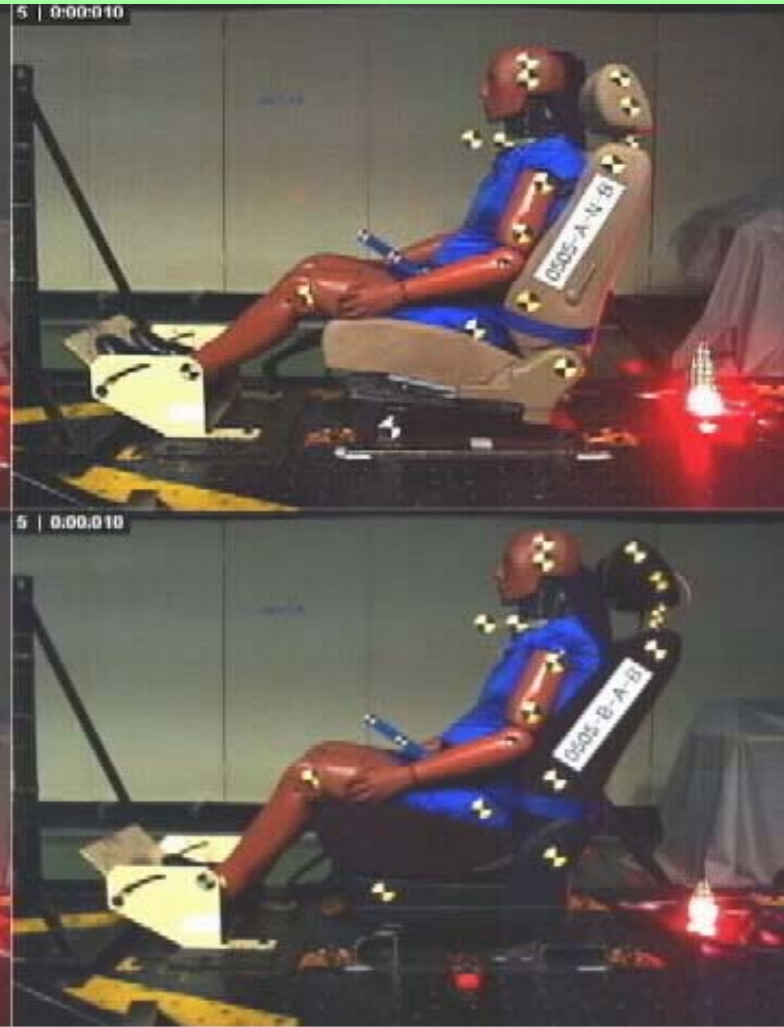
Results

HR-3-8

HY-III: Normal Seat



BioRID II: Normal Seat



HY-III: Active Headrest Seat

BioRID II: Active Headrest Seat

Types of Test

ANB: A seat, Normal HR, BioRID II

ANH: A seat, Normal HR, HY-III

BAB: B seat, Active HR, BioRID II

BAH: B seat, Active HR, HY-III

CNB: C seat, Normal HR, BioRID II

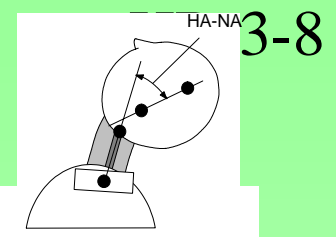
CNH: C seat, Normal HR, HY-III

CAB: C seat, Active HR, BioRID II

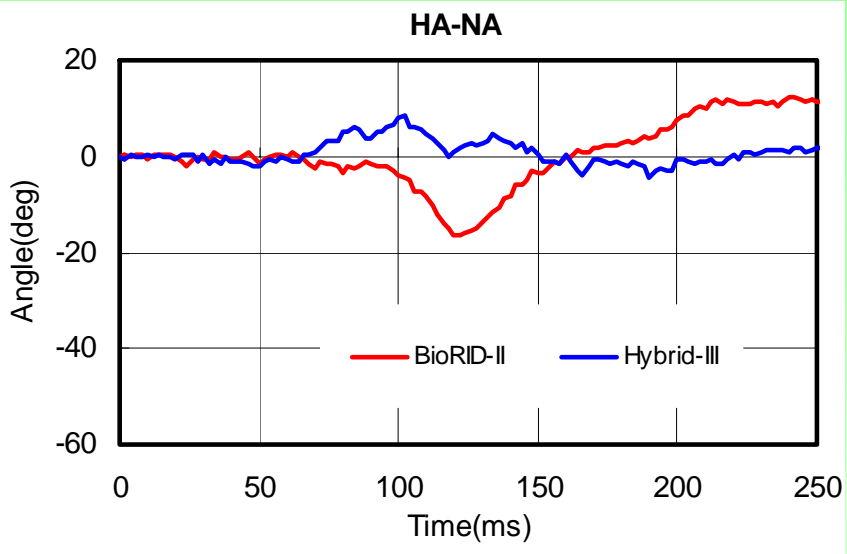
CAH: C seat, Active HR, HY-III

HA-NA

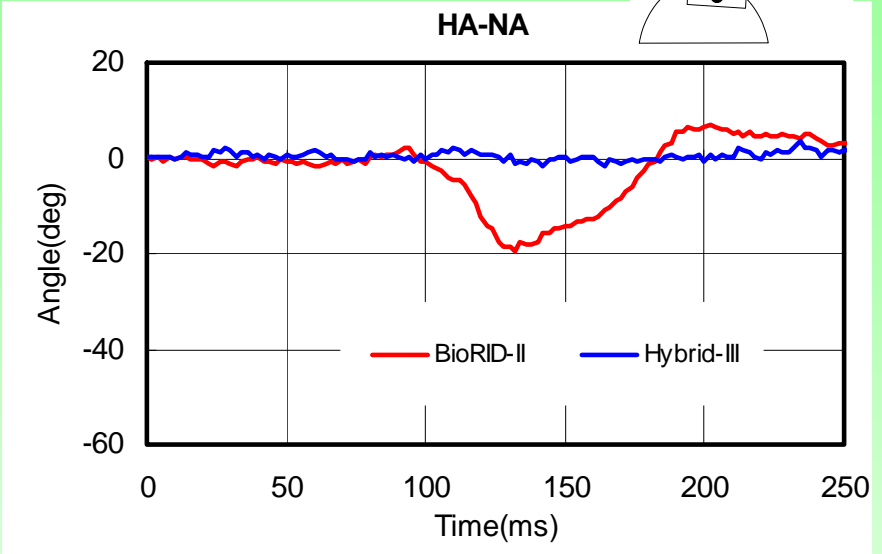
HA : Head Angle NA : Neck Angle



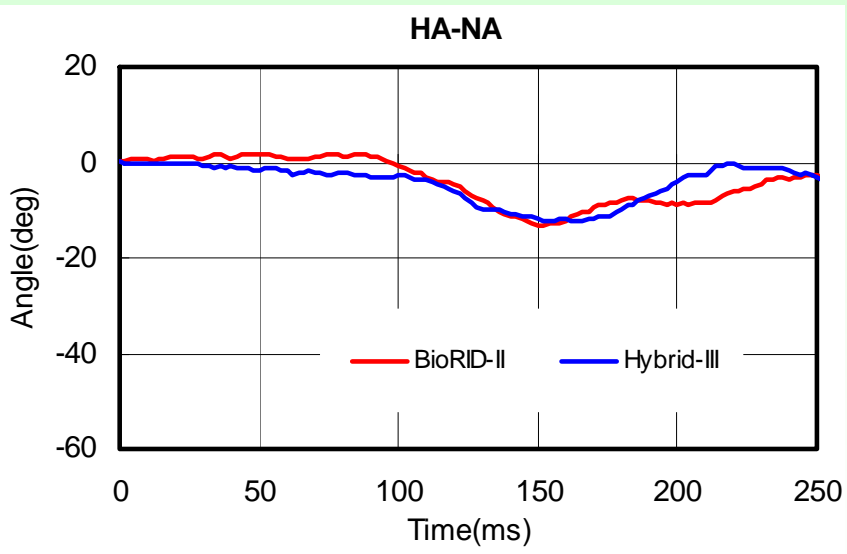
Seat A (Normal)



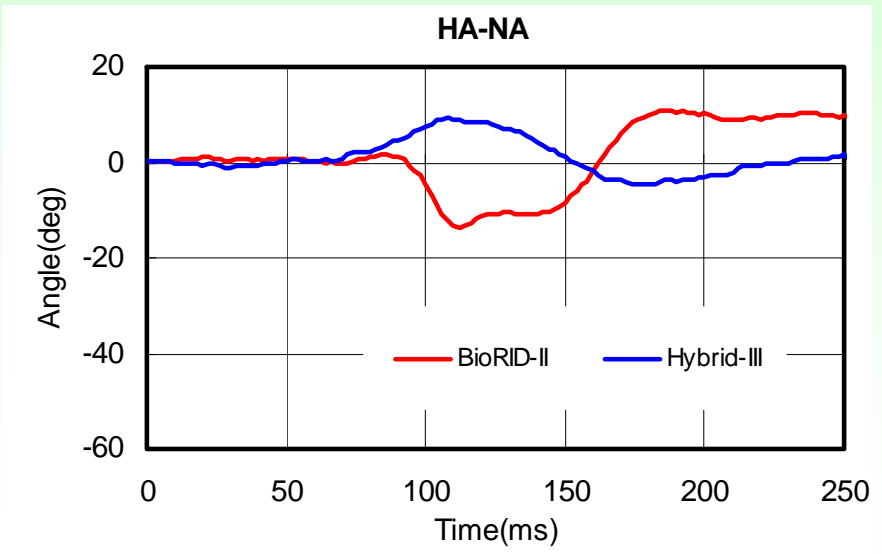
Seat B (Active)



Seat C (Normal)

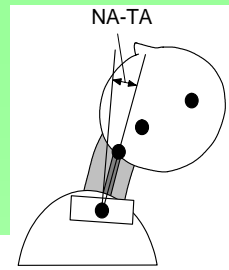


Seat D (Active)

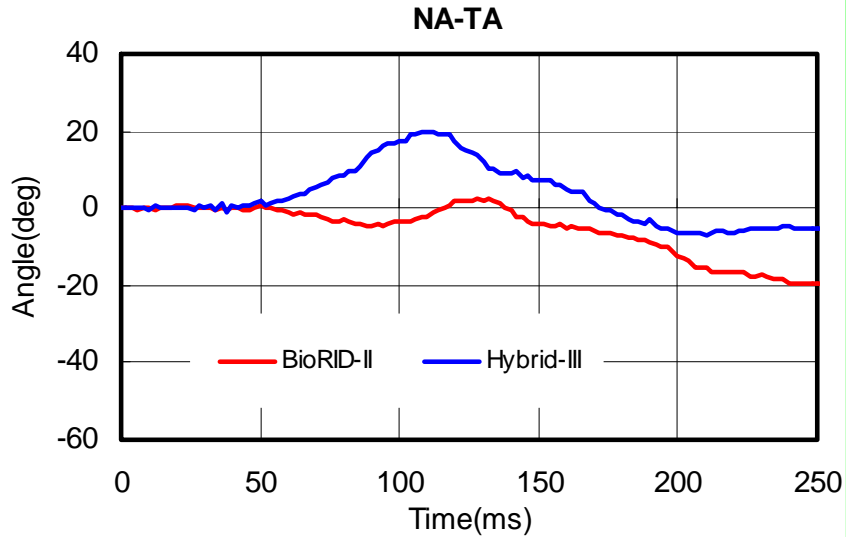


NA-TA

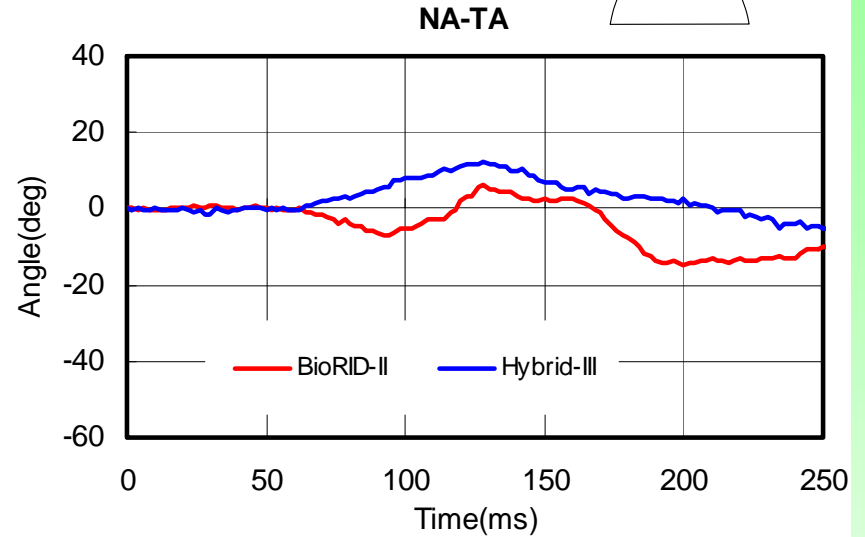
NA : Neck Angle TA : Torso Angle



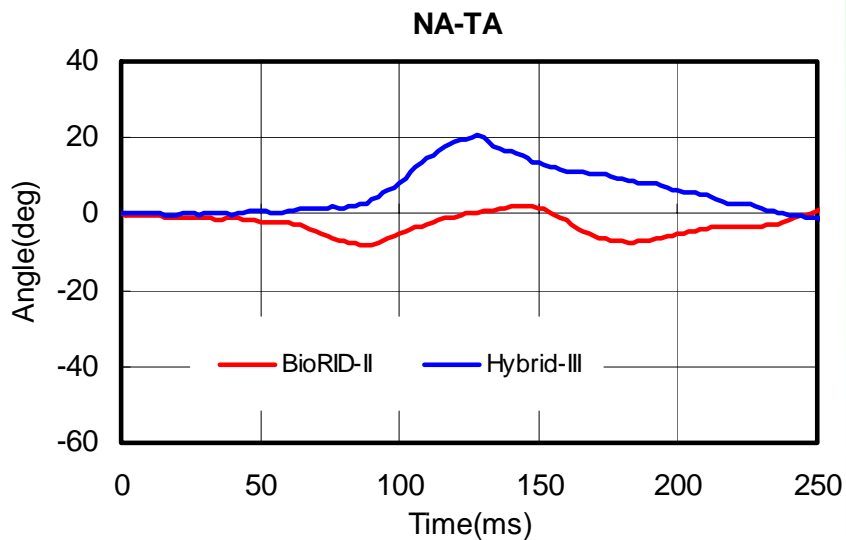
Seat A (Normal)



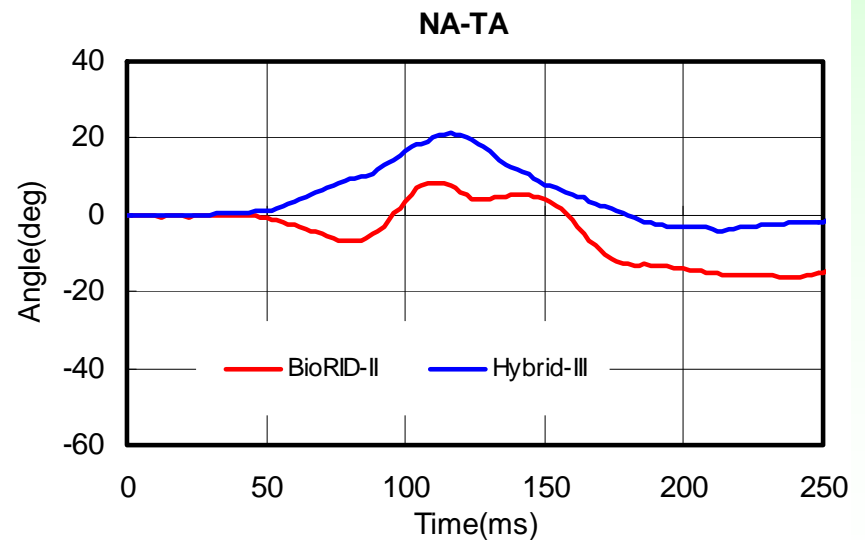
Seat B (Active)



Seat C (Normal)

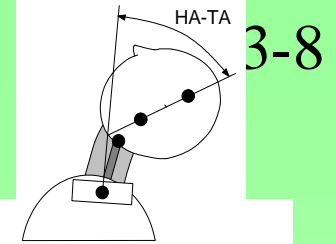


Seat D (Active)

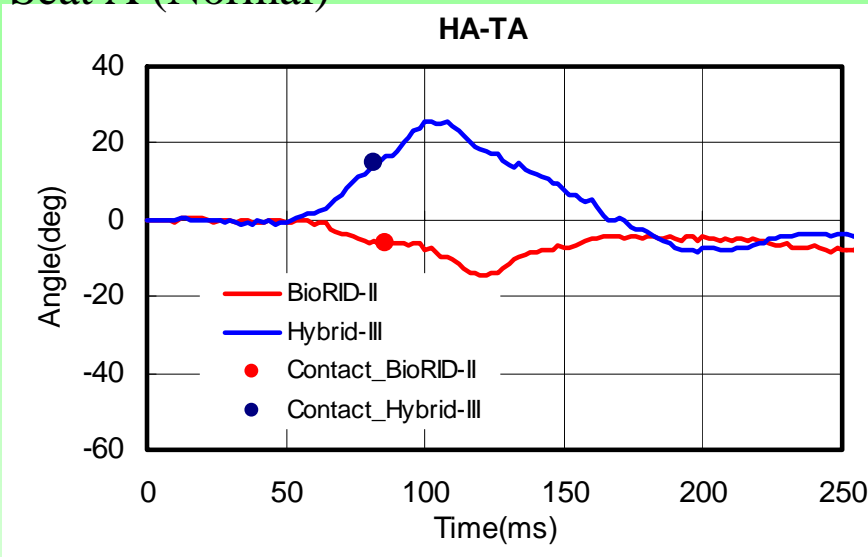


HA-TA

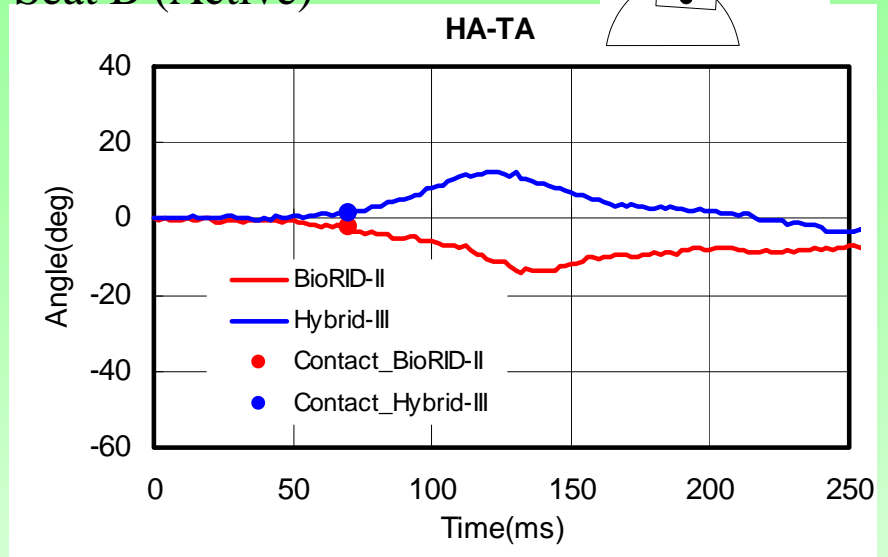
HA : Head Angle TA : Torso Angle



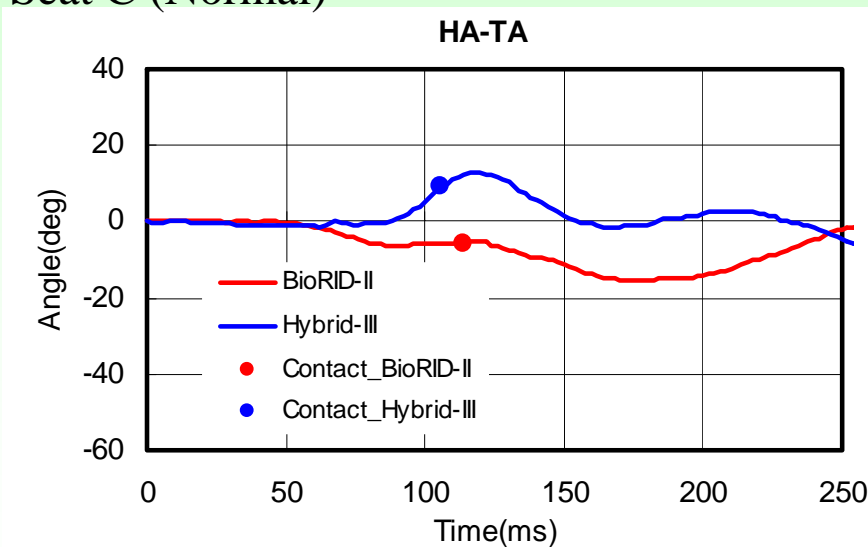
Seat A (Normal)



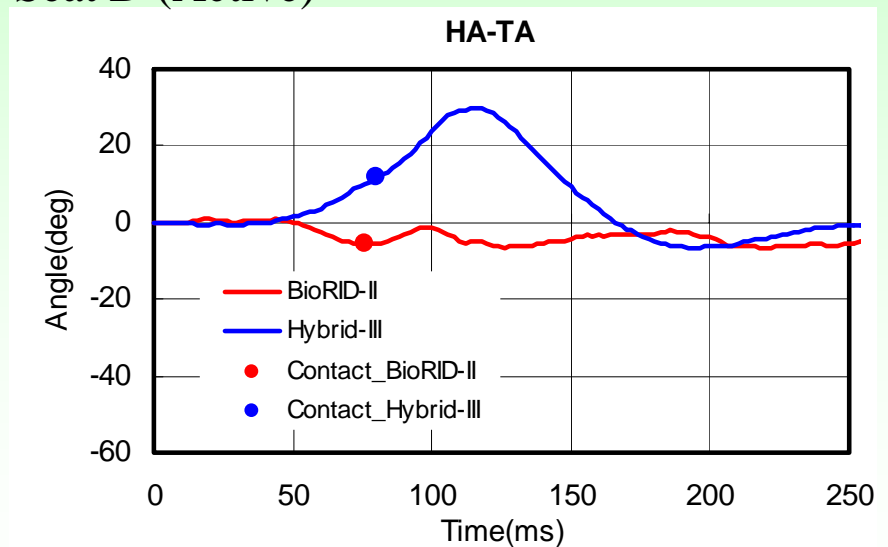
Seat B (Active)



Seat C (Normal)

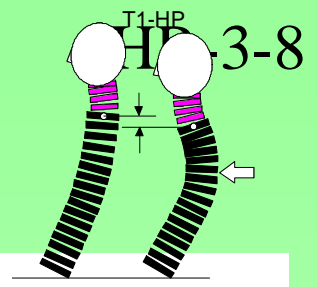


Seat D (Active)

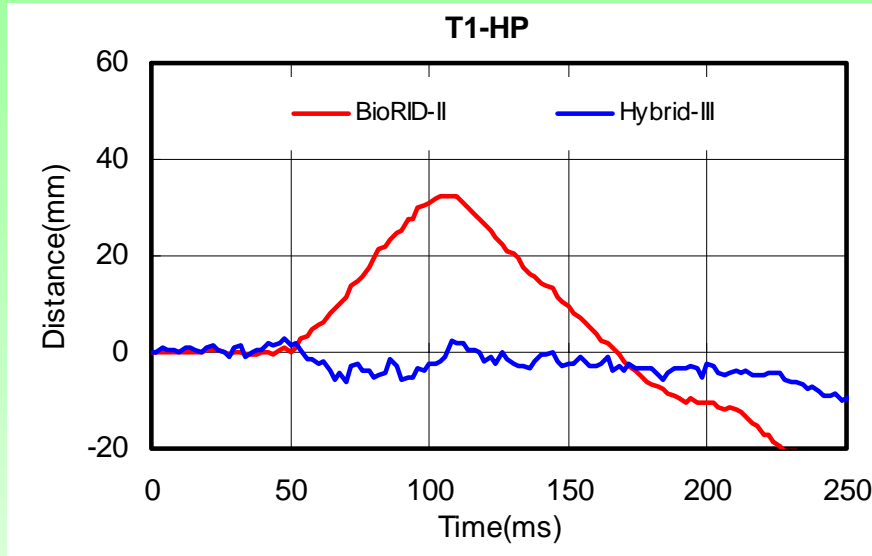


T1-HP

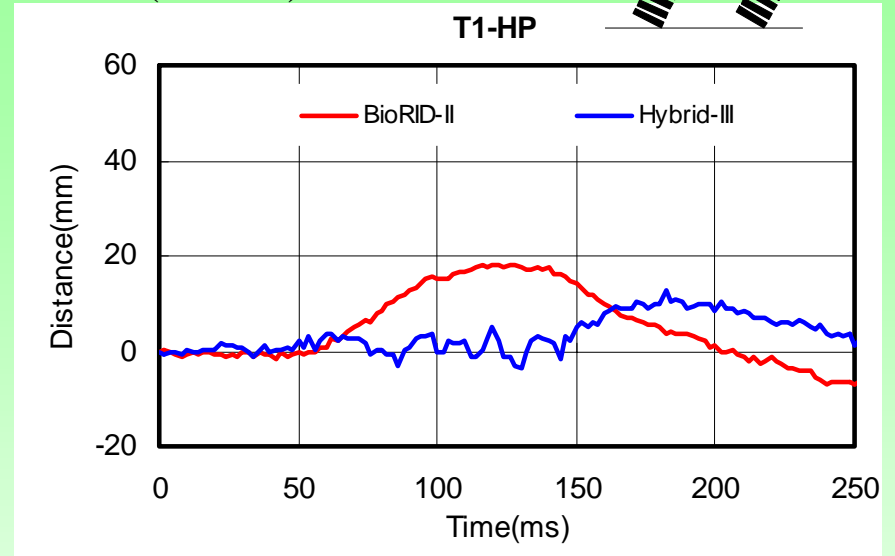
Length change between T1 and Hip point



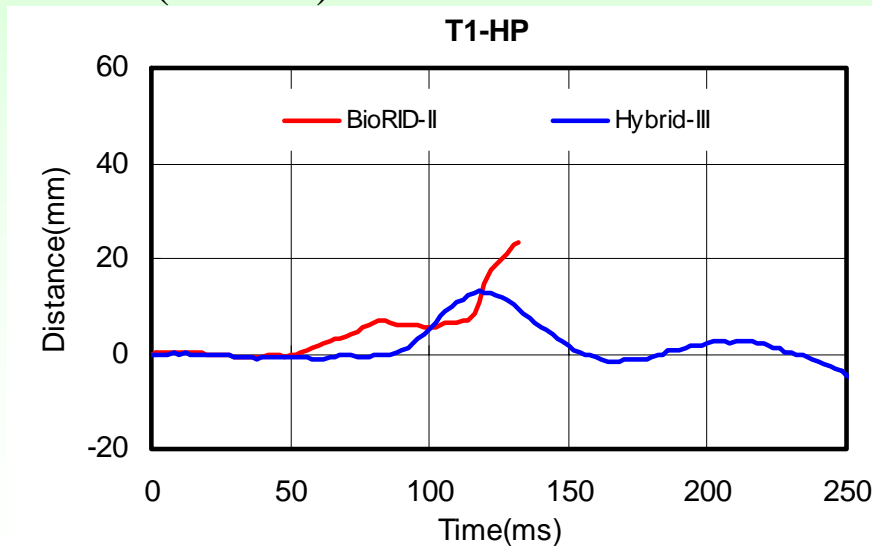
Seat A (Normal)



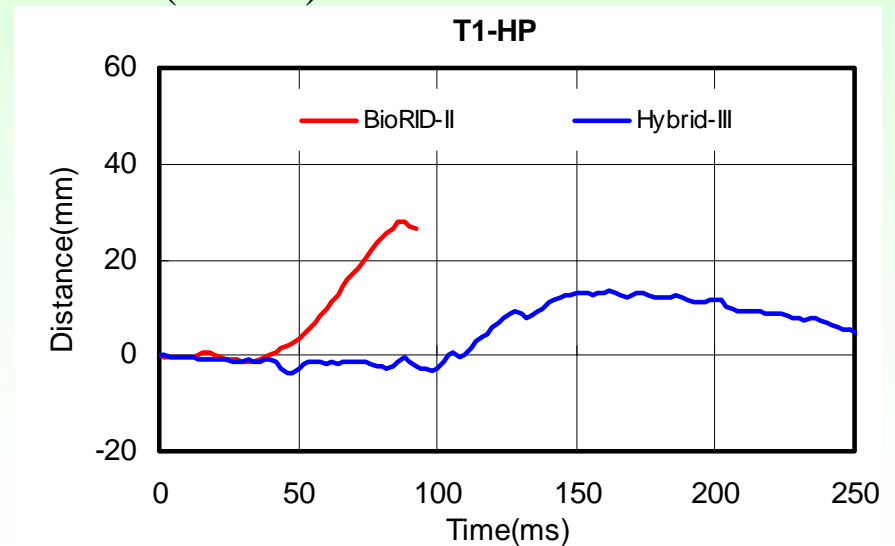
Seat B (Active)



Seat C (Normal)



Seat D (Active)



Conclusion

- 1. The performance evaluation of four different seats with or without Active Headrest was performed by using HY-III and BioRID II.**
- 2. The tendency of biomechanical responses of HY-III and BioRID II may vary due to the difference of the seat characteristics. For example, the head rotational angle relative to the neck and the torso may be reversed with HY-III and BioRID II.**
- 3. This phenomenon is reflected by the head and T1 acceleration on these dummies, too.**
- 4. According to the above, it can be said that the different results of the performance evaluation of seat are likely to be caused by the difference in the dummy performance.**