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

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 C (Normal)**
- **Seat B (Active)**
- **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.