# WorldSID50 Update
# ISO/TC22/SC12/WG5報告

2014年JASTIユーザー会議

2014/2/12　沼津

JASTI Co., Ltd.

**ISO TC22 SC12 WG5 N1053**

Anthropomorphic Test Devices

# Resolutions taken at the ISO TC22 SC12 WG5 meeting in Troy, Michigan, USA 14 November 2013

**RESOLUTION # 1**

The members of ISO TC22/SC12/WG5 agree to request a New Work Item proposal to develop a technical specification [part 5] for the WorldSID-50 documenting changes in recommendations from the WorldSID TG since the publication of the standard ISO 15830 part 1-4 [May2013].

Les membres de l ISO TC22/SC12/GT5 se sont mis d'accord pour demander une enquête de question nouvelle afin de développer une spécification technique (part 5) pour le mannequin WorldSID 50 documentant les changements recommandes par le groupe de travail du worldSID faisant suite a la publication de la norme iso 15830 parties 1 a 4 (mai 2013).

**RESOLUTION # 2**

The members of ISO TC22/SC12/WG5 agree to define WorldSID-50 as ISO 15830 parts 1-4 [May 2013] plus revisions as documented in WG5 N1041 Nov. 14, 2013 until the publication of part 5 which will replace WG5 N1041.

Les membres de l ISO TC22/SC12/GT5 se sont mis d'accord pour définir le mannequin WorldSID comme étant spécifié par l ISO15830 parties 1 a 4 (mai 2013) plus la révision documentée dans le document référencé GT5 N1041 14 Nov. 2013, jusqu' a la publication de la partie 5 qui remplacera le GT5 N1041.

**RESOLUTION # 3**

The members of ISO TC22/SC12/WG5 agree that the convener shall send a letter to the Global NCAP organizations informing them of the actions taken in resolutions 1 and 2.

Les membres de l ISO TC22/SC12/GT5 se sont mis d'accord pour que l animateur du groupe de travail envoie une lettre aux organisations Global Ncap afin de les informer des actions décidées dans les résolutions #1 et #2

**RESOLUTION # 4**

The members of ISO TC22/SC12/WG5 want to thank Michele Maitre for her years of dedicated service and support in the development of standards to improve automotive safety.

Les membres de l ISO TC22/SC12/GT5 remercient Michèle Maitre pour ses années de services et d assistance au développement de normes pour l amélioration de la sécurité automobile.

**This document specifies the new validation specifications for the WorldSID 50th agreed and recommended by WorldSID Task Group in October 2013 and endorsed by ISO Working Group 5 in November 2013. The specification corridors below supersede those in ISO 15830 (2nd edition, May 2013) Road vehicles – Design and performance specifications for the WorldSID 50th percentile male side-impact dummy, Part 2: Mechanical subsystems.**

**Note :**
**All specification changes take effect immediately in all new production and re-validations and remain in effect until the publication of ISO TS 15830, Part 5. All other specifications in ISO 15830-2 (2nd edition, May 2013) that are not revised below are still valid.**

**4.1 Head**
**4.1.3 Validation**

**Table 1 — WorldSID head validation specifications**

| **Frontal drop** | | |
|---|---|---|
| Variable | ~~ISO 15830-2: May 2013~~ | Recommended by WorldSID Task Group Oct. 2013 |
| Peak resultant acceleration (G) | ~~225 to 275~~ | 205 to 255 |
| Peak lateral acceleration ($a_y$) (G) | ~~< 15~~ | < 15 |
| Maximum percentage, subsequent-to-main peak (%) | ~~< 10~~ | < 10 |
| | | |
| **Lateral drop** | | |
| Variable | ~~ISO 15830-2: May 2013~~ | Recommended by WorldSID Task Group Oct. 2013 |
| Peak resultant acceleration at CG (G) | ~~99 to 121~~ | 104 to 123 |
| Peak longitudinal acceleration ($a_x$) (G) | ~~< 15~~ | < 15 |
| Maximum percentage, subsequent-to-main peak (%) | ~~< 10~~ | < 10 |

**4.2 Neck**
**4.2.3 Validation**

**Table 2 — WorldSID neck validation specifications**
**No new recommendations. The specifications in ISO 15830-2 (2nd edition, May 2013) are still valid.**

**4.3 Thorax/abdomen/shoulder**
**4.3.3 Validation**
**4.3.3.1 Shoulder**

**Table 3 — WorldSID shoulder validation specifications**

| Variable | ISO 15830-2: May 2013 is still valid |
|---|---|
| Pendulum velocity (m/s) | 4.3 ± 0.1 |
| Peak pendulum force (kN) | 2.6 to 3.3 |
| Peak shoulder rib deflection (mm) | 35 to 45 |

**4.3.3.2 Thorax with half arm**

**Table 4 — WorldSID thorax with half-arm validation specifications**
**No new recommendation. The specifications in ISO 15830-2 (2nd edition, May 2013) section 4.3.3.2 are still valid.**

**Note :**
**Replacing the thorax with half arm validation test by a "single-rib validation" and a single half arm validation is under discussion. Until a final decision is made, the specifications in ISO 15830-2 (2nd edition, May 2013) section 4.3.3.2 are still valid.**

**4.3.3.3 Thorax without half arm**

**Table 5 — WorldSID thorax without arm validation specifications**

| Variable | ISO 15830-2: May 2013 is still valid |
|---|---|
| Pendulum velocity (m/s) | 4.3 ± 0.1 |
| Peak pendulum force (kN) | 3.2 to 3.8 |
| Peak T4 acceleration along y axis (G) | 14 to 20 |
| Peak T12 acceleration along y axis (G) | 14 to 22 |
| Peak thorax rib 1 deflection (mm) | 33 to 43 |
| Peak thorax rib 2 deflection (mm) | 35 to 43 |
| Peak thorax rib 3 deflection (mm) | 32 to 40 |

**4.3.3.4 Abdomen**

**Table 6 — WorldSID abdomen validation specifications**

| Variable | ISO 15830-2: May 2013 is still valid |
|---|---|
| Pendulum velocity (m/s) | 4.3 ± 0.1 |
| Peak pendulum force (kN) | 2.7 to 3.1 |
| Peak T12 acceleration along y axis (G) | 15 to 20 |
| Peak abdomen rib 1 deflection (mm) | 33 to 40 |
| Peak abdomen rib 2 deflection (mm) | 30 to 36 |

**4.6 Lumbar spine and pelvis**
**4.6.3 Validation**

**Table 7 — WorldSID pelvis validation specifications**

| Variable | ~~ISO 15830-2: May 2013~~ | Recommended by WorldSID Task Group Oct. 2013 |
|---|---|---|
| Pendulum velocity (m/s) | ~~6.7 ± 0.1~~ | 6.7 ± 0.1 |
| Peak pendulum force (kN) | ~~6.3 to 7.8~~ | 6.8 to 8.2 |
| Peak T12 acceleration along y axis (G) | ~~10 to 14~~ | 10 to 14 |
| Peak pelvis acceleration along y axis (G) | ~~41 to 51~~ | 37 to 47 |

**Section 5.2 Neck**
**Section 5.2.5 Preparation**
**5.2.6 Procedure**

**Table 10 — (Neck) Pendulum arm deceleration pulse**

| Variable | ~~ISO 15830-2: May 2013~~ | Recommended by WorldSID Task Group Oct. 2013 |
|---|---|---|
| Pendulum velocity (m/s) | ~~3.4 ± 0.1~~ | 3.4 ± 0.1 |
| Velocity change at 4 ms* (m/s) | ~~0.8 to 1.0~~ | 0.77 to 1.04 |
| Velocity change at 8 ms* (m/s) | ~~1.6 to 1.9~~ | 1.60 to 1.90 |
| Velocity change at 12 ms* (m/s) | ~~2.4 to 3.3~~ | 2.43 to 3.29 |
| * T=0 s at initial pendulum contact with honeycomb or alternative products which can be shown to lead to the same results | | |

# WorldSID
# Head Certification
# Front

Test I.D. 1103

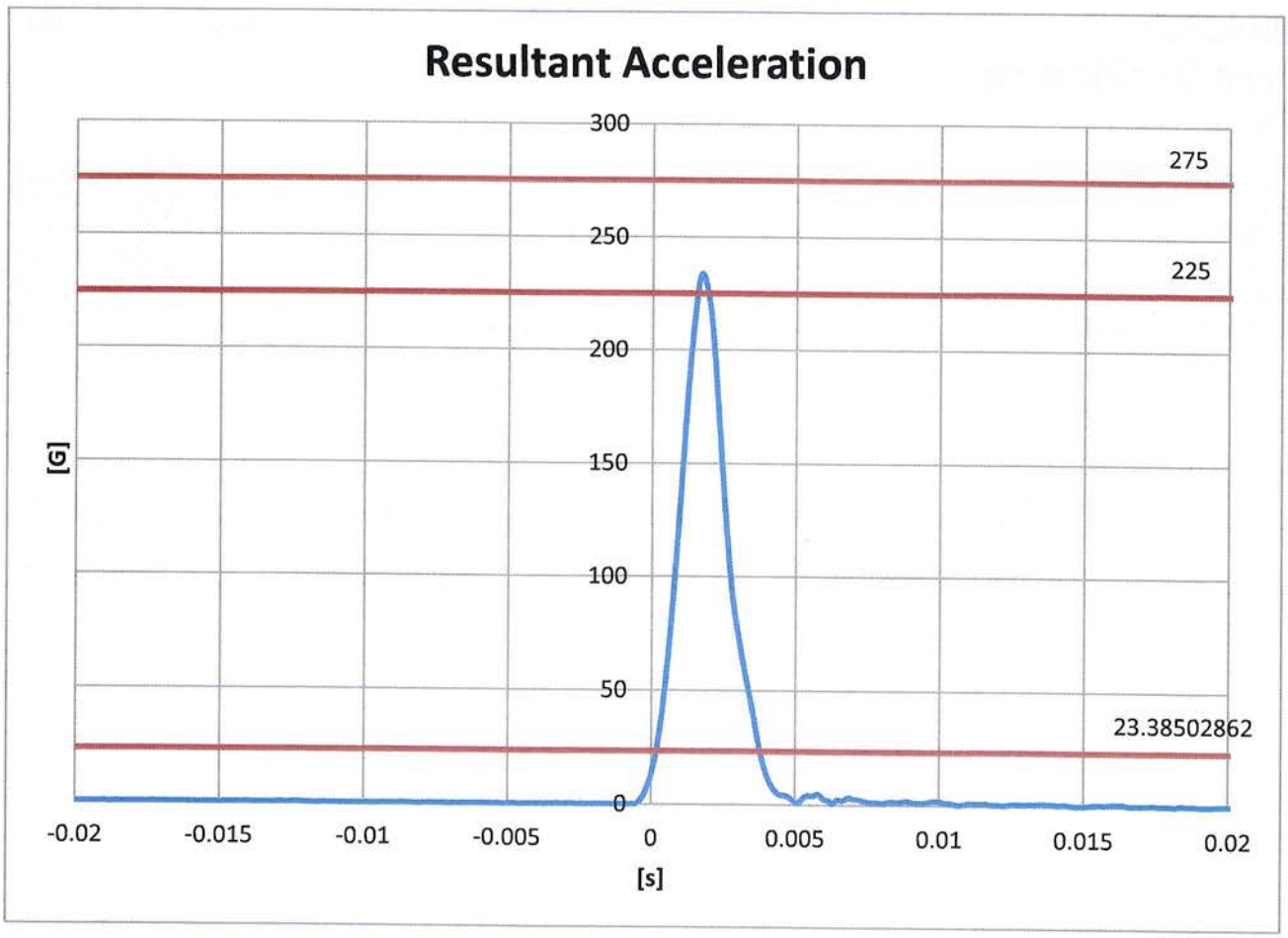
| Tested Parameter | Units | Specification | | | Results | | | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| Temperature | ℃ | 20.6 | ～ | 22.2 | | 21.5 | | Pass |
| Humidity | % | 10 | ～ | 70 | | 50 | | Pass |
| Peak Resultant Acceleration | G | 225 | ～ | 275 | | 233.85 | | Pass |
| Peak Lateral Acceleration | G | −15 | ～ | 15 | −7.35 | ～ | 3.15 | Pass |

Technician M.sugiyama

Test Date 2013/12/24

Approved By S.kobayashi

Approved Date 2013/12/24


Resultant Acceleration
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250
200
150
100
50
0
275
225
23.38502862
[G]
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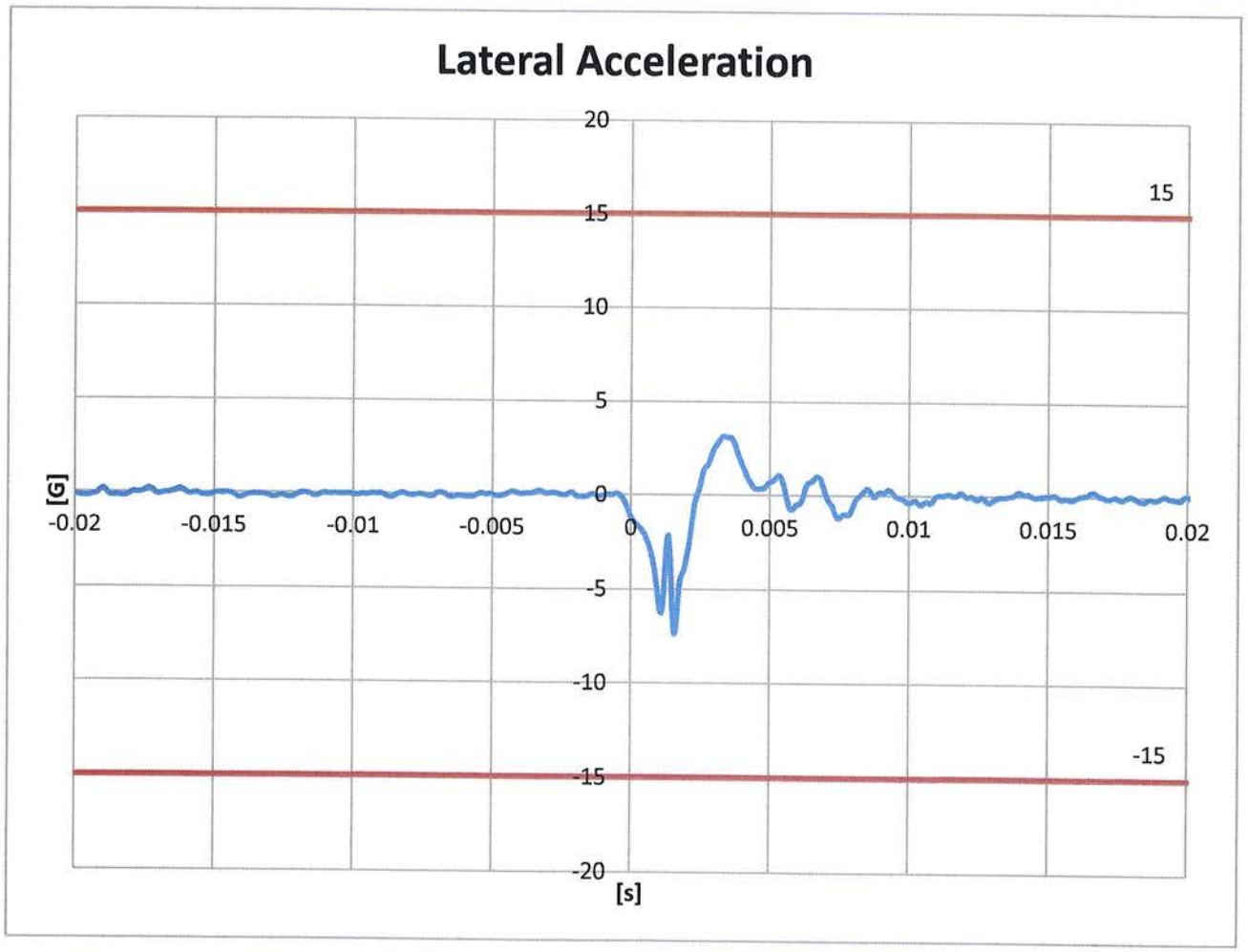
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
0.02
[s]


Lateral Acceleration
20
15
10
5
0
-5
-10
-15
-20
15
-15
[G]
-0.02
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
0.02
[s]

# WorldSID
# Head Certification
# Front

Test I.D. 1103

| Tested Parameter | Units | Specification | | | Results | | | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| Temperature | ℃ | 20.6 | ~ | 22.2 | | 21.5 | | Pass |
| Humidity | % | 10 | ~ | 70 | | 50 | | Pass |
| Peak Resultant Acceleration | G | 225 | ~ | 275 | | 231.16 | | Pass |
| Peak Lateral Acceleration | G | -15 | ~ | 15 | -2.06 | ~ | 3.81 | Pass |

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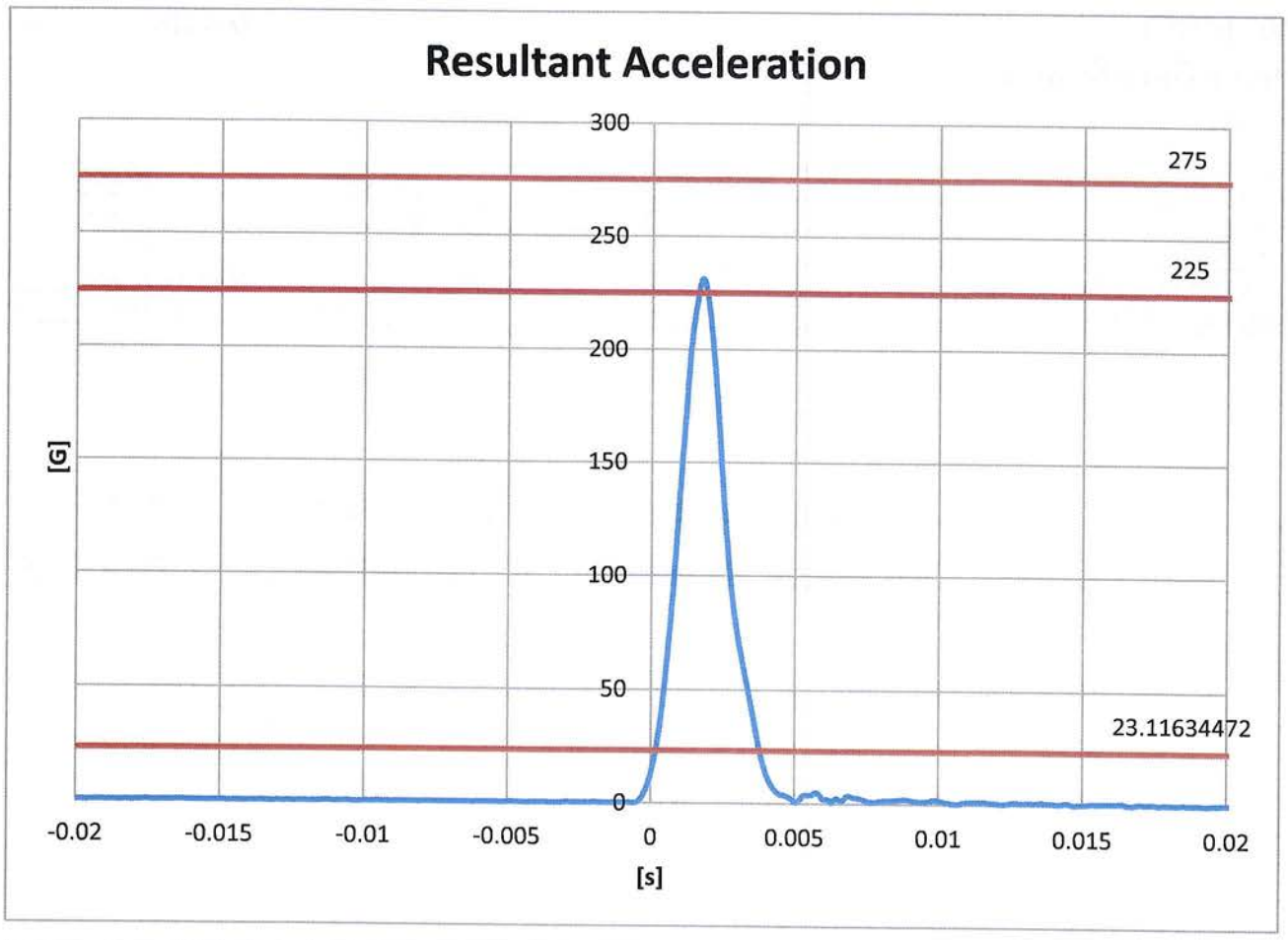
Resultant Acceleration
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250
200
150
100
50
0
275
225
23.11634472
[G]
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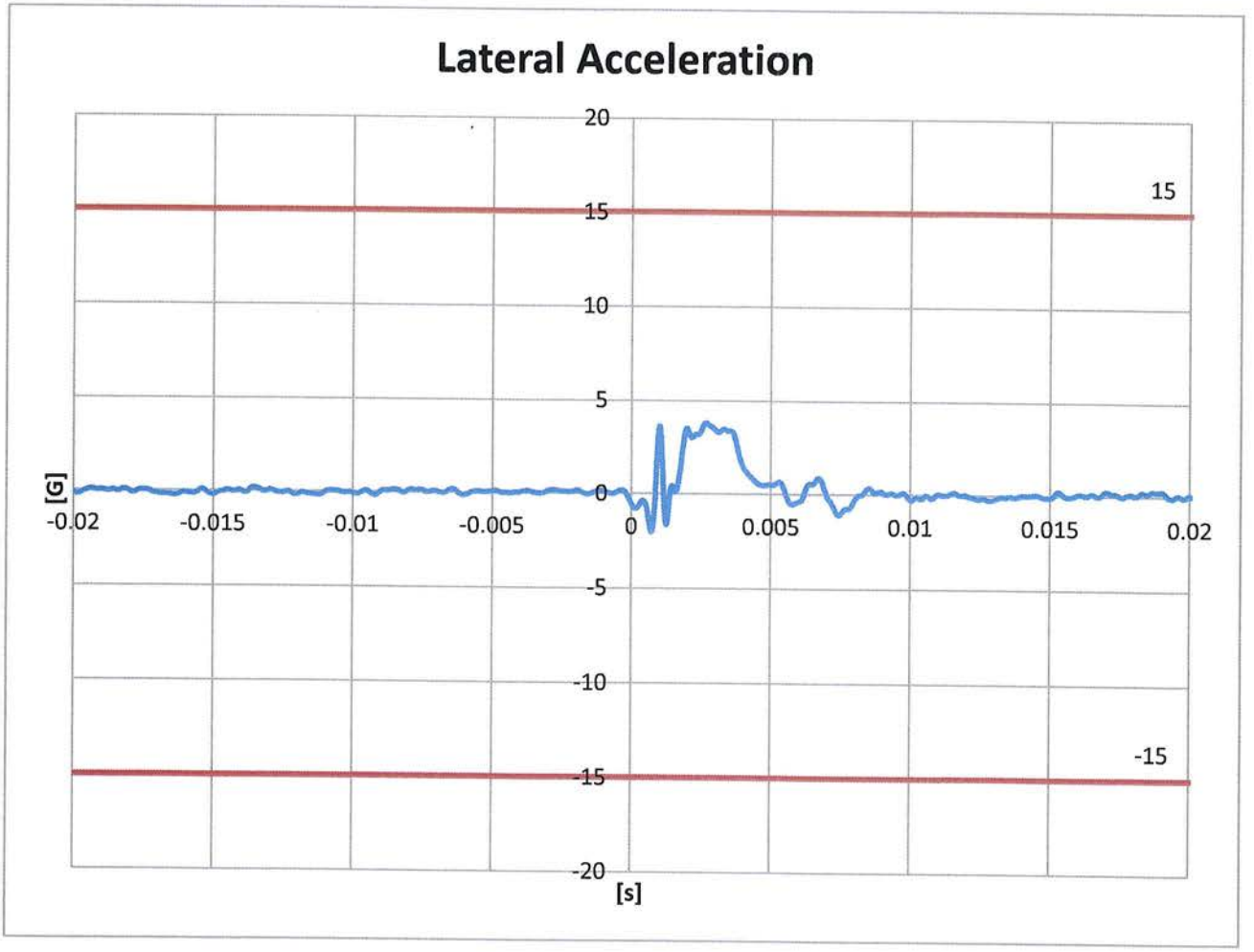
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
0.02
[s]


Lateral Acceleration
20
15
10
5
0
-5
-10
-15
-20
15
-15
[G]
-0.02
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
0.02
[s]

# WorldSID
# Head Certification
# Left

Test I.D. 1103

| Tested Parameter | Units | Specification | | | Results | Pass/Fail |
|---|---|---|---|---|---|---|
| Temperature | ℃ | 20.6 | ~ | 22.2 | 21.5 | Pass |
| Humidity | % | 10 | ~ | 70 | 50 | Pass |
| Peak Resultant Acceleration | G | 100 | ~ | 150 | 126.80 | Pass |

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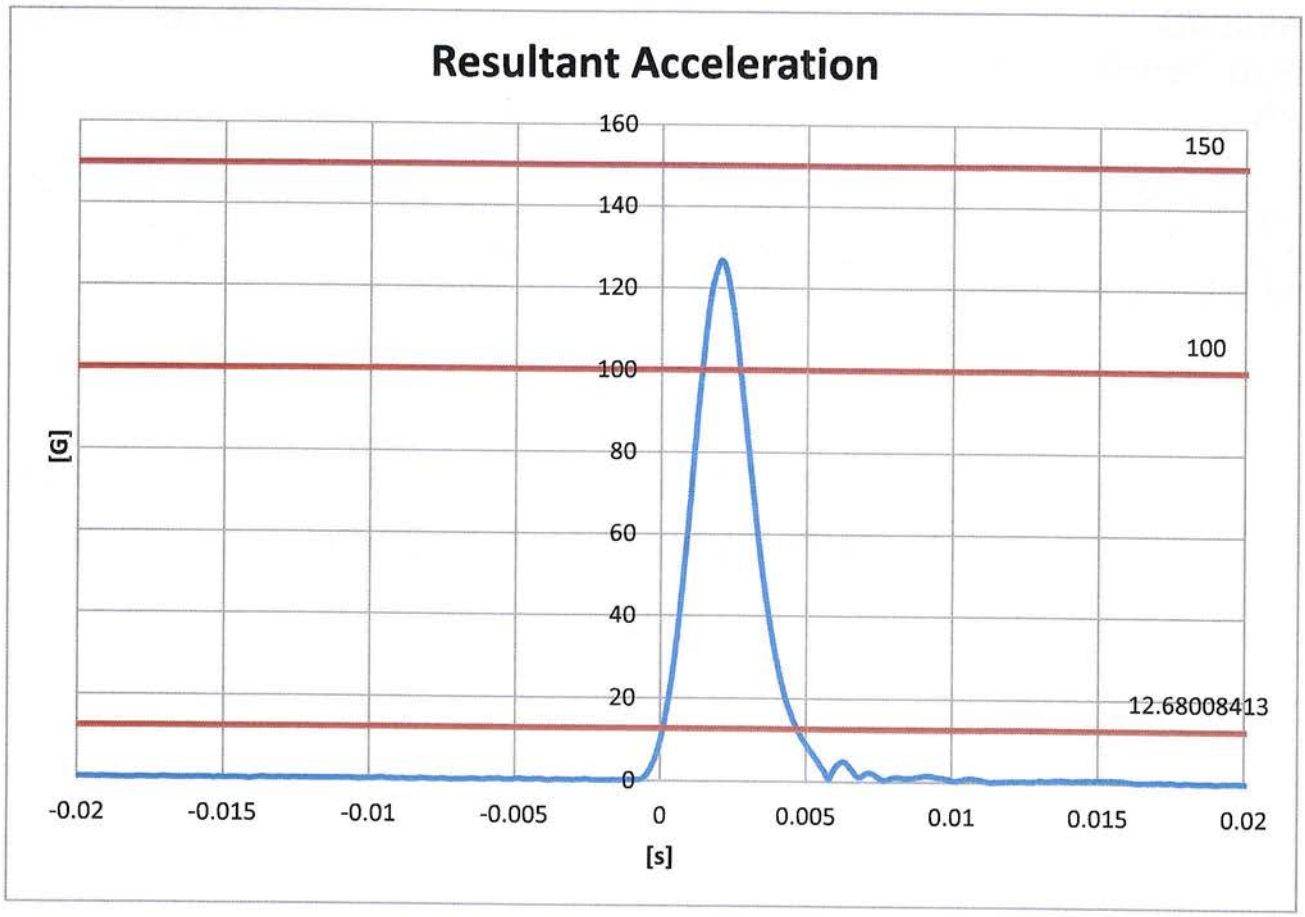
Resultant Acceleration
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140
120
100
80
60
40
20
0
150
100
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[G]
-0.02
-0.015
-0.01
-0.005
0
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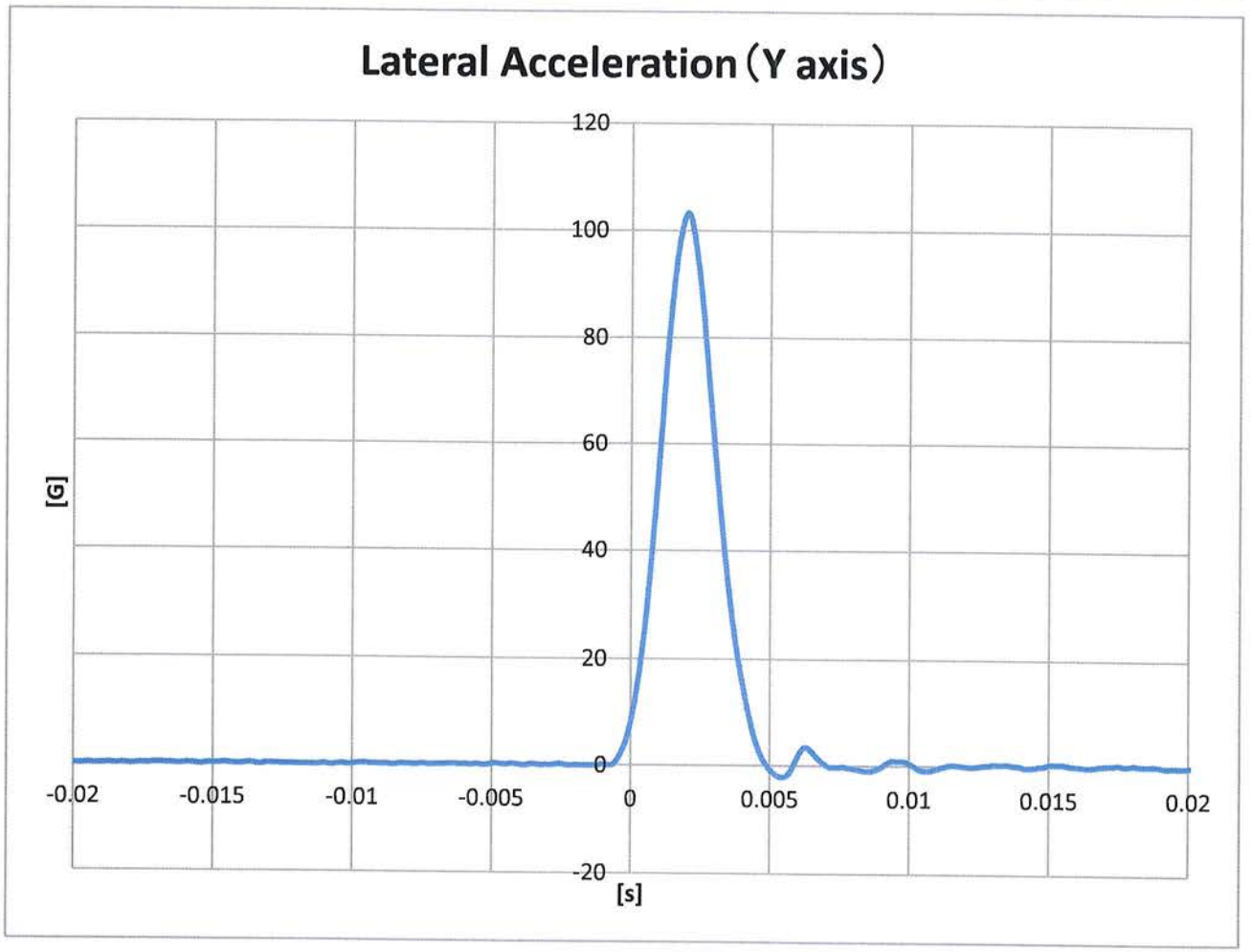
0.01
0.015
0.02
[s]


Lateral Acceleration (Y axis)
120
100
80
60
40
20
0
-20
[G]
-0.02
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
0.02
[s]

# WorldSID
# Head Certification
# Right

Test I.D. 1103

| Tested Parameter | Units | Specification | | | Results | Pass/Fail |
|---|---|---|---|---|---|---|
| Temperature | ℃ | 20.6 | ~ | 22.2 | 21.5 | Pass |
| Humidity | % | 10 | ~ | 70 | 50 | Pass |
| Peak Resultant Acceleration | G | 100 | ~ | 150 | 125.65 | Pass |

Technician M.sugiyama

Test Date 2013/12/24

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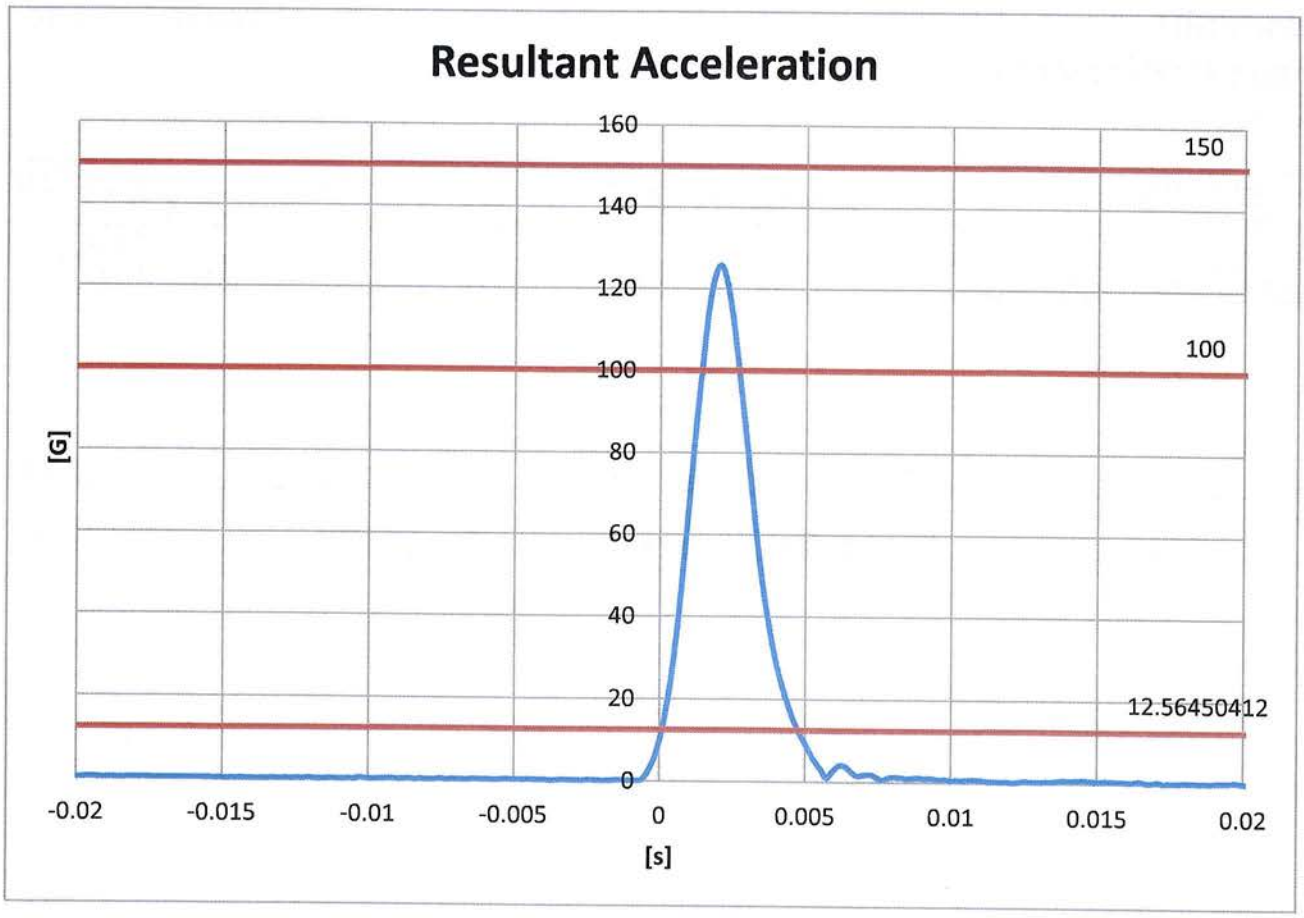
Resultant Acceleration
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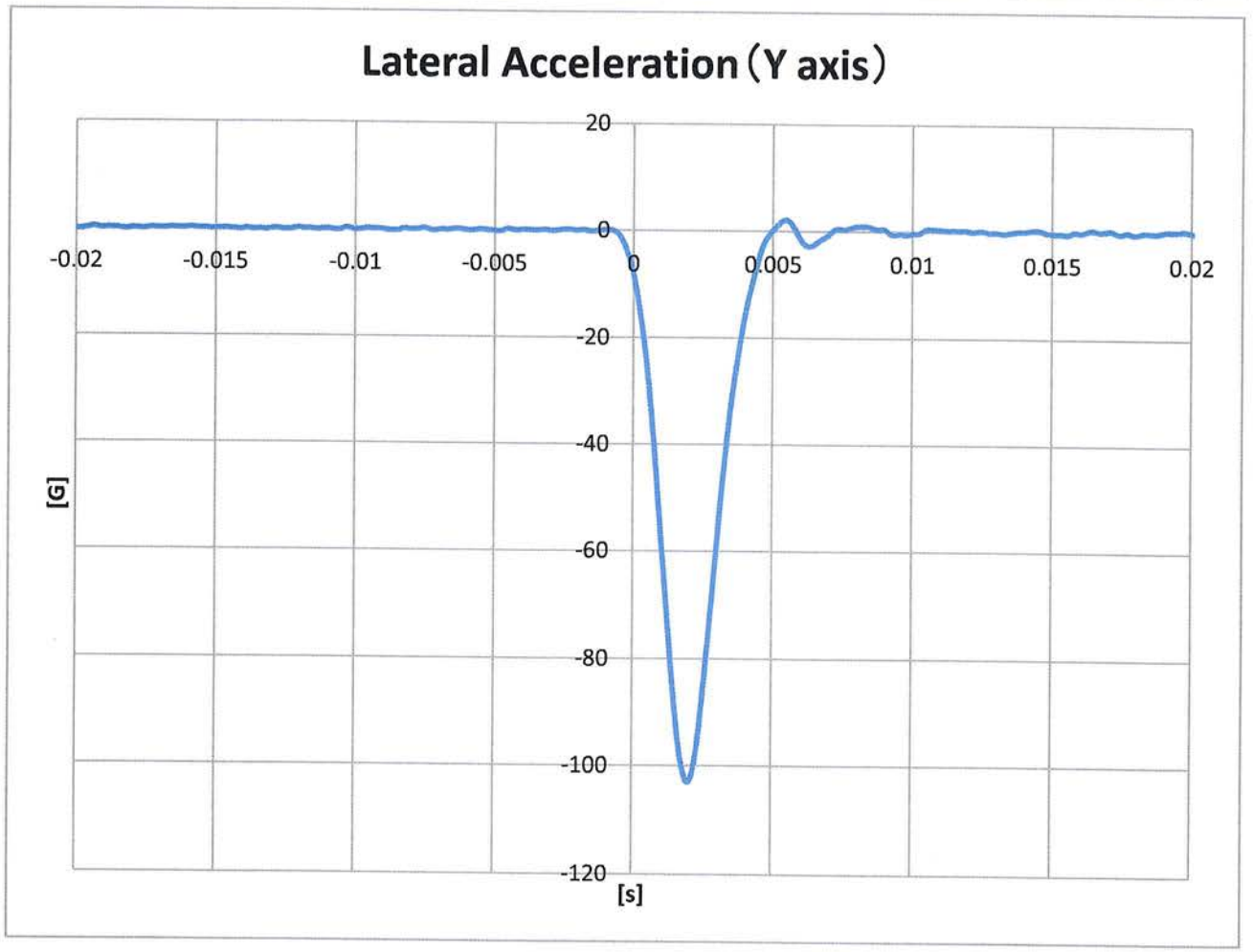
140
120
100
80
60
40
20
0
150
100
12.56450412
[G]
-0.02
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
0.02
[s]


Lateral Acceleration (Y axis)
20
0
-20
-40
-60
-80
-100
-120
[G]
-0.02
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
0.02
[s]

# WorldSID
# Neck Certification
# Left

Test I.D. 81851

Serial No. 1106

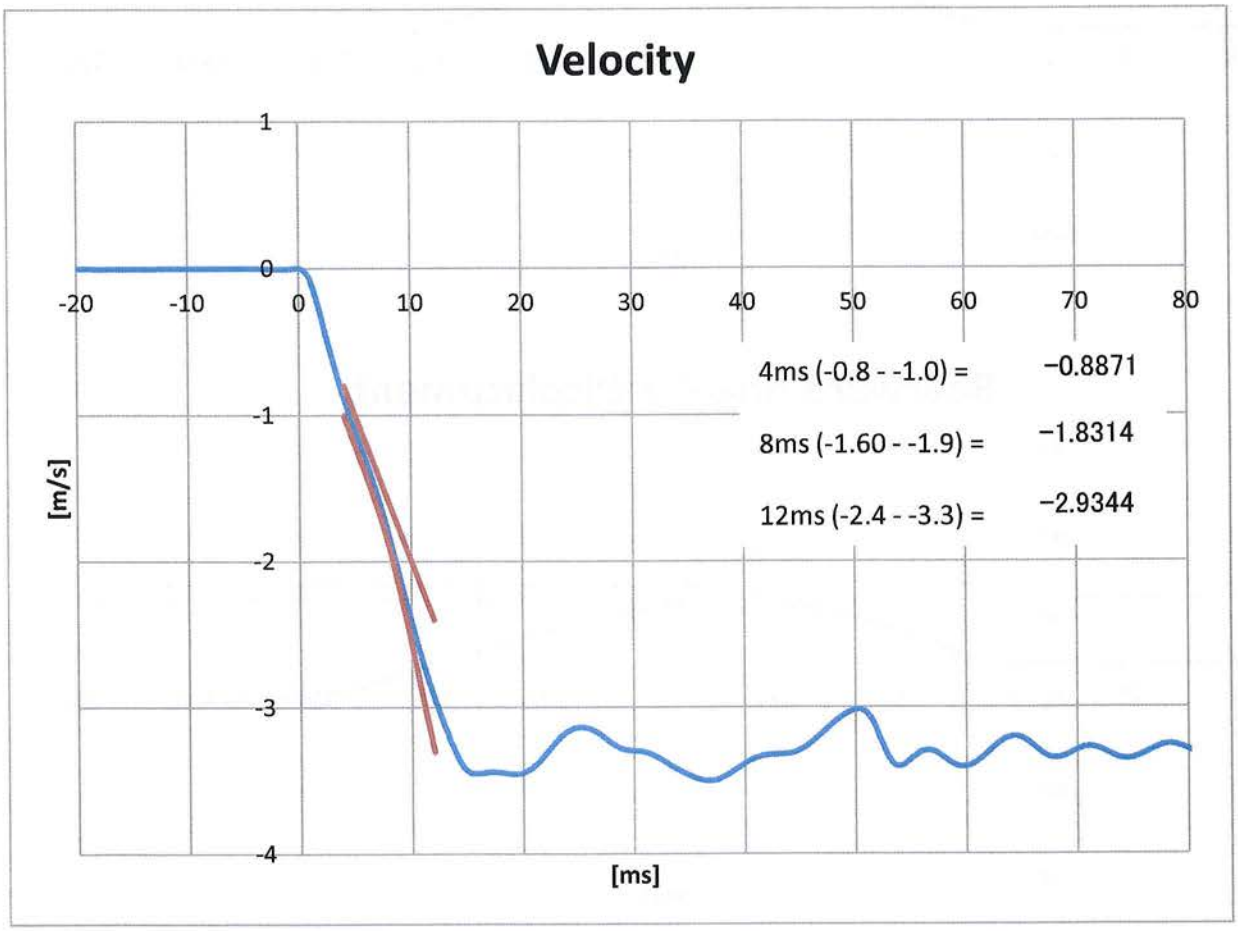
| Tested Parameter | Units | Specification | Results | Pass/Fail |
|---|---|---|---|---|
| Temperature | ℃ | 20.6 ~ 22.2 | 21 | Pass |
| Humidity | % | 10 ~ 70 | 50 | Pass |
| Velocity | m/s | See Chart | - | Pass |
| Maximum Angular Displacement | degrees | 50 ~ 61 | 53.86 | Pass |
| Decay time | ms | 58 ~ 72 | 60.50 | Pass |
| Peak Forward Angular Displacement | degrees | 32 ~ 39 | 35.56 | Pass |
| Time of Peak Forward Angular Displacement | ms | 56 ~ 68 | 61.90 | Pass |
| Peak Rearward Angular Displacement | degrees | 30 ~ 37 | 31.20 | Pass |
| Time of Peak Rearward Angular Displacement | ms | 56 ~ 68 | 60.50 | Pass |
| Pendulum Velocity | m/s | 3.3 ~ 3.5 | 3.46 | Pass |

Technician M.sugiyama

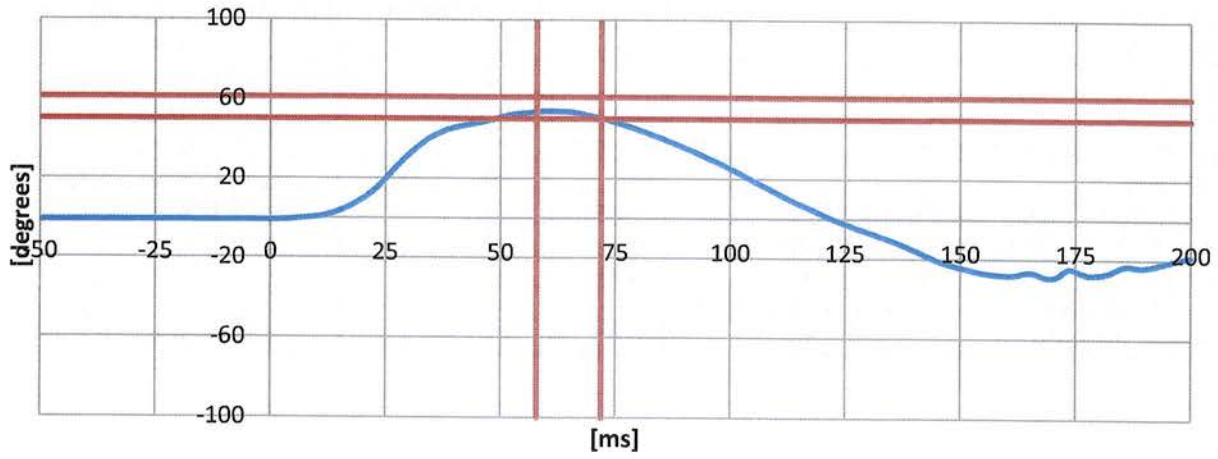
Test Date 2013/12/25

Approved By S.kobayashi

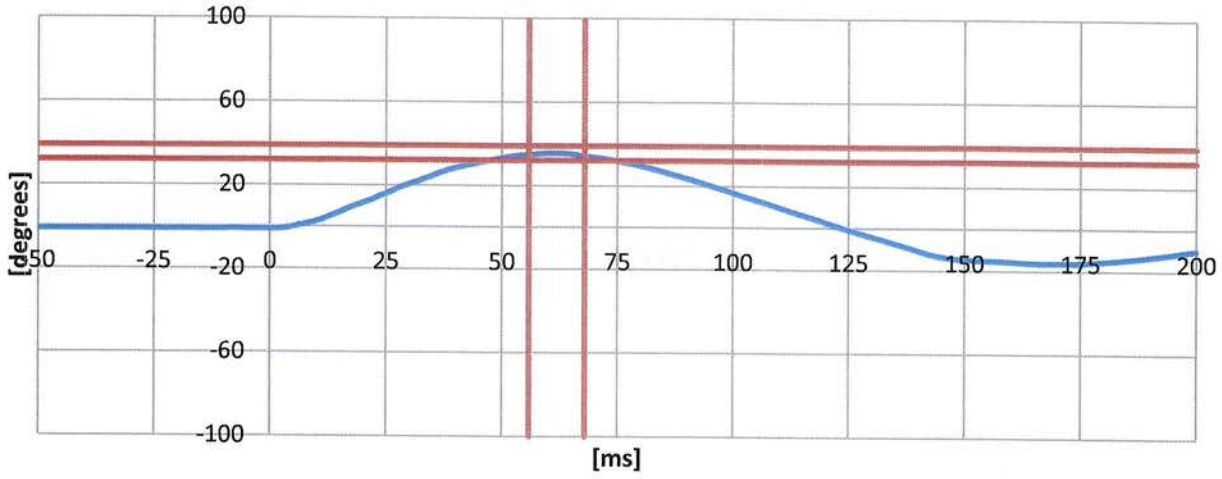
Approved Date 2013/12/25



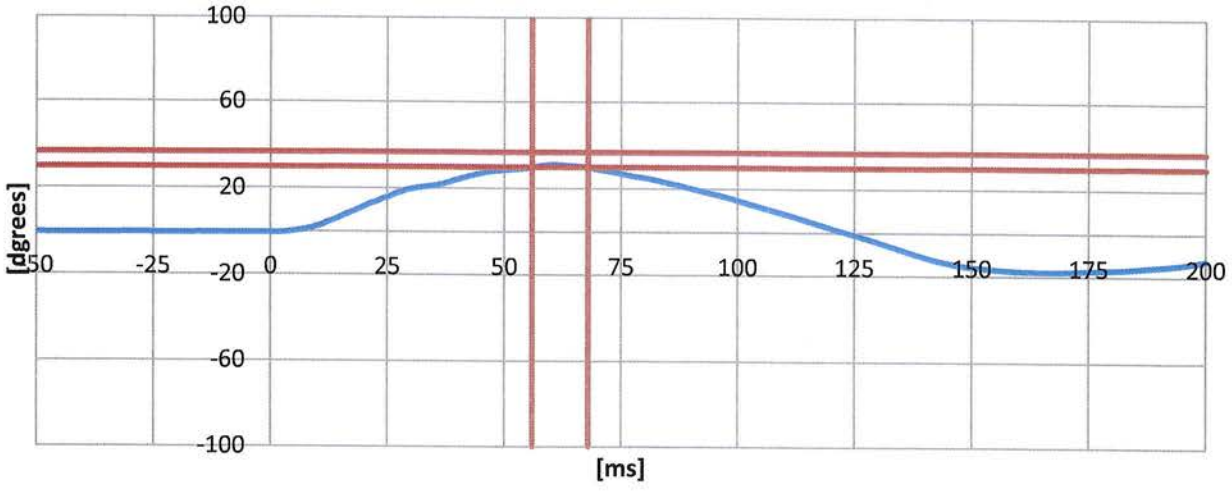
## Angular Displacement of the Head Form Relative to Pendulum, β




## Forward Angular Displacement




## Rearward Angular Displacement



# WorldSID
# Neck Certification
# Right

Test I.D. 81825

Serial No. 1106

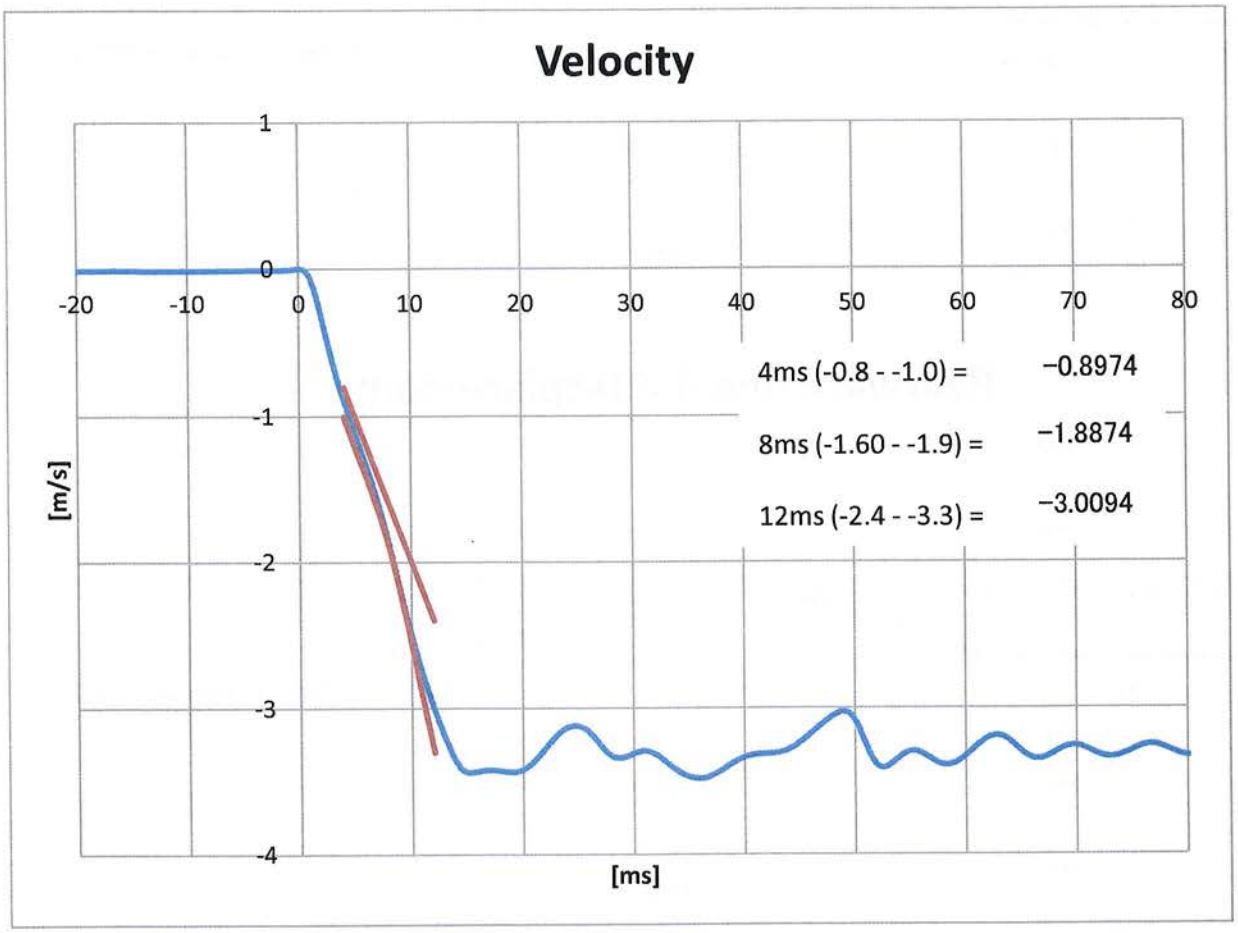
| Tested Parameter | Units | Specification | Results | Pass/Fail |
|---|---|---|---|---|
| Temperature | ℃ | 20.6 ~ 22.2 | 21 | Pass |
| Humidity | % | 10 ~ 70 | 50 | Pass |
| Velocity | m/s | See Chart | - | Pass |
| Maximum Angular Displacement | degrees | 50 ~ 61 | 53.57 | Pass |
| Decay time | ms | 58 ~ 72 | 59.80 | Pass |
| Peak Forward Angular Displacement | degrees | 32 ~ 39 | 35.07 | Pass |
| Time of Peak Forward Angular Displacement | ms | 56 ~ 68 | 59.80 | Pass |
| Peak Rearward Angular Displacement | degrees | 30 ~ 37 | 31.30 | Pass |
| Time of Peak Rearward Angular Displacement | ms | 56 ~ 68 | 57.30 | Pass |
| Pendulum Velocity | m/s | 3.3 ~ 3.5 | 3.46 | Pass |

Technician M.kobayashi

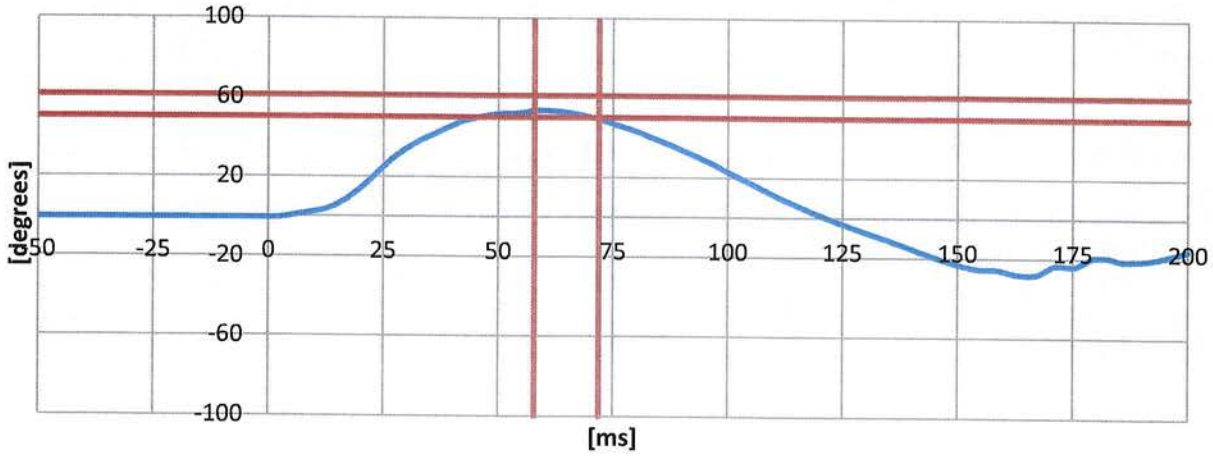
Test Date 2013/12/25

Approved By S.kobayashi

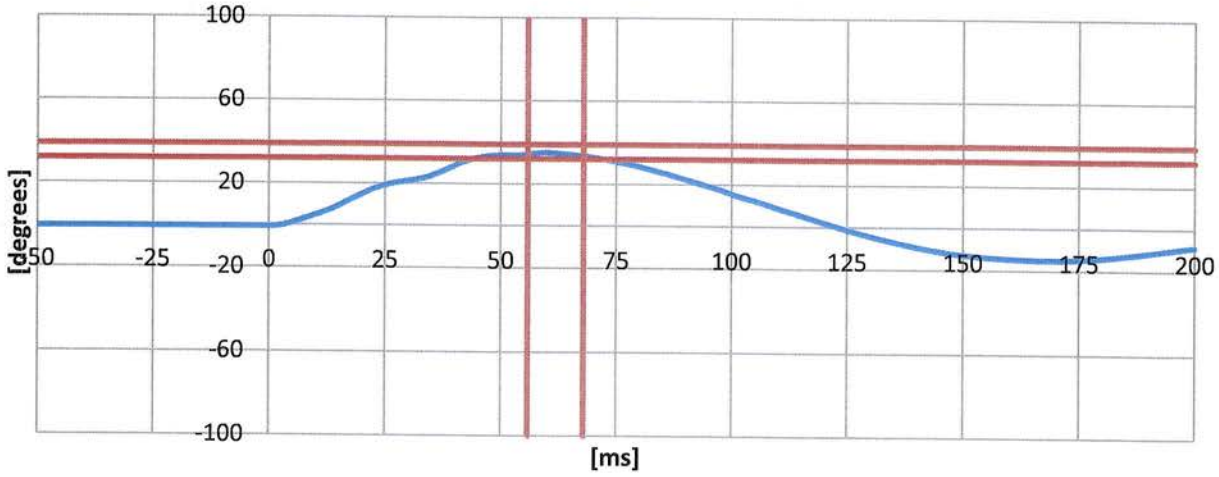
Approved Date 2013/12/25



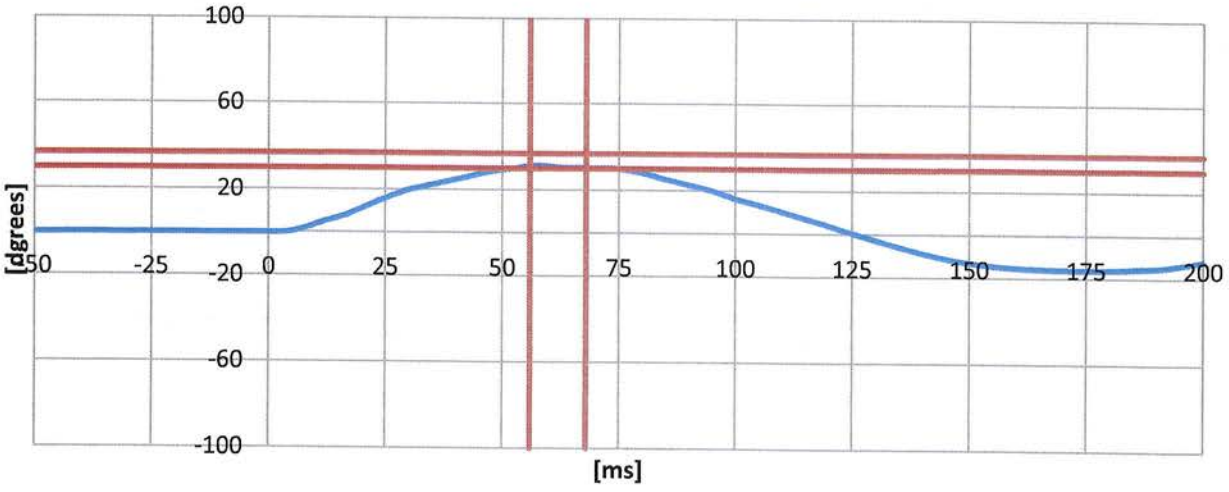
## Angular Displacement of the Head Form Relative to Pendulum, β




## Forward Angular Displacement




## Rearward Angular Displacement



# ご静聴ありがとうございました

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# New Car Assessment Program for Southeast Asian Countries (ASEAN NCAP): Progress & Way Forward

Mohd Hafzi Md Isa

JASTI User Meeting

*12 February 2014 @ Numazu Riverside Hotel*

ASEAN NCAP

www.aseancap.org

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## Contents



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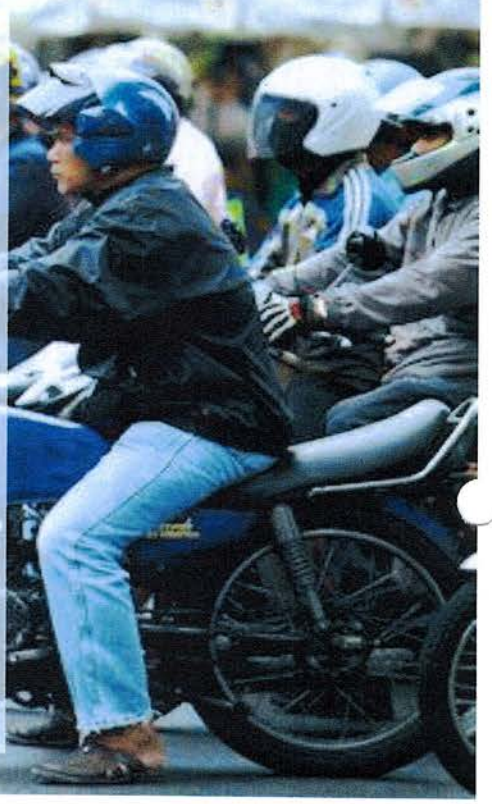
# ASEAN Layout

- Socioeconomic disparity.
- High no. of Motorcycles > up to 95% in Vietnam.
- No. of cars also growing:
  - 2.4 mil. 2011 >> 4.7 mil. 2018
  - 6th biggest global market 2018
- Now, 44 cars per 1000 people.



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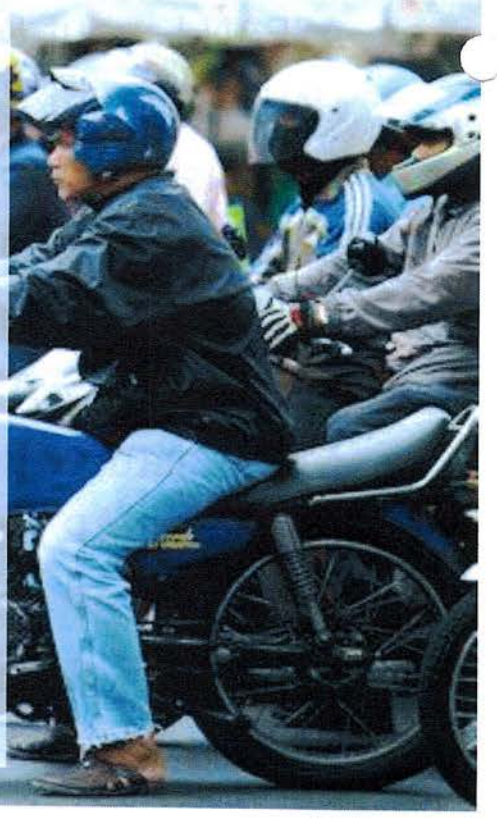
# ASEAN Challenges

- Vulnerable Road Users (VRUs) is the current issue – 90% in MIC, 60% in LIC (WHO, 2009).
- Consider increase in no. of cars >> a new, more complex environment?
- Modal change >> increase in exposure, speed, road sharing conflict, crash compatibility.



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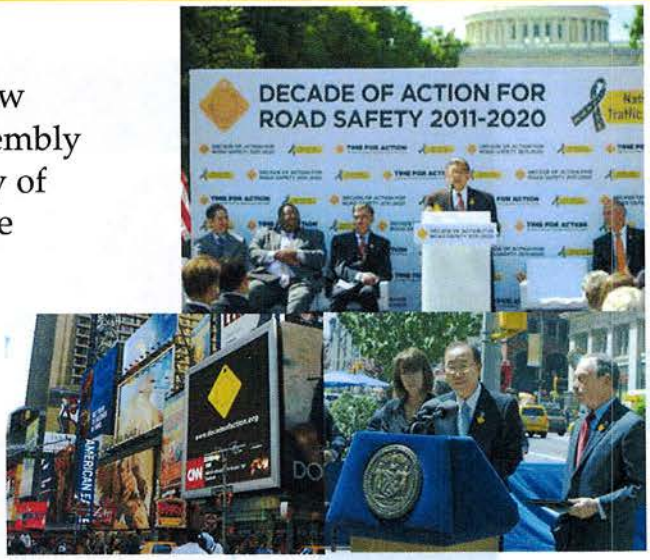
# UN Decade of Action for Road Safety – May 11 2011




The Decade was approved by the Moscow Ministerial in 2009 and UN General Assembly in 2010. It was launched by a global relay of events on 11th May. A Plan for the Decade has been prepared based on five pillars:

1. Building Management Capacity
2. Encouraging Safer User Behaviour
3. Building Safer Roads
4. Building Safer Vehicles
5. Improving Post Crash Care

Each pillar includes indicative and interim targets to progress towards the Decade's overall goal which is to 'stabilize and then reduce the level of road fatalities'. This requires a 50% reduction in the forecast level of fatalities by 2020 which could avoid 5 million deaths, 50 million injuries and save $3 trillion in social costs.

General inquiries: aseancap@gm...

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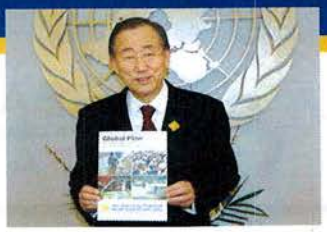
# Decade Plan - Influencing Vehicle Design



**Activity 1**: Encourage Member States to apply and promulgate motor vehicle safety standards as developed by the UN's World Forum for the Harmonization of Vehicle Regulations (WP 29).

**Activity 2**: Encourage implementation of new car assessment programs in all world regions to increase the availability of consumer information about the safety performance of motor vehicles.

**Activity 3**: Encourage agreement to ensure that all new motor vehicles are equipped with seat belts and anchorages that meet regulatory requirements and pass applicable crash test standards (as minimum safety features)..

**Activity 4**: Encourage global deployment of crash avoidance technologies with proven effectiveness such as Electronic Stability Control and Anti Lock Braking systems in motorcycles.

**Activity 5**: Encourage use of fiscal and other incentives for motor vehicles that provide high levels of road user protection and discourage export of new and used cars that have reduced safety standards.

**Activity 6**: Sustain investment in research and development of safety technologies that will improve vehicle safety and reduce risks to vulnerable road users.

**Activity 7**: Encourage managers of governments and private sector fleets to purchase and maintain vehicles that offer advanced safety technologies and high levels of occupant protection.

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# Establishment of ASEAN NCAP


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# NCAPs Around the World

ASEAN NCAP

**No. 9th in the world, a collaborative effort between Global NCAP and MIROS**


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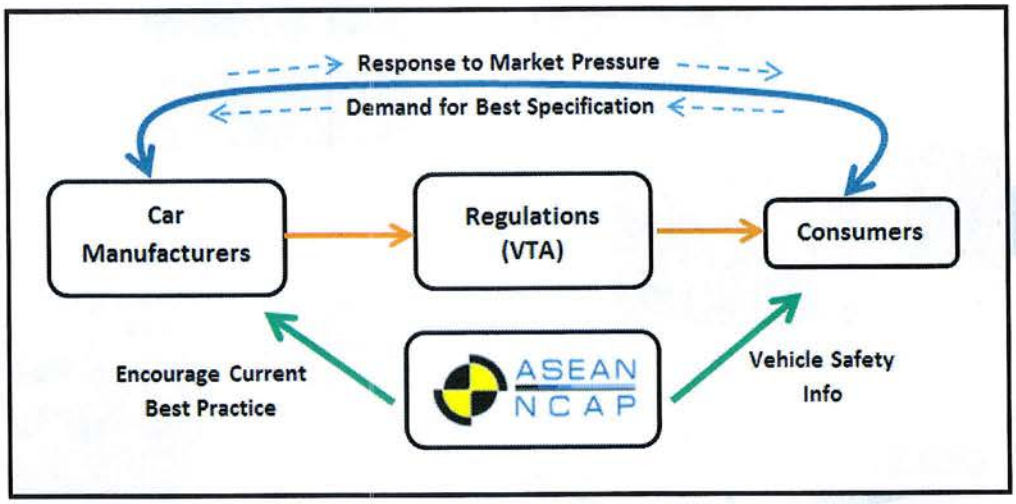
# Benefits of ASEAN NCAP




General inquiries: aseancap@gma...

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# Why do we need NCAP for ASEAN?


General inquiries: aseancap@gmail.com

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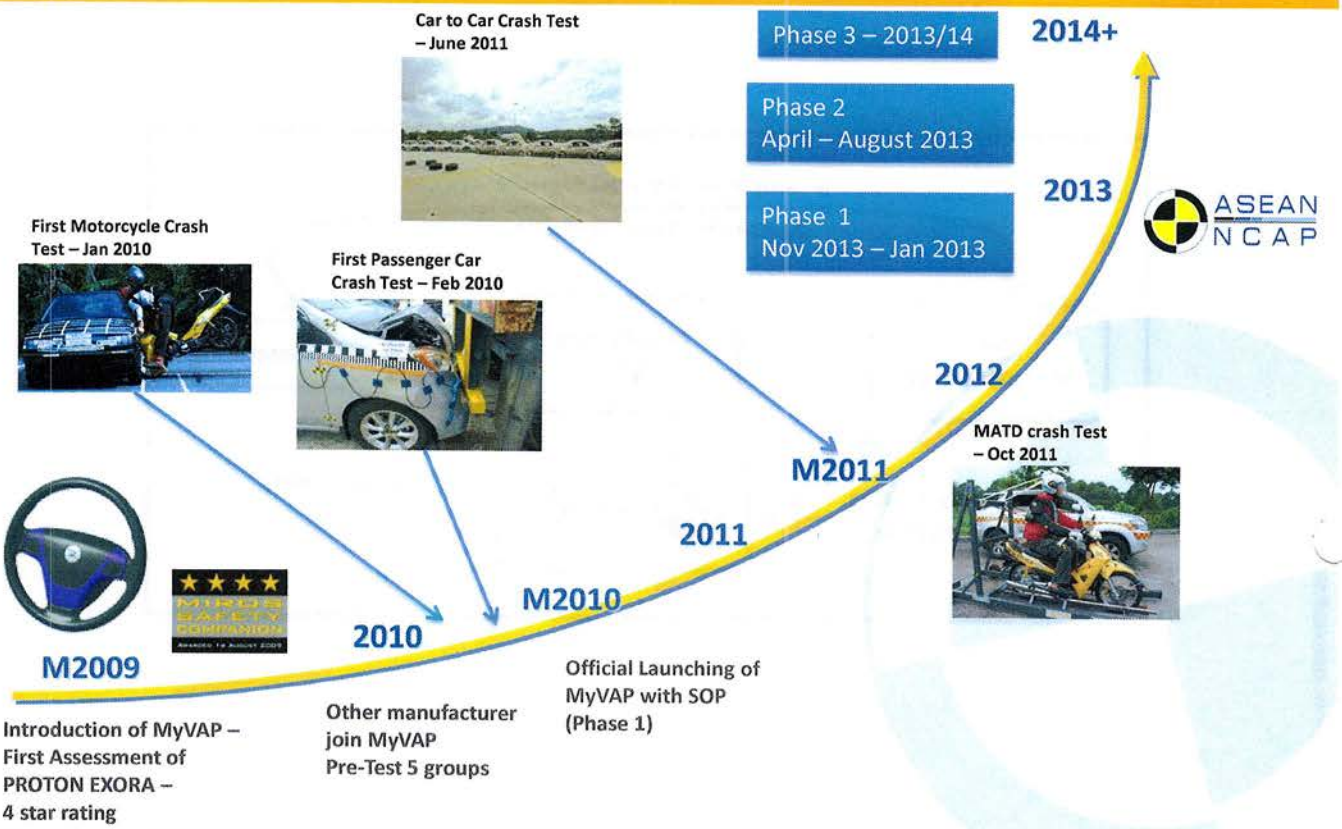
# The Journey of ASEAN NCAP




General inquiries: aseancap@gmail.com

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# ASEAN NCAP Supporters

ASEAN NCAP

MIROS Malaysian Institute of Road Safety Research · AAP · Automobile Association of Cambodia · Automobile Association of Singapore · AAM

*Stake Holders*

Global NCAP www.globalncap.org · FIA Foundation for the Automobile and Society

*Financial Support*

ANCAP Crash testing for safety – Australasian New Car Assessment Program · Latin NCAP · Euro NCAP www.euroncap.com

*Technical Support*

JNCAP · KNCAP Korean New Car Assessment Program

*Program Advisory*

General inquiries: aseancap@gmail.com

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# Support from Related Parties

MIROS PC3

MIROS
MALAYSIAN INSTITUTE OF ROAD SAFETY RESEARCH — *Financial Support*

JARI
一般財団法人日本自動車研究所
Japan Automobile Research Institute — *Technical Support*

JASTI KYOWA — *Product Support*

General inquiries: aseancap@gma...m

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# ASEAN NCAP Organization Chart

**Steering Committee**

(MIROS, AAM, AAS, AAP & AAC) + (Global NCAP, Latin NCAP & Australasian NCAP – Advisory Panel)

**Technical Committee**

(MIROS, TGGS, UOP, Latin NCAP & ANCAP)

| WG | WG | WG | WG |
|---|---|---|---|
| Frontal Impact | Side Impact | Child Restraint | Safety Assist |

General inquiries: aseancap@gmail.com

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# ASEAN NCAP Implementation Flow


General inquiries: aseancap@gmail.com

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# Vehicles Involved in Phase I


*Start Date: 15th November 2012
*Last test: 29th January 2013

General inquiries: aseancap@gmail.com

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# Vehicles Involved in Phase II


*Start Date: 18th April 2013
*Last test: 2nd August 2013

General inquiries: aseancap@gma.

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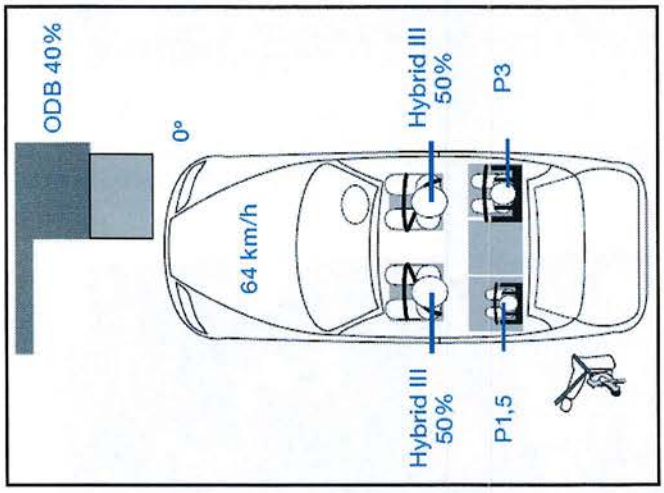
# Crash Test Configuration




*TEST REQUIREMENT*
**SPEED**
64±1 km/hr

**40 % OFFSET**
±20 MM IMPACT POINT

**Single Crash Test Configuration >>**
**Produces 2 Separate Ratings**
**Adult Occupant Protection (AOP)**
**Child Occupant Protection (COP)**

General inquiries: aseancap@gmail.com

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# Test Laboratory: MIROS PC3

Southeast Asia's sole crash lab has received the distinction with the title of 'First Full-Scale Crash Test Laboratory' by the Malaysia Book of Records.

General inquiries: aseancap@gmail.com

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# Test Laboratory: JARI

General inquiries: aseancap@gmail.com

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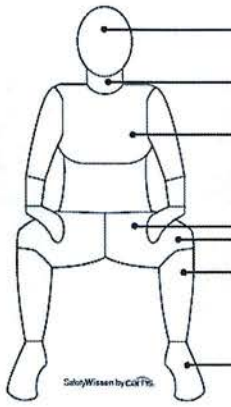
# Adult Occupant Protection

For each body region (grey boxes) the score is calculated based on the worst injury criterion and applicable modifiers. Where a value falls between the upper and lower limit the score is calculated by linear interpolation. The scores are presented visually, using coloured segments within body outlines. The colour used is based on the points awarded for that body region as follows:

- 4,00 points
- 2,67 – 3,99 points
- 1,33 – 2,66 points
- 0,01 – 1,32 points
- 0,00 points



| Head | |
|---|---|
| 4 points | HIC 36 < 650; $a_{3ms}$ < 72 g |
| 0 points | HIC 36 > 1000; $a_{3ms}$ > 88 g |
| Modifier | unstable airbag contact (-1 point); Steering column displacement (-1 point) |

| Neck | | |
|---|---|---|
| 4 points | $M_{upper}$ Tension: | < 42 Nm |
| | | < 2,7 kN @ 0 ms |
| | | < 2,3 kN @ 35 ms |
| | | < 1,1 kN @ 60 ms |
| | Shearing: | < 1,9 kN @ 0 ms |
| | | < 1,2 kN @ 25 – 30 ms |
| | | < 1,1 kN @ 45 ms |
| 0 points | $M_{upper}$ Tension: | > 57 Nm |
| | | > 3,3 kN @ 0 ms |
| | | > 2,9 kN @ 35 ms |
| | | > 1,1 kN @ 60 ms |
| | Shearing: | > 3,1 kN @ 0 ms |
| | | > 1,5 kN @ 25 – 35 ms |
| | | > 1,1 kN @ 45 ms |

| Chest | |
|---|---|
| 4 points | Deflection < 22 mm; VC < 0,5 m/s |
| 0 points | Deflection > 50 mm; VC > 1,0 m/s |
| Modifier | Deformation A-Pillar (-2 points) Compartment deformed (-1 point) Contact with steering wheel (-1 point) |

| Femur | |
|---|---|
| 4 points | Compression force < 3,8 kN |
| 0 points | Compression force > 9,07 kN > 7,56 kN @ 10 ms |

| Knee | |
|---|---|
| 4 points | Displacement < 6 mm |
| 0 points | Displacement > 15 mm |
| Modifier | Variable contact (-1 point) Concentrated Loading (-1 point) |

| Tibia | |
|---|---|
| 4 points | TI < 0,4; Compression force < 2 kN |
| 0 points | TI > 1,3; Compression force > 8 kN |
| Modifier | z-displacement of worst pedal (-1 point) |

| Foot | |
|---|---|
| 4 points | x-displacement braking pedal < 100 mm |
| 0 points | x-displacement braking pedal > 200 mm |
| Modifier | footwell intrusion (-1 point) blocked pedal (-1 point) |

| Airbag | |
|---|---|
| Modifier | Airbag Deployment Modifier for incomplete unfolding of any Airbag (-1 Point) |

- The overall point is determined after taking the lower of driver and front passenger scores.
- 5 star – more than 14 points and vehicle equipped with SBR & ESC.

| Score | Star Rating |
|---|---|
| 14.00 – 16.00 | ★★★★★ |
| 11.00 – 13.99 | ★★★★ |
| 8.00 – 10.99 | ★★★ |
| 5.00 – 7.99 | ★★ |
| 2.00 – 4.99 | ★ |
| 0.00 – 1.99 | *Zero-Star* |

General inquiries: aseancap@gmail.com

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# Data Comparison – JASTI Dummy

- Repeatability – Comparison between Pre-Test and Official ASEAN NCAP Test of the same variant using JASTI dummies.

**JASTI vs. JASTI**

- Comparison 1 – Performance comparison between JASTI and HUMANETICS dummies of the same variant.

**JASTI vs. HUMANETICS**

- Comparison 2 - Performance comparison between JASTI (tested in PC3) and HUMANETICS (tested in Crashlab, Australia) dummies of the same variant.

**JASTI [PC3] vs. HUMANETICS [CRASHLAB]**

General inquiries: aseancap@gmail.com

# Data Comparison – Toyota Vios

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- **Repeatability** – Comparison between Pre-Test and Official ASEAN NCAP Test of same variant using JASTI dummies.

Pre-NCAP



^V = 1.4 km/h

Official



General inquiries: aseancap@gmail.com

# Data Comparison – Toyota Vios

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- **Repeatability** – Comparison between Pre-Test and Official ASEAN NCAP Test of same variant using JASTI dummies.

| Comparison Items | Driver | Passenger |
|---|---|---|
| HIC36 | (86.76) | (27.72) |
| Resultant | (2.82) | (0.24) |
| Extension | (0.9) | (16.07) |
| Chest Compression | 5.37 | 0.39 |
| VC | 0.05 | 0 |
| Right Knee displacement | (0.71) | (0.87) |
| Left Knee displacement | (0.82) | (1.28) |
| Right Upper/Lower tibia | 0.14/(0.07) | 0.1/0.01 |
| Left Upper/Lower tibia | (0.02)/(0.11) | 0.16/(0.01) |
| Right Upper/Lower tibia Fz | 0.44/0.47 | 0.06/0.21 |
| Left Upper/Lower tibia Fz | 0.52/0.51 | 0.06/0.08 |

General inquiries: aseancap@gmail.com

# Data Comparison – Perodua Myvi

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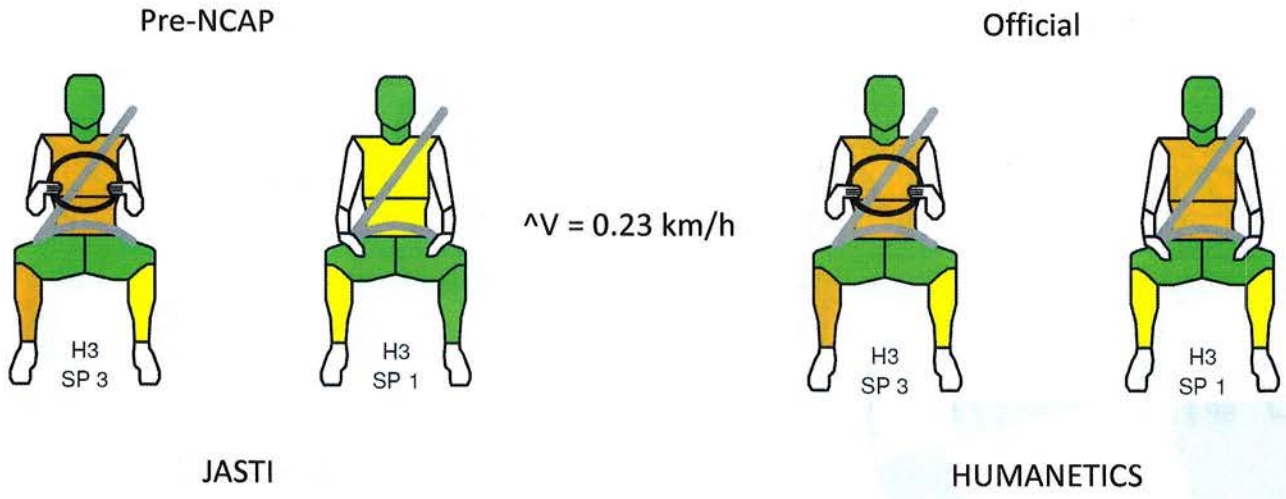
- **Comparison 1** – Comparison between Pre-Test using JASTI dummies and Official ASEAN NCAP Test using HUMANETICS dummies.






# Data Comparison – Perodua Myvi

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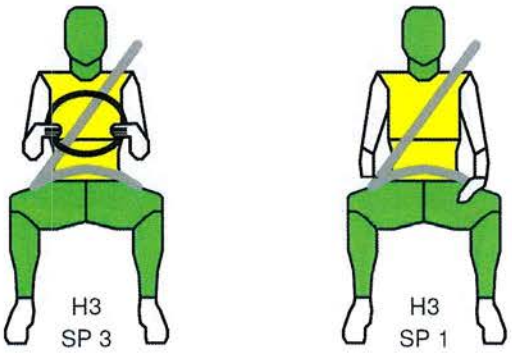
- **Comparison 1** – Comparison between Pre-Test using JASTI dummies and Official ASEAN NCAP Test using HUMANETICS dummies.

| Comparison Items | Driver | Passenger |
|---|---|---|
| HIC36 | (305.47) | 250.93 |
| Resultant | (20.78) | (18.61) |
| Extension | (10.72) | (18.14) |
| Chest Compression | 0.26 | 3.01 |
| VC | (0.03) | (0.02) |
| Right Knee displacement | 3.63 | 4.3 |
| Left Knee displacement | (0.3) | (0.35) |
| Right Upper/Lower tibia | 0.44/(0.18) | (0.05)/(0.03) |
| Left Upper/Lower tibia | (0.16)/0.26 | 0.09/0 |
| Right Upper/Lower tibia Fz | 2.06/2.56 | 1.31/1.95 |
| Left Upper/Lower tibia Fz | 1.65/2.22 | 1.43/1.85 |

# Data Comparison – Honda City

- **Comparison 2** Performance comparison between JASTI (tested in PC3) and HUMANETICS (tested in Crashlab, Australia) dummies of the same variant.

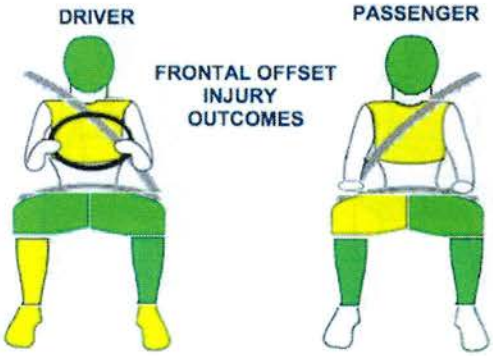
ASEAN NCAP




ΔV = 0.2 km/h

JASTI
[MIROS PC3]

ANCAP




HUMANETICS
[CRASHLAB]

General inquiries: aseancap@gmail.com

# Data Comparison – Honda City

- **Comparison 2** Performance comparison between JASTI (tested in PC3) and HUMANETICS (tested in Crashlab, Australia) dummies of the same variant.

| Comparison Items | Driver | Passenger |
|---|---|---|
| HIC36 | 63.87 | (13.62) |
| Resultant | 4.93 | 7.94 |
| Extension | 7.59 | 17.27 |
| Chest Compression | (10.18) | (7.51) |
| VC | 0.03 | 0.01 |
| Right Knee displacement | (0.45) | 2.37 |
| Left Knee displacement | 1.49 | (0.41) |
| Right Upper/Lower tibia | (0.09)/(0.07) | 0.06/0.05 |
| Left Upper/Lower tibia | 0.04/0.07 | (0.04)/0.01 |
| Right Upper/Lower tibia Fz | (1.07)/(0.72) | (0.38)/(0.17) |
| Left Upper/Lower tibia Fz | 1.14/0.58 | 0.95/(0.26) |

General inquiries: aseancap@gmail.com

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# Child Occupant Protection

| Child Occupant Rating Scheme | |
|---|---|
| Dynamic Test | 24/24 |
| CRS Based Assessment | 12/12 |
| Vehicle Based Assessment | 13/13 |
| **TOTAL** | **49/49** |
| **Compliance Percentage** | **100%** |

General inquiries: aseancap@gma...n

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# ASEAN NCAP Plate

Manufacturer & Vehicle Model

No. of airbag for tested vehicle


Star rating for adult occupant from 0 ~ 5 star; 5 stars is the best.

Percentage of safety for child occupant from 0 ~ 100%; 100% is the best.

Month of crash test conducted

General inquiries: aseancap@gmail.com

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# Phase I & II Results [Adult Occupant Protection]

## PHASE I

- FORD FIESTA [5] 15.73/16
- HONDA CITY [5] 15.44/16
- TOYOTA VIOS [4] 13.61/16
- NISSAN MARCH [4] 11.66/16
- PROTON SAGA SV [3] 10.23/16
- PERODUA MYVI [3] 8.71/16
- HYUNDAI i10 [2] 7.31/16
- PROTON SAGA FLX [1] 4.30/16

## PHASE II

- TOYOTA PRIUS [5] 15.30/16
- HONDA CIVIC [5] 14.63/16
- SUBARU XV [5] 14.31/16
- SUZUKI SWIFT [4] 13.32/16
- MAZDA 2 [4] 13.10/16
- MITSUBISHI MIRAGE [4] 13.07/16
- TOYOTA AVANZA [4] 12.98/16
- PERODUA ALZA [4] 12.86/16
- NISSAN ALMERA [4] 12.74/16
- DAIHATSU XENIA[4] 12.34/16
- MITSUBISHI PAJERO SPORT[4] 13.32/16

General inquiries: aseancap@gmail.com

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# Phase I & II Results [Child Occupant Protection]


General inquiries: aseancap@gmail.com

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# Manufacturer Responses

- **Toyota Vios** – upgraded all version to double airbags starting September 2012.
- **Honda City** – New column pad cover, SBR for both front passenger; create ASEAN specification for low and high grade.
- **Nissan March** – New column pad cover for whole ASEAN region.
- **Ford Fiesta** – Implementation of top tether for all ISOFIX application starting 20th May 2013.
- **Proton Saga** - No single airbag variant starting February 2013. Lowest variant will be equipped with double airbags and top tether (SV version).
- **Toyota Avanza/ Daihatsu Xenia** – Lowest variant without radio but equipped with double frontal airbags.



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# Cont..

- Utilization of ASEAN NCAP ratings for marketing purposes.



- Engagement with manufacturers and other related automotive associations through ASEAN NCAP Working Groups.

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# ASEAN NCAP Phase III

- Another test requirement (UN R95) has been added starting Phase III - prerequisite to obtain 4 or 5 stars.
- 11 models – pickups, LHD, OEMs from India, China & France
- Expected to finish by end of March 2014
- Phase III Launching @ Bangkok – will be confirmed soon.
- Plan B – may be delayed in a month or two (which will be held in Malaysia)

General inquiries: aseancap@gmail.com

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# ASEAN NCAP Roadmap (2014-2020) - Tentative

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| Frontal Impact | *Study of the Real World Crash statistics for ASEAN* | | | Development of Test Protocols including type, dummy usage & modifiers* | | | Additional Frontal Test |
| | To maintain current ODB Test Protocols | | | Soft Landing of decided test criteria* | | | |
| | | | | Combined Rating | | | |
| Side Impact | *Study of the Real World Crash statistics for ASEAN* | | | Combined Rating | | | |
| | *Development of Curtain Airbag Evaluation (combined rating)* | | | | | | |
| | UN R95 required for | UN R95 required for | | | | | |
| | Min 4 Star Vehicle | Min 3 Star Vehicle | | | | | |
| Child Restraint | Using BRITAX or equivalent or Manufacturer proposed CRS | | | Manufacturer to select the list of CRS from ASEAN NCAP | | | |
| | *Development of CRS list for selection* | | | Using Q1.5 & Q3 | | | |
| | | | | Combined Rating | | | |
| Safety Assist | | | | | | | |
| ESC | ESC for 5 star vehicle | | ESC for Min 4 star vehicle | Combined Rating | | | |
| SBR | SBR for 5 star vehicle | | SBR for Min 4 star vehicle | Combined Rating | | | |
| Future SAT | *Development of AEB Protocols* | | | | AEB for 5 star vehicle | | |
| | | | | | | | |
| Overall | *Development of comprehensive rating system (combined rating)* | | | | | | |
| | Future SAT ratings awarding system | | | | | | |
| | Rating Rationalization for each variants & model | | | | | | |
| | New Plate for ASEAN NCAP (Phase 3) | | | | | | |

The potential test specification are
1. Full Frontal
2. Small Overlap
3. Small Offset

1st January 2017 - The ASEAN NCAP will decide which one of the test for additional test from current ODB Test Protocols and it will be considered as starting point of soft landing.

General inqu

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# Challenges & Future Direction

- **Test Requirement > Expansion of Test Spectrum & Adoption of Domestic Values**

- **Variation in Industry & Vehicle Regulations >> 10 ASEAN Countries**
  - 2-5-3 Formation
  - Brunei:Singapore <>
    Malaysia:Thailand:Philippines:Vietnam:Indonesia <>
    Laos:Myanmar:Cambodia



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Challenges & Future Direction

- **Budgetary Constraint – ASEAN Wide Coverage**
  - Currently supported by MIROS & Global NCAP (monetary)

- **Language Barrier in Disseminating Info**
  - Currently, English is the main medium

General inquiries: aseancap@gmail.com

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# Support ASEAN NCAP

## www.aseancap.org


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# Thank you for your attention

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# Copyright Statement



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# Systems for Vehicle Safety




## 目次

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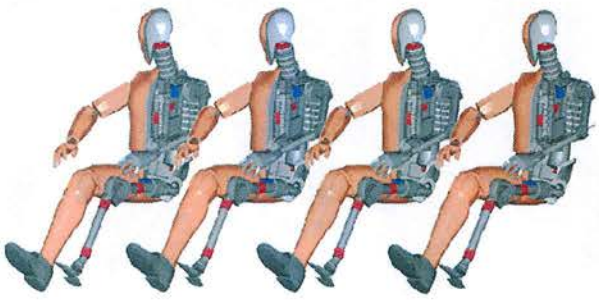
- 会社紹介
- 製品紹介
- **WorldSID Dummy Integration**




会社紹介 - Kistler 衝突安全ビジネス各拠点
KISTLER
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センサ
Schönaich
(シェーナイヒ)
ダミー Inst., ラボ
Heidelberg
(ハイデルベルク)
インダミー& 車載DAS
Munich
(ミュンヘン)
クラッシュバリヤ
Winterthur
(ウィンターツール)
東京，中部，関西
Vehicle Safety / Sua / February 2014
3


CrashDesigner
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1. ソフトウェア
2. ラボ
3. センサ類、インダミー DAS
4. 計装化クラッシュバリヤ (Movable)
5. 計装化クラッシュポール
6. オンボードDAS
7. 計装化クラッシュバリヤ
8. 計装化バンパー
9. オフボードDAS
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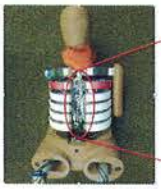
## 製品紹介 – 主力製品

- ダミー用ロードセル
- DAS（オンボード、オフボード、インダミー）
- クラッシュバリヤ
- サービス (校正, インダミー化)
- 加速度計



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## WorldSID Dummy Integration

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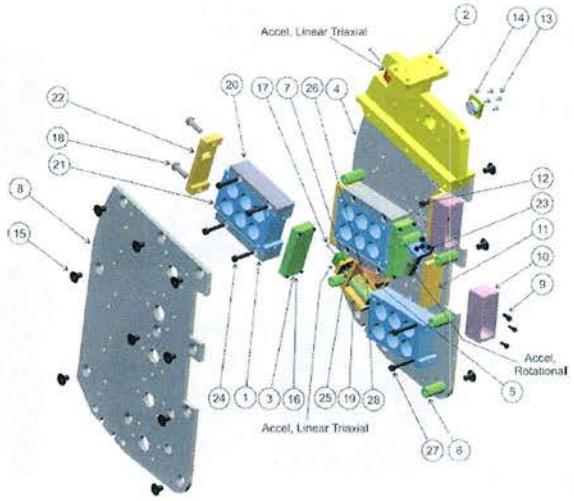
## WorldSID 50th スパインボックス

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## WorldSID NXT32バージョン

WorldSID 50th %tile SBL-E:

- European OEM
- Humanetics Instrumentation
- 85 Channels
- ID-Chips present

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## WorldSID DTIバージョン

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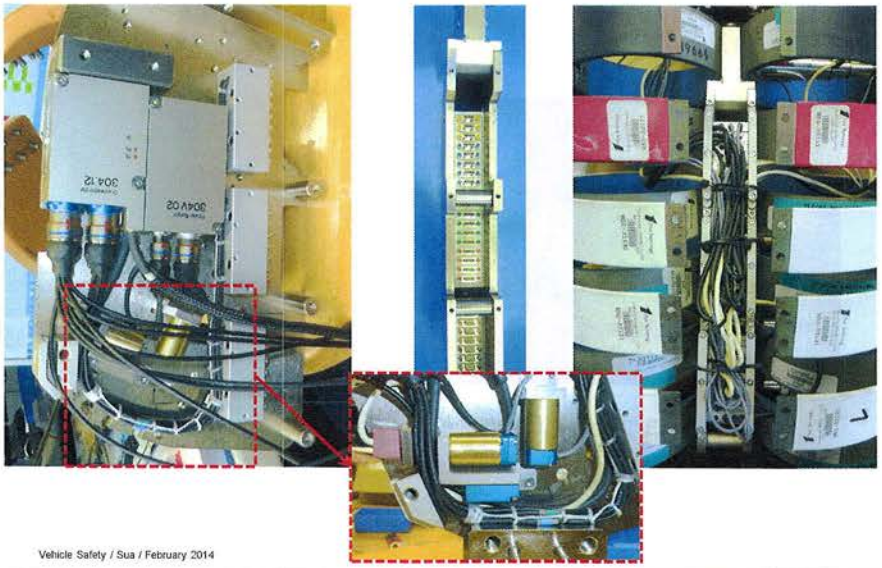

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## WorldSID DTIバージョン

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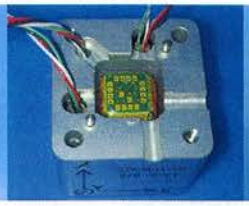
12-axis Sacro Iliac LC

12-axis Sacro Iliac LC

(3ea) 1-axis Accel



(1ea) 3-axis Accel

6-axis Lumbar Spine LC

3-axis Femoral Neck LC

3-axis Shoulder LC

1-axis Pubic LC

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## DTI構成例 – H3-3YO

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- DTI – H3-3YO

47ch アナログケーブル

1ch デジタルケーブル

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## DTI構成例 – Flex-PLI

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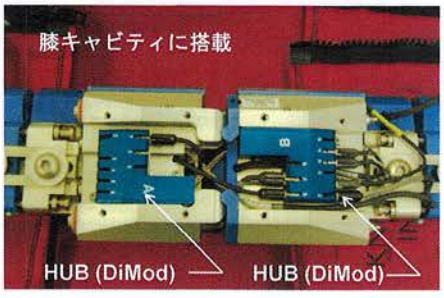
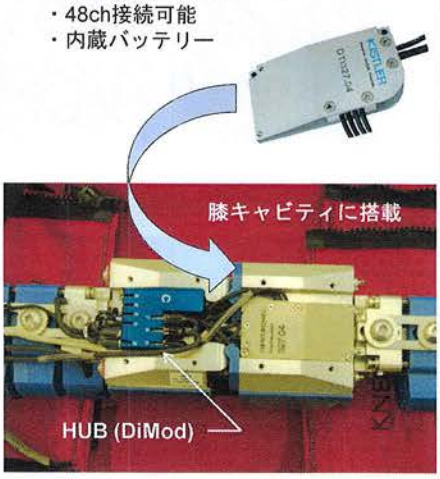
measure. analyze. innovate.

- DTI – Flex-PLI




Flex-PLI用データレコーダ
・48ch接続可能
・内蔵バッテリー

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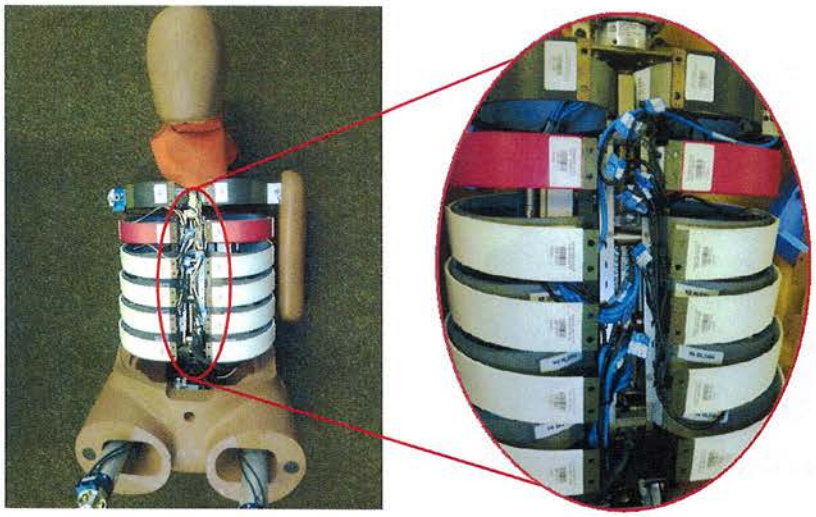
## WorldSID NXT32バージョン

KISTLER
measure. analyze. innovate.



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## WorldSID NXT32バージョン（センサリスト）

KISTLER
measure. analyze. innovate.

| NXT32 | Connector | Description | Connection | Channel 1 | Channel 2 | Channel 3 | Channels count |
|---|---|---|---|---|---|---|---|
| 150 | 11 | N.C. | 31,32 | | | | 0 |
| | 10 | Shoulder acceleration | 28 ... 30 | AX | AY | AZ | 3 |
| | 9 | Thorax Rib 1 Acceleration | 25 ... 27 | AX | AY | AZ | 3 |
| | 8 | Thorax Rib 2 Acceleration | 22 ... 24 | AX | AY | AZ | 3 |
| | 7 | Thorax Rib 3 Acceleration | 19 ... 21 | AX | AY | AZ | 3 |
| | 6 | Abdomen Rib 1 Acceleration | 16 ... 18 | AX | AY | AZ | 3 |
| | 5 | Abdomen Rib 2 Acceleration | 13 ... 15 | AX | AY | AZ | 3 |
| | 4 | Shoulder 2D IRTRACC | 10 ... 12 | DY | AN | | 2 |
| | 3 | Thorax Rib 1 2D IRTRACC | 7 ... 9 | DY | AN | | 2 |
| | 2 | Thorax Rib 2 2D IRTRACC | 4 ... 6 | DY | AN | | 2 |
| | 1 | Thorax Rib 3 2D IRTRACC | 1 ... 3 | DY | AN | | 2 |
| 152 | 11 | Abdomen Rib 1 2D IRTRACC | 31,32 | DY | AN | | 2 |
| | 10 | Abdomen Rib 2 2D IRTRACC | 28 ... 30 | DY | AN | | 2 |
| | 9 | Head Acceleration | 25 ... 27 | AX | AY | AZ | 3 |
| | 8 | Upper Neck Force | 22 ... 24 | FX | FY | FZ | 3 |
| | 7 | Upper Neck Moment | 19 ... 21 | MX | MY | MZ | 3 |
| | 6 | Lower Neck Force | 16 ... 18 | FX | FY | FZ | 3 |
| | 5 | Lower Neck Moment | 13 ... 15 | MX | MY | MZ | 3 |
| | 4 | T1 Acceleration | 10 ... 12 | AX | AY | AZ | 3 |
| | 3 | Shoulder Force | 7 ... 9 | FX | FY | FZ | 3 |
| | 2 | T4 Acceleration | 4 ... 6 | AX | AY | AZ | 3 |
| | 1 | T12 Acceleration | 1 ... 3 | AX | AY | AZ | 3 |
| 151 | 11 | Pubic Force | 31,32 | FY | | | 1 |
| | 10 | N.C. | 28 ... 30 | | | | 0 |
| | 9 | Sacro Iliac Left Force | 25 ... 27 | FX | FY | FZ | 3 |
| | 8 | Sacro Iliac Left Moment | 22 ... 24 | MX | MY | MZ | 3 |
| | 7 | Sacro Iliac Right Force | 19 ... 21 | FX | FY | FZ | 3 |
| | 6 | Sacro Iliac Right Moment | 16 ... 18 | MX | MY | MZ | 3 |
| | 5 | Lumbar Spine Force | 13 ... 15 | FX | FY | FZ | 3 |
| | 4 | Lumbar Spine Moment | 10 ... 12 | MX | MY | MZ | 3 |
| | 3 | Pelvis Acceleration | 7 ... 9 | AX | AY | AZ | 3 |
| | 2 | Femoral Neck Left Force | 4 ... 6 | FX | FY | FZ | 3 |
| | 1 | Femoral Neck Right Force | 1 ... 3 | FX | FY | FZ | 3 |

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## Worldsid DTIバージョン

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WorldSID 50th %tile SBL-E:

- European OEM
- Humanetics Instrumentation
- 105 Channels



## DTIとは？ = デジタル トランスデューサ インターフェース

KISTLER
measure. analyze. innovate.

# ■ Digital Transducer Interface

- ■ DTI = DiModによるA/D変換
- ■ センサ内部もしくはセンサコネクタ内に搭載
- ■ 計測データ保存（RS485 BUS）
- ■ Ethernetデータ転送

↳ DTIは***DiMOD Module***によるA/D変換と、***Data Recorder***でのデータ保存→転送を行います。

## Kistler Customers

KISTLER
measure. analyze. innovate.

- Peugeot (2*WS50, µDau)
- Audi (2*WS50)
- Daimler (4*WS50 + 1*WS05 +1*WS50 (DTI)+6 on order)
- BMW (5*WS50 + 2*WS05)
- Ford US (2*WS50 + 1*WS05)
- TRW (1*WS50)
- VW (1*WS50 (DTI))
- Porsche (3*WS50 (DTI))
- Skoda (1*WS50 (DTI))
- Volvo (1*WS50 (DTI))
- GM-PATAC (1*WS50)
- Renault (1*WS50)
- UTAC (1*WS50)
- PDB (1*WS05 (DTI))
- Continental (1*WS50 (DTI))

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## Thank you for your attention!

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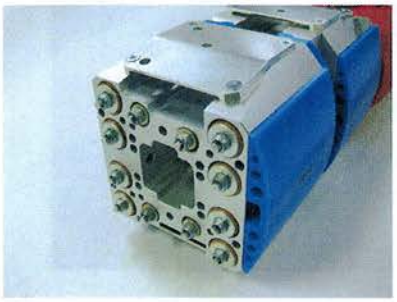
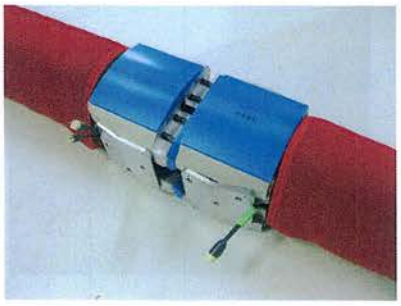
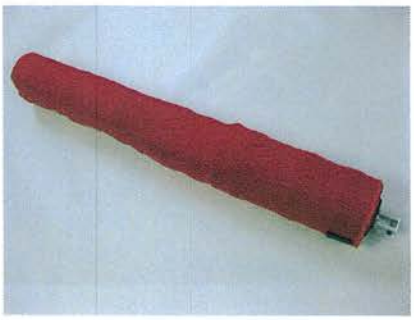
- KNEE ASSEMBLY
  ワイヤーおよびスプリング仕様決定

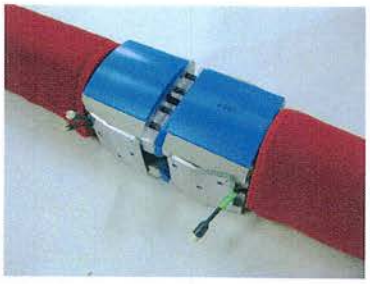


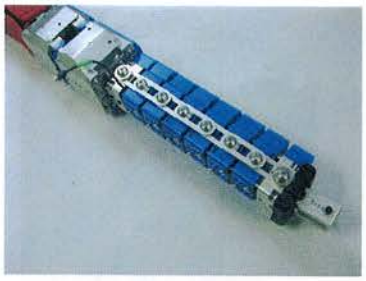


- BUFFER & COVER
  COVERのレターリングは順次準備
  BUFFERはBONEとの検証が必要ではあるが、
  一応の開発は完了。
  コンプリート完成後、検証・校正に入ります。



# Flex GTRの紹介と開発計画





- PCB BONE ASSEMBLY, FEMUR
- PCB BONE ASSEMBLY, TIBIA

BONE素材とPCB及び歪ゲージの特性検証を順次行っていきます。