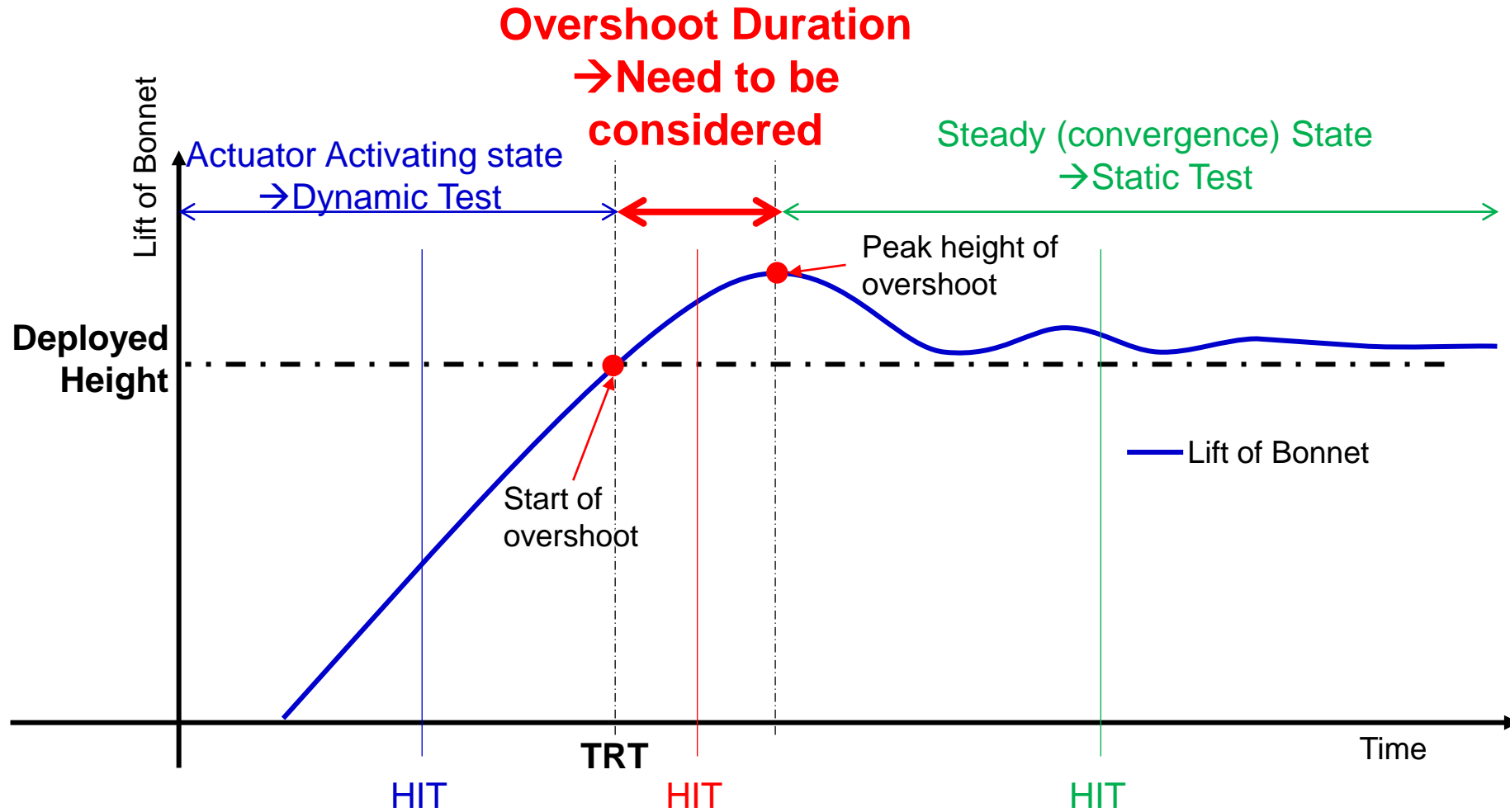# Investigation on Condition for Static Test in Overshoot Duration

Current Discussion for Overshoot Duration
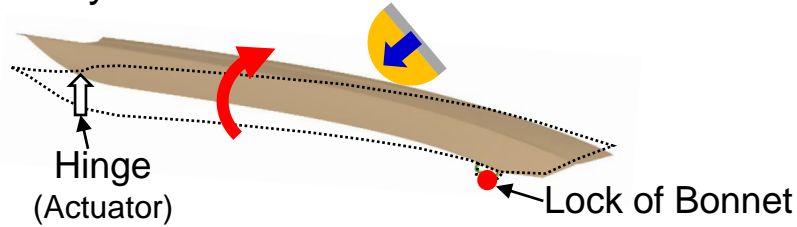
Condition for Parametric Study Representing Dynamic Test
- Applying Initial Velocity to Bonnet -

Purpose: To identify the simulation condition for identifying HIC increase ratio as a function of bonnet velocity
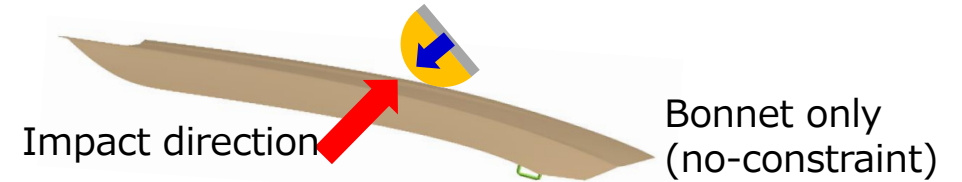
Condition1:
Dynamic activation of DPPS

Hinge
(Actuator)
Lock of Bonnet

Simulate actual dynamic test by representing constraint at lock and lift of actuator (mainly rotational motion)

Condition2:
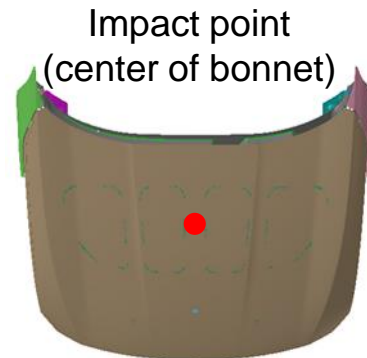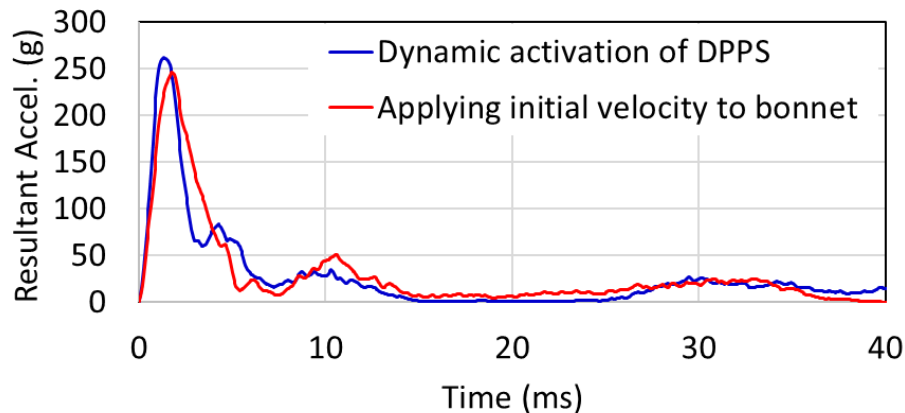Apply initial translational velocity to free bonnet component

Impact direction

Bonnet only
(no-constraint)

Apply the impact angle directional component of translational bonnet velocity obtained from "Conditon1" as the initial velocity to the no-constraint bonnet (Translational motion)

Result

Legend:
— Dynamic activation of DPPS
— Applying initial velocity to bonnet

Y-axis: Resultant Accel. (g) — 0, 50, 100, 150, 200, 250, 300
X-axis: Time (ms) — 0, 10, 20, 30, 40

Impact point
(center of bonnet)

*Although static test is available in all of headform test area in this car, HIC difference was virtually confirmed at the start timing of overshoot
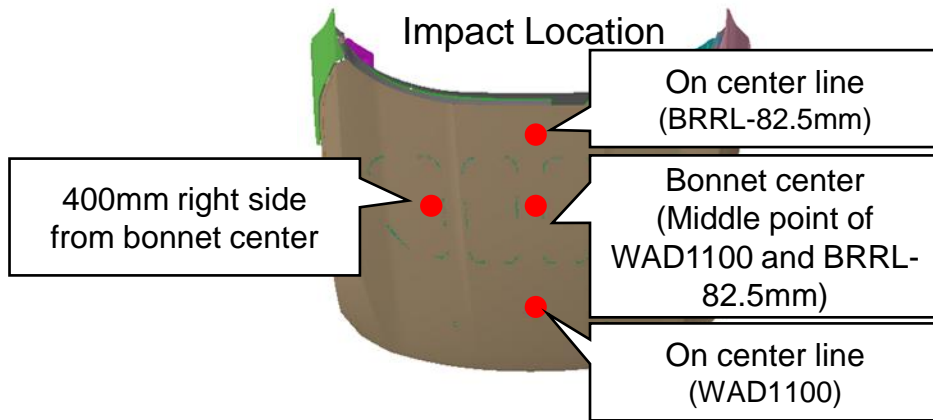
Difference of HIC between two conditions: 3.2%

Headform Impact simulation using no-constrain bonnet with initial velocity can be used for parametric study to obtain the relationship between bonnet velocity and HIC increase

3

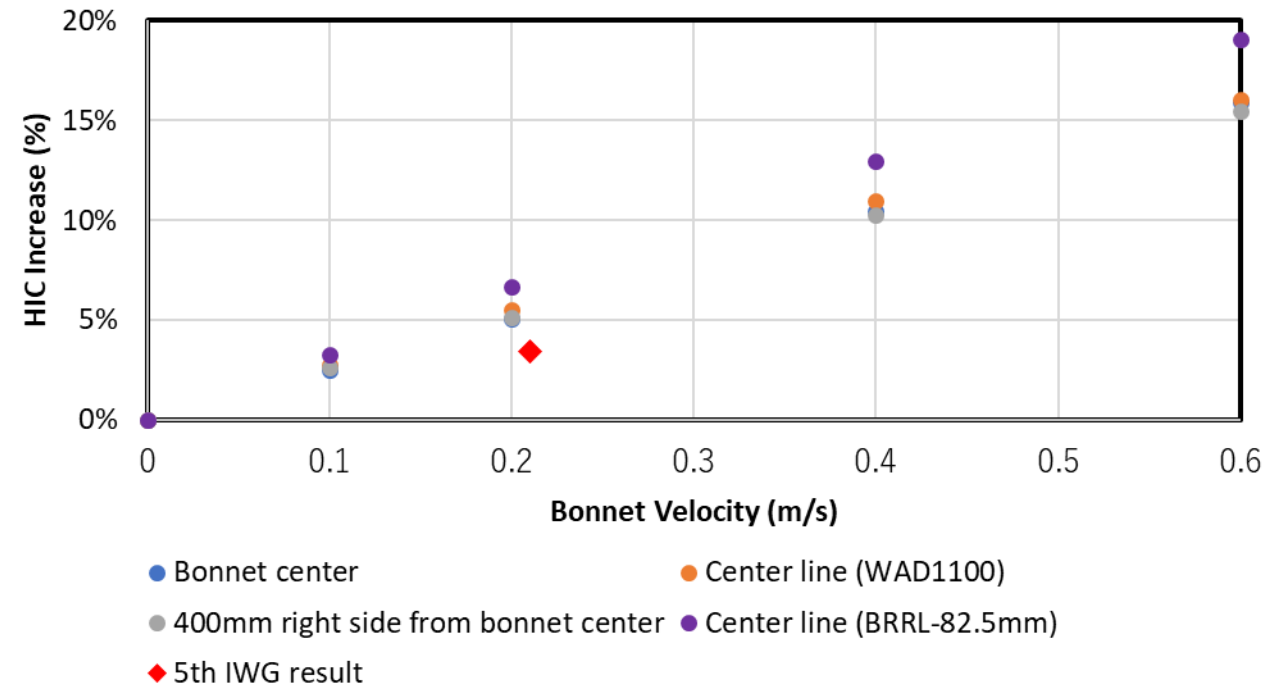# Relationship Between Bonnet Velocity and HIC Increase

Car model and simulation condition

- **Car model**: with active bonnet (static test is available in all of headform test area)
- **Impact Point**: 4 locations
- **Impactor**: Child 50 degree
- **Bonnet initial velocity**: 0 to 0.6 m/s

Impact Location

On center line (BRRL-82.5mm)

400mm right side from bonnet center

Bonnet center (Middle point of WAD1100 and BRRL-82.5mm)

On center line (WAD1100)

Impact simulations using no-constrain bonnet with initial velocity were conducted

Relationship between bonnet velocity and HIC increase

Legend:
- ● Bonnet center
- ● Center line (WAD1100)
- ● 400mm right side from bonnet center
- ● Center line (BRRL-82.5mm)
- ◆ 5th IWG result

Identify the bonnet velocity threshold for static test in overshoot duration from the relationship between bonnet velocity and HIC increase