Korean New Car Assessment Program (KNCAP)

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Korea Automobile Testing & Research Institute (KATRI)

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Goals of KNCAP

- For the promotion of public safety for the protection and preservation of human life
  - For Car buyers: Inform comparative safety rating of vehicles
  - For Automobile manufactures: Promote the development of safer vehicles

Korean NCAP
- From 1999
- Based on the Motor Vehicle Control Act Article 32 of 2 (Aug. 2002)

<Results announcement>
- Publish the results (Korean only)
- www.car.go.kr/kncap (website)
- m.car.go.kr/kncap (mobile)
KNCAP applied to passenger car from 1999.
  - Add bus from 2005 (not more than 4.5ton)
  - Add small truck from 2007 (not more than 1 ton)

KNCAP in the vehicle categories shall be covered 95% of all vehicles.
  - The distribution of bus not more than 4.5 tons was 87% of all buses
  - The distribution of truck not more than 1.0 ton was 72% of all trucks

- Vehicle categories
  - Passenger car
  - Add bus not more than 4.5tons
  - Small truck not more than 1ton
9 Items, total tested vehicles by 2013, 118 Vehicles: Sedan 112, Bus 4, Small Truck 2

- Full frontal impact
- Brake
- Side impact
- Dynamic rollover
- H/Rest (05~)
- Whiplash (08~)
- Pedestrian: Head (07~)
- Head & Leg (08~)
- Offset frontal
- Pole side impact
- Active safety sys.

Overall Rating
Test Items Overview

Full Frontal Impact

- Test vehicle is crashed to the rigid barrier with 56 km/h velocity
- 50%ile male dummy (driver seat) and 5%ile female dummy (passenger seat)
- Evaluate passenger injuries (for example head, chest and upper legs)

Offset Impact

- Test vehicle is crashed to the 40% offset barrier with 64 km/h velocity
- 50%ile male dummies (driver and passenger seat)
- Evaluate passenger injuries (for example head, chest, upper and lower legs)
Test Items Overview

- **Side Impact**
  - The movable barrier crashes to test vehicle with 55 km/h velocity
  - 50%ile EuroSID II dummy (driver seat)
  - Evaluate passenger injuries (for example head, chest and pelvis).

- **Pole Side Impact**
  - Impact speed: 29 km/h
  - 50%ile EuroSID II dummy (driver seat)
  - Evaluate passenger head injury
**Test Items Overview**

- **Whiplash**
  - This test is a rear crash using sled equipment
  - Test velocity is 16 km/h and dummy is BioRID II

- **Pedestrian Protection**
  - Head and leg form are impacted on vehicle hood and bumper with 40 km/h velocity
  - Evaluate head and leg injuries
Test Items Overview

Roll over

- Evaluated the probability of Roll over
- Static and dynamic test

\[ SSF = \frac{T}{2H} \]

Braking

- Evaluate the braking distance while vehicle is quick braking from 100 km/h to 0 km/h
- Performed on dry and wet road

\[ 45.3 \text{ m} \]

\[ 3.5 \text{ m} \]
Test Items Overview

- **Seat Belt Reminder**
  - Driver and Passenger seat on first row
  - Initial, Middle and Final warning occurrence check

- **Lane Departure Warning System**
  - Warning occurrence check when vehicle is crossed the lane

- **Forward Collision Warning System**
  - Warning occurrence check when vehicle is sensing probability of contact with forward vehicle or hazard
Integrated Overall Rating System

Crashworthiness Section (58pts)
- Full Frontal (16pts)
- Offset Frontal (16pts)
- Side Impact (16pts)
- Whiplash (10pts)

Pedestrian Section (30pts)
- Pedestrian Protection (30pts)

Driving Safety Section (10pts)
- Rollover & Brake (10pts)

Safety Assistance Section (+1pt)
- Active Device (+1pt)

<Weight Factor>
Crashworthiness: 65%
Pedestrian: 25%
Driving Assistance: 10%

Weight

Modified Scores
- Pole Side (+2pts)

Class

Meet min. Scores?

Overall Rating (100+3pts)

Minimum Required Scores to meet Class Level

<table>
<thead>
<tr>
<th>Class</th>
<th>Crashworthiness</th>
<th>Pedestrian</th>
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<tbody>
<tr>
<td>Class1</td>
<td>90.1%~</td>
<td>50.1%~</td>
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<tr>
<td>Class2</td>
<td>87.1%~</td>
<td>40.1%~</td>
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<td>Class3</td>
<td>84.1%~</td>
<td>35.1%~</td>
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<td>Class4</td>
<td>81.1%~</td>
<td>30.1%~</td>
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<tr>
<td>Class5</td>
<td>~81.0%</td>
<td>~30.0%</td>
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</table>
Effects of KNCAP: Full Frontal Impact Test

- Impact Speed: 56 km/h
- Driver: 50%ile Male
- Passenger: 50%ile Male (~2012)
  5%ile Female (2013~)

Average Probability of Injury (AIS 4+)

- Average for first 3 years (1999-2001)
- vs. Average for recent 3 years (2010-2012)

※ Average for first 3 years (1999-2001)
  vs. Average for recent 3 years (2010-2012)
Side Impact Test

- Moving Barrier: 950 kg
- Impact Speed: 55 km/h
- Driver: 50%ile EuroSID II

Average Probability of Injury (AIS 3+)

Comparison of initial data and recent data

- Combined injuries: 11.3% ⇒ 3.0%
Pole Side Impact Test

- Impact Speed: 29 km/h
- Impact Angle: 90 degree
- Driver: 50%ile EuroSID II

Comparison of test data (AIS3+)

- Probability of combined injuries
  - 2009: 95.6% (No curtain airbag)
  - After 2010: Less than 10% (with curtain airbag)

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<td><strong>Full Frontal</strong></td>
<td>5%ile F(Passenger)</td>
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<td>Amend of Notice Effective</td>
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<td><strong>Offset Impact</strong></td>
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<td><strong>Side Impact</strong></td>
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<td>AE-MDB</td>
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<td>WorldSID (50%ile M)</td>
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<td><strong>Pole Side Impact</strong></td>
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<td>75 degree</td>
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<td>WorldSID (50%ile M)</td>
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<td><strong>Whiplash</strong></td>
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<td>Flex-PLI / Grid method</td>
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<td>2nd row seat (Dynamic)</td>
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<tr>
<td><strong>Pedestrian</strong></td>
<td>Active hood / Pedestrian Airbag</td>
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<td><strong>Active Safety</strong></td>
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<td>FCWS</td>
<td>AEBS (Inter-urban): +a</td>
<td>AEBS (Inter-urban, City, Pedestrian)</td>
<td>ACC</td>
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<td><strong>Rollover/Brake</strong></td>
<td>LDWS</td>
<td>SBR</td>
<td>SBR 2nd Seat</td>
<td>SLD, BSD, ISA, RCTA, LKAS, Ad A/Bag</td>
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<td><strong>Others</strong></td>
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Road accidents are a leading cause of unnatural death and responsible for substantial productivity losses in all countries.

A successful accident reduction framework needs to address primary vehicle safety as well as infrastructural and behavioural aspects.

For the promotion of public safety, NCAP is very powerful tool.

ASEAN NCAP is essential to promote safety of vehicle and protection of people.
Thank you for your attention!

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