Analysis of Australian National Crash In-Depth Study (ANCIS) Pole Side Impact Cases by Angle of Impact

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About ANCIS

• The Australian National Crash In-depth Study (ANCIS) commenced in 2000.

• ANCIS is managed by Monash University Accident Research Centre (MUARC).

• Participants identified and recruited by MUARC appointed nurses.

• Participants interviewed.

• Vehicle inspections conducted.

• Crash site inspections conducted.

• Cases finalised and details coded to a database.
Process Used to Identify ANCIS Pole Side Impact Serious Injury Cases

- Filter cases by case participant MAIS (MAIS 3+ and MAIS 4+ cases analysed)
- Filter cases by object hit code (codes 10-12 identify trees and codes 15, 21-25 identify poles)
- Filter cases by case participant seating position (code 1 is used to identify drivers, code 2 is used to identify front-row outboard passengers)
- Identify struck side occupant cases (CDC codes used in combination with case participant position codes to identify struck side front row occupants of pole side impact vehicles with damage to passenger compartment)
Collision Deformation Classification (CDC)

3rd Digit:

- Used to select side impacts. Cases were therefore excluded if 3rd CDC digit was not R or L.
Collision Deformation Classification (CDC)

4th Digit:

- Used to select cases with damage to passenger compartment. Cases were therefore excluded if 4th CDC digit was not D, Z, Y or P.
- For all MAIS 4+ pole side impact cases, 4th digit was always D, Z, Y or P anyway.
ANCIS MAIS 3+ Pole Side Impact Cases

N = 57
Analysis based on ANCIS cases in database at 31 August 2011

- 60 degree oblique is clearly most common coding for MAIS 3+ injured struck side front row occupants in ANCIS.
- Serious injuries were recorded for angles of impact between 15 degrees and 150 degrees.
ANCIS MAIS 4+ Pole Side Impact Cases

- 75 degree oblique is most common coding for MAIS 4+ injured struck side front row occupants in ANCIS.
- Severe injuries more likely to have occurred at angles of impact between 60 and 90 degrees.

Analysis based on ANCIS cases in database at 31 August 2011

N = 22

No. of MAIS 4+ PSI Cases (Struck Side Front Row Occupants Only)

Angle of Impact (Degrees)

0 15 (345) 30 (330) 45 (315) 60 (300) 75 (285) 90 (270) 105 (255) 120 (240) 135 (225) 150 (210)
Conclusions

- Analysis is based on a relatively small number of cases, but nevertheless supports conclusions of similar in-depth data analyses completed by NHTSA and BASt.

- Data does not show any reason why a pole side impact GTR should not specify a 75° oblique impact angle. In fact 75° oblique is likely to be a very reasonable choice given:
  - 75° was most common angle for MAIS 4+ injured occupants and second most common for MAIS 3+ injured occupants.
  - 75° bisects the 60-90° range within which most MAIS 4+ pole side impact injuries occurred.

- Regardless of what field crash data supports, it is also important that the angle of impact suits the biofidelity, design and measurement capabilities of the dummy:
  - Pole side impact crash test research with RibEye suggests WS 50th male is actually likely to be better suited to 75° pole side impact than 90° pole side impact.
Acknowledgement

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Thank you