



Transport
for NSW

An Evaluation of ANCAP Frontal Offset Score Reduction in Older Cars

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Introduction

- ANCAP is a consumer comparative program aimed to provide information on the safety performance of new vehicles
- ANCAP carries out laboratory crashes of new cars using frontal, side and pedestrian impact tests together with an optional side pole test
- No study has been conducted to re-assess the safety score of ANCAP or other similar programs using older vehicles
- The focal question is then does the ANCAP safety rating remains unchanged as the vehicle ages, considering the vehicle deterioration while in service?

Methodology

- Only the ANCAP 40% offset frontal crash barrier tests were conducted
- A passenger vehicle model representing the average age of passenger vehicles registered in Australia
- Ford Falcon AU2 was selected as it is considered:
 - one of the most popular model in 2000
 - performed adequately well in the frontal offset test
- Three used but undamaged 9 years old Falcons were tested
- Results from these three tests were compared with the initial ANCAP test

Test No	Test Description	Vehicle Age	Mileage (km)
1	Initial ANCAP Test	A new Car	14
2	Vehicle 1	9 years	164,000
3	Vehicle 2	9 years	212,982
4	Vehicle 3	9 years	398,853

Results

ANCAP Initial 40% Frontal Offset Test

- ANCAP rated Ford Falcon AU2 an overall score of 3 stars
- In the frontal offset test, it scored 11.07 out of 16
- Score 4 in head and knee areas, 3.07 in chest and 0 in lower leg
- This equates to a low risk of injury to all body regions but a risk of foot and lower leg injury due to excessive brake pedal movement and footwell intrusion



Results

Frontal Offset Tests for 9 Years Old Falcons



	Vehicle 1		Vehicle 2		Vehicle 3	
	Drivr	Passgr	Drivr	Passgr	Drivr	Passgr
Head/Neck Area						
HIC (g)	443	403	456	388	396	285
3ms Head Clip (g)	51.6	54	54.9	49.6	49.3	45.6
Neck Shear (kN)	0.43	1.02	0.44	0.85	0.38	0.56
Neck Tension (kN)	1.08	1.43	1.01	1.47	1.09	0.92
Neck Extsion (Nm)	28.1	30.3	8.5	20.6	11.1	18.8
Chest						
Compression (mm)	28.6	31.7	27.1	28.7	31.3	28
Visc Criteria (m/s)	0.1	0.09	0.1	0.09	0.13	0.11
Knee/Femur Area						
Femur Comp (kN)	2.01	0.3	2.47	1.17	2.74	0.41
Knee Displ (mm)	4.06	0.45	7.53	0.6	6.55	0.25
Lower Leg						
Tibia Index	0.88	0.44	1.01	0.45	0.82	0.51
Tibia Comp (kN)	4.06	1.88	4.24	2.08	3.59	2.31

Results

Frontal Offset Tests for 9 Years Old Falcon



- In all 4 tests, both the driver's and passenger's airbags were deployed at approximately 32 ms from the first contact and were able preventing the dummies contacting the vehicle interior
- In all tests the seatbelt pretensioners were activated at approximately 27 ms from the first contact

Results

ANCAP Score comparison

- The average ANCAP frontal score for vehicles 1 to 3 is 10.46 which gives a 5.5% reduction compared with the initial score
- Averaging the scores would cause outlying values which are above the ANCAP performance limits to lose points but those which are below the threshold will not get “bonus points”
- An alternate method is to average dummy responses and then calculate the ANCAP score. Score obtained using this approach is 10.91, which gives a 1.5% reduction on the initial score

	Initial ANCAP Test	Vehicle 1	Vehicle 2	Vehicle 3	Average ANCAP scores from Vehicles 1-3	ANCAP score from averaged dummy responses
Head/Neck	4	4	4	4	4	4
Chest	3.07	2.61	3.03	2.67	2.77	2.93
Knee/Femur	4	4	3.32	3.75	3.69	3.98
Lower Leg	0	0	0	0	0	0
Frontal ANCAP Score	11.07	10.61	10.35	10.42	10.46	10.91

Conclusions

- This study indicates that there is a 5.5% reduction in the average ANCAP frontal offset score of in an older vehicle model compared to when it was new
- Alternatively, averaging the contributing data would result a 1.5% reduction
- Both results demonstrate a notably small reduction in the ANCAP score
- This illustrates only a minor degradation of vehicle features ***provided*** the vehicle safety features such as airbags, seatbelt pretensioners and load limiter in the older vehicles still continue to work

Limitations

- The results presented in this paper are made from observations of one model of passenger vehicle. Other vehicles may behave differently.
- The initial ANCAP rating was based on one test. It is assumed that those results are typical of the model when new
- The 9-year-old vehicles were not randomly sampled from within the fleet. Only vehicles with working airbags and intact structures were selected and used.

Thank you

- Questions

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