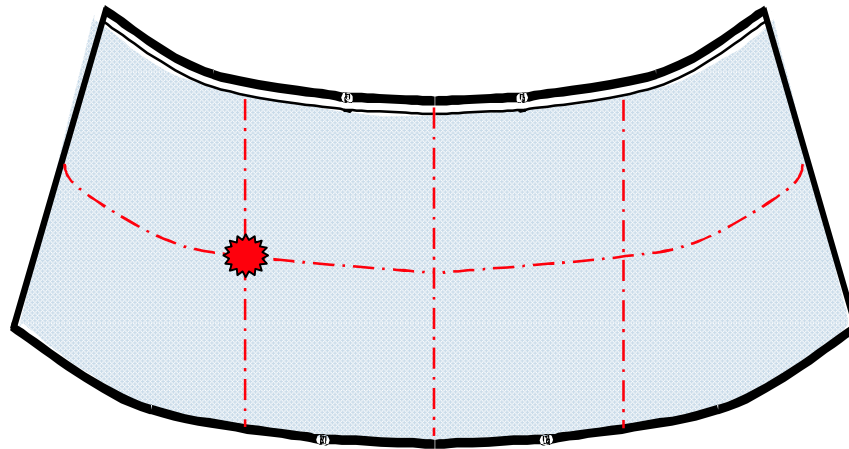


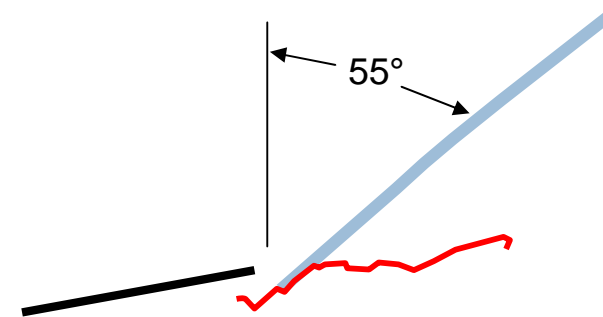


# SUV - Windshield Head Impacts



Impact to windshield:

- Midway between base and top of windshield
- 1/4 windshield width inboard from passenger side of vehicle



Windshield marking  
(replacement part only):

Laminated GS

DOT-376 ASI M334

Trans 75% MIN

AP Technoglass.

43R-000052

# Impact Conditions

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- SUV vehicle (GVW 2160 kg FWD / 2209 kg AWD)
- Windshield angle 55°
- ISO adult headform (4.5 kg)
- Impact speed 35 km/h
- Impact angles 35°, 40° & 65°
- 1 test with OEM windshield
- 2 tests per impact angle with replacement windshield
- = 7 impact tests in total, all to the same vehicle
- Same impact point for each test (mid height, ¼ width)
- No secondary impact

# Test Results



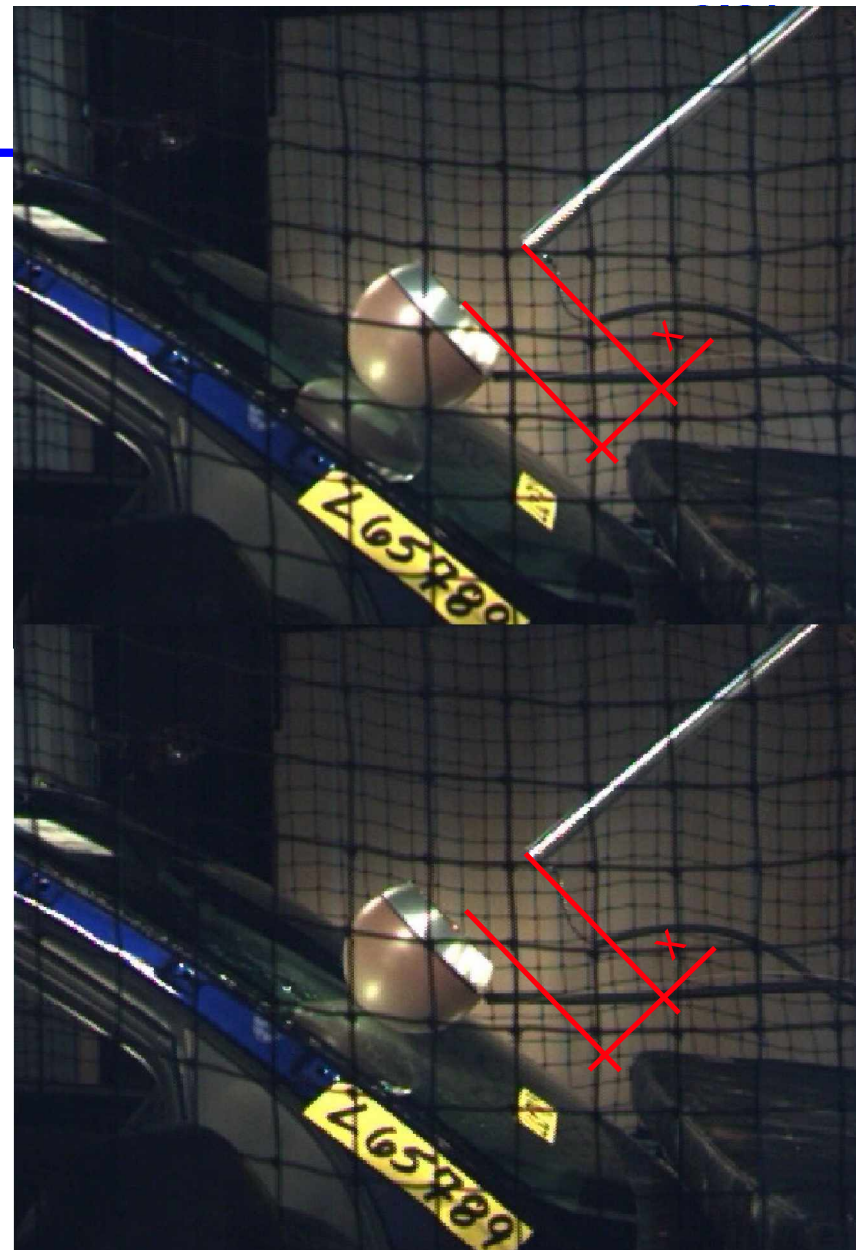
Test Number	Impactor Type	Velocity (km/h)	Impact Angle	HIC	Max Accel (g's)	Max Displ (mm)
L65787	ISO Adult Head	35.2	35°	150	127	135.0
L65788	ISO Adult Head	35.2	35°	730	155	90.4
L65789	ISO Adult Head	35.2	40°	690	158	90.8
L65790	ISO Adult Head	35.3	65°	870	166	74.2
L65791	ISO Adult Head	35.1	65°	180	149	142.0
L65792	ISO Adult Head	35.3	40°	760	161	75.8
L65793	ISO Adult Head	35.5	35°	760	157	77.5

## Test Results

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Tests 2, 3, 4, 6 and 7:

Windshield bounces before  
fracturing



x = headform travel distance  
at the time of the first contact

# Test Results

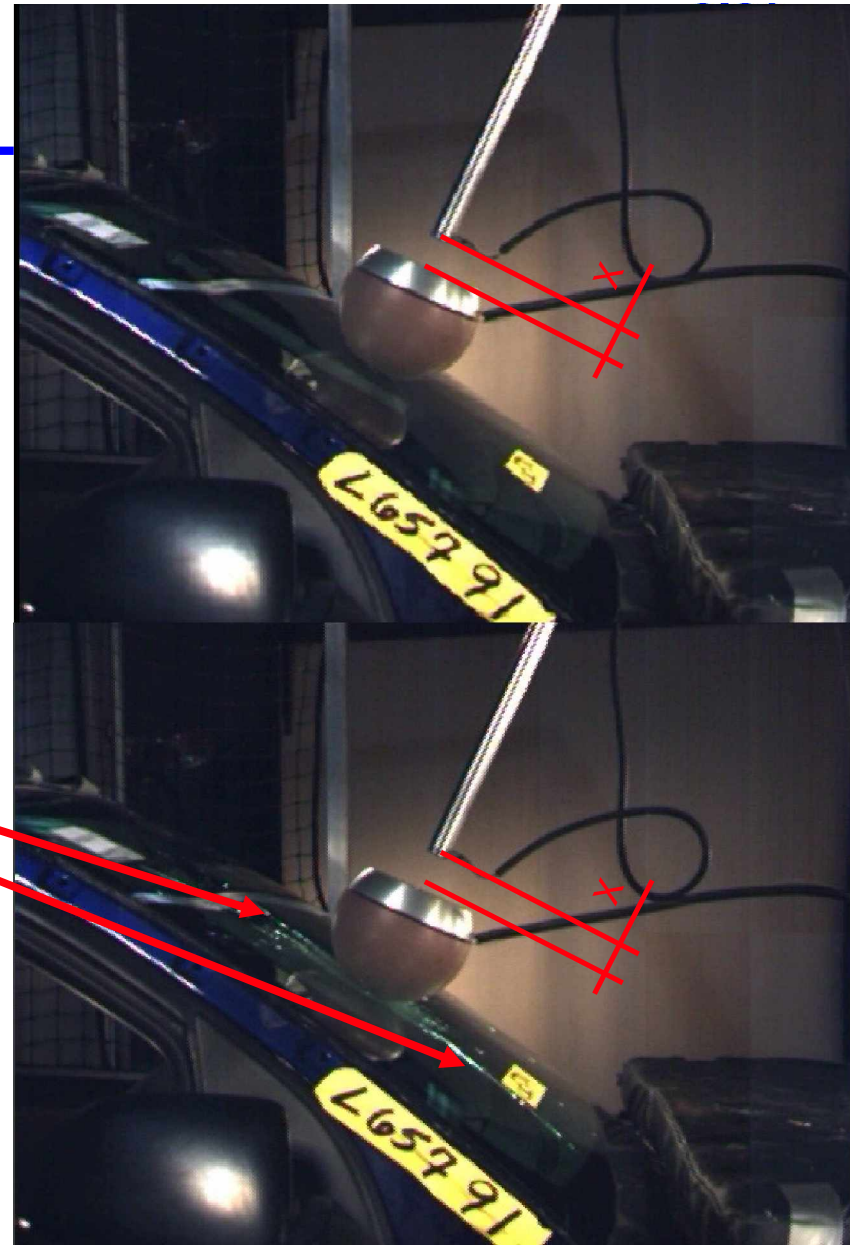
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Tests 1 and 5:

- Lower HIC
- Greater intrusion of headform

Only difference: Windshield fractures immediately after being contacted by the headform

x = headform travel distance  
at the time of the first contact



## Conclusions

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- Ø Impact angles 35°, 40°, 65° do not appear to have a significant effect on HIC levels.
- Ø HIC and intrusion depend on timing of windshield fracture.
- Ø Secondary impacts due to intrusion seen as biggest concern.
- Ø **Test results are unpredictable.**
- Ø **Design towards compliance seems impossible.**
- Ø **Further research necessary, especially regarding the behavior of the windshield glass.**