GTR9: Headform Area Split

Dirk-Uwe Gehring
BGS Böhme & Gehring GmbH

03 December 2021

GTR9 Citations

5.2.3. The HIC recorded shall not exceed 1,000 over a minimum of one half of the child headform test area and 1,000 over two thirds of the combined child and adult headform test areas. The HIC for the remaining areas shall not exceed 1,700 for both headforms.

In case there is only a child headform test area, the HIC recorded shall not exceed 1,000 over two thirds of the test area. For the remaining area the HIC shall not exceed 1,700.

5.2.4. Splitting of headform test zone

5.2.4.1. The manufacturer shall identify the zones of the bonnet top where the HIC must not exceed 1,000 (HIC1000 Zone) or 1,700 (HIC1700 Zone) (see Figure 11).

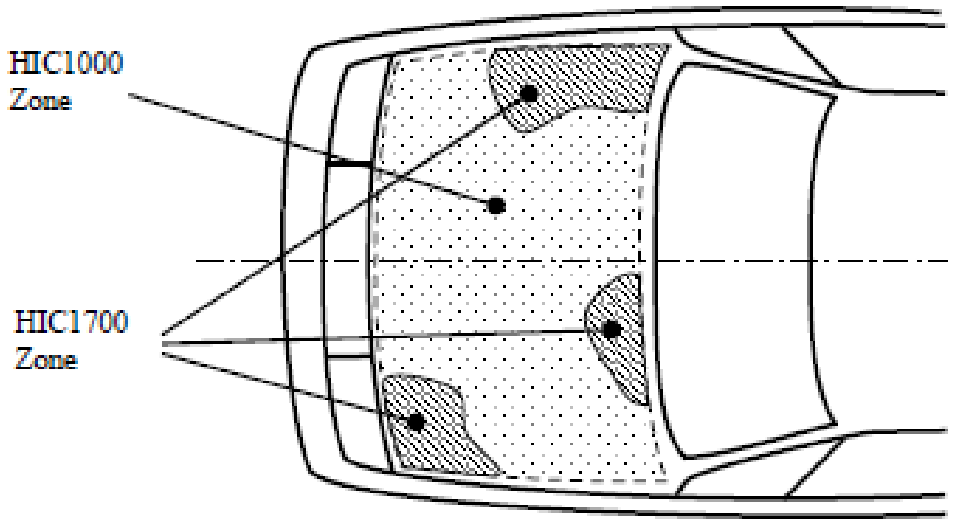


Figure 11: Example of marking of HIC1000 zone and HIC1700 zone

GTR9 Citations

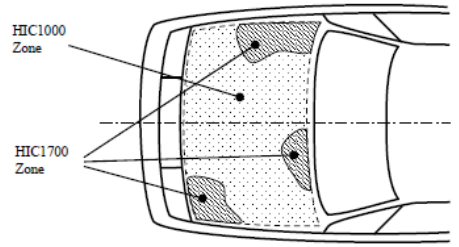


Figure 11: Example of marking of HIC1000 zone and HIC1700 zone

5.2.3. The HIC recorded shall not exceed 1,000 over a minimum of one half of the child headform test area and 1,000 over two thirds of the combined child and adult headform test areas. The HIC for the remaining areas shall not exceed 1,700 for both headforms.

In case there is only a child headform test area, the HIC recorded shall not exceed 1,000 over two thirds of the test area. For the remaining area the HIC shall not exceed 1,700.

5.2.4. Splitting of headform test zone

5.2.4.1. The manufacturer shall identify the zones of the bonnet top where the HIC must not exceed 1,000 (HIC1000 Zone) or 1,700 (HIC1700 Zone) (see Figure 11).

3.7. "Bonnet top" is the area which is bounded by (a), (b) and (c) as follows:
(a) the bonnet leading edge reference line;
(b) the bonnet rear reference line;
(c) the side reference lines.

3.12. "Child headform test area" is an area on the outer surfaces of the front structure. The area is bounded, in the front, by the front reference line for child headform, and, at the rear, by the WAD1700 line, and by the side reference lines.

3.15. "Front reference line for child headform" means the geometric trace as described on the vehicle front structure using a WAD1000 line. In the case of vehicles where the wrap around distance to the bonnet leading edge reference line, is more than 1,000 mm at any point, then the bonnet leading edge reference line will be used as the front reference line for child headform at that point.

3.1. "Adult headform test area" is an area on the outer surfaces of the front structure. The area is bounded, in the front, by a wrap around distance (WAD) of 1,700 mm and, at the rear, by the rear reference line for adult headform and, at each side, by the side reference line.

3.23. "Rear reference line for adult headform" means a geometric trace as described on the front structure of the vehicle using a WAD2100 line.

GTR9 – Fig. 11

3.7. "Bonnet top" is the area which is bounded by (a), (b) and (c) as follows:
(a) the bonnet leading edge reference line;
(b) the bonnet rear reference line;
(c) the side reference lines.

- Fig. 11 is only referred to in 3.7, i.e. the dotted line is the whole bonnet top, **not** the combined child and adult impact area
- => No WAD 1000, no WAD 2100
- No 82.5 mm distances
- No 1/3 – 2/3 rule for this figure

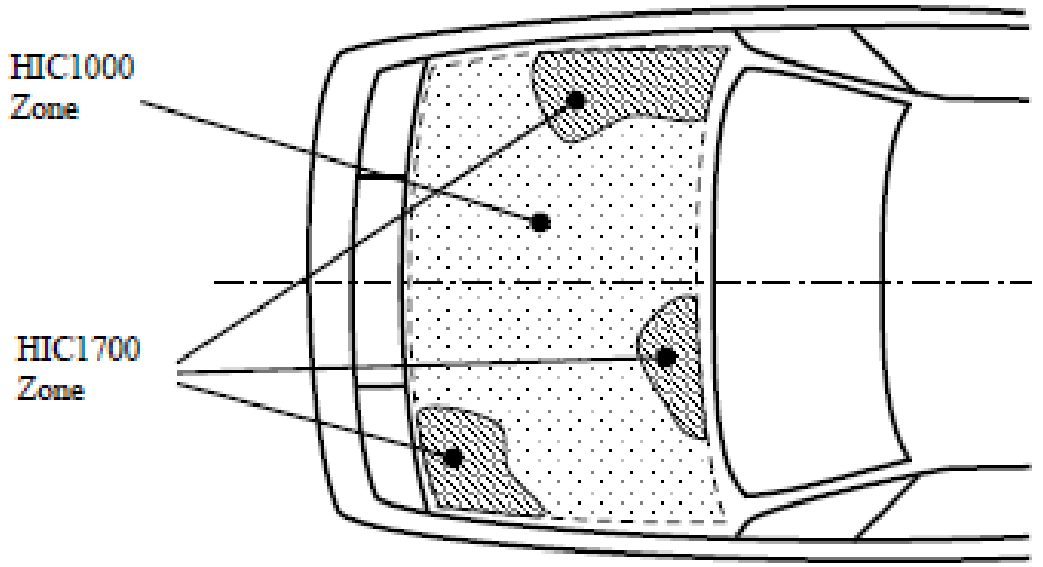
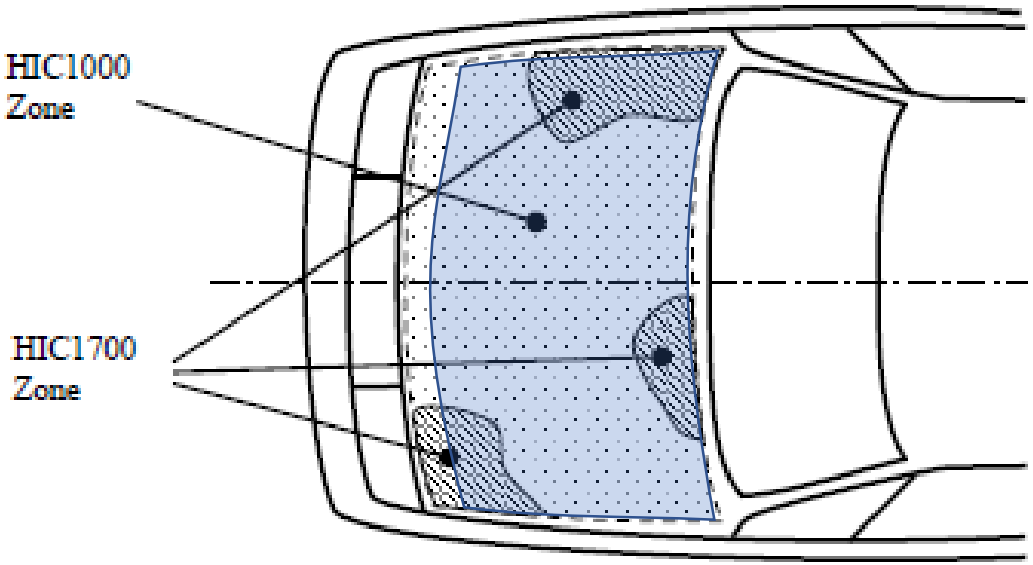


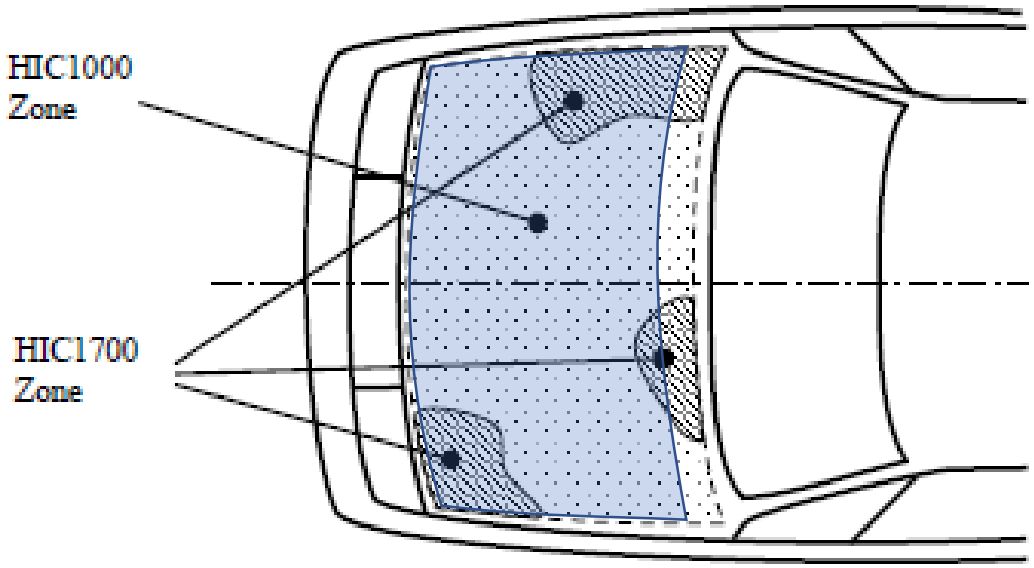
Figure 11: Example of marking of HIC1000 zone and HIC1700 zone

GTR9 – Examples of the „combined test area“

WAD 1000 rearward of BLERL



WAD 2100 forward of BRRL



The HIC recorded shall not exceed 1,000 over a minimum of one half of the child headform test area and 1,000 over two thirds of the combined child and adult headform test areas. The HIC for the remaining areas shall not exceed 1,700 for both headforms.

In every case there are parts of the HIC 1000 zone up to the test area borders!

GTR9 Citations

Child Headform Test Procedure

7.3.2. No impact point shall be located so that the impactor will impact the test area with a glancing blow resulting in a more severe second impact outside the test area.

Selected impact points on the bonnet for the child headform impactor shall be, at the time of first contact:

(a) a minimum of 82.5 mm inside the defined side reference lines, and;

(b) forward of the WAD1700 line, or,
a minimum of 82.5 mm forwards of the bonnet rear reference line,
- whichever is most forward at the point of measurement, and;

(c) be rearward of the WAD1000 line, or,
a minimum of 82.5 mm rearwards of the bonnet leading edge reference line,
- whichever is most rearward at the point of measurement.

Adult Headform Test Procedure

7.4.2. No impact point shall be located so that the impactor will impact the test area with a glancing blow resulting in a more severe second impact outside the test area.

Selected impact points on the bonnet for the adult headform impactor shall be, at the time of first contact:

(a) a minimum of 82.5 mm inside the defined side reference lines, and;

(b) forward of the WAD2100 line, or,
a minimum of 82.5 mm forward of the bonnet rear reference line,
whichever is most forward at the point of measurement, and;

(c) rearward of the WAD1700 line.

GTR9 – Testable headform area (example)

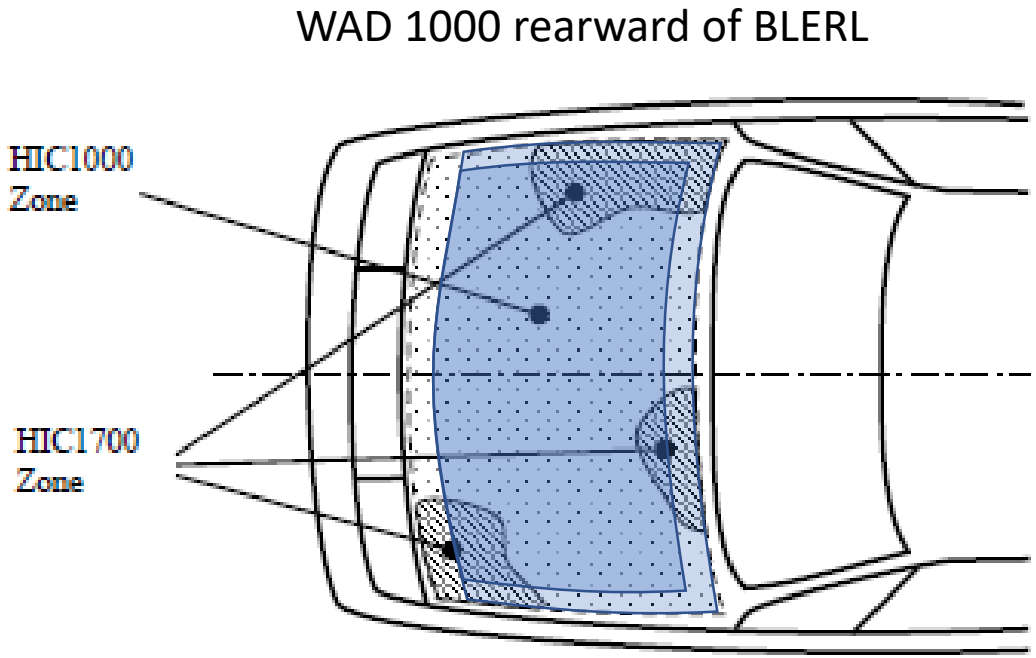


Figure 11: Example of marking of HIC1000 zone and HIC1700 zone

- GTR 9 allows the HIC 1000 zones to exceed the testable area
- The manufacturer may allocate parts of the HIC 1000 zones to untestable parts of the combined impact area
- These allocations cannot be verified

Conclusion

- GTR 9 must be amended to ensure that the 1/3-2/3 requirement can be verified , i.e. that it is only related to the testable part of the impact area.