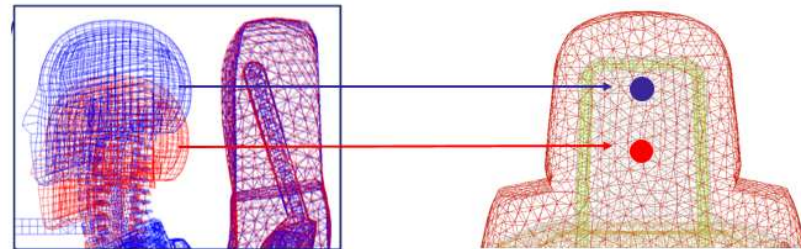




## DEOP - WHIPLASH improvements

### Whiplash for males and females - Reminder

Outcome of previous presentation :



- **Actual regulation** does not assure that the head of the 50th female is completely retained in rear impact by stiff parts within the head restraint even when the head restraint is adjusted correctly by the occupant to its lowest position.
- The effective height of 830mm and EuroNcap whiplash protocol are aggravating the problem.
- Improvements are possible in geometry by geometric checks on the seat/head restraint.
- No need to wait for a new female dummy : an additional geometric check is possible

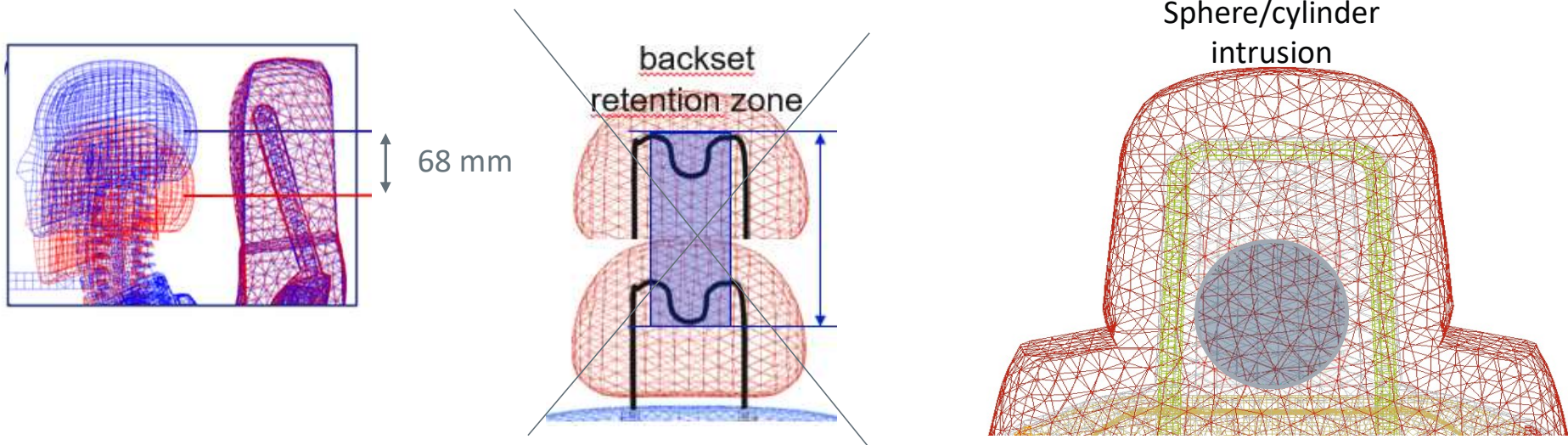


## DEOP - WHIPLASH improvements

# Whiplash for males and females – Proposal – Clepa

How could these additional geometric requirements look like ?

- > Height difference between 50th males and 50th females (Biorid/Evarid) : about 68mm of difference



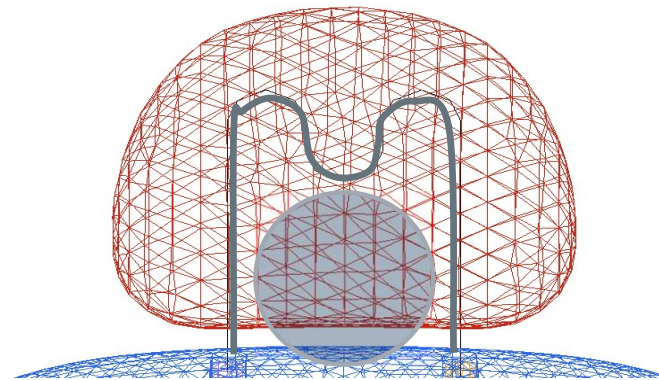
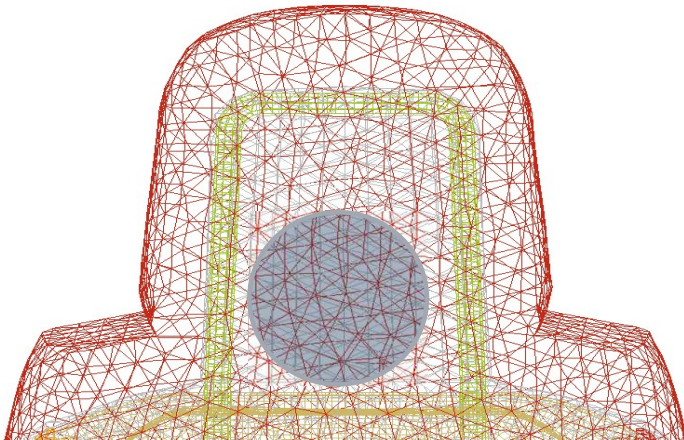


## DEOP - WHIPLASH improvements

# Whiplash for males and females – Proposal – Clepa

Define head restraint geometry which avoid excessive intrusion of a sphere or a cylinder :

- Proposal : when head restraint parts lower than 50 Shore A are removed, it shall not be possible to pass a cylinder of diameter of [120]mm through the head restraint when the head restraint is adjusted to it's lowest head restraint use position :



- For seats which have backset requirements



## DEOP - WHIPLASH improvements

# Whiplash for males and females – Proposal – Clepa

of Backset retention zone :

- Using a cylinder of [120mm] would limit the penetration of a sphere of a diameter of 165mm to [25.9]mm

