1.3 Frontal offset modifiers

1.3.1 Knee impact modifiers

The Upper Leg Score is subject to modifiers resulting from a post-crash assessment of the knee impact zone. These zones are illustrated in the diagram below and depend on the actual points of impact of each of the dummy knees (driver and front passenger). Where there is no clear evidence of a knee contact (paint marks or deformed components) then that particular zone is not subject to a modifier (but comment may still be made about components that might present an undue hazard to the knees).

A *Variable Contact* modifier (up to 1 point deduction from leg score) applies where the component is clearly stiffer than the structure at the actual impact point and is likely to produce a femur compression in excess of 3.8kN and/or knee slider displacements greater than 6mm. Metal brackets are generally considered to be stiffer than plastic components, unless they are clearly designed to collapse during a knee impact (such as diamond shaped hollow extrusions).

In accordance with Version 4.2 of the Euro NCAP protocol, the variable contact modifier will be reduced to 0.5 points where there is no concentrated load modifier for that side and
Aug 10 the stiffer structure is confined to either the steering column (defined to be 75mm on either side of the centreline of the steering column) or the remainder of the knee impact zone for that side.

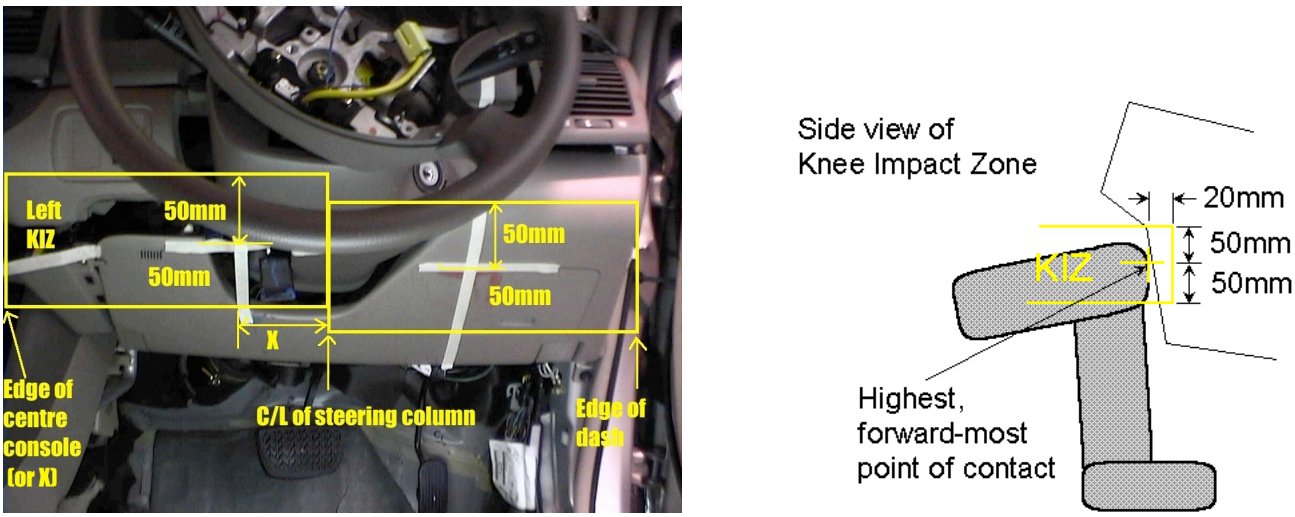

Illustration of Knee Impact Zone (a rectangular prism based on actual points of impact)

Manufacturers may provide test data to show that the injury criteria (femur force and knee displacement) are unlikely to exceed the prescribed limits, if the component of concern is struck by the knee.

An object is regarded as a "*concentrated load*" if it presents an unyielding impact surface with any linear dimension less than 20mm or otherwise *exposes the knee to a risk of a penetrating knee injury*. For the purpose of this assessment an "unyielding" component is one
Aug 10 that deflects less than 10mm when subjected to a load of 400N in the likely direction of a knee impact. A spherical impact surface with a radius of about 25mm would be suitable to simulate knee loading.

Usually the Concentrated Loading modifier (1 point deduction each knee) applies where the component is also found to be a 'Variable Contact' and the two point modifier is applied. However, cases have occurred where the point of impact was found to be the stiffest structure