

The Analysis of Occupant Injury in Frontal Impact of Traffic Accident

吳建昌、鄧作樑

E-mail: 9224278@mail.dyu.edu.tw

ABSTRACT

Traffic accident now is stated as a danger threatening man's safety on live and health as well as causing great losses to mankind. Injury prevention therefore is useful and significant for its relation to the happiness of each individual, family in a safe and sound society. According to the accident statistics, 58.1% of the occupants suffered head injuries. Therefore, analyzing human body's dynamic response and head injury in relation to considerations of men's safety are a relevant task. Generally, there are two methods to investigate the dynamics response and injury analysis on human body under car crash. One is experimental method, and the other is numerical simulation. Among experimental method, it can be divided into real car collision test and sled experiments. Even though the real car collision test can get the results close to the real accident, but it is complicated and expensive to do so. Furthermore, it is not always practical or ethical to use actual occupant to assess the risks. Recently test dummies are used for research and development, it can simulate human response when exposed to a car collision environment. In recent years, the rapid advance of computer technology has enabled to apply mathematicians, engineers and scientists to make significant progress in the solution of previously intractable problems. The numerical simulations of crash provide a valuable tool for automotive engineers. The purpose of this study is to explore frontal collision phenomena by using LS-DYNA finite element code and Hybrid deformable dummy model. The Hybrid finite element model is verified by the FMVSS 208 for occupant safety rule. The injury analysis of human body under crash is discussed. Additionally, the results of Hybrid deformable dummy model are compared with the rigid body model. Accident reconstruction and investigation remains an essential part in understanding the nature of physical injury as a result of vehicular impact. The injury analysis under car crash in this study provides the necessary materials in completing an accident reconstruction investigation. An understanding of AIS and HIC values is considered essential in determining the cause of a motor vehicle accident.

Keywords : Sled Test, Head Injury Criteria (HIC), Vehicle Impact , Accident Reconstructure

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