The effect of bumper on the pedestrian leg injury

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ABSTRACT

Every year several thousands of unprotected pedestrians are killed or suffer serious injuries in car accidents. In nonfatal passenger vehicle-pedestrian accidents, pedestrian leg injuries are the most commonly injured body parts. Therein, the main causes for leg injuries are the front bumper of passenger vehicle. Therefore, studying effect of bumper on pedestrian leg injury plays an important role in pedestrian safety. The first objective of this study is to evaluate effect of bumper shape on the pedestrian leg injury. Using different FE vehicle models have the different bumper shape to impact with FE legform models. Analyzing received results during impact process between legform and bumper to assess effect of different impact positions on each bumper for pedestrian leg injury. After, choosing all advantages of each bumper shape that make pedestrian leg injury reduces so that support designs new bumper. Material bumper has great effect to hardness of bumper structure. Therefore, material bumper plays an important role in reducing pedestrian leg injury. Thus, the second objective of this study is to evaluate effect of bumper material on pedestrian leg injury. To research effect of bumper material, we use above bumper structures to change material. Analyzing received results in impact position to choose suitable material for each bumper structures. The last objective of this study is to design pedestrian friendly bumper. Using all analyzing results relate effect of bumper shape and bumper material to design pedestrian friendly bumper. This bumper has to satisfy EEVC/WG17 safety requirements about pedestrian leg injury.

Keywords : Pedestrian, Leg Injuries, Bumper, Legform Impactor

Table of Contents

AUTHORIZATION LETTER..............................................iii
ABSTRACT..........................................................iv
CHINESE ABSTRACT..................................................v
ACKNOWLEDGEMENTS..................................................vi
TABLE OF CONTENTS................................................ vii
TABLE OF FIGURES................................................. ix
LIST OF TABLES................................................... xii
Chapter I: INTRODUCTION ......................................... 1
  1.1 Motivation................................................... 1
  1.2 Literature Survey............................................ 5
  1.3 The Purpose of this Study................................... 11
  1.4 Structure of this Thesis.................................... 11
Chapter II: INTRODUCTION OF EECV LEGFORM TO BUMPER TEST 23
  2.1 Legform Impactor to Bumper Test............................. 23
  2.1.1 Purpose of the Test........................................ 23
  2.1.2 Testing Procedure......................................... 24
  2.1.3 Legform impactor description............................... 25
  2.1.4 Certification tests for legform impactor................... 26
  2.2 Simulation of legform to bumper test........................... 27
  2.2.1 Finite element of legform impactor........................ 27
  2.2.2 Finite element passenger car............................... 28
  2.2.3 Simulation of legform to bumper test...................... 29
Chapter III: ANALYSING FOR DESIGN PEDESTRIAN FRIENDLY BUMPER .... 42
  3.1 Introduction of experiment tests............................ 42
  3.2 Simulation of legform to bumper test........................... 43
  3.3 Verification of simulation results........................... 44
  3.4 Analyzing for design pedestrian friendly bumper.............. 45
    3.4.1 The effect of bumper geometry on the pedestrian leg injury. 45
    3.4.2 The effect of bumper material on the pedestrian leg injury. 47
Chapter IV: DESIGN OF FRIENDLY BUMPER FOR PEDESTRIAN ............ 66
  4.1 Design of friendly bumper for pedestrian.................... 66
  4.2 The test procedure and requirements......................... 68
  4.3 Discussions and conclusions.................................. 68
Chapter V: CONCLUSIONS AND PERSPECTIVES.......................... 75
  5.1 Conclusions.................................................. 75
  5.2 Further Studies ............................................. 76
REFERENCES...................................................... 77

TABLE OF FIGURES

Figure 1-1. The injuries people distribution in traffic crashes...
Figure 1-2. The killed people distribution in traffic crashes...
Figure 1-3. Road fatalities in 2005: Pedestrian fatalities / Road fatalities in total .
Figure 1-4. Pedestrian fatalities and injuries by type of vehicle 1992-2001 average ...
Figure 1-5. Impact location on the car...........................
Figure 1-6. Distribution of body region for fatalities and serious injuries ...........
Figure 1-7. Distribution of impact parts for head and leg injuries.....................
Figure 1-8. EEVC/WG17 subsystem test..................................16
Figure 1-9. Setup of full-scale test conducted at JARI ................................17
Figure 1-10. Design variable of the bumper structure ...................................17
Figure 1-11. Bumper system with foam ...................................................18
Figure 1-12. Centerline section of bumper structures....................................18
Figure 1-13. Proof of concept pedestrian airbag system..................................19
Figure 1-14. A single sensor module integrated into bumper..............................19
...


REFERENCES

Table 1-1. Occupants and Non-occupants Killed and Injured in traffic Crashes

Table 1-2. First impact point on bumper

Table 1-3. Percentage of AIS .2 pedestrian injuries by body region of crashes involving children, 2000-2006

Table 2-2. Finite element model of Ford-Taurus

Table 2-3. Finite element model of Dodge Neon

Table 3-1. Impact locations of the legform with bumper (Dodge-Neon car)

Table 3-2. Impact locations of the legform with bumper (Ford-Taurus car)

Table 3-3. Impact locations of the legform (intrepid car)

Figure 2-1. Tolerances of angles for the legform impactor at the time of first impact

Figure 2-2. Legform to bumper tests for complete vehicle

Figure 2-3. Legform impactor

Figure 2-4. Static bending certification test of the legform

Figure 2-5. Static shearing certification test of legform

Figure 2-6. Requirements of static certification tests

Figure 2-7. Dynamic certification test of the legform

Figure 2-8. Finite element model

Figure 2-9. Legform impactor

Figure 2-10. The knee

Figure 2-11. The force versus bending angle of the legform

Figure 2-12. The shearing displacement of the knee

Figure 2-13. The acceleration of the legform

Figure 2-14. The bending angle of the legform

Figure 2-15. The bending angle time history of the knee

Figure 2-16. The shearing displacement of the knee

Figure 2-17. The bending angle time history of the knee

Figure 2-18. Finite element model of Dodge-Intrepid

Figure 2-19. Finite element model of Ford-Taurus

Figure 3-1. Determination of upper bumper reference line

Figure 3-2. Lower legform impact test

Figure 3-3. Impact locations for legform to bumper tests

Figure 3-4. Knee

Figure 3-5. The shearing displacement of the legform impactor

Figure 3-6. The acceleration of legform

Figure 3-7. The bumper shape of the Ford-Taurus car

Figure 3-8. The bumper shape of the Intrepid car

Figure 3-9. The bumper shape of the Dodge Neon car

Figure 3-10. The acceleration of the legform

Figure 3-11. The Bending angle of the knee

Figure 3-12. The shearing displacement of the knee

Figure 3-13. The acceleration of the legform

Figure 3-14. The Bending angle

Figure 3-15. The shearing displacement of the knee

Figure 3-16. The acceleration of the legform

Figure 3-17. The Bending angle of the knee

Figure 3-18. The shearing displacement of the knee

Figure 3-19. The acceleration of the legform

Figure 3-20. The bending angle of the knee

Figure 3-21. The shearing displacement of the knee

Figure 3-22. The acceleration of the legform

Figure 3-23. The bending angle of the knee

Figure 3-24. The shearing displacement of new bumper

Figure 4-1. Determination of upper bumper reference line

Figure 4-2. Determination of lower bumper reference line

Figure 4-3. The shape and dimension of new bumper

Figure 4-4. The shearing displacement of new bumper

Figure 4-5. The bending angle of new bumper

Figure 4-6. The shearing displacement of new bumper

Figure 4-7. The bending angle of new bumper

Figure 4-8. The bumper shape of the Intrepid car

Figure 4-9. The bumper shape of the Ford-Taurus car

Figure 4-10. The bumper shape of the Dodge Neon car

Figure 4-11. The Bending angle of the knee

Figure 4-12. The shearing displacement of the knee

Figure 4-13. The acceleration of the legform

Figure 4-14. The Bending angle

Figure 4-15. The shearing displacement of the knee

Figure 4-16. The acceleration of the legform

Figure 4-17. The Bending angle of the knee

Figure 4-18. The shearing displacement of the knee

Figure 4-19. The acceleration of the legform

Figure 4-20. The bending angle of the knee

Figure 4-21. The shearing displacement of the knee

Figure 4-22. The acceleration of the legform

Figure 4-23. The bending angle of the knee

Figure 4-24. The shearing displacement of new bumper

Figure 5-1. Material properties of the legform

Figure 5-2. Material properties of the legform

Figure 5-3. Material properties of the legform

Figure 5-4. Material properties of the legform

Figure 5-5. Material properties of the legform

Figure 5-6. Material properties of the legform

Figure 5-7. Material properties of the legform

Figure 5-8. Material properties of the legform

Figure 5-9. Material properties of the legform

Figure 5-10. Material properties of the legform

Figure 5-11. Material properties of the legform

Figure 5-12. Material properties of the legform

Figure 5-13. Material properties of the legform

Figure 5-14. Material properties of the legform

Figure 5-15. Material properties of the legform

Figure 5-16. Material properties of the legform

Figure 5-17. Material properties of the legform

Figure 5-18. Material properties of the legform

Figure 5-19. Material properties of the legform

Figure 5-20. Material properties of the legform

Figure 5-21. Material properties of the legform

Figure 5-22. Material properties of the legform

Figure 5-23. Material properties of the legform

Figure 5-24. Material properties of the legform

Figure 5-25. Material properties of the legform

Figure 5-26. Material properties of the legform

Figure 5-27. Material properties of the legform

Figure 5-28. Material properties of the legform

Figure 5-29. Material properties of the legform

Figure 5-30. Material properties of the legform

Figure 5-31. Material properties of the legform

Figure 5-32. Material properties of the legform

Figure 5-33. Material properties of the legform

Figure 5-34. Material properties of the legform

Figure 5-35. Material properties of the legform

Figure 5-36. Material properties of the legform

Figure 5-37. Material properties of the legform

Figure 5-38. Material properties of the legform

Figure 5-39. Material properties of the legform

Figure 5-40. Material properties of the legform

Figure 5-41. Material properties of the legform

Figure 5-42. Material properties of the legform


