

The Computational Simulation in Fupd Analysis for Impact Loading

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ABSTRACT:

Under the term of protection device in the car it is one of the most important boundaries that should be considered during the design and development of chassis of trucks and cars. Protection device, plays an important role to avoid a lack of operation of the vehicle from the front and the back of the truck. In India, the reform of the legal requirements for the protection device in the organization ES 14812-2005. To reduce the number of repetition during the development and use of computer simulation method in the protection device to load impact analysis. the finite element code is used as a simulation eagle radio. Deformation protection device, plastic ribbons and tensions in the protection device components can be defined by the forecasting system does not pass the physical examination to meet compliance requirements, as it is in 14812-2005. In addition, the center no protection device, points to the structure can be determined. Physical tests can be greatly reduced with

this approach, which ultimately reduces the overall cycle time, as well as participate in product development costs.

This paper describes the analysis of the protection device, suddenly it affects load. The evaluation of all the results that have been obtained from the analysis CAE in the light of the requirements of IS 14812-2005, which can reduce operation and development and the cost of participating in the same time.

Keywords—Front Under-run Protection Device (FUPD), IS 14812 -2005, Chassis design, ECE R58, Heavy Vehicle Systems

INTRODUCTION:

In a collision face to face with the hood of the type of car (sedans, wagons, hatchbacks, etc., hereinafter, only one car) and heavy trucks and vehicles often below the front of the truck the crew car received serious performance or safety car accident fatal injuries depends on how structural parts



interact with the structural parts of the truck. Protective device, which prevents the car under the truck and because treatment equipment India. It is required to determine FUPDs power and ground clearance used in the relevant standards in India. Accidents between cars and trucks are some of the most fatal car accidents due to low, respectively. This phenomenon can lead to serious and fatal vehicle occupants injuries due to leakage chassis in passenger compartment. This aimed at developing the test for energy absorption front action under the term of protection systems for trucks. A summary of the analysis of incidents in many European countries, where we read that 48,000 people were injured fatally in traffic accidents in 1992 was 13,000 people have died in an accident with a truck in question, 7000 was a passenger car and he had 4200 of them died in a car collision in front of the truck. At the same time, in 1994, it began in France cooperation between Renault VI (truck manufacturer) and INRETS. It builds on the research program was created in the design of experiments to determine the effect of car fans, speed overlap and closure and the effect of the protection device against me to work on the mechanical properties of the bioactivity. Full of this experimental design, which is also

analyzed and made available for use under the valid term protection for the device front truck. It is very common that the incident through a passenger vehicle traveling under heavy commercial vehicles, both from the rear, front or side impact. During the collision, there is a risk that a passenger car will penetrate under the (trading) the front or the back of the truck, so there are great opportunities for fatal injuries to occupants of passenger vehicles. It is a study of statistical data by protecting agent device range (updated) is the fixed installation in heavy commercial vehicles to avoid under the direction of passenger vehicles and further reduce the chances of injury hard fatal car occupied by the passengers. It must be designed and force protection agent to run the front device (protective device) of the type which should enter into force and avoid pregnancy under the guidance of a passenger car on the back of heavy commercial vehicles. Indian standard is from 14812 to 2005 device determines the protection requirements ., And physical test with 5 actors disc loading a particular sequence. Protection device, beaten to evaluate their resistance. This scenario is repeated using the finite element solvers (FE) as a Radioss eagle. The pregnancy was evaluated by the protection device, which

are captured using a reaction force. This verification of the virtual health is important to save costs in tools and frequent testing of the vehicle and the cost of participating in it.

Government of India felt the need for a permanent body to accelerate the implementation of standards and the development of test facilities in parallel when the work of preparing standards, to develop a significant improvement in safety can be carried out only after the publication of parts of standards and mandatory testing facilities. To this end, it has formed the Ministry of system permanently advice will be approved 1997. The criteria preparation No.RT-11028/11/97 dated 15 September MVL standing committee amputation CMVR art, permanent transport surface (MOST) automotive standards Committee (amputation) (CTSC). After approval, the car Research Association in India (ARAI), Pune, being the Secretariat of the AIS Committee, has been the standard for publication. To deploy the best of this information ARAI This document has been published on the website. The purpose of this standard is to provide effective protection against the front of the vehicles under the administration of M1 or N1 category in a frontal collision with vehicles of categories N2 and N3 While this AIS is

preparing a big help is derived from the standard ECE R 93 (the date of entry into force: 27 February 1994) uniform provisions concerning the approval of:

I. Protective equipment first run reception (FUPDs)

II. Vehicles with regard to the installation and the type of protective device, Approval

III. Vehicles with regard to their execution under the front protection (FUP)

LITERATURE REVIEW:

The truck accident scene is an important factor in road accidents in general. European problem analysis (1997), involved trucks with gross vehicle weight of more than 3.5 tons in about 20% of fatal road accidents. And about 60% of these are car accidents trucks. It seems that the risk of injury in a heavy vehicle accidents to be much of the occupants of the vehicles the largest discount, especially for cars. This increases the risk of the condition of the car to truck collision in front of me. That EEVC WG14 in 1994 Search programmed to determine the needs of the energy absorbing protection systems to bypass the front of the truck, and to develop a test for these devices. The overall objective of the project consists of the development of the test procedure and

the level of performance for energy - absorbing front under-term protection systems for trucks in order to reduce injuries to occupants of the vehicle passengers in collisions. The Spanish partner in this work group is INSIA (University Institute for Research cars).

Strategy in the selection of the test procedure to determine the tests that have the potential to improve crash protection provided via a wide range of circumstances, the impact in the real world. Terms crash tests, for example, the speed of impact, impact angle, test configurations and devices, and must be carefully chosen to be represented, as far as possible from the real car to crash the truck.

In March 1995, the Working Group concluded 14 statistical analysis of the data in front of me a car to truck collision in most European Community countries accident. And discuss the possible implications of the test configurations. This includes a proposal to define the target and the bullet compounds for use in the dynamic tests, the first approximation to the type of parameters to be measured.

Analysis resulted in the definition of the parameters typical accident in cases of frontal crash the car into the truck, and to

identify the type of representation in the incident. It has been selected for instance physically doing the effect of a car on the truck and auditing. It has been selected the following parameters typical incident:

- The speed of the effect: 75 km per hour
- Overlap: 75%.
- Collision angle: 0 degrees.
- Occupants: two passengers in the front seats.

During the research EEVC WG14 programmed (started in September 1995), and to create the effect of protection devices running in front of me (in the FUPD) in terms of injury, the car carried out several tests of truck collision:

- been conducting the first car truck crash test matrix. The installation of the truck with a solid front under run protection device, and the impact speed was about 56 kilometers per hour.
- in the second car of a truck crash test matrix, were fitted with the truck in front of me protect your run energy absorption, the impact speed was about 75 kilometers per hour.

This information about the tests the protection provided for in the energy absorption has provided

And FUPD installed in trucks. At the same time, it provides information to define the true tests for the evaluation suggested. The aim of this project from the following task is to propose guidelines to define the procedure less complicated and easier to test and clear and unambiguous from the car to truck collision tests. We should make this test without a car, to assess the behavior of FUPD independently attached to a truck, the vehicle that affect them.

CONCLUSION:

In the design mentioned above, the displacement of the maximum bar FUPD limited to 50mm and plastic strain is limited to 15% and thus meet the requirements as it is in 14812: 2005. But this needs to be confirmed with the physical test in the future. Virtualization is a tool that can be used to avoid or minimize mechanical systems and components of the physical exam. The overall effect of this is the cost savings is the same with the analysis of FUPD. According to the top three results of the second model is a safe, strength, low weight model. We can suggest to the automotive industry to maintain this type of FUPD to the car, and Roma, trucks, buses, etc., save the lives of passengers with less injury.

REFERENCES

- [1] EEVC Working Group 14. "Development of Test Procedure for Energy-absorbing Front Underrun Protection Systems for Trucks". Report, December 1996.
- [2] FAEBER, E.; CESARI, D.; HOBBS, A.; HUIBERS, J.; KAMPEN, B.; PAEZ, J.; WYKES, N. "Improvement of Crash Compatibility Between Cars". 16th ESV Conference, Windsor. 1998.
- [3] MENDIS, K.; MANI, A.; PRASAD, A.K.; WILKE, D.; MONK, M.; CLARKE, R.M. "Concepts to Reduce Heavy Truck Aggressivity in Truck-to-Car Collisions". 15th ESV Conference, Melbourne. 1996.
- [4]. Bjornstig J, Bjornstig Ulf, Eriksson A, "Passenger car collision fatalities - With special emphasis on collision with heavy vehicles", Accident Analysis and Prevention 2008, P 158-166.
- [5]. Cercarelli L.R., Lagge M., Lee A.H, Meuleners L.B., "Estimating crash involving heavy commercial vehicles in western Australia", Accident Analysis and Prevention, 1999-2000, P 170-174.
- [6]. Leneman F J W, Schram R, Wismans J S H M, Zweep W J , "Assessment criteria for assessing energy absorbing Front Under-run Protection on Trucks", Eindhoven University of Technology, Netherlands, ICrash 2006