

Harness Design for Four Wheeler Vehicle using ECAD Tool

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Abstract – In today's automotive industry, wire harness fields are employed to increase performance and reduce its manufacturing costs, but they are not successful in that field. We have designed inexpensive, less complex and low weight wire harnesses for HEV (Hybrid Electric Vehicle) to increase performance and reduce the cost of wire harnesses. In today's wire harness are available for HEV but they are more economical and expensive so indirectly cost of HEV is increased.

Keywords– Development of HVDC & FACTS, Current status of power electronics techniques, Future development of HVDC & FACTS.

I. INTRODUCTION

In an epoch where energy conservation is a developing “trend” not only among the learned but also among the ordinary responsible citizens. Fuel efficiency along with minimum pollution has become the standard for any new automobiles [1]. In the same case “Hybrid cars” come as the latest addition. Also dependency on fossil fuels can be decreased. Any vehicle is hybrid when it combines two or more source of power. A hybrid electric vehicle (HEV) combines the power of a conventional internal combustion engine (ICE) with an electric motor. But it is not very simple task to combine both. For appropriate performance of HEV proper way of electric power supply is necessary. If it is not supply power properly it affects performance of HEV. And short circuit problem will be increases in vehicles. For proper supplying power to the HEV and avoiding the short circuit problem proper wire harness design is require [2]. In today's time that type of wire harness is not present to support HEV, so many problems face by HEV. Since our project aim to make that type of wire harness to support HEV.

II. LITERATURE REVIEW

In the wire harness each wire transmit different rating current from source to destination so selection of wire is very important. Now a day need to customers will be change day by day, so different type of electronics devices is added in wire harness so circuit complexity will be increase and its affects indirectly cost of wire harness [3]. To overcome that types of problem so many CAD tools are today present like Electronics computer aided design tool (ECAD), ZUKEN, etc.

But that tool have major problems they could that give information of at BOM (Bill of material) there are used in wire harness [4]. So many time is waste to finding accurate bill separately and don't have any idea about BOM at a time of wire harness designing. So automatically generation of BOM is necessary. That type of software/tools are very important. Another thinks is that wire harness transmit electric power so their major chance to short circuit [5]. To overcome that type of problems properly skilled testing of wire harness is required.

III. DESIGN AND MANUFACTURING PROCESS OF WIRE HARNESS

- The wire harness design will follow the steps listed below which can occur sequentially or can currently.
- First study the circuit diagram.
- Then that circuit drawn any CAD Tool like ECAD for exact schematic diagram purpose.
- Electrical power distribution and circuit protection is must in any wire harness so select that terminals carefully.

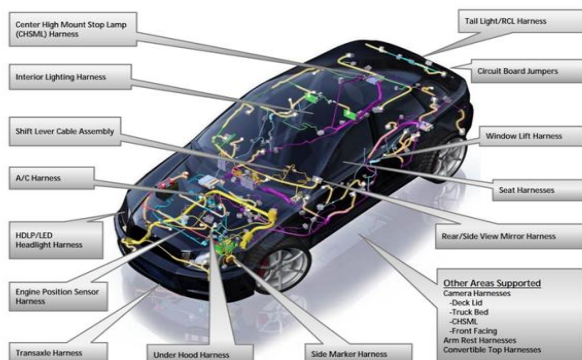


Fig.1. Wire Harness of Four wheeler Vehicle.

- Study the branches of wire (cable) for transmitting proper amount of current to the device and components.
- Interpol the electronic component/devices in wire harness.
- Deciding proper earth/ground points.
- For avoiding any damage mechanical and electrical protection is required.
- Selection of proper connector type is required because every connector have different rating and different capacity to sustain load.
- Stripping & connections must be well required.
- Apply insulating material tube on wire harness for protection purpose.
- Assembly – In the last wire are gather into harness utilizing a work bench or assembly board to meet the design specifications.
- Hand manufacturing of wire harness production is necessary to route wires through sleeves and applies fabric tape.
- Testing - After completion each individual wire harness must undergo electrical safety testing for any specification it may be subjected to real word operation.
- Any fault detection in testing again rearrange the wire harness. Then after successfully testing of wire harness, it can be used in vehicle.

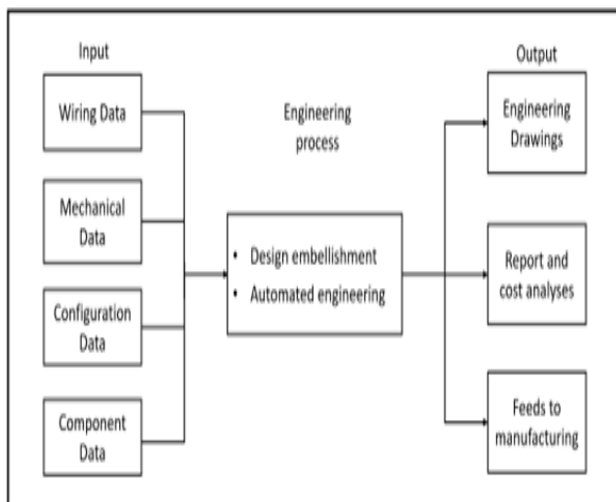


Fig.2.Block Diagram of Wire Harness Engineering Process.

IV. FUTURE SCOPE OF WIRE HARNESS

- We expect wireless technologies to continue to evolve and new technologies will continue to emerge. These technologies will become more integrated with other technologies and as costs reduce.
- In wire harness, we can used live link for monitoring and precaution and alert purpose.

- With the help of a solar panel we can implement wire harness to save more energy.

V. CONCLUSION

After the completion of the project work, we tried to work in our College Instrumental Lab. We saw what it means to meet the requirements. The product performs well, is fairly simple and has reduced its weight. Wire harnesses are easily deployed in HEV devices. This product is low cost and is easily used in HEVs, so the price of HEVs decreases and common people are easily afforded HEVs. After the test is conducted, we found that there was no damage to the electronics devices. It is found that the wire harness consumed less power to glow the devices. It designed very flexible so small and large HEVs vehicles are easily deployed.

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