Design your Destiny!

Who are we?

Mission: Imparting Practical Domain knowledge to Mechanical Engineering Graduates and Automotive enthusiasts by our seasoned industry experts. Empowering our students to become an expert in the domain of their choice.

3,00,000 mechanical engineers graduate every year in India and only a few get into core companies. Mechanical engineers find it difficult to get employed in the industry due to their sole focus on learning the design software, without proper domain knowledge. We Disenosys, are working to bridge this skill gap between students and the industry requirements. We have a team of industry experts, with over a decade of experience who

empower our students to land their dream jobs. We connect to our students from all the corners of the world through live, interactive and virtual classrooms.

Disenosys is bootstrapped by Praveen Kumar, who has worked with many multinational OEMs like Ford, Daimler, Ashok Leyland. Together as a team, we are constantly working to provide Automotive industrial domain training to young and aspiring design engineers around the globe.

Our students are our Hope. We are dedicated to making their dreams into reality.

Automotive Electrical Wiring Harness Design

What is Wiring Harness?

Wire harnessing also known as cable harnessing is an assembly of wires which transmit electric signals. These wires are clipped together by ties, laces, tape or a conduit strung together or in a combination thereof.

You see them almost everywhere, under the hood of your car, on in your motorbike, home appliances such as microwave, refrigerator, TV, computers, phones, anywhere you need electrical cabling. The purpose of lacing together many wires and cables is to protect them from shocks, vibrations, abrasions and also moisture. Although, most of the cables do come with a water protective rubber shielding to seal off the wires from being affected from outside moisture.

There are many benefits to doing this. Space is optimized to a great deal, so it saves the time for both the installer and your own, from having to install each wire carefully, and thus the overall installation time is greatly reduced which helps standardize the process. Also, the wires are protected by a sleeve that is fire-resistant in case of electrical malfunction causing fire outbreak.

Cable harnessing is mainly manufactured by hand instead of using automated tools because of the many processes involved.

Who can take this course?

- 3rd and Final year B.E/B.Tech students in Mechanical/Automobile, Aerospace, Electrical, Electronics and Communication branch.
- M.Tech students in Mechanical/Automobile and Aerospace discipline, Electrical, Electronics and Communication branch.
- Working professionals who are looking for better job opportunities in CAD, CAM, CAE, Auto Cad, Autodesk Domain.

- Automotive enthusiasts.
  Prerequisite: Working Knowledge of Mechanical CATIA V5

Why should I take the Wiring Harness course with Disenosys?

Top career benefits of Automotive Electrical Wiring Harness course:

- Get trained by seasoned industry **experts working in OEMs**.
- We help in **building your resume** after completion of the course.
- A **course completion certificate** from Disenosys.
- **Mock interviews** will be conducted after completion of the course, to clear Industrial Technical rounds for placement.
- You shall learn the basics of electrical wiring and the schema of wiring systems in a car.
- you will able to **design electrical layouts,** identify and **resolve electric circuit** errors in diagnostic problems.
- You will be able to test wire harnesses, develop harness designs and draft harness blueprints.
- Excellent performers will be **referred to top OEMs** through our internal contacts.
- Stand out among your peers in getting placed for Electrical Wiring Harness Designer Engineer jobs.

OUR TRAINERS

Our team comprises of design experts, working in top OEMs around the globe. We stand apart from others with the quality we deliver to our students. Our seasoned industry experts impart their knowledge for the betterment of the future generation.

Course Duration

- **2 months, Live, Online and Interactive Sessions**

Certification

- **A digital certificate will be provided by Disenosys after successful completion of the course.**

Course Curriculum

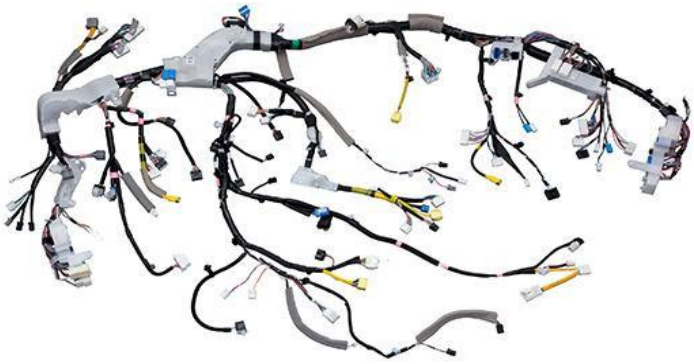
Module 1:

- Overview of Electrical Harness Systems of Vehicle
- Protection Considerations
- Wiring Harness Design Guidelines
- Wiring harness Topology

Module 2:

- Electrical part Design-Toolbars
- Harness Components selection
- Catalog Management
- Bracket Design

Module 3:



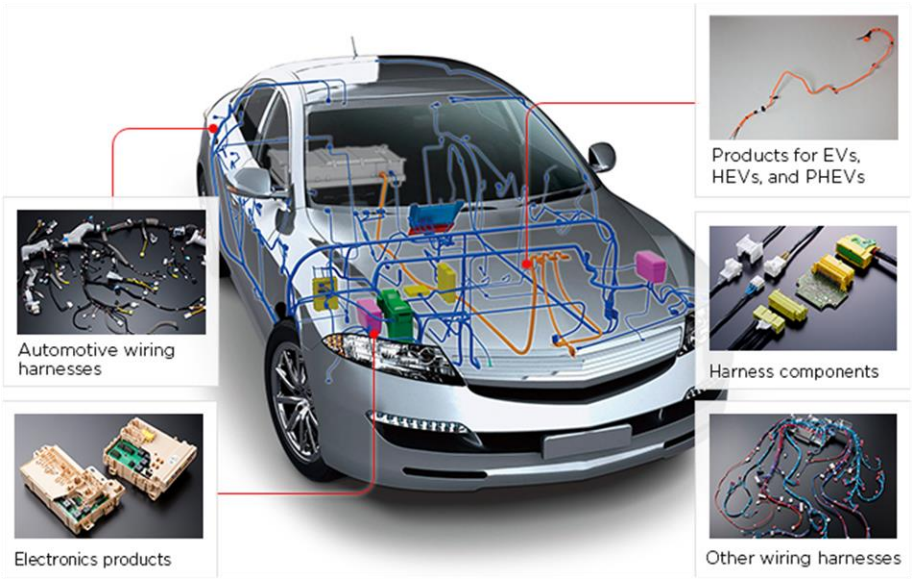
- Define Connector
- Define Support
- Define Protection
- Define Equipment
- Define Grommets

Module 4:

- ➢ **Harness Manufacturing Process**
- ➢ **Assembly of Components**
- ➢ **Wire Routing**
- ➢ **Creating the branch-out**

Module 5:

- ➢ **Splice and Splice Balancing in Manufacturing Process**
- ➢ **Vehicle Schematic Introduction**
- ➢ **Workbench Management**

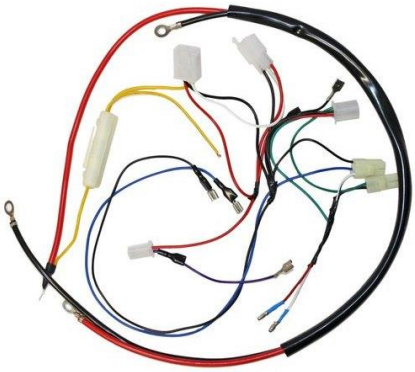


What is Electrical Wiring Harness?

Where is it used?

Types of Wiring Harness

- Main or Body
- Front
- Door
- Roof
- HVAC
- Engine
- Chassis
- Pump
- Bumper
- Headlight
- Rear
- Middle
- Battery



Wiring Harness Components

- Clips
- Clamps
- Fuse Box
- HST
- Cable Ties
- Different types of coverings
- Wires
- Connectors
- Terminals
- Corrugated tubes
- Tapes
- Channels
- Brackets

Wiring Harness Design Flow

Automotive Wiring Harness Design parameters

Wire Selection:

- Maximum current carrying capacity.
- Flexibility (Bend Radius)
- Heat resistance
- Operating Temperature
- Wire strand / Core construction
- Insulation Thickness
- Size
- Space Availability
- Cost
- Length

Fuse Selection:

- Fast Blow Fuse
- Slow Blow Fuse

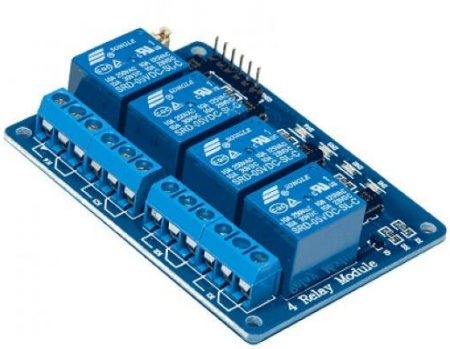
Fuse Selection Criteria:

- Voltage Rating
- Current Rating
- Interrupting Rating
- Temperature Derating
- Melting Integral (I^2t)/ Inrush current & its time interval
- Space
- Wire Size

Relay

Types:

- Maxi relay
- Mini Relay



Selection Criteria:

- Circuit Load Requirement
- Fuse box space
- Load details
- Area to be used
- Application requirement
- Mounting Type: *Printed Circuit Board etc.*

Connector and it's selection Criteria:

- Current rating
- Fluid Resistance
- Material
- Space
- Locking Mechanism
- Packaging space
- Poles requirement
- IP class
- Parking requirement
- Serviceability
- Temperature zone

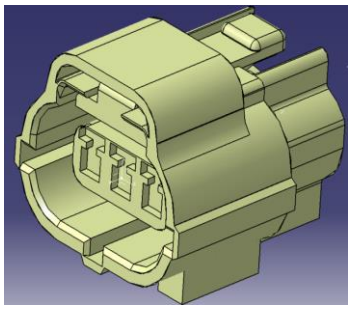
Protective Coverings and it's Selection Criteria

Grounding and it's Components

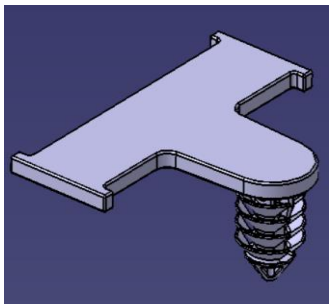
Wiring Harness Important Routing Considerations

ELECTRICAL PART DESIGN WORKBENCH

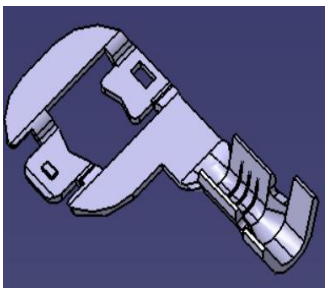
- Presentation of CATIA V5 Electrical Part Design Workbench
- Settings for CATIA V5 Electrical Part Design Workbench
- Define Connector
- Creation of bundle entry point
- Creation of bundle connection point
- Creation of Connector connection point
- Define Support



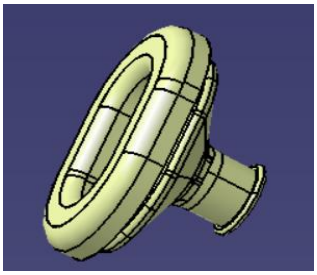
Connector



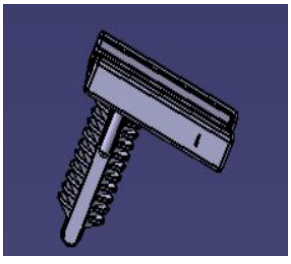
Clips



Ring Terminals

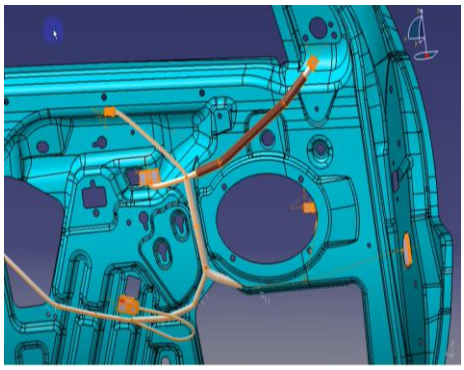


Grommets



Connector Clip

- Preparation of harness assembly
- Settings for CATIA V5 Electrical Harness Assembly Workbench
- Define Geometrical Bundle
- Inserting harness components into geometrical bundle
- Positioning your inserted electrical parts
- Add Global & Local Slack
- Arrange Bundle Segments inside Supports
- Connecting & Disconnecting electrical components
- Defining the wiring harness routing
- Modifying the wire harness bundle segments
- Creating Branch Points
- Specification Tree Management

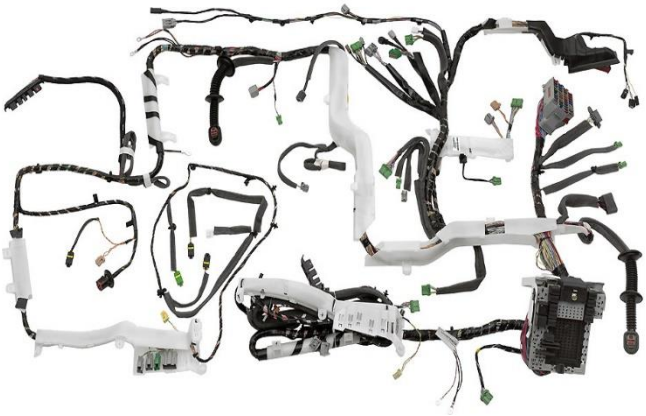


CAD Vs Actual

HARNESS MANUFACTURING PROCESS

"IPC/WHMA-A-620A standard " used for manufacturing the wiring harness assemblies

- Wire Cutting
- Crimp Height and Crimp Width
- Splicing
- Taping and its Types
- Preassembly
- Main Assembly
- Testing & QA
- Final Check
- Dispatch



CERTIFICATE

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