Cover Letter

Continental TEMIC

My primary job function was engineering support for doors. Our module controls the window lifter regulator. The Temic module has express up with anti-trap feature. In order to calibrate the module to the particular door, the parameters stored in the EEPROM were modified according to the particular door in question. I calibrated many doors for customer demonstrations especially executives who needed to see the system work before they felt comfortable approving Temic as the source. The executives were impressed which is why the LX doors are being controlled with our module. The module uses an ST7 Micro w/ flash. The LX module is CANoe controlled. I used data collection software to record window lifter data from the doors. This data allows me to make the critical calibration adjustments, which allow the system to work in varying temperatures and environments.

I reverse engineered several modules from our competitors. The module is dissected and analyzed. I created a schematic of each module using ORCAD Schematic Capture, and created a specification that explained exactly how the module functioned. Within the report was a BOM and data sheets of the main components.

The CS project is a motor integrated module. This module has the express up anti-trap feature and diagnostics. The module is controlled by LIN software and the diagnostic functions controlled via J1850. I did minor hardware changes in order to fit the module to various door types. . I used data collection software to record window lifter data from the doors. This data allows me to make the critical calibration adjustments, which allow the system to work in varying temperatures and environments. I modified a Cadillac Seville door to demonstrate a ride and drive event held at the Auburn Hills Dome. The data collection software helped me calibrate the Cadillac Seville door so that it out performed all the competition on the rough road test.

Valeo Wiper Systems

Valeo WIPER SYSTEMS

I designed various analog and micro-controller based wiper controllers. The analog controllers includes the GM U-Van Front, GMT250 Front & Rear, GMT800 Front, GM P90, etc; The micro-controller designs include GMT800 Rear 1998 redesign effort, 2002 GMT800 Rear Completely new Design, & Global GMT800 Front. The Motorola MC68HRs, & National COP8s were used for the micro based designs. All designs are EMC compliant. I was involved in all the relevant EMC testing to pinpoint areas of the circuitry that required optimization. I supervised the PCB layout to assure the best possible layout for EMC compliance.

The GMT800 Rear had a blade bounce issue, which the customer (GM) wanted a solution for. I decided to stop the controller from dynamically braking the motor and allow the blade to coast to the in-wipe position. Testing was required in order to know the best time to disengage the relay. Once that was known, I had the software engineer modify the code to accommodate this new idea. This was demonstrated to the customer and approved for implementation. The motor had no room for suppression devices so I put LC filter on both motor terminals on the PCB. The suppression was successful. I later redesigned the 800 Rear for 2002 replacing the National COP8 with the Motorola MC68HR. All components are on the topside. Except for the relay, inductors, stack film capacitors, and connector pins, all components are SMD. The grounding scheme is greatly improved. The design uses fewer components and is more reliable than any other design. The design also meets EMC requirements.

The Global Front Wiper controller required a design that was highly efficient and reliable. Previously on the GMT800 Front and the U-Van Front there was a diode problem. The original design had a 10-amp diode to block reverse voltage. In the winter months when the wiper blades would freeze, a stall condition would result. The diode would become hot and melt the high temperature solder. As a result, the diode would fall out of the GMT800 Front vehicles because the controller sat up side down in the vehicle. The U-Van vehicles used a more powerful motor. The diode would blow out of the circuit board. To eliminate this problem, I redesigned the circuitry to use 2 relays, which replaced the original relay and the diode. The 2 low-profile small Aromat relays performed flawlessly. The design is still in place today. All diode designs were eliminated. The Global Front Wiper controller is a completely new design. It is a micro based design that uses fewer components than the analog design. All components are SMD except for the relays and connector pins, and are on the topside of the PCB to eliminate manufacturing processes. The ground scheme is perfect and the design is EMC compliant. I replaced the park switch with a Hall Sensor. The Motorola MC68HR is the micro used on the design.

Mentoring Skills

When new engineers were hired in my group at Valeo who recently graduated from a university, I was responsible for training them. I trained them on company procedures, engineering techniques, the use of various tools in the lab especially soldering skills, schematic capture software, the companies current technologies, and engineering forms. Whenever the engineers had questions, they would come to me. Also more experienced engineers in my group, who had questions about difficult circuit issues, would ask for my assistance in finding a solution.