Window Regulator Forensic Analysis:

An American Big 3 automotive manufacturers and one of their OEM suppliers were involved in an expensive subrogation dispute. The supplier manufactured an electric window regulator that failed in the field. Investigation showed that the component was subjected to an operating temperature and an input voltage that exceeded the blueprint specifications. The window position motors failed within 2 years in places such as Saudi Arabia and Phoenix. The warranty repair costs were substantial, and the automobile manufacturer demanded that the supplier bear those costs. The suppliers were willing to bear the cost of recall if they were truly at fault. I was hired to give an intellectual property analysis and serve as an expert witness as necessary. I toured the plant, reviewed documents, and met with the engineers and general counsel. The supplier suspected that the motors wouldn't fail if the blueprint specifications presented to them were accurate. That is, the motors were designed to operate "up to **X** ^{o}C" and the supplied voltage was to operate, "up to **Y** volts". The supplier validated their prototype assemblies by testing to the supplied specifications. However, the temperatures were higher than blueprint in Phoenix, and the voltages supplied by the alternator were higher as well, putting added thermal stress on the motors. The company's dilemma was that they did not maintain old stock, and couldn't test their product under the now-known conditions, as they had no motors. I recommended that they acquire several old regulators by cannibalizing used cars and then refurbish them to "factory original" specs by replacing the motor and any worn parts. Then, endurance test the refurbished components under the known *actual*, not *blueprint*, conditions. I indicated that if they failed under the more severe conditions, you would have known at the time of validation and would have redesigned them to be sufficiently rugged for field use prior to release. This would be the most desirable result. However, if the refurbished parts did not fail even under the more severe conditions, then the manufacturer and the OEM supplier needed to work together to find the actual problem. The case was quickly settled under confidential terms.