

AUTOMOTIVE COMPONENT PARTS AND ACCESSORIES

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Automotive component parts and accessories are as important as the complete car itself. Whenever there are discussions on car issues, people either talk about the complete car or the price and hardly touch on the component parts and accessories which really makes up the whole car in the first place.

Car manufacturers believe that the quality of automotive component parts and accessories have a direct effect on the optimum performance of the car.

According to Mark D. Bill, Chief Platform Engineer of Ford Motor Company – Asia Pacific Division, it is very important to look into the manufacture of accessories in order to produce a more balanced and customer-oriented vehicle.

"Accessories are designed to meet strict vehicle engineering attributes and performance requirements. They are designed to improve vehicle appeal, performance and functional capability by providing high-value customers features, such as leather seats, bedliners, premium audio, and console. Improvements in these areas are expected to greatly contribute to customer satisfaction and cater for a very diverse group of customers," he said.

Bill, who is based in Japan, said accessories were so important that a significant number of accessories for Ford cars and trucks were developed by its Vehicle Personalisation (VP); a division created specifically to respond to customers needs for accessories.

"VP performs engineering and durability testing for all accessory components in compliance with Ford engineering standards," he said adding that on durability testing, it was usually conducted by using one or more of the following methods:

- On-road vehicle durability – to verify part/system/total vehicle durability.
- Rolling chassis durability (Simulation of on-road vehicle durability) – to verify part/system/total vehicle durability.
- Key life test (laboratory) – to verify part/system durability.

Computer aided engineering (CAE) is a major part of VP accessory engineering work and is essential to enable release of high quality accessories in a very short development period.

"Access to sophisticated CAE models differentiates our accessories from after-market

manufacturers and provides a critical basis for quality," he said adding that some examples of where CAE is typically used include:

- NVH (Noise, Vibration, Harshness) analysis
- Part/System strength/Life
- Performance/Fuel economy

When asked whether Ford manufactured their own component parts and accessories, Bill said that quality component parts and accessories was an important business for Ford.

VP is involved in selecting which companies manufacture components and selecting them if quality was up to standard. A primary responsibility is to provide quality assurance activities supporting suppliers through our Supplier Technical Assistance process. VP has facilities to install accessories on complete build up vehicles at their vehicle modification center employing OEM factory-installed quality processes, he said.

He added that there was stringent quality control applied to these parts. VP uses Advanced Product Quality Planning (APQP) for all accessory



components, and confirms the component quality compliance at each prototype stage with formal reviews and exacting sign-off procedures. VP also utilises quality audit tools similar to those used to provide quality assurance in the vehicle assembly plant.

Each component goes through the following tests:

- Design verification (CAE, Lab Testing and vehicle testing)
- Attribute and Reliability verification (vehicle testing)
- Production Validation (vehicle testing)
- Engineering Standard testing (manufacturing capability validation)

These processes are intended to ensure that every component meets the same life expectancy as the original vehicle.

Bill stressed that it is important to regularly service one's vehicle in order to ensure longevity of component parts and accessories.

"Servicing interval requirements are designed to ensure vehicle performance, durability and longevity to meet customer expectations. In the real world situation where these requirements might be ignored, the effect would result in the shortening of the vehicle longevity," he said.

It is best to know what the requirements are and have your vehicle serviced routinely. After all, you've invested a lot in making your vehicle extra special with parts and accessories that suit your expression and personality, he added.

According to Kaz Okihiro, Vehicle Personalisation Manager for Ford Ranger and Everest at Ford Motor Company - Asia Pacific Division, based on the company's Competitive Quality Survey Data, vehicles equipped with VP accessories have higher scores



than base vehicles in both quality and ownership satisfaction categories.

On the issue of manufacture of automotive parts, he said that the overall product development process to produce automotive parts and accessories requires extensive engineering involvement.

The basic stages start with a Design Concept and then progresses through Engineering Design, Development and Manufacturing. Many different engineering disciplines are usually engaged at the early program development stages. They identify and address all design, manufacturing and assembly requirements. They also set the quality control process for the assembly/ supplier plants.

Accessory development process is fully a customer-driven process. Through close communication with markets in its planning stage, all contents, designs, costs are decided very early on based on customer feedback

At each stage of the design and styling process (sketch and full scale model development), the design elements are shared with markets for feedback. The product development process will start based on programme assumptions. Several market reviews are conducted to ensure that these assumptions will meet customer requirements. Testing and design verification/validation follow the Ford standard product development process. Engineering sign-off takes place to ensure that parts/products have met all vehicle attributes and reliability standards.

Okihiro stressed that accessories were considered highly customer-driven products.

"Input from customers creates the feedback to engineers playing an important role in determining which products or modifications customers will want to meet their future needs," Okihiro said. ■