



*"Using components like the customizable Eaton switches helps Kenworth achieve its goal of designing and manufacturing robust vehicles that provide maximum uptime and ensure operators' productivity and profitability."*



**Location:**  
Kirkland, WA

**Problem:**  
Develop custom switches for the new, state-of-the-art Kenworth T680 truck to meet application-specific requirements

**Solution:**  
A unique instrument panel designed with the Eaton NGR and pushbutton switches

**Results:**  
Innovative switch solutions meet Kenworth's functionality, reliability, and styling requirements.

**Contact Information**  
Readers who may have similar application challenges and would like to discuss this success are invited to call 877-ETN-CARE or John Dunne at 704-904-6609.

## Kenworth Truck Company Partners With Eaton to Develop Custom Switches for World Class Kenworth T680™ Trucks

### Background

When Kenworth Truck Company, a PACCAR Company, began designing its new Kenworth T680™ truck, it wanted the truck to be best-in-class in the following key areas: aerodynamics, quietness, comfort, reliability, durability, and serviceability. To fulfill these requirements, the company invited 75 fleet and maintenance managers and 850 drivers to participate in focus groups to voice their opinions and preferences. Collecting data on all aspects of the truck enabled the company to develop a truck that surpassed current and new models in the marketplace.

### Switch supplier requirements

Kenworth made unique enhancements to the instrument panel of the T680 using data from the focus groups. The T680 is a multifunctional truck that can be specified as a day cab or a 76-inch sleeper equipped for many different applications, including pickup and delivery, line haul, and regional haul. As operators use switches for a variety of applications, this was a very important part of their study. Operators communicated their key requirements for the switches including seeing and reaching them, operating them with a glove on, and being able to tell whether they are on or off by touch or sound. These features in a switch increase their functionality, ease of use, and safety while in operation.

Kenworth T680 Engineering Manager Doug Caley explains, "After we received user input and asked switch suppliers for proposals, we used a decision matrix to make our selection. We evaluated suppliers based on their products' reliability, durability, customizability and

cost as well as the suppliers' ability to meet our production schedule.

"When we choose a supplier, we are looking for a partner—not merely a company that can provide components. Our objective is to establish a relationship for the long term, which includes helping us develop a custom product for our application as well as providing service parts in a timely manner, getting parts into the plant when needed, and providing support if issues arise. Based on our assessment, we were confident in the ability of Eaton to help us to meet our objectives, as well as the company's commitment to partnering with us."

### Custom solutions

After being chosen as the key switch supplier, Eaton used its product development process, which requires a cross-functional team to ensure validation testing and high reliability to develop Kenworth's custom panel switches. Eaton proposed using its NGR and pushbutton switch platform as the base for



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development. This platform has proven reliability and durability in rugged applications.

Caley reports, "Since one of our requirements was that the switches give clear feedback to the drivers, we collaborated with Eaton to develop units that have varying level of warning lights. This was the first time we designed switches that have different colors when they are activated. The backlighting changes colors depending on the function of the switch (green/amber). The switch icons also change color when activated for easy at-a-glance recognition.

"If a switch can be activated while driving, such as an interactual differential lock, it will indicate on with a green light letting the operator know that it is safe to travel on the road with it on. If the truck should not be driven with that switch on, an amber light will appear, which cautions the operator that the truck should not be driven.

"Protecting switches from accidental activation was another key requirement. To meet that need, a wire guard was developed to protect the switch. For other applications, we worked with Eaton to create a flip cap to protect the switch. In that case, an operator has to lift up the cap to activate the switch."

The Kenworth T680 can have between 10 and 30 Eaton rockers switches for functions including cruise control, fog lights, differential locks, and fifth wheel slides. The trucks also have four pushbutton switches, which are used in lighting control.

Kenworth also provided Eaton with specific styling requirements to ensure that the switches were harmonious with the design of the entire dashboard. The company collaborated with Eaton to design switches to meet specific durability and strength requirements, including the number of cycles it has to

move, the amount of force it has to take if something hits in on the side, its ability to withstand electrical currents running through the system, like spikes, and reverse polarity.

### Integrated approach

The Eaton switches not only enable Kenworth to meet its million mile, 10-year life, and 99 percent reliability goals, but their standard proven platform also saved time and money in the development of the switches. Caley adds, "The focus groups and Eaton worked with us throughout the entire design, development, and testing process. This integrated approach to meeting functionality and user requirements was the key to developing an optimal solution.

"Our rigorous performance and reliability requirements for all aspects of the development of the T680 are the cornerstone of Kenworth's ability to provide superior quality, robust heavy duty trucks. In the commercial vehicle industry, trucks have to be up and running for a million miles in harsh environments. Using components like the customizable Eaton switches helps Kenworth achieve its goal of designing and manufacturing robust vehicles that provide maximum uptime and ensure operators' productivity and profitability."

### Product Information

The Eaton NGR offers both European styling and ergonomic design while providing solid durability. Available with illuminated and non-illuminated versions, the NGR is designed with a variety of rocker buttons and indicators with laser-etched or pad-printed icons, insertable lenses and adhesive-backed labels.

For more information on NGR visit [www.eaton.com/vcbu](http://www.eaton.com/vcbu).

