

# Instrument Clusters

**V**ehicle instrumentation needs to provide drivers with a huge and fast-increasing amount of information. As the world's largest supplier of instrument clusters, DENSO leads the industry in developing products to convey that information safely and efficiently. The company's competitive edge is especially apparent in "black-face" clusters and in transparent electro-luminescent displays for superimposing warnings and messages atop other information displays

## In the marketplace

The amount of information required by drivers is burgeoning. That imposes new demands on dashboard instrumentation.

DENSO is the world's largest manufacturer in this product category, with a global market share of about 15%. We have supplied instrument panel meters for about 200 million vehicles since 1951. We have produced black-face clusters for a cumulative total of 3.5 million vehicles since 1989, and those clusters now account for about 15% of our production of instrument clusters. Since 1998, we have supplied instrument clusters for mounting at the center of vehicle dashboards. That positioning enhances safety by minimizing the amount of eye movement required for the driver to check the instrument readings.

## In comparison with competitors

Our patents on black-face clusters give us a decisive edge in this product category. We reinforce our competitive position in instrument clusters through original technology in transparent electroluminescent displays. That technology allows for superimposing warnings and messages atop other information displays.

## Issues and outlook

Prices for instrument clusters have declined sharply in recent years. Maximizing quality and performance while lowering costs is a big challenge. We also need to accommodate the trend toward delivering components and systems in preassembled modules.

Reducing wire harness and connectors is an emphasis in efforts to simplify and lighten automobiles. That will include integrating control wires and electronic control units for different functions into multiplex trunk lines and control units.

An environmental issue in this product category is cold cathode tubes used as light sources in black-face clusters. Those tubes contain mercury, and we began replacing them with light-emitting diodes (LEDs) in 2000.

## Technical highlights

Black-face clusters are a DENSO invention. Our products provide clear, high-contrast displays of information. They are available in numerous variations to reinforce the identity that automakers intend for different vehicle models.

We also led the development of transparent electroluminescent displays. And some of our newest clusters combine lucid black-face displays with transparent electroluminescent messaging.

In multiplexing, we have developed microprocessors to control multiple display functions, including analog indicators. We are using our multiplex microprocessor technology to combine multiple electronic control functions in single units.



*Black-face cluster with transparent electroluminescent display*