

## LOW VOLTAGE CIRCUITS

There are an increasing number of applications on heavy-duty vehicles that are either data input or data output to an integrated circuit. The typical designs of integrated circuits create a situation where the voltage range on the analog signal to the IC ranges from 0 volts to a maximum of 5 volts. These signals require special consideration in the connector selection. The primary problem is that the plating used on typical heavy-duty applications is designed to operate at battery voltage. The nickel and tin type platings that are used are not designed for voltage levels less than 5 volts. When these platings are used in these applications they perform acceptably when they are first installed on the vehicle. Over



time and with the addition of heat and vibration, a layer of oxidation forms on the surface of the plating. When a voltage is applied, there is not sufficient voltage to pierce through the oxidation and allow the current to flow. This creates an open circuit. The solution in many cases is to use a terminal that is plated with gold. The small additional cost for the gold plated terminal can dramatically improve the reliability of the electronic system.



A system designer must consider several factors in order to determine if gold plating should be used. These factors include ambient temperature, vibration levels and the duty cycle on the particular circuit.

## IPD Technical Papers



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