

Putting Our Relays to Work for OEMs, Guides Our Design Process

Picker's PC7150 is a Maxi ISO Automotive Relay with a rating of 150 Amps at 14 VDC and 25°C. When asked why anyone would need a 150 Amp relay we often respond; "they needed a bigger hammer".

Three Available Case Styles



The OEM Application:

As 150 Amp applications go, this design requirement was extreme. The OEM required a relay to replace a Triac to add a dynamic-braking feature to the motor control. The application was rigorous, drawing in-rush current exceeding 300 Amps; potentially repeating every few seconds in an extremely high-vibration, random-axis environment.

- Steady-State Current 75 Amps at 18 VDC
- 300 Amps of In-Rush
- Run Time can be in Excess of 30 Minutes
- High Vibration

In short it generates a lot of heat!

Note: The essential design parameter and key to relay reliability is heat dissipation both internally away from the contacts to minimize the effects of the in-rush currents, and with external connections to a PCB to further dissipate heat. Both are essential to not exceed the temperature rating of the coil wire insulation and capable of the most demanding environments.

For the data sheet go to:

www.pickercomponents.com/pdf/Relays/PC7150.pdf



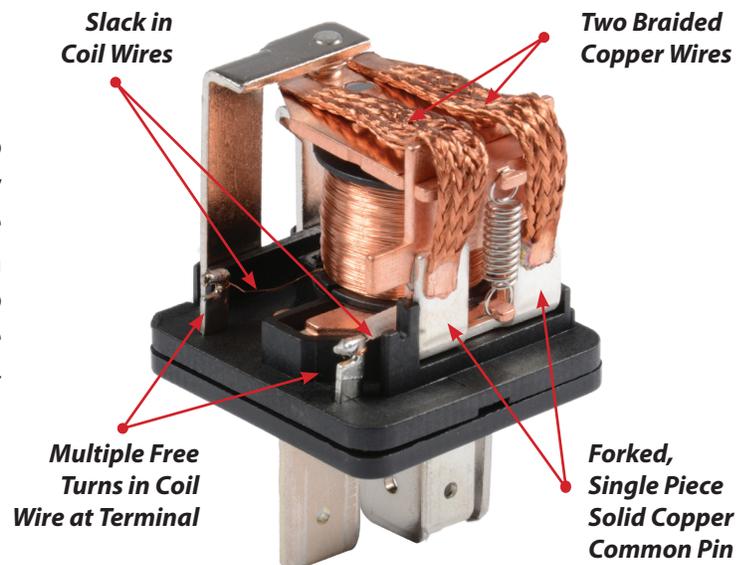
Picker Components' PC7150 may be the only ISO Pluggable and PC board mountable, 150 Amp 14VDC ISO Relay on the market and has proven capable in the most demanding environments. The challenges of this application guided us in making improvements, which are now standard, in our PC7150 relay.

Innovations that allowed Picker's PC7150 to meet the requirements of the application:

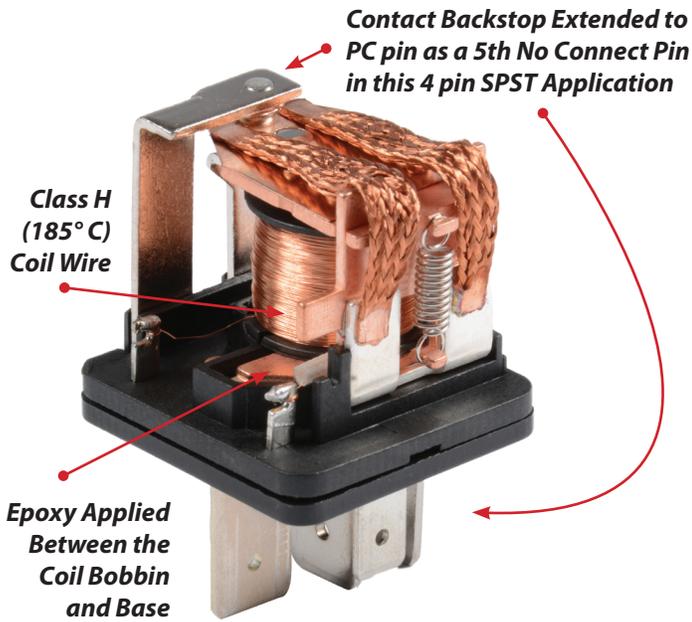
- Braided copper wires from the "common" contact to the common pins are excellent conductors of electricity and heat so we replaced one braided copper wire with two.
- The two copper braids directly connecting the contact area to the forked common contact pin fosters excellent thermal and electrical conductivity. Thus we redesigned the Common Pin creating this single piece fork.

Design enhancements made to our standard PC7150 150 amp automotive relay

Note the Forked Pin which is an extension of the Common Pin as it exits the bottom of the package. This facilitates efficient heat and current flow.



Design Changes for a Specific Extreme High Vibration Environment



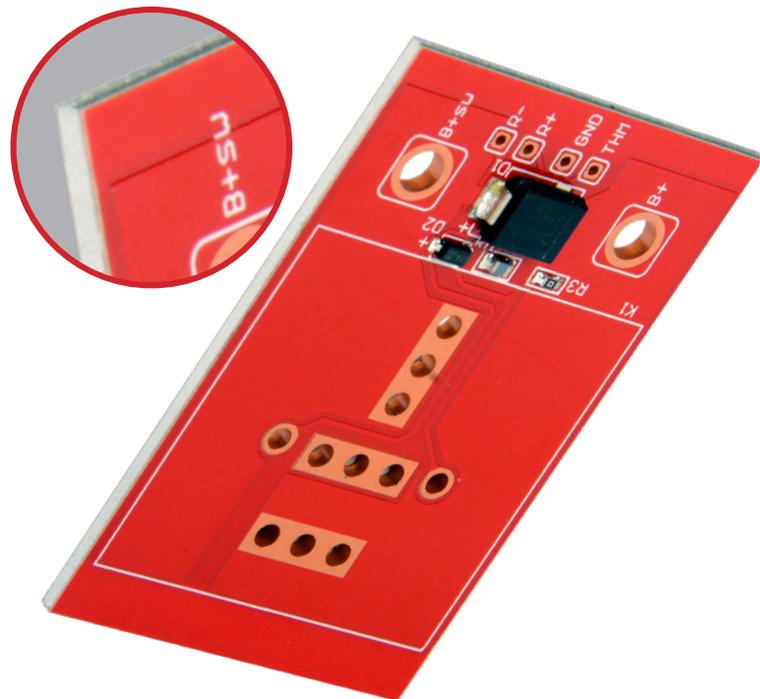
- The normally Closed (backstop) post which in this SPST (form 1A) was not extended through the base of the relay was cited as a potential problem to shake loose. The solution was to extend the post through the base and into a pin thereby securing it in the high vibration environment. The back side contact pin, while present is electrically a no connect. This is an optional feature.
- Optional class H (185°C) magnetic coil wire Insulation providing for 150°C operating temperature. Again an option.
- Service loops (slack) were added to the coil wires between the coil and pin posts to dampen the vibration effects.

In the world of high-current relays, heat is the greatest enemy to reliability. Picker Components has gone to great lengths to provide an efficient path for exothermal heat transfer. But, the heat must also be sinked outside of the relay.

1. In this application, two methodologies of heat-sinking were incorporated: Large areas of copper were utilized on both surface layers of the host printed circuit board.

2. An aluminum printed circuit board was used with its aluminum thermal-plane embedded within the layers of the PCB. This provides a ready conduction path for heat to travel from the pins of the relay to the outside world a significant amount of convection surface area

The extensive copper trace areas can be seen on the top layer. It is mirrored on the bottom layer. Further, there is an aluminum thermal plane sandwiched between the copper and insulated layers



The heat generated by the High-In Rush and Surge Currents tend to form at a single point on the contacts and are hotter than the melting point of the contact metal. Picker utilizes a Japanese foundry to alloy its contacts. The proprietary formulated Silver Tin Indium Oxide contacts are stamped from sheets to be massive enough to dissipate that heat before it can melt the metal at the surface of the contacts.

In short, the Maxi ISO PC7150 is designed to dissipate the intense heat of In-Rush and Surge currents and the long term heat generated from the high steady state current at the contacts as well as the high power coil.

Let me introduce you to the **Picker Components PC7150**, a 150 Amp 14 VDC relay designed to meet the most demanding applications of our customers.

For the data sheet go to:
www.pickercomponents.com/pdf/Relays/PC7150.pdf