

Motorcycle Seat Heating and Cooling System

Sponsor: Polaris Industries

Sponsor's General Mission or Business Statement: Understand the riding experience. Live the riding experience. Work to make it better.

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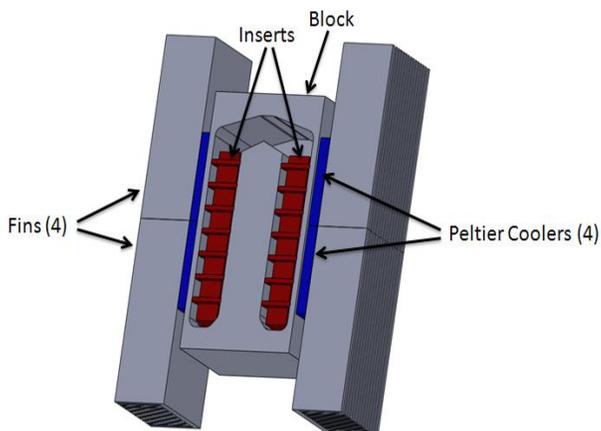
Senior Design Clinic I-II (ENGR 480-1) 2008-9 Project Mission Statement: Develop an accessory seat for the Vision touring motorcycle that has heating and cooling capabilities for both driver and passenger.

Major Design Requirements:

- Packaged within the current seat geometry.
- Cost within 1.2X price of current heated seat.
- No negative effect on general seat comfort.
- Ability to control heating and cooling level with on and off switch.
- Separate controls for passenger and driver.
- Easy to install.
- Ability to withstand vibration.
- Electrical Compatibility of 4.5 Amps on 12 Volt system.

Project Summary: Heated motorcycle seats are a common motorcycle accessory. They allow riders in cooler climates to extend their riding season. Conversely, cooled seats are basically non-existent, but would enable riders to stay cool in warmer climates. The team is to develop an accessory seat for the Vision touring motorcycle with heating and cooling capabilities for both driver and passenger. The ideal embodiment of this design would provide both heating and cooling, however the emphasis is on the cooling seat design. First, the team generated an extensive list of concepts and narrowed the list based on the customer requirements. The concepts underwent testing to determine the most suitable for the situation. The concept chosen was the Peltier-Liquid cooled design. Peltier coolers are thermoelectric ceramic plates which cool on one side and heat on the other. The heating and cooling effect can be transposed to opposite sides by reversing the polarity. The Peltier coolers are attached to a heat exchanger to transfer temperature to a fluid, which is pumped through hoses that are arranged under the seat to then pass on temperature to the riders. This design was chosen because it is able to heat and cool within a single unit.

CAD Drawing of Design



Actual Design

