

Rider Education Report

Today's motorcycles have come a long way since their invention at the turn of the 20th century. One of the more important developments to become mainstream in motorcycle design is the control of heat. Burning fuel in a motorcycle engine produces lots of heat. If engine cooling is insufficient to remove the waste heat, the engine's internal parts will wear out prematurely or fail outright.

Early engine design used rows of fins cast directly on the hottest parts of the engine to conduct the heat away and disperse it into the air. More modern designs have moved to liquid cooling to control engine temperature. The engine coolant contained in a closed system is pumped into and through various passages within the engine structure directly to where the heat is generated, then out through radiators equipped with fins to conduct the heat from the liquid and disperse it into the air. Some engine designs use a combination of air and liquid cooling, allowing for a more "classic" appearance, yet still providing heat control in the hottest parts of the engine.

Unlike motorcycles, which have experienced a great deal of evolution especially where heat control is concerned, we humans have basically remained the same for the last few thousand years. The food we eat is used to power our bodies and produces a lot of heat in the process. As in motorcycles, our body heat must also be controlled, or we will wear out and fail prematurely.

Our bodies use a combination of liquid and air cooling with both an open and closed system. Internally, our blood is pumped by our heart through every part of our bodies absorbing the heat generated at the source. As our body temperature rises, the closed system of blood vessels will move closer to the skin to disperse the heat there. Continued temperature rise will trigger our open cooling system of water perspiration. Sweat glands excrete water onto the skin which absorbs heat from the blood vessels below and carries this heat away as the sweat evaporates.

Both motorcycle and human body cooling systems ultimately rely on air circulation to carry the heat away from the parts needing to stay controlled. Motorcycles have electric fans that will keep the air moving over the radiators when the machine is stopped or otherwise moving too slowly to stay cool. Our bodies are not equipped with fans, so we must find alternate ways to supplement the natural cooling process. Drinking cool (not cold) liquids can help by absorbing heat in our core, and at the same time replenishing the water we are losing when we perspire. We can also place wet towels or other material in strategic places like around our neck where the top part of the item is sticking out where the airflow over our collars pulls the heated moisture away.

Both motorcycles and human beings have a maximum temperature where their cooling systems can no longer keep up with the heat being generated while working in their environment. Motorcycles usually have a gauge or other visual indication they are close to overheating. Human beings are not equipped with a gauge as such but do offer signs of the onset of heat related issues. Things like skin that is hot and dry to the touch, not needing to urinate at rest stops, dizziness, nausea, muscle cramps, headaches, and heavy breathing are some symptoms of heat stress. If you are riding and begin to experience any of these symptoms, stop and take a break in a cool place or a shady spot, and drink some liquids, preferably water. Motorcycles that overheat will need a tow vehicle. Human beings that overheat may need a hearse.

Until next month – stay cool.

Richard Artmayer
KY State Educator