

**Issue no. 01/2016: Fitting instructions for thermal switches (TSW)—  
 delayed opening and closing times**

Combustion engines require a nearly constant temperature level in order to ensure low-wear, low-emissions operation whilst maintaining efficiency. In addition to the thermostat, the thermal switch critically contributes to temperature regulation. When the appropriate engine operating temperature is reached, this component controls the fan for the cooling circuit to start up, for example.

As with a thermostat, this is accomplished by means of a wax element that expands inside the switch. The space containing the wax is precisely calculated and calibrated. As the temperature rises, the volume of the wax increases, thereby actuating a microswitch. The microswitch in turn mechanically closes the circuit (see Figure 1).

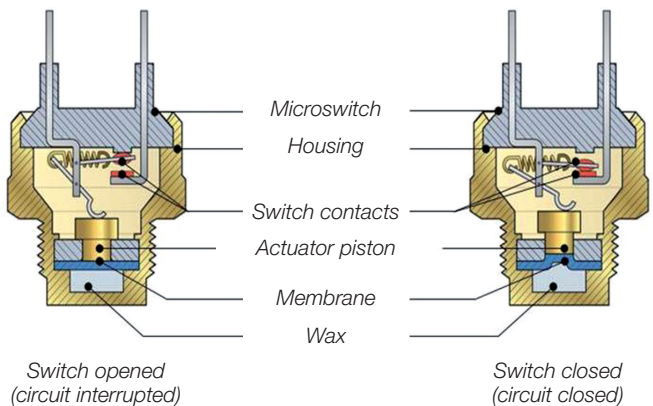


Figure 1: Cross section of a thermal switch, opened and closed positions.

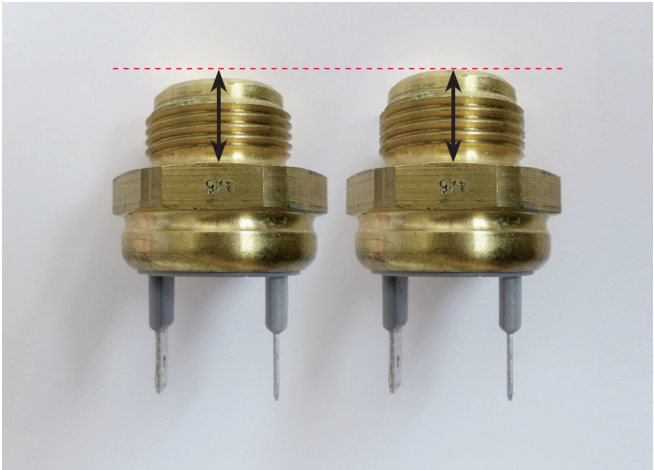


Figure 2: Different thread length due to excessive assembly torque, original condition on the left, and elongated due to excessive assembly torque on the right.

Caution: If, for instance, the switch is over-tightened when fitted, the thread will elongate, as will the space in which the wax is located (see Figure 2). This space will then no longer comply with the specifications, and the switch will no longer open and close at the defined time or will fail entirely.

It is therefore important to observe the specified torque during fitting—not only to prevent deformation of the thermal switch, but also to avoid damaging the thread in the radiator.