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### **Torque Sensor Boards**

One of the most common problems Bunn and Ultra users have is one or both of the hoppers will not freeze at all. In troubleshooting, some users even jumper power directly to the compressor and when it starts up they believe the main board is bad. The most common reason for this problem is the small Torque Sensor Board at the back of each hopper near the auger motor.

The machine needs to know when to turn the compressor on and off, and in addition to some automatic requirements the user gets to change the settings to command the compressor to come on and off by changing the thickness settings on the Ultra touch panel or the knobs at the back of the control drawer on the CDS. These user settings allow you to determine the product thickness, and the machine uses an interesting way of continually determining how thick the product actually is.

The auger in the product hopper connects to the motor in the back via a multi-piece shaft that is inside the silver metal cooling drum (evaporator). The front end of the shaft sticks out the front of the drum and engages the plastic auger, and the back end of the shaft engages the motor shaft at the back of the machine. The shaft has two flat metal springs inside it, and these springs twist as the product gets thicker.

Both the motor shaft and the back end of the auger shaft have metal pins sticking up about a half an inch. As the product in the hopper gets thicker, it is harder to turn the auger. The harder it is to turn the auger, the metal springs inside the shaft twist more. This twisting changes the distance between the pin on the motor shaft and the pin on the auger shaft. As the shafts spin, the two pins pass through an invisible light beam on the Torque Sensor Board. The distance between the pins is measured by the time between the pins breaking the light beam and, based on the desired product thickness the user has set, the main control board turns the compressor on or off as needed. (Note that there are other components and actions that turn the compressor on and off, but we're concentrating on just these boards in this service sheet).

If the main control board does not receive any signal from the Torque Sensor Board, the compressor will not come on. The components on this little board are often damaged when the motor and shaft are removed if you do not spin the shaft so the pins point away from the board before removing the motor.

So there are two important things to remember: Always insure the pins on the motor and auger shafts are pointed away from the Torque Sensor Board before unscrewing the motor; and always suspect the Torque Sensor Board first if one (or both) hoppers do not freeze. Luckily, this board is not expensive – Margarita Guys offers the Torque Sensor Board for only \$20.

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