

Furnace Will Not Start (...sometimes...)

Problem: My Atwood furnace will, on occasion, not start or having started, will just randomly turn off (usually in the middle of a cold night). Nothing works, not even the fan. Everything else in the trailer works fine.

Answer: Normally the furnace fan comes on and starts the air flow which activates the sail switch. If the thermostat calls for heat and the sail switch is activated, then the propane valve will receive 12 volts through the circuit board. This starts the entire heat cycle. If the fan does not come on, then this usually means that the furnace is not getting 12 volts. This problem occurred at a Unit Rally and the WBCCI member indicated that it had been going on for several months with a number of repair attempts being made that were unsuccessful.

The proper 12 volt power was measured at the furnace input terminal. An on/ off power switch was next followed by a DC circuit breaker. In some models these are two separate devices, however, this unit used a combination power switch/ circuit breaker. This furnace had the combination unit which attached to the 12 volts with a wiretap quick connector, Figure (1). This type of connector is used extensively in RV, automatic and marine applications. If not properly seated they can develop corrosion or get dirty and result in an intermittent connection. These connections were checked and cleaned and the furnace seemed to work fine that evening.

During the night the furnace again stopped working (temperature went down to 39). The easy way to troubleshoot the switch and circuit breaker is to unplug them and bypass them with a jumper. The furnace immediately started and worked fine. When removing the push-on terminal to the switch, I noticed that it was using a IDC tap splice lug (Insulation Displacement Connector), Figure (2), that was clamped on to 12 volt wire. Instead of being tightly clamped, the connector, Figure (3), easily turned on the wire indicating that it was not making a good contact. In fact, after removing it I found that it was the wrong size for the wire size. For a good connection an IDC tap splice must be the correct size, for the wire, or it will not cut through the insulation and make a good electrical connection. This was internal to the Atwood furnace and appeared to be properly attached but was just not the right size.

These connectors are designed to splice connections into other wires without the need for cutting and soldering. They come in all sorts of sizes and for all types of uses and are used extensively in our RV's. The color of the connector indicates the wire gauge size it is designed for. A quick check is to see if it will move on the wire it is spliced too, which would indicate a poor connection. If it moves at all, do not try to re-clamp the connection, move to an adjacent area on the wire and just replace it with the proper size connector.

Reference: <http://tech.bareasschoppers.com/resources/the-problem-with-wire-tapconnectors/>



Figure (1) IDC Connectors



Figure (2) Push-in IDC



Figure (3) IDC Inside