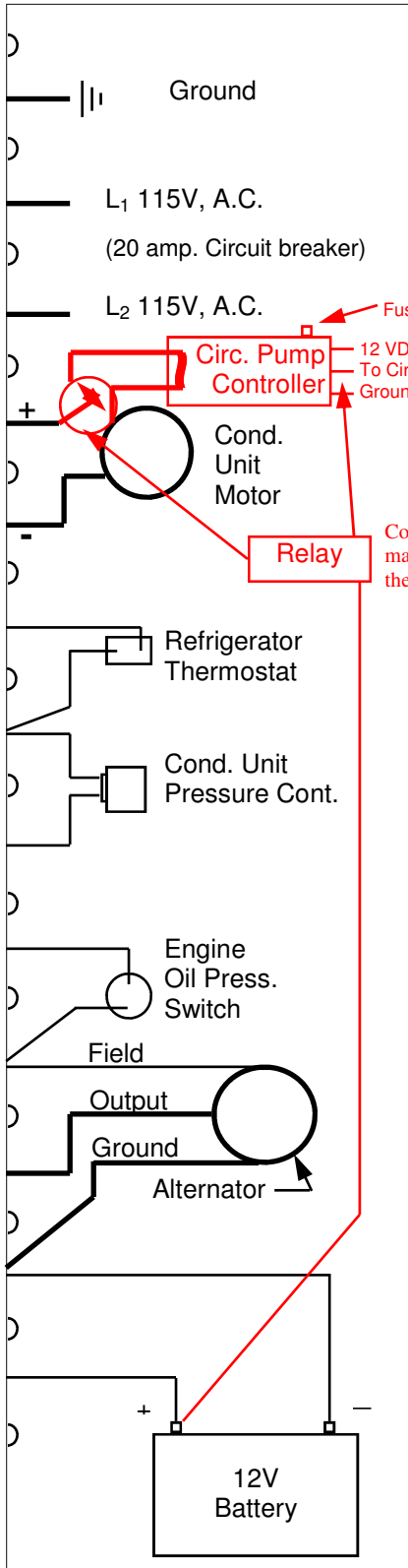


Modifications to the Refrigerator Circuit

Label for Refrigerator Connection Panel



Explanation

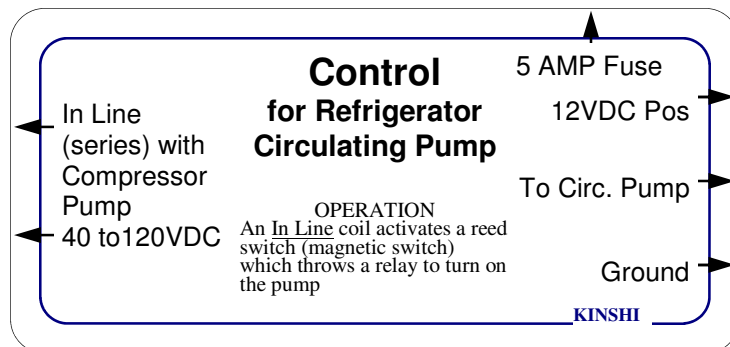
Originally the circulating pump for the condenser was mechanically driven (belt driven) by the condenser motor. Because this pump was so high above the waterline, it continually had trouble getting a prime. To solve this problem, the mechanical pump was removed and a 12VDC electric pump was installed at the waterbox. To control this electric pump, a "Control for Refrigerator Circulating Pump" was installed and mounted next to the Refrigerator Connection Panel on the forward bulkhead in the engine room. An indicator lamp was also connected to this controller to show if the circulating pump is getting power. The reason for the Control was that there was no 12VDC point in the refrigerator circuit that could turn the circulating pump on ONLY when the condenser pump was running.

How it Works

An In Line coil has been inserted in the positive DC line (60 to 140VDC) to the condenser motor. This coil creates a magnetic field that activates a reed switch (magnetic switch) that closes a relay to run the 12VDC circulating pump. The 12VDC circuit is fused. This system works fine when being powered by the engine alternator. However, when

Red colour indicates modifications to the original circuit

Label for Installed Circulating Pump Control



powered by the original bridge rectifier (shore power), it would not operate properly because the sign wave created by this rectifier had a ripple that the reed switch could not handle.

Further modifications to the circuit

These comments relate to the circuit when the fridge is on shore power only.

The original bridge rectifier also produced 120VDC current and the compressor pump motor is rated at 90VDC and as a result the motor burnt out after a few years. I decided to replace the bridge rectifier with a motor controller designed for the compressor motor. The motor controller is mounted in the hanging locker in the companionway to the aft cabin. It is powered by the same source as the original bridge rectifier and as a result is controlled by the main solenoid in the original circuit. The power to the compressor motor was now 90VDC but still had a ripple that the reed switch could not handle. To solve the reed switch problem (in shore power mode only), I installed another relay that takes the reed switch out of the circuit when on shore power and also drives the circulating pump. This relay (mounted under the original circuit board in the engine room) is also controlled by the main solenoid in the original circuit.

