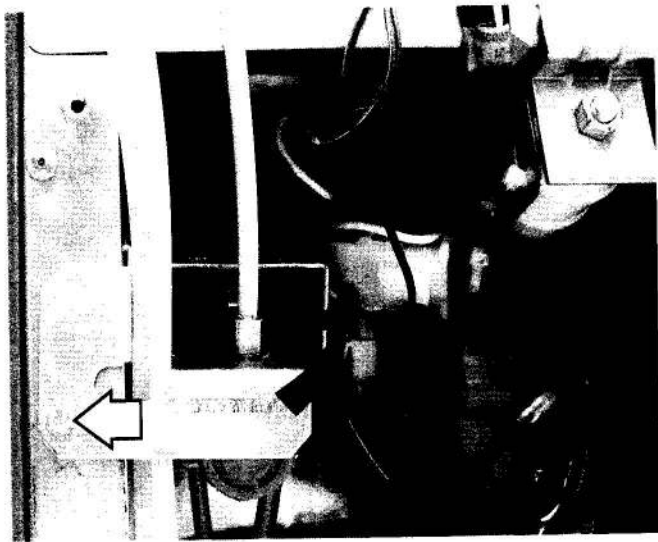


Water Valve

The water valve is accessed from the back of the refrigerator and is located on the left side of the compressor. The valve contains 2 solenoids. The icemaker solenoid (red) has an approximate resistance value of $180\ \Omega$ and can be checked on the main control board J18 to J7-9. The water dispenser solenoid (blue) has an approximate resistance value of $320\ \Omega$ can be checked from J7-3 to J7-9.

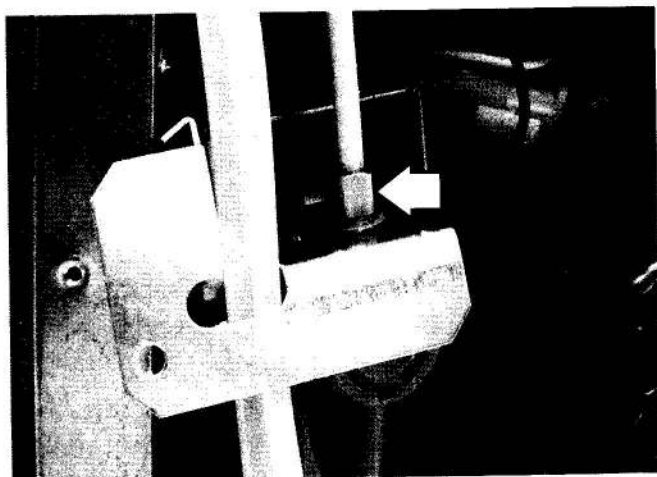
To remove the water valve:

1. Shut off the water supply to the unit.
2. Remove the 1/4-in. hex-head screw that attaches the water valve bracket to the cabinet.
3. Lift and unhook the valve from the cabinet.

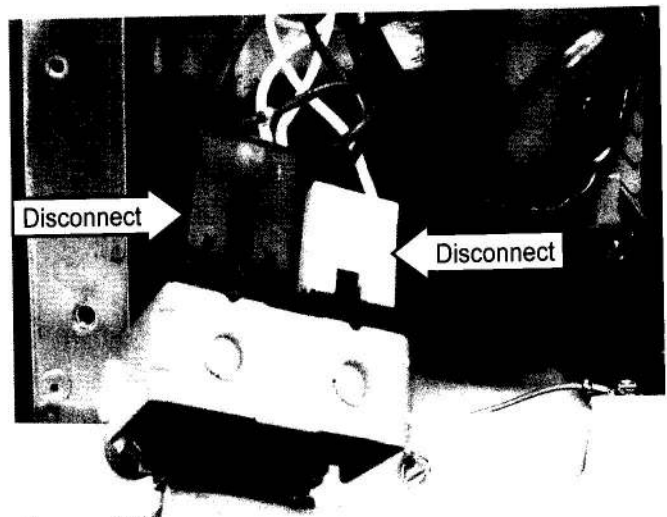


Note: In the following steps, some water may drain from the disconnected tubing. Use care to avoid water spills.

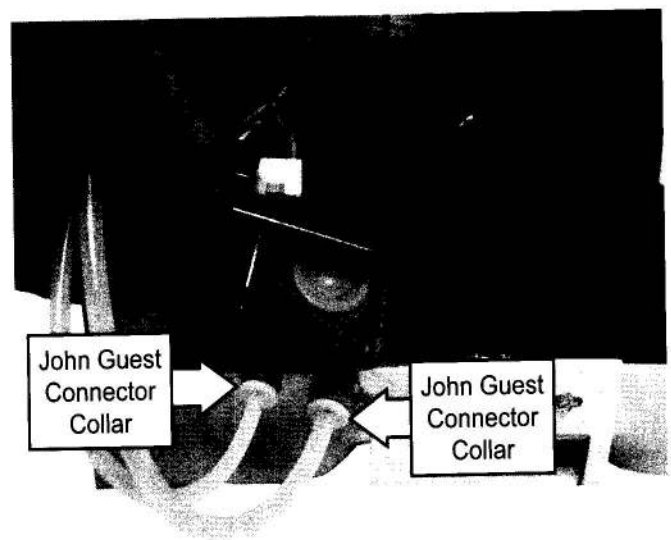
4. Remove the 1/2-in. nut and the water inlet tube.



5. Disconnect both wiring harnesses from the valve.



6. Press the John Guest connector collar and remove each outlet tube from the water valve.

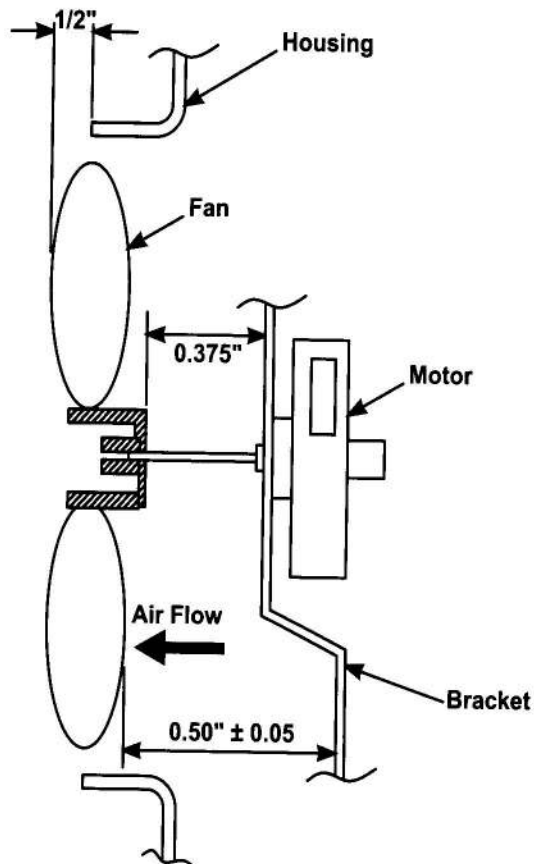
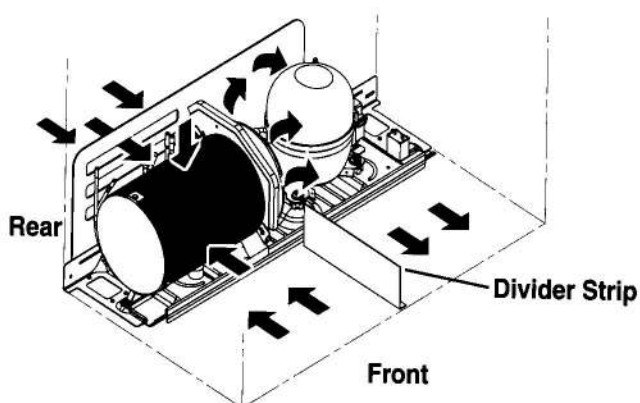


Condenser Fan

The fan is mounted in the machine compartment with the no-clean condenser. The fan and fan shroud are mounted on one end of the condenser, and the other end of the condenser is blocked.

When the fan is operating, air is pulled from the center of the condenser, drawing air in through the coils. The air is then exhausted over the compressor and out the right side of the refrigerator.

Inlet air is available through the left front and left rear of the machine compartment. A rubber divider strip underneath the refrigerator divides the inlet and outlet sides of the machine compartment.



The rear access cover must be tightly fitted to prevent air from being exhausted directly out of the rear of the machine compartment, bypassing the compressor.

The condenser fan is mounted with screws to a fan shroud and mounting bracket that is attached to the condenser. To access the condenser fan motor, disconnect power from the refrigerator and remove the machine compartment cover.

Use one of the two following methods to remove the condenser fan motor from the refrigerator:

Method #1

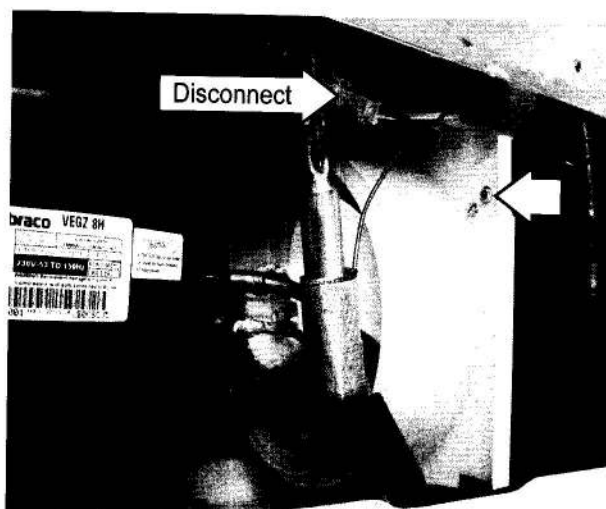
1. Disconnect the condenser fan harness, and then remove the 1/4-in. hex-head screw from the upper corner (closest to you).
2. Pull the shroud assembly slightly to disengage from the mounting tab.

Note: In the following step, adequate clearance may not exist to easily pull the assembly out. It may be necessary to reverse steps 1 and 2, and then proceed to method #2.

3. Tilt the shroud assembly towards the compressor and gently pull the assembly out.

Method #2

1. Pull the condenser fan blade off the motor shaft.
2. Remove the two 1/4-in. hex-head screws that hold the mounting bracket together.
3. Remove the front mounting bracket and note the position of the grommet.
4. Disconnect the condenser fan harness, remove the wire harness from the fan shroud clips, and then remove the fan motor.



Condenser fan speed corresponds with compressor speed (low, medium, high) to minimize pressure variations in the sealed system except when the freezer temperature is 20°F above the set point. If this condition exists (such as during initial startup), the condenser fan operates at super high speed while the compressor operates at medium speed.

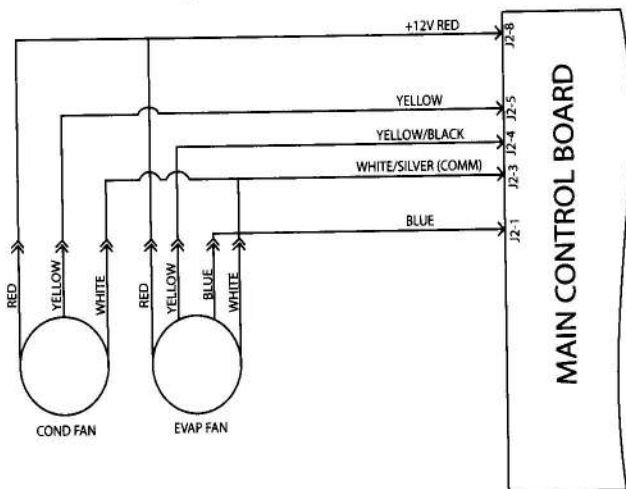
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Supply voltage from the main control board (J2-8 to J2-3) remains at a constant 13.6 VDC.

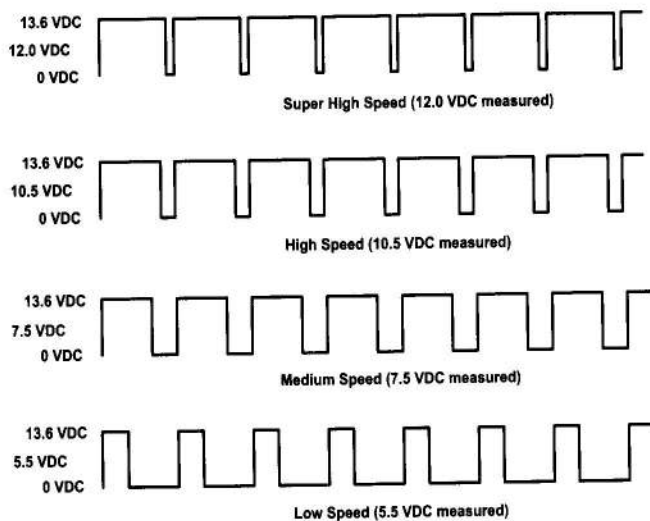
The speed of the fan is controlled by the signal voltage output from the main control board (J2-5 to J2-3). Voltage output from the control board to the fan is 13.6 VDC; however, to regulate the speed of the fan, the main control board uses pulse width modulation (PWM).

When operating, voltage is sent in pulses (much like a duty cycle) as opposed to an uninterrupted flow. This pulsing of 13.6 VDC produces effective voltage being received at the motor, that is equivalent to a reduction in voltage.

Fan speed is selected and maintained by the main control board regulating the length and frequency of the 13.6 VDC pulse.



Temperature can cause some fan speed variation. Fan speed can vary +/- 5%, depending on the temperature, with higher temperatures causing slightly higher speeds.



Voltage can be checked on the fan harness:

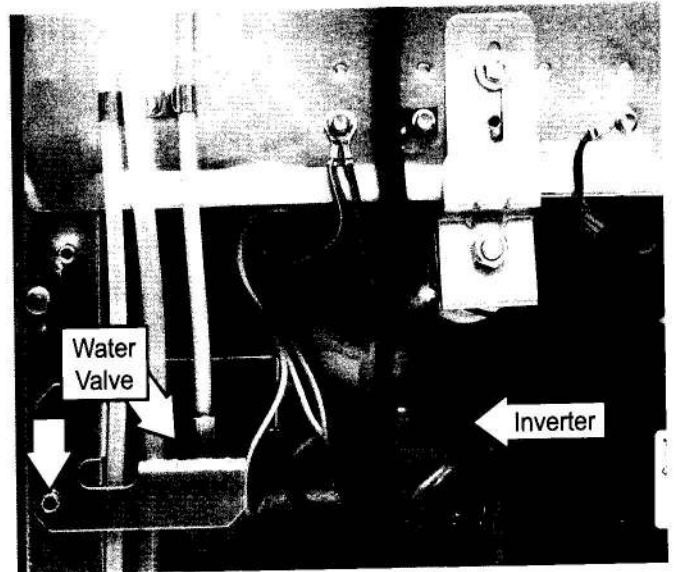
- Supply voltage (red and white wires) = 13.6 VDC
- Signal voltage (yellow and white wires) = 5.5 - 12 VDC, depending on speed of fan.

Inverter

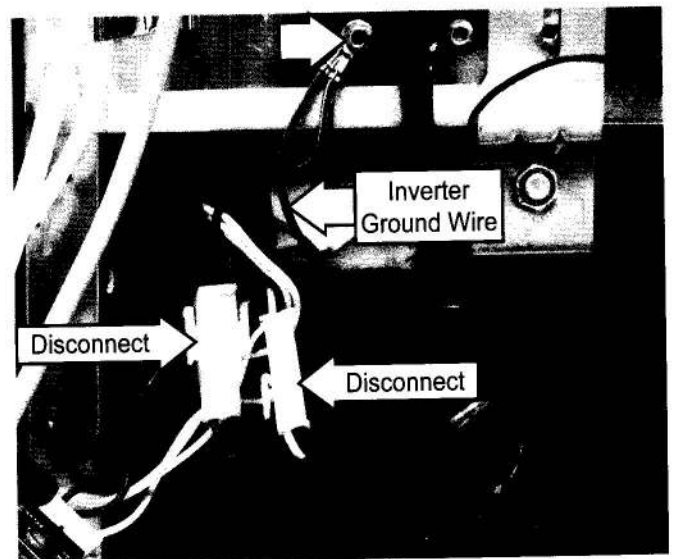
The inverter is accessed from the back of the refrigerator and is located on the left side of the compressor behind the water valve. The water valve must be removed to access the inverter.

To remove the inverter:

1. Remove the 1/4-in. hex-head screw that holds the water valve to the cabinet.



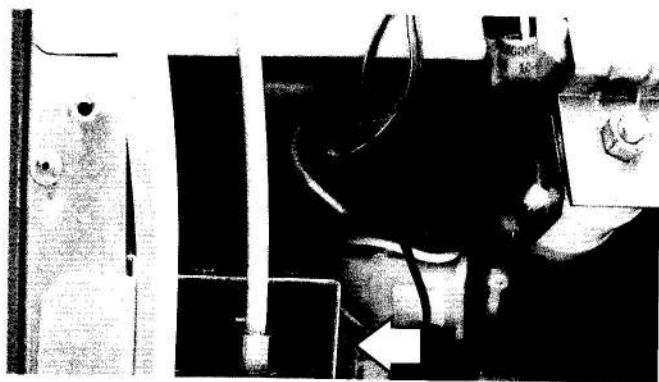
2. Carefully pull the water valve out from the cabinet.
3. Disconnect the 2 wire harnesses to the inverter.
4. Remove the 1/4-in. hex-head screw and the inverter ground wire from the cabinet.



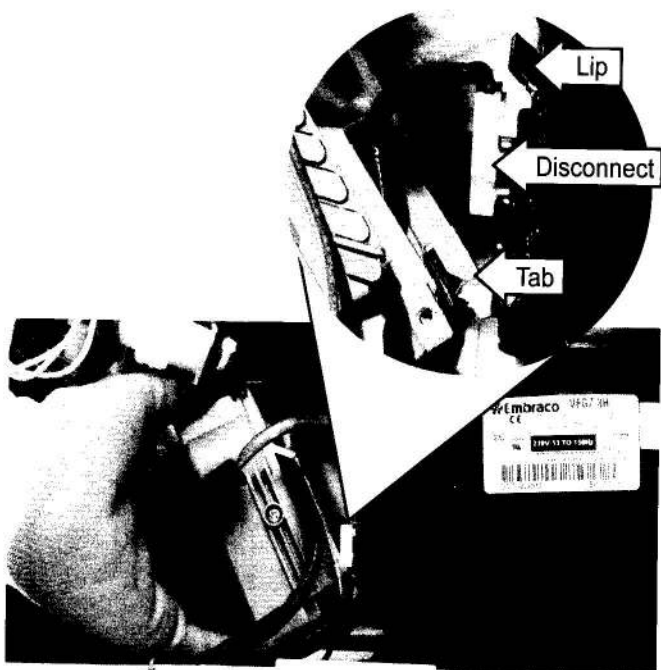
Note: The inverter is attached to the compressor by a lip above the compressor terminals, a tab (located at the bottom rear corner), and a Phillips-head screw.

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5. Remove the Phillips-head screw from the inverter.



6. Lift and rotate the inverter counterclockwise.
7. Disconnect the compressor harness from the compressor terminals.



WARNING: When the refrigerator is plugged in, 120 VAC is always present at the inverter.

Note: Certain voltmeters will not be able to read voltage output from the inverter. If no voltage or erratic voltage is measured, it does not necessarily indicate a faulty inverter.

The inverter receives 120 VAC line-in from the power supply. The inverter converts this single-phase, 60 Hz, 120 VAC into 3-phase, 240 VAC, with frequency variations between 57 Hz and 104 Hz. This voltage is delivered to the compressor through 3 lead wires. Each wire will carry identical voltage and frequency.

Note: The compressor leads must be connected to measure voltage output. If the compressor wires are not connected, or if an open occurs in 1 of the 3 lead wires or in the compressor, the inverter will stop voltage output.

When checking inverter voltage output, connect the test-meter leads to any 2 of the 3 compressor lead wires at the inverter plug (plug should be connected). The same reading should be measured between any 2 of the 3 wires.

The inverter controls compressor speed by frequency variation and by Pulse Width Modulation (PWM). Changing frequency and PWM will cause an effective voltage between 80 and 240 VAC to be received at the compressor.

- Low speed (1710 rpm) - 57 Hz
- Medium speed (2100 rpm) - 70 Hz
- High speed (3120 rpm) - 104 Hz

The inverter receives commands from the main control board. The main control board will send a PWM run signal from the J15 connector of 4-6 VDC effective voltage to the inverter (all wires must be connected). The inverter will select compressor speed (voltage output) based on this signal.

The main control board will only send a run signal to the inverter when the compressor should be on.

Note: When measuring signal voltage (from the main control board) at the inverter, a reading of 4-6 VDC will be measured with all wires connected. If the inverter wiring is disconnected, the board output will measure between 10-12 VDC.

The inverter will monitor compressor operation. If the compressor fails to start or excessive current draw (4 amps maximum) is detected, the inverter will briefly stop voltage output. The inverter will then make 12 consecutive compressor start attempts (once every 12 seconds). If the compressor has not started after 12 attempts, an 8-minute count will initiate. After the 8-minute count, the inverter will attempt to start the compressor again. If the compressor starts, normal operation will resume. If the compressor fails to start, this process will be repeated. Removing power to the unit will reset the inverter count. When power is restored, the inverter will attempt to start the compressor within 8 minutes.

The inverter has a built-in circuit protection to guard against damage from a failed or shorted compressor. However, if a failed compressor is diagnosed, order a new compressor and inverter. If the compressor fails to start after replacement, replace the inverter.

Inverter Compressor

Caution: Do not attempt to direct-start the compressor. The compressor operates on a 3-phase power supply. Applying 120 VAC to the compressor will permanently damage the unit. It is not possible to start the compressor without an inverter.

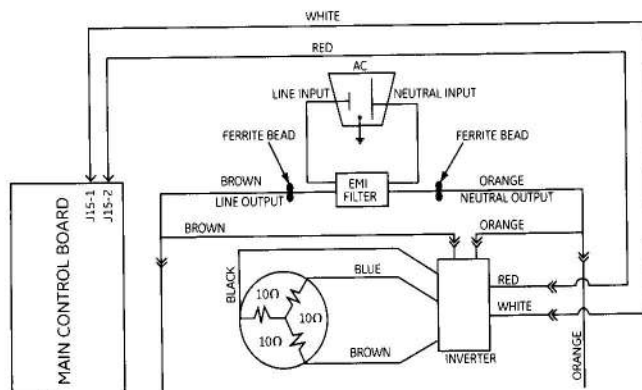
The compressor is a reciprocating, variable-speed, 4-pole type. It operates on 3-phase, 80 to 240 VAC within a range of 57 to 104 Hz.

Note: Certain voltmeters will not be able to read voltage output or frequency from the inverter.

Compressor wattages at various speeds are:

- LOW - 65 watts
- MED - 100 watts
- HIGH - 150 watts

The compressor is controlled by the inverter, which receives its signal from the main control board. Varying the frequency to the inverter changes the compressor speed.



Compressor speed is based on the temperature set point in conjunction with the specific cabinet temperature. Speeds are selected according to the following cabinet temperatures, with freezer temperature being the primary:

- 7°F to 19.5°F above freezer set point = high speed.
- 4.5°F to 6.5°F above freezer set point = medium speed.
- 1°F to 4°F above freezer set point = low speed.
- 1°F to 2.5°F above refrigerator set point = low speed.

- 3°F to 5°F above refrigerator set point - medium speed.
- 5.5°F to 7°F above refrigerator set point - high speed.

Note: The compressor will run at medium speed if the freezer temperature is 20°F or more above the setpoint.

The use of 3-phase power eliminates the need for the relay, capacitor, and individual start and run windings; therefore, the start, run, and common pins found on conventional compressors are not applicable on this 3-phase model. Compressor pin functions are identical and compressor lead wire configuration is of no importance. A resistance of 9 Ω to 11 Ω should be read between any 2 of the 3 pins. Should an opening occur in the compressor winding or should one of the compressor lead wires become open or disconnected, the inverter will stop voltage output to the compressor.

Compressor operation is extremely smooth and cool. The compressor exterior may be slightly higher than room temperature while operating; therefore, it may be difficult to detect a running unit.

To verify that the compressor is running:

Disconnect power from the unit and place a hand on the compressor. Reconnect power and feel for a vibration when the compressor tries to start. It may take up to 8 seconds before the compressor attempts to start.

Note:

- When ordering a replacement compressor, order both the compressor and inverter. Replace the compressor first. If the compressor fails to start after compressor installation, replace the inverter.
- When servicing the compressor, it is important to dress the wiring to keep low voltage DC wiring and 120 VAC wiring separate.