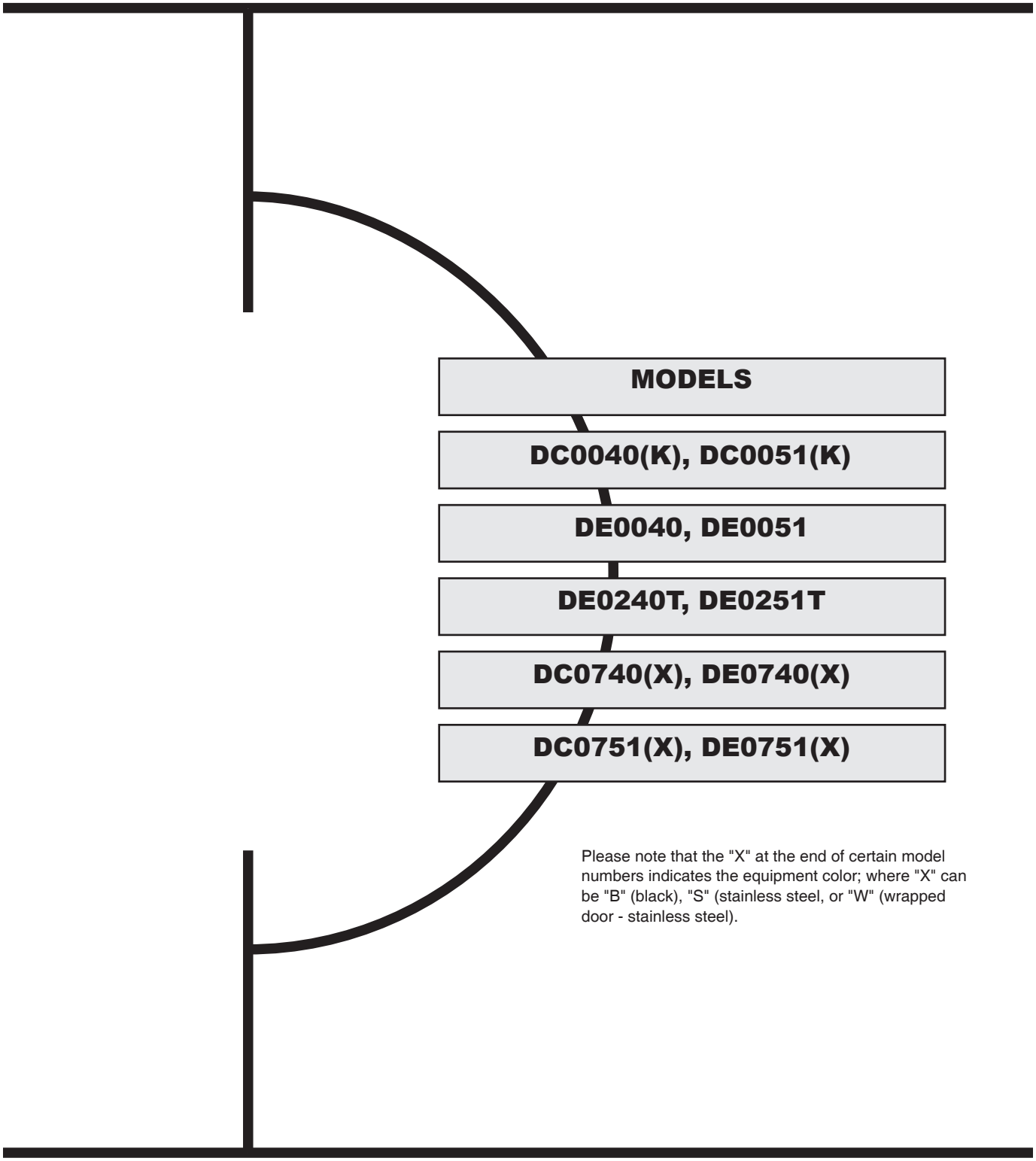
NORCOLD® INC.

Service Manual

DCXXXX, DEXXXX Model Compressor Refrigerators



Please note that the "X" at the end of certain model numbers indicates the equipment color; where "X" can be "B" (black), "S" (stainless steel, or "W" (wrapped door - stainless steel).

Part No. 631842A (08-08-07)

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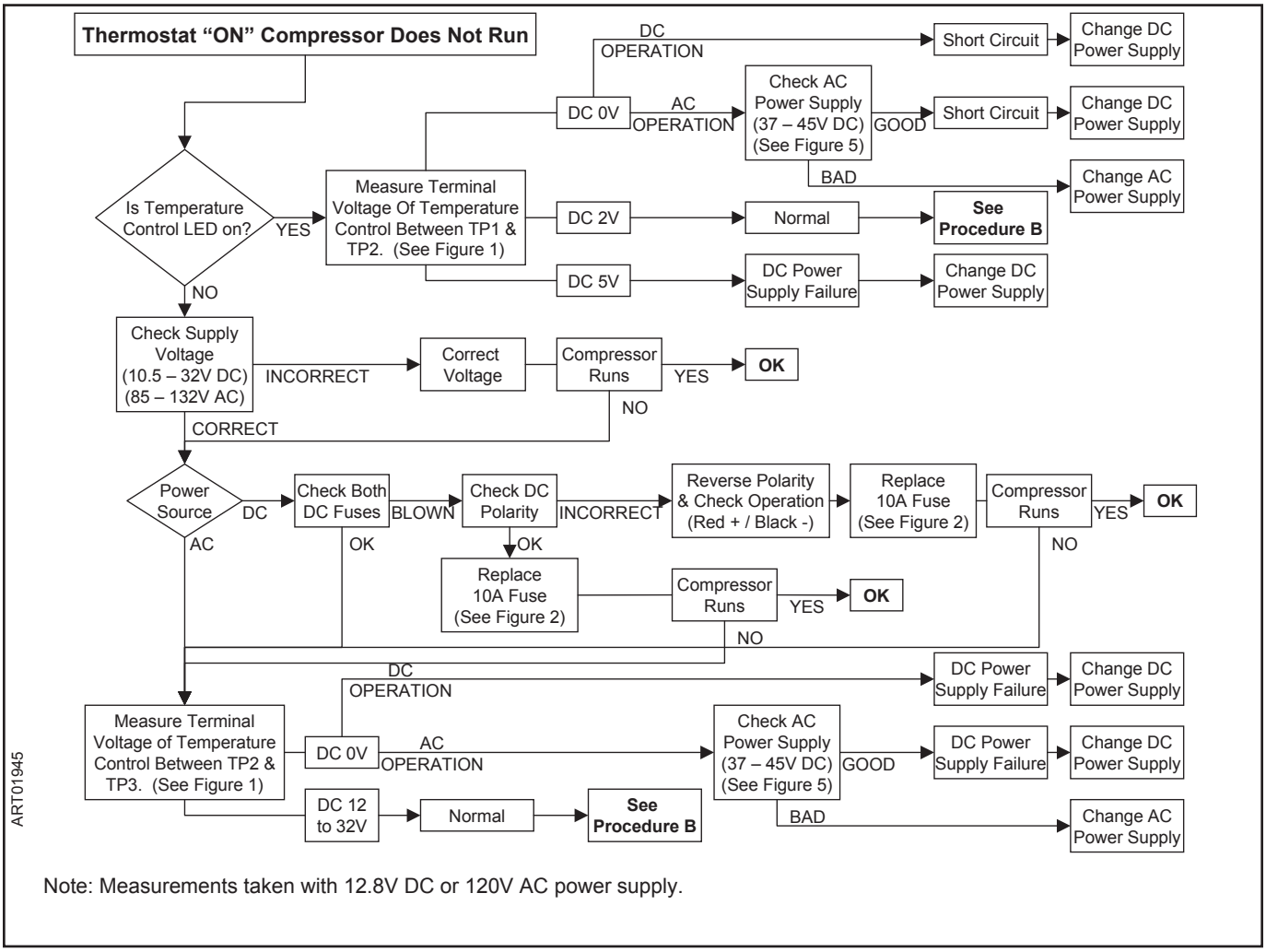
WARNING! Perform all tests using a fully charged 12V DC battery. Using other equipment that supplies DC voltage may cause permanent refrigerator component failure.

Troubleshooting - Procedure A

Compressor Doesn't Run with Thermostat "On"



Note: Measurements taken with 12.8V DC or 120V AC power supply.

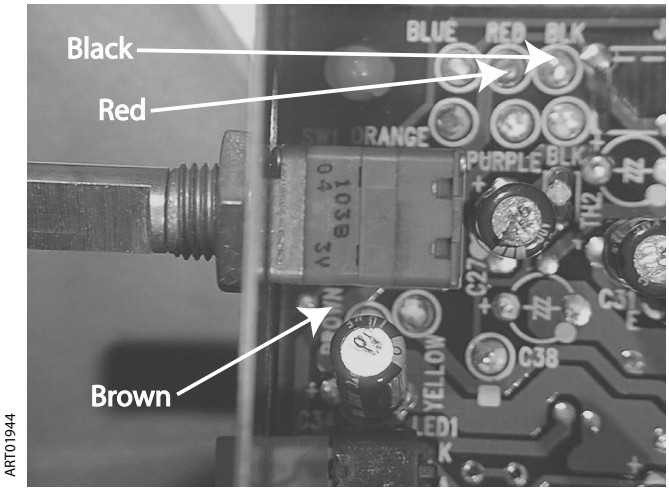


Figure 1. Temperature Control

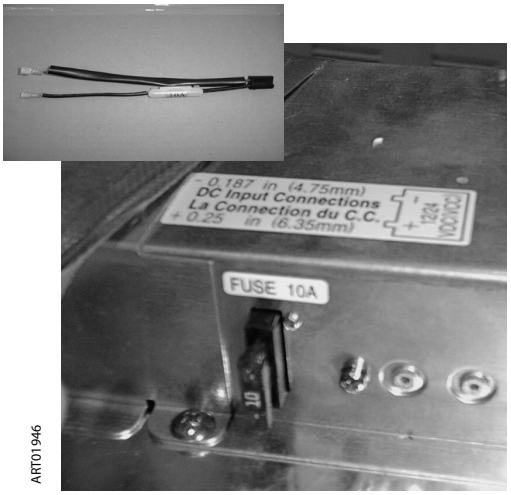
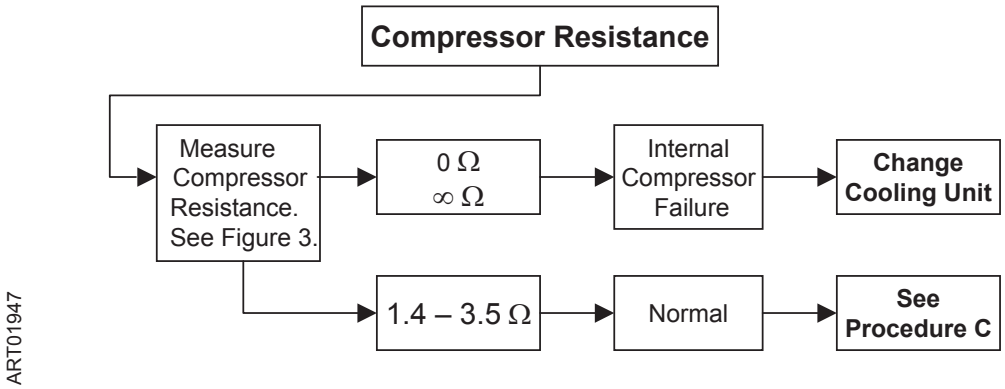


Figure 2. Fuse Locations

NOTE: If 10 Amp fuse is blown, check the vehicle's wiring.

Compressor Resistance



Note: Perform procedure at room temperature.

Measuring the Compressor Resistance

1. Turn the temperature control to the "Off" position.
2. Remove the black wire to the compressor.
3. Measure the resistance of the compressor between point A and point B. Refer to Figure 3.

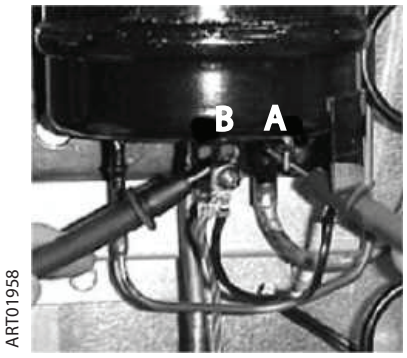
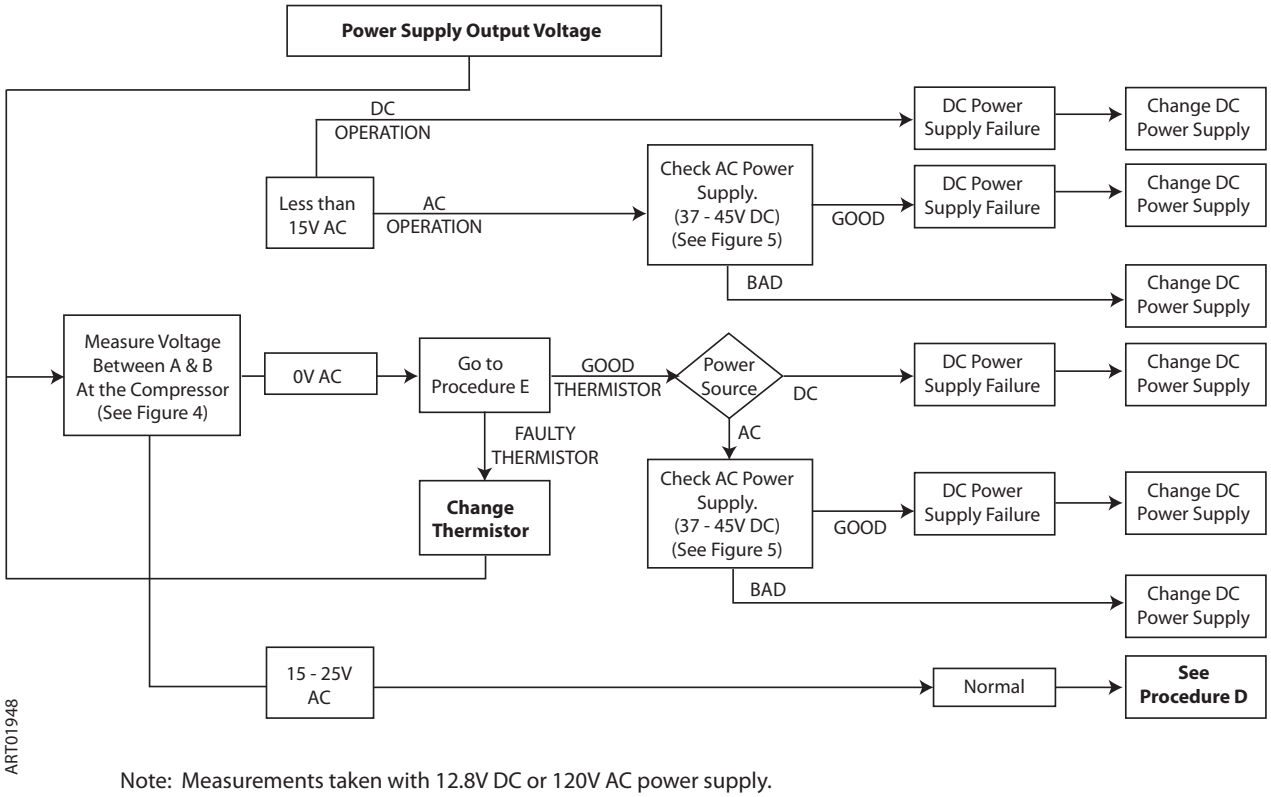


Figure 3. Measuring Compressor Resistance

Power Supply Output Voltage



Note: Measurements taken with 12.8V DC or 120V AC power supply.

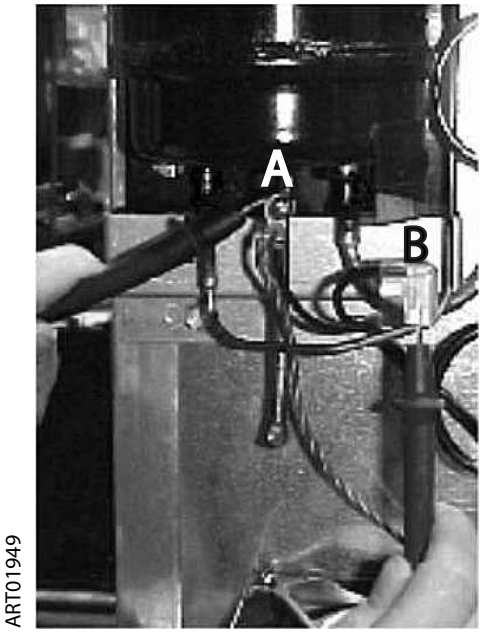


Figure 4. Measuring Power Supply Output Voltage

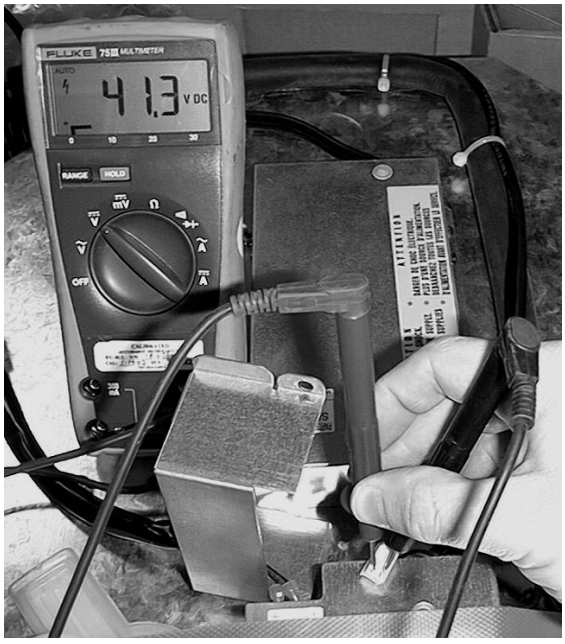
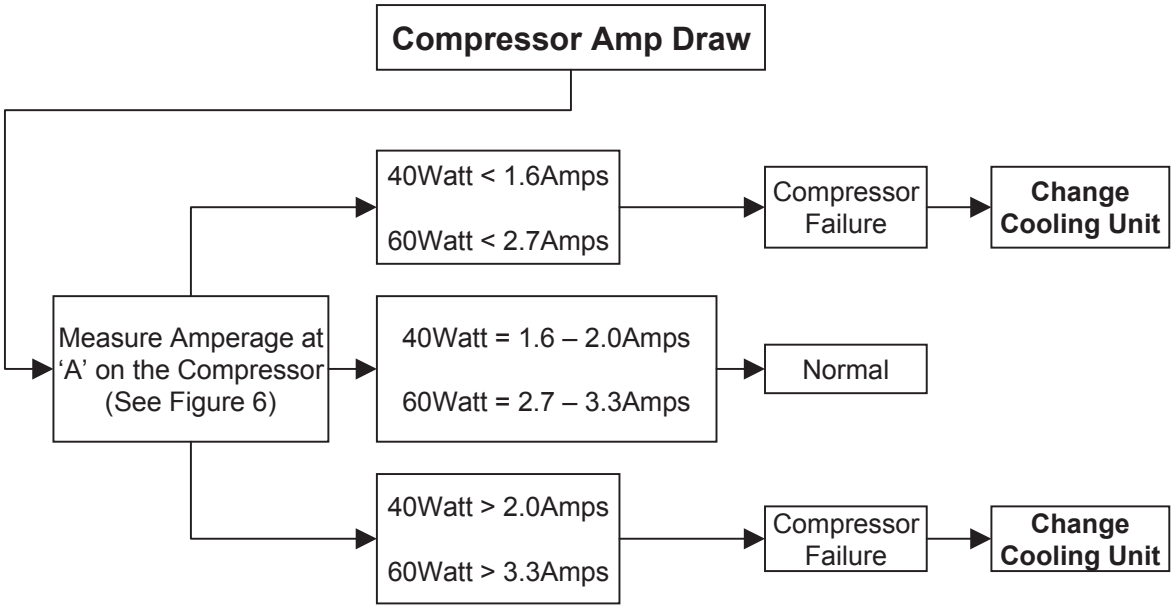


Figure 5. Measuring AC Power Supply Output

Measuring Compressor Amp Draw



Note: Measurements taken with 12.8V DC power supply.

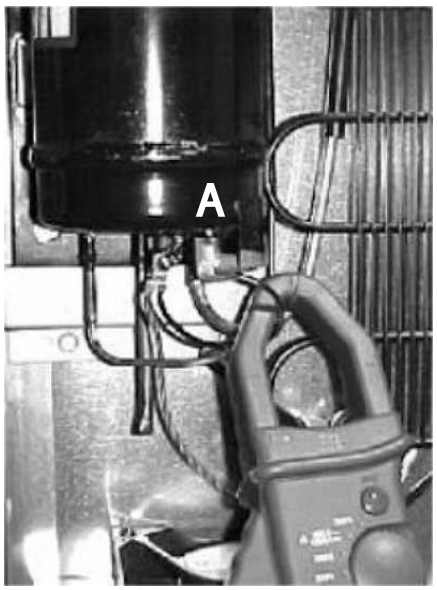


Figure 6. Measuring Compressor Amp Draw

Verifying Thermistor Operation

To measure the resistance of the evaporator thermistor, complete the following procedure.

1. Turn the temperature control to the "Off" position.
2. Disconnect the 3-pole connector. Refer to Figure 7.
3. Measure the resistance across the two pins. Refer to Figure 8.
4. Check the evaporator thermistor by measuring the temperature and resistance of the thermistor.

   Refer to Table 1 for a listing of acceptable resistance ranges.

   NOTE: In general, 1.6K - 29KΩ = good thermistor. ∞Ω = defective thermistor. An open thermistor will stop normal compressor operation. Replace the defective thermistor.

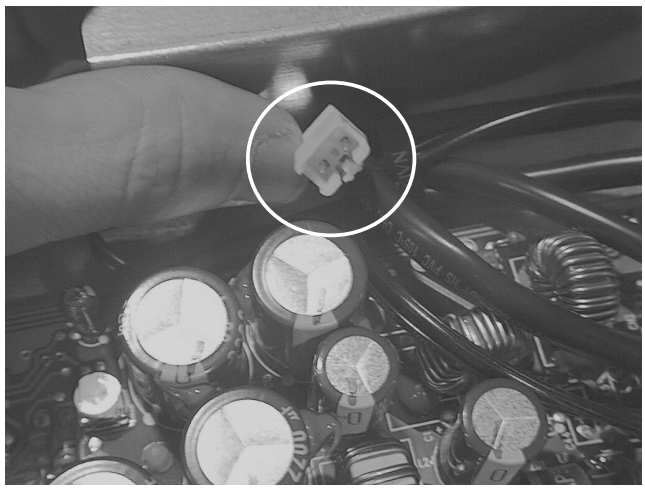


Figure 8. Measure Resistance Across Pins

Figure 7. Evaporator Thermistor Connection (Inside Power Supply)

Evaporator Thermistor Resistance			
Thermistor Temperature (°F)	Thermistor Temperature (°C)	Resistance	Allowable Resistance Range
0	-18	9.7 KΩ	8.7 - 10.7 KΩ
10	-12	7.8 KΩ	7.0 - 8.6 KΩ
20	-7	6.4 KΩ	5.7 - 7.0 KΩ
30	-1	5.3 KΩ	4.8 - 5.7 KΩ
40	4	4.5 KΩ	4.0 - 4.9 KΩ
50	10	3.6 KΩ	3.2 - 4.0 KΩ
60	16	2.8 KΩ	2.5 - 3.1 KΩ
70	21	2.1 KΩ	1.9 - 2.3 KΩ
80	27	1.9 KΩ	1.7 - 2.0 KΩ
90	32	1.8 KΩ	1.6 - 1.9 KΩ

Table 1. Evaporator Thermistor Resistance

Troubleshooting - Procedure F

Insufficient Cooling

NOTE: Check input voltage before proceeding. Refer to Procedure A.

If the compressor runs continuously, do the following:

- Check the voltage across the fan leads. There will be a slight voltage reading even if the fan isn't operational. The fan will only operate when the compressor is running, and the ambient temperature is sufficient to engage the fan. The operational voltage of the fan is between 17 and 22VDC. If this is present at the leads and the fan is not running, replace the fan.

CAUTION: When servicing the fan, do not short the wires. Shorting the wires will damage the power supply.

- Make sure that the ventilation vents are not blocked. Refer to Procedure I.
- Make sure that the auto shut-off device is operational. Refer to Procedure H.
- If the reason for insufficient cooling is not found, start with Procedure B.

Replace the cooling unit if:

- The compressor is hot to the touch and not vibrating.
- The compressor vibrates but there is no cooling.

Troubleshooting - Procedure G

Refrigerator is Too Cold

If the refrigerator is too cold, do the following:

- Adjust the temperature control to a lower setting. Number 1 is the warmest setting; number 5 is the coldest.
- Make sure that the thermistor is securely mounted to the evaporator plate.
- If you cannot determine a cause, refer to Procedure E.

Troubleshooting - Procedure H

Auto Shut-Off Device

NOTE: Only the 12/24V DC and DE/Truck models are equipped with the auto shut-off device within the power supply.

Operating the Shut-Off Device

To protect the cooling unit from overheating, the refrigerator will automatically shut-off when the ambient air temperature is approximately 110°F (43°C). If shut-off occurs, the refrigerator will sound an intermittent alarm tone. To stop the alarm, the refrigerator must be restarted using the following procedure:

1. Turn the temperature control counterclockwise to the "Off" position.
2. Turn the temperature control to the desired setting.

NOTE: The refrigerator will not restart until the ambient conditions allow for normal operation.

NOTE: To test the shut-off device's functionality, heat the device with a heat gun. Refer to Figure 9.

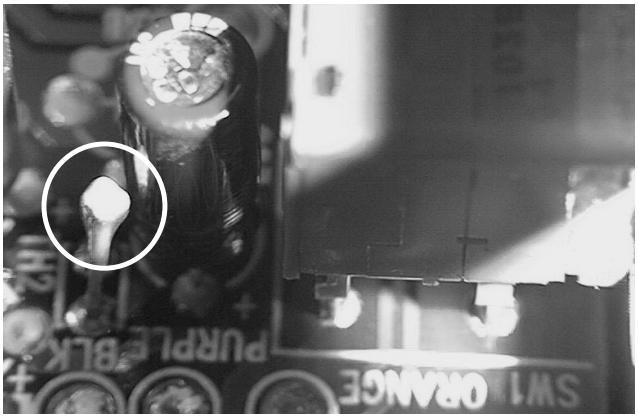


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Figure 9. High Temperature Shut-off Device

Proper Ventilation

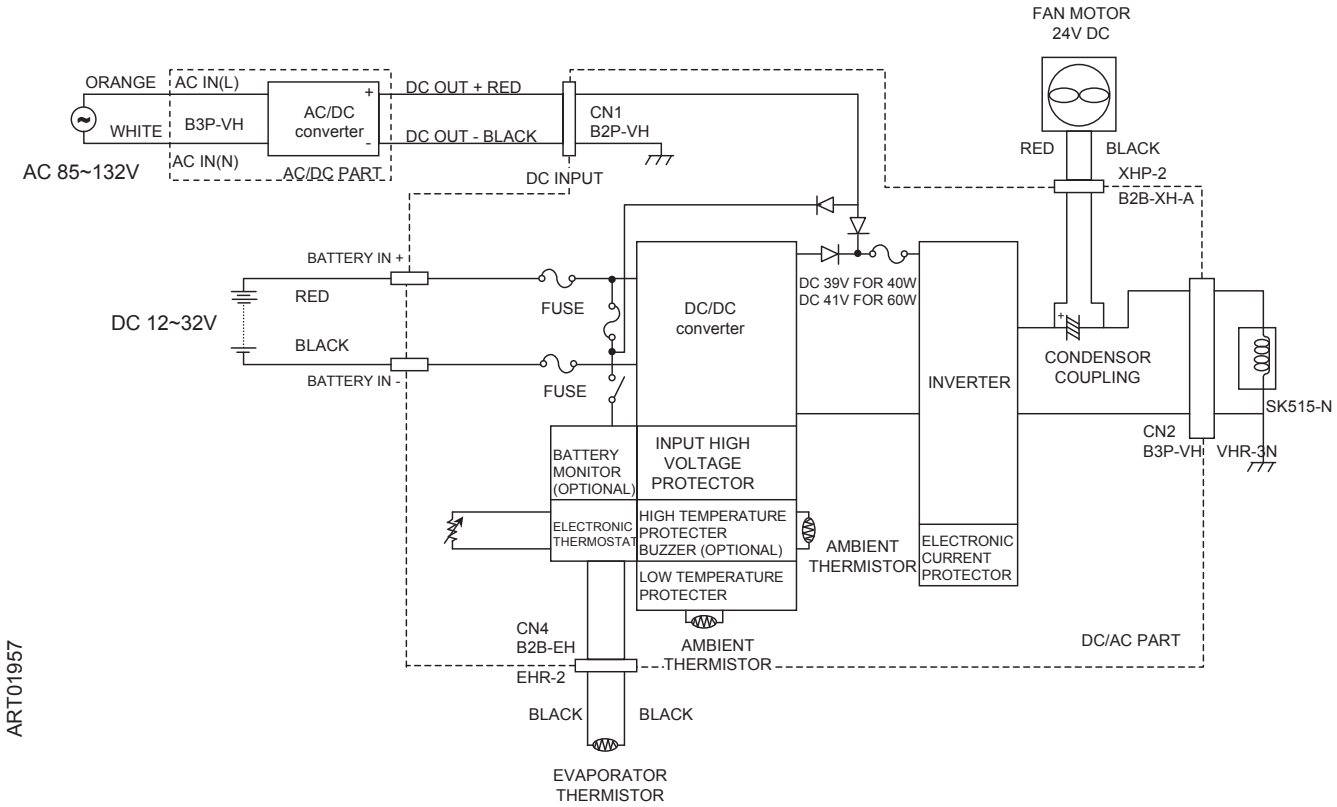
Ventilation is necessary for the correct operation of the refrigerator. Good ventilation also increases the life of the refrigerator's cooling system. The current models are equipped with built-in ventilation systems that draw cooler air through the lower intake vent. This air is then circulated over the cooling unit to remove excess heat from the cooling system. The heated air is then rejected through the upper vent. If this airflow is blocked or decreased, the refrigerator will not cool correctly.

CAUTION: Do not block the vents by closet or cabinet doors.

Reducing the vent area can cause the following:

- Shortened life of the refrigeration-cooling unit.
- Poor cooling performance of the refrigerator.
- Continuous operation of the refrigerator.
- Fast battery discharge.
- Voiding the refrigerator warranty.

Wiring Schematic



Quick Reference Troubleshooting Steps

1. Check for supply voltage at the rear of the refrigerator.
2. Turn the temperature control to the "On" position.

   The operating voltage should be between 10.5V and 32V DC. There will be some variation in these readings depending on the supply voltage.
3. Check the compressor voltage between points A and B. Voltage should be between 15V - 25V AC. Refer to Figure 10.

   If voltage is not within range, refer to Procedure C.
4. With the refrigerator power on, take an Ohm reading (1.4 - 3.5Ω) at the compressor between points A and B. Refer to Figure 11.

   If the Ohm reading is not within range, refer to Procedure B.
5. With the refrigerator power off, and the lead removed from point "A", take an Amp reading (1.6 - 3.3 Amps) at the black wire with the rubber boot. Refer to Figure 12. If amperage is not within range, refer to Procedure D.

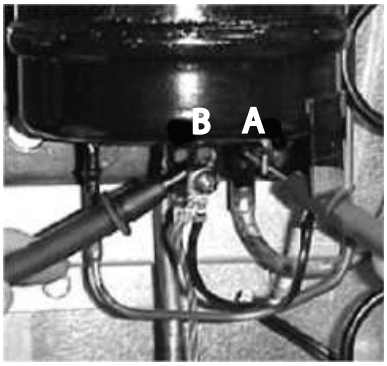


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Figure 11. Taking an Ohm Reading

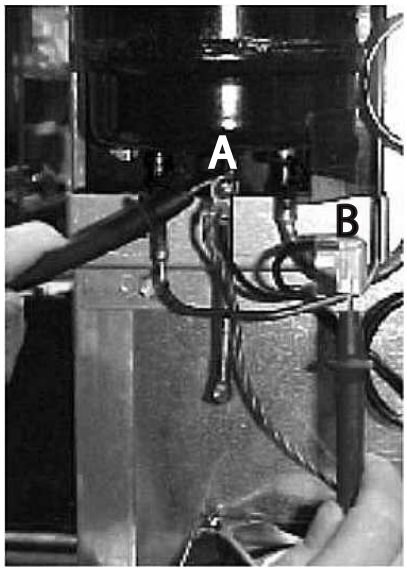

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Figure 10. Checking Compressor Voltage

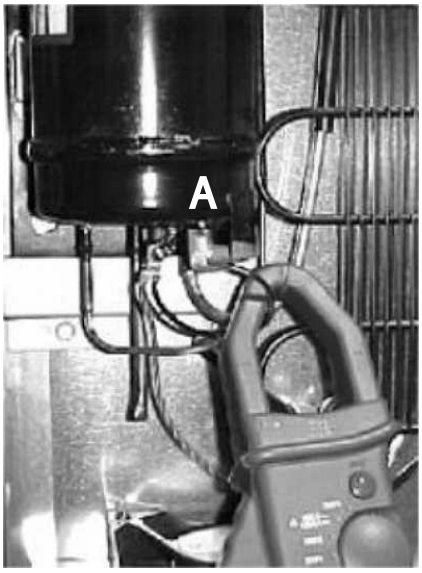

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Figure 12. Measuring the Amp Draw

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