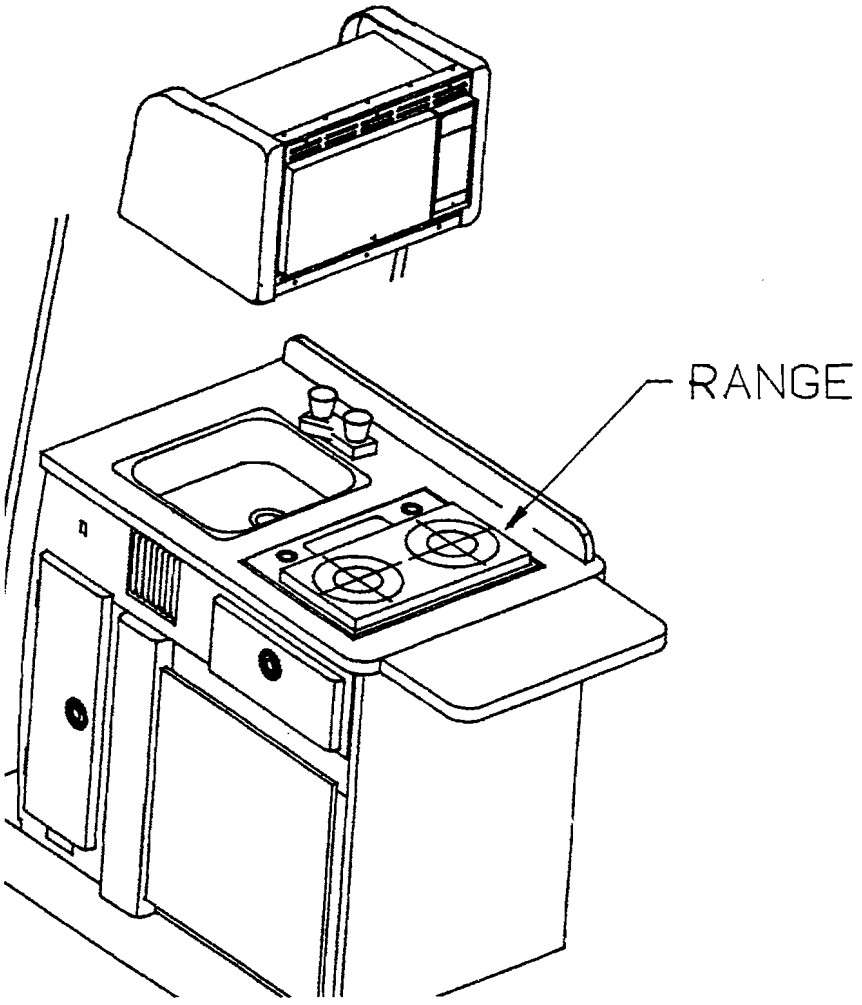
TABLE OF CONTENTS

SECTION 6
APPLIANCES



RANGE
The two-burner range is designed for cooking purposes only. DO NOT use as a heating device!

CAUTION: The range should NEVER be used to heat the interior of the vehicle. Failure to comply could result in physical injury or death.

OPERATION

The burner controls operate counterclockwise and must be pressed inward to turn on.

To ignite a burner:

1. Make sure gas supply is turned on at tank.
2. Light ignition source (match, etc.) and hold in position near burner.
3. Depress appropriate burner control down and rotate counterclockwise.

4. Once burner ignites, ignition source may be removed. Adjust flame to desired height by rotating control knob.

NOTE: The range does not utilize a pilot light, so the burners must be normally relit before each use.

Range Removal:

NOTE: For most maintenance and service procedures, it will NOT be necessary to remove the entire range, but only the range cook top. (See Steps 1 and 2.)

1. Remove range lid and remove grate by pulling upward.

CAUTION: Make certain grate is cool before touching.

2. Loosen and remove two cook top retaining screws. Remove cook top.
3. Turn "off" LP at tank. Disconnect LP line at range LP regulator.
4. Remove four (4) range retaining screws. Remove range by lifting up and sliding toward front of vehicle to clear LP line.

CAUTION: Exercise extreme care so as NOT to kink or deform the copper tube.

Range Replacement:

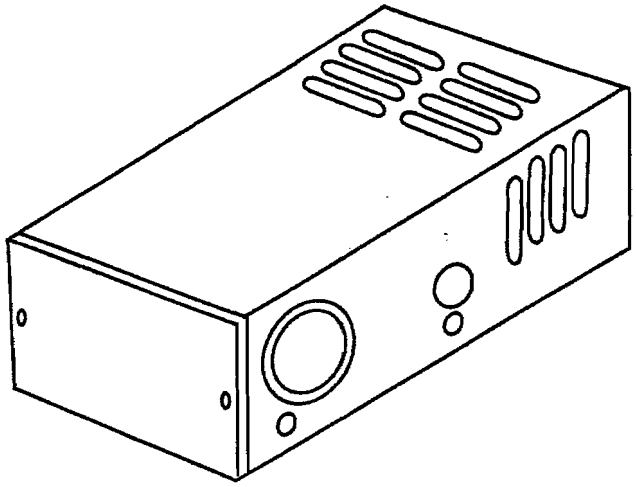
1. Position range into counter top opening.

CAUTION: Exercise extreme care so as NOT to kink or deform copper tube.

2. Carefully position LP line into range regulator. Install and tighten four (4) range retaining screws.
3. Tighten LP line connector at range regulator. Turn on gas supply at tank and leak test connections. See "Soapy Solution Leak Test" in Liquid Propane System section.
4. Install cook top and secure with two retaining screws.
5. Install grate into cook top.

Main Index Section Index Print

FURNACE



The furnace installed in the Rialta is classified as a Forced Draft Furnace. A forced draft furnace utilizes a sealed combustion chamber which is vented to the outside atmosphere. The intake air for combustion is also taken from outdoors and is completely isolated from the exhaust. A motor is used to drive an impeller wheel to draw intake air into the chamber to support combustion and force the exhaust gases through the furnace chamber to the outside atmosphere. A second impeller wheel (driven by the same motor yet totally isolated from the combustion air) is used to circulate room air across the furnace chamber where it is heated. The blower then forces the hot air into the living area.

There are several differences between the forced air furnace in the Rialta and most central furnaces designed for residential use. The major difference is that in a forced draft combustion furnace, a separate combustion air blower must deliver a predetermined volume of air into the burner chamber before ignition of the main burner can occur. Once the main burner flame is established, it is sustained by the air supplied by the blower.

The vehicle's furnace operates on 12-volt DC current which is supplied by the 12-volt battery and converter.

The forced draft combustion furnace is designed for use with Liquefied Petroleum (LP) Gas. The operating pressure is between 10.5" - 13.0" of water column.

The operation of the forced draft combustion furnace is controlled through a 12-volt thermostat. When the thermostat is set above room ambient, the contacts close completing a circuit through the coil of the time delay relay. The contacts on the relay then close, completing a circuit through the windings of the motor and the motor comes on.

As the motor reaches approximately 75% of its normal rpm, the airflow generated by the room air blower pushes against the paddle on the sail switch (sometimes referred to as a micro switch) sailing it in and closing the contacts. A circuit is then completed through a high temperature limit switch to the module board on a direct ignition furnace.

On a direct ignition furnace, as current passes through the ignition module to the valve, a high-voltage spark is produced at the electrode assembly located over the burner. Simultaneously, the valve opens, gas flows into the burner and is ignited by the spark.

Direct ignition furnaces must have a flame sensing circuit through the control module which senses the presence of main burner flame. If proper flame sensing is not obtained or if the burner fails to light (on certain models after third attempt), the furnace must go into 100% lockout. When lockout occurs, the valve closes and will remain closed until the thermostat circuit is broken. Reignition will not occur automatically. If it could, it would not be 100% lockout.

While 100% lockout is a safety factor, it can prove to be frustrating for a vehicle owner who has experienced lockout problems. Not only can a lockout problem be difficult at times to diagnose, it will result in continuous operation of the furnace blower (that is, until the thermostat circuit is broken) and can drain the battery if the owner is not in the vehicle. The solution for this complaint is not to try and eliminate the lockout function of the furnace, but rather to find the cause for lockout, and correct it.

The motor circuit contains a time delay relay. The purpose of a time delay relay is to provide a means of the blower operation on initial startup and after the thermostat is satisfied. When the thermostat contacts open, the circuit through the coil of the time delay relay is broken and the contacts open after approximately 3-5 minutes, depending on the furnace model.

Main Index Section Index Print

ELECTRONIC IGNITION

The electronic ignition system is made up of three main parts: the module board, the electrode assembly, and the electrode wire. The module board is the brain of the electronic ignition system and it has several functions.

1. When the blower reaches approximately 75% of the normal rpm and sufficient airflow is established, the sail switch engages and completes a 12-volt circuit through the limit switch to the module board. (NOTE: Low voltage power supply will not provide sufficient motor rpm to engage the sail switch.)

2. After a 12-18 second delay, 12-volt current will pass through the module board to the solenoid valve. The current to the valve opens it and allows gas to the main burner, simultaneously, the module board sends high- voltage through the electrode wire to the electrode assembly. The voltage seeks a ground between electrode and ground probe and a spark occurs. The spark then ignites the main burner.

3. The module board also performs the lockout function in cases where the spark fails to light the burner. When lockout occurs, the spark stops, the voltage from the module board to the gas valve is discontinued, and the valve closes. The unit will remain in lockout and the blower will continue to run until the thermostat is turned off. (NOTE: Some models are equipped with a 3-try ignition module board and will go through three tries automatically before lockout function occurs.) Turning the thermostat off disengages the lockout function of the module board. After the blower has stopped, the ignition sequence can be started again.

MAINTENANCE

Preventative maintenance is essential if the vehicle owner is to have reliable, safe operation of his furnace. By far, the two most important areas to watch closely in order to assure safe, reliable operation, are the venting and the main burner.

An obstruction in the vent or main burner will reduce the intake of combustion air which results in incomplete combustion. Whenever incomplete combustion occurs, the by-products are carbon monoxide (CO) and soot. If the furnace outside exhaust vent shows black soot may be forming, the furnace should not be operated until the problem is corrected. Possible causes are air restriction combustion air, low gas pressure, dirty burner, slow motor, low voltage, etc.

If operation of the furnace continues under these conditions, it could result in serious injury to the occupants of the vehicle or even death.

Cleaning of the main burner and an inspection of the venting system should be done at least once a year, preferably just before the beginning of the heating season. Some vehicle owners and service personnel have the false assumption that if a furnace has not been used, it will not require cleaning. NOT SO! A furnace which has not been used for some time could be more in need of cleaning than a furnace which has been used extensively.

Dust and lint should be removed from the room air blower wheel and sail switch. A buildup of dust and lint on the blower wheel can cause the motor to drag and not generate enough airflow to engage the sail switch. Dust accumulation on the sail switch will restrict the travel of the actuator arm to where the airflow across the paddle will not sail it in and complete the valve circuit.

A yearly inspection should be made of all gaskets on the furnace. If any gaskets show signs of leakage or deterioration, they must be replaced to assure proper pressurization of the sealed combustion chamber.

The motor used on the Rialta's furnace is permanently lubricated and does not require oiling.

Main Index Section Index Print

TROUBLESHOOTING

SAFETY

As a part of repairing any gas appliance, be certain to check all gas connections both inside and outside the appliance (furnace) with a proper leak check solution or a leak detector before returning the equipment to service. Also make certain the furnace operation and functions are in accordance with the written instructions supplied with each furnace.

CAUTIONS

1. Never operate the furnace with the electrode wire disconnected nor with the electrode assembly removed from the furnace.

2. Never use a battery charger to checkout an electronic ignition furnace - use a 12-volt battery.

3. Never use a screwdriver on any part of the electrode assembly while the furnace is in operation.

4. Be sure the electrode assembly screws are snug at all times, especially after the electrode has been removed and reinstalled.

5. If the module board is found to be defective, it must be replaced - it is not field repairable. Any attempts to repair the board may alter the board and cause it to operate in an unsatisfactory manner.

6. Ensure that the gap between electrode and ground is always 1/8". The gap between the ground and the flame sensor should be approximately twice the gap between electrode and ground to ensure no sparking to sensor. Sparking to sensor will damage the module board (see Figure 14).

TYPE GAS PROPANE	SERVICE TOOLS REQUIRED
Line Pressure: Minimum 11" WC*, Maximum 14" WC Operating Pressure: Minimum 105" WC, Maximum 13.5" WC *WC - water column	Manometer gauge Voltage multimeter Phillips screwdriver 1/8" Allen wrench 8" length 1" open-end wrench Gas leak detector or approved leak check solution Channel lock pliers Module board tester (Fenwall tester)

Furnaces With Direct Spark Ignition:

Each step in this operation must be completed in the listed order before the next function will occur. To properly diagnose a malfunction and correct it, it must be determined at what step the operation of the furnace failed.

1. When the temperature drops to a set temperature, the wall thermostat contacts close.

2. The fan relay coil is energized in the thermostat relay, completing the circuit to the blower motor. (Some models equipped with a time delay relay have a 5-25 second time delay after the thermostat contacts close).

3. The motor starts and, after reaching 75% of its normal rpm, the room air blower wheel or blade activates the sail switch micro switch), sending current to the temperature limit switch (a normally closed switch), and on to the module board.

4. When energized, the module board has a built-in 15-20 second delay, allowing the combustion air to purge the combustion chamber.

5. The module board supplies a high-voltage spark through high tension wire to the electrode assembly, at the same time sending voltage to the gas valve, opening the valve.

6. Burner ignites.

7. The sensor probe signals the presence of flame and the spark stops. (If flame is not established within 7 seconds, the system closes the gas valve and goes into lockout).

8. The gas valve closes when either the limit switch or thermostat contacts open.

9. The blower motor goes off when the time delay relay opens.

Do not use a battery charger to power or test the furnace, as they sometimes provide more than the 14.5-volts DC that will damage the control module board.

All testing and repair should be done by qualified personnel only. Do not use a screwdriver or touch any part of the electrode assembly while the furnace is running.

Do not operate the furnace with the high-tension lead wire disconnected or the electrode assembly removed from the burner access plate.

Do not perform any high-pot tests on this furnace!

Main Index Section Index Print

TROUBLESHOOTING

Condition	Course of Action
1. Thermostat is calling for heat, but blower will not run.	1. Check for 12-volts DC on red wire at furnace wire harness connector. Are 12 volts present? (Yes) Proceed to Step 2. (No) Trace circuit back to power source to determine cause of voltage loss. 2. Check wall thermostat for continuity. With thermostat contacts closed, check for 12-volts DC on single blue wire on furnace side of wire harness connector. Are 12 volts present? (Yes) Proceed to Step 3. (No) Trace back circuit to determine cause of voltage loss. Repair or replace as necessary. *3. With thermostat contacts closed, check for 12-volts DC on red wire at blower motor. Are 12 volts present? (Yes) Proceed to Step 4. (No) Proceed to Step 5. *4. Jumper a wire from ground terminal on blower motor to a known good ground, with thermostat contacts closed. Does blower motor operate? (Yes) Repair or replace defective ground wire. (No) Replace defective motor. *5. With thermostat contacts closed, check for 12-volts DC on red wire to blower motor at time delay relay. Are 12 volts present? (Yes) Repair or replace defective wire to motor. (No) Proceed to Step 6. 6. Check for 12-volts DC on red wire from wire harness connector at time delay relay. Are 12 volts present? (Yes) Proceed to Step 7. (No) Trace circuit back to power source to determine cause of power loss. Repair as necessary. 7. With thermostat contacts closed, check for 12-volts DC on brown wire at time delay relay. Are 12 volts present? (Yes) Proceed to Step 8. (No) Trace circuit back to thermostat to determine cause of voltage loss. Repair as necessary. 8. With thermostat contacts closed, jumper a wire to the ground terminal on the time delay relay (where green wire attaches) to a known good ground. Does motor operate? (Yes) Repair or replace defective ground wire. (No) Replace defective relay. * Allow 3-10 seconds for circuit to motor to be energized as time delay relay coil must heat up to close contacts.

Condition	Course of Action
2. Blower is noisy.	1. Visually inspect the room air blower wheel. Is there any lint or debris on the blower wheel or damage to the wheel? (Yes) Clean and repair or replace as necessary. (No) Proceed to Step 2. 2. Refer to appropriate wiring diagram. Check for proper polarity at motor. If polarity is reversed, motor will whine and run backwards. Is polarity correct? (Yes) Proceed to Step 3. (No) Repair as necessary. 3. Check combustion air housing and wheel. Remove combustion air housing cover. Inspect for foreign material. Is wheel clean and free of debris? (Yes) Proceed to Step 4. (No) Clean as necessary. 4. Inspect combustion air wheel for warpage. Does wheel pass inspection? (Yes) Proceed to Step 5. (No) Replace wheel. 5. Inspect housings for evidence of wheels rubbing. Adjust wheels as necessary by using a T-Handle 1/8"-Allen wrench and a 90° angle 1/8"- Allen wrench. If noise persists, check motor for worn bushings and check wheels for balance. Replace as necessary.

Main Index Section Index Print

Condition	Course of Action
3. Blower runs, but burner does not ignite.	1. Is sparking audible during the ignition cycle? (Yes) Proceed to Step 2. (No) Proceed to Step 12. 2. Is manual gas valve in the "on" position? (Yes) Proceed to Step 3. (No) Turn on manual gas valve. 3. Check for restrictions or blockage of return air. Check furnace ducting for collapsed hoses, kinks, severe bends, or blockage. Does return air and ducting look good? (Yes) Proceed to Step 4. (No) Repair as necessary. 4. Check gas pressure at input to control valve. Does manometer indicate at least 11 inches of water column. (Yes) Proceed to Step 5. (No) Inspect LP system to determine cause of pressure loss. Repair as necessary. 5. During ignition cycle, check for 12-volts DC on brown wire feeding into control valve solenoids. Are 12 volts present? (Yes) Proceed to Step 6. (No) Proceed to Step 10. 6. During ignition cycle. Check gas pressure at tap on control valve. Does manometer indicate 10.2 inches of water column or greater? (Yes) Proceed to Step 7. (No) Proceed to Step 9. 7. Check electrode. Make sure electrode is not grounding to burner, gap between spark probe and ground probe should be 1/8 inch. Electrode ceramic should be free of soot with no cracks or breaks. Does electrode check out okay? (Yes) Proceed to Step 8. (No) Adjust, clean, or replace as necessary. 8. Check the main burner for correct relationship to the electrode assembly (burner should be 3/16" from the spark probe and sawports or charge ports directly under the spark gap). Check main burner for soot build-up in ports. Clean cast-iron burners by passing a hacksaw blade through the sawports, being careful not to enlarge the openings. Wirebrush stainless tube burners to remove build-up.

Condition	Course of Action
	9. Jumper ground wires from ground terminals on control valve solenoids to known good grounds. Initiate ignition cycle. Does manometer indicate 10.2 inches of water column or greater? (Yes) Replace or repair ground wires. (No) Replace defective control valve. 10. During ignition cycle, check for 12-volts DC at brown wire out of module board. Are 12 volts present? (Yes) Repair or replace brown wire to control valve solenoid. (No) Proceed to Step 11. 11. Clean module board connector with electric contact cleaner. Inspect for bent pins. Reconnect. If 12 volts are not present on brown wire, test module board with Fenwall tester. Replace as necessary. 12. During ignition cycle, check for 12-volts DC on red wire at module board. Are 12 volts present? (Yes) Proceed to Step 13. (No) Proceed to Step 18. 13. Clean module board connector with electric contact cleaner. Inspect for bent pins. Reconnect. If no spark is audible during ignition cycle, Proceed to Step 14. 14. Does small bulb in board flash during ignition cycle? (Yes) Proceed to Step 15. (No) Replace board. 15. Test module board with Fenwall tester. Does board test okay? (Yes) Proceed to Step 16. (No) Replace board. 16. Disconnect high voltage wire from board and electrode. Perform a continuity test. Does wire test okay? (Yes) Proceed to Step 17. (No) Replace wire. 17. Check electrode. Make sure electrode is not grounding to burner, gap between spark probe and ground probe should be 1/8 inch. Electrode ceramic should be free of soot with no cracks or breaks. Adjust, clean, or replace as necessary. 18. Check for 12-volts DC on both sides of the limit switch. Are 12 volts present on both sides? (Yes) Proceed to Step 19. (No) Replace defective limit switch.

Condition	Course of Action
	19. Check for low voltage on red wire at wire harness connector leading into furnace. Is voltage 11-volts DC or greater? (Yes) Proceed to Step 20. (No) Inspect 12-volt system for cause of low voltage. Repair as necessary. 20. Disconnect wires from sail switch. Initiate ignition cycle. Jumper disconnected wires together. Does furnace ignite? (Yes) Proceed to Step 22. (No) Proceed to Step 21. 21. Inspect wiring from limit switch to module board. Is wiring damaged? (Yes) Repair as necessary. (No) Proceed to step 23. 22. Replace sail switch. If furnace does not ignite. Proceed to Step 23. 23. Inspect room air blower wheel for dirt, debris, or damage. Is any dirt or damage evident? (Yes) Clean and repair or replace as necessary. (No) Proceed to Step 24. 24. Inspect room air blower wheel to assure proper rotation and installation. Adjust or repair as necessary.* * If after completing all troubleshooting steps and furnace will still not ignite, suspect a bad gas supply or air in gas lines. Isolate furnace from coach gas supply. Use a known good supply of gas. If furnace operates properly, vent bad gas and refill with gas and proper amount of drying agent.

Condition	Course of Action
4. Burner ignites, but shuts off.	1. Check that flame sensor is over slots in main burner and that main burner flame is burning against tip of flame sensor. (Sensor probe should be in the inner blue cone of burner flame. Approximately 1/4 - 5/6 inch above the burner.) Adjust by bending probe. Does furnace operate properly? (Yes) Return to service. (No) Proceed to Step 2. 2. Check sensor wire connections at sensor and module board. Are connections okay? (Yes) Proceed to Step 3. (No) Clean and repair as necessary. 3. Disconnect sensor wire. Perform continuity test on wire. Does wire pass test? (Yes) Proceed to Step 4. (No) Replace wire. 4. Check sensor output. Attach microamp meter in series with flame sensor and flame sensor wire. (Connect + lead to sensor wire and - lead to sensor probe.) Flame sensor should generate at least seven microamps in seven seconds after burner ignition (on units with separate sparker and flame sensor). For units with local flame sensing (sparker and flame sensor are one probe), attach micro ammeter as per accompanying "Local Flame Sensing" in this section. Once flame is established and spark shuts off, ammeter should indicate a minimum of 1.5-microamps DC. Does the flame sensor pass the test? (Yes) Proceed to Step 6. (No) Proceed to Step 5. 5. Check sensor probe for carbon. If carbon is present, clean off probe. Repeat sensor output test in Step 5. If output is not within specification, replace flame sensor. 6. If flame sensor output is within specification and furnace still is inoperative, replace module board.

Main Index Section Index Print

Condition	Course of Action
5. Main burner will not shut off.	1. Check thermostat contacts. Are contacts open? (Yes) Proceed to Step 3. (No) Proceed to Step 2. 2. Adjust thermostat to lower temperature. Do contact open? (Yes) Cycle furnafe several times. If contacts continue to stick, replace thermostat. (No) Replace thermostat. 3. Check for DC voltage on brown wires at gas control valve solenoids. Is there any voltage present? (Yes) Inspect circuit to determine cause of short circuit. Repair as necessary. (No) Replace defective valve.

Condition	Course of Action
6. Blower fan continues to run after thermostat has been satisfied and burner has shut off.	1. Check for DC voltage on brown wire at time delay relay. Is voltage present? (Yes) Proceed to Step 2. (No) Proceed to Step 3. 2. Trace circuit back to thermostat to determine cause of short circuit. 3. Replace defective time delay relay.

Condition	Course of Action
7. Fan cuts on and off.	1. Check thermostat. Are contacts open? (Yes) Proceed to Step 2. (No) Proceed to Step 3. 2. Check for voltage on brown wire at time delay relay. Voltage may be intermittent. Is there voltage present? (Yes) Trace circuit back to thermostat to determine cause of short circuit. Repair as necessary. (No) Replace time delay relay. 3. Check for a constant 12-volts DC on red wire at motor. Are 12 volts constant? (Yes) Proceed to Step 4. (No) Proceed to Step 5. 4. Check for intermittent ground at motor. Jumper wire from ground terminal on motor to known good ground. Is condition alleviated? (Yes) Repair or replace ground wire. (No) Replace motor (defective thermal overload switch.) 5. Check for a constant voltage on red wire at time delay relay. Is voltage intermittent? (Yes) Proceed to Step 6. (No) Proceed to Step 9. 6. Check for constant 12-volts DC on red wire from wire harness connector at time delay relay. Is voltage constant? (Yes) Proceed to Step 7. (No) Trace circuit back to voltage source to find cause of intermittent voltage. Repair as necessary. 7. Check for constant voltage on brown wire at time delay relay. Is voltage constant? (Yes) Proceed to Step 8. (No) Trace circuit back through limit switch to thermostat to find cause of intermittent voltage. Repair as necessary. 8. Check for intermittent ground at time delay relay. Jumper wire from ground terminal to known good ground. Is condition alleviated? (Yes) Repair or replace ground wire. (No) Replace time delay relay. 9. Replace or repair red wire.

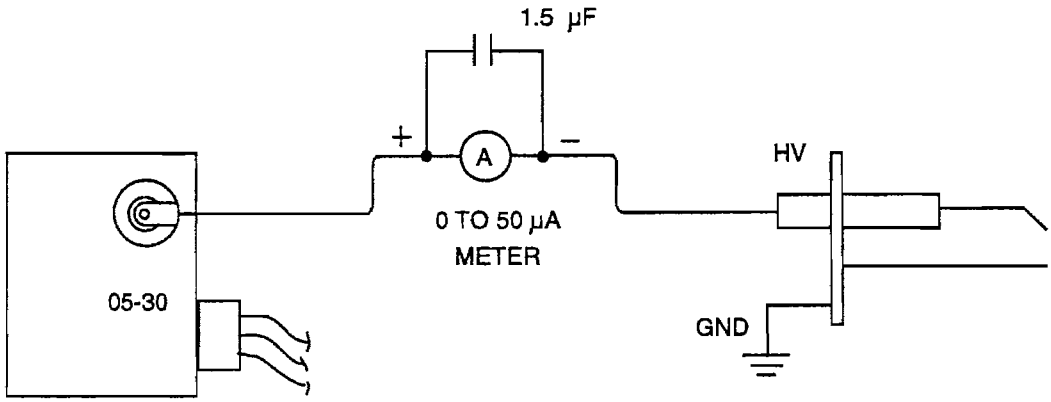
Condition	Course of Action
8. Module board repeatedly fails.	1. Check for high DC voltage on red wire at furnace wire connector. Maximum operating voltage is 14.5 - volts DC. Is voltage below 14.5 volts? (Yes) Proceed to Step 2. (No) Inspect circuit to determine cause of high voltage. Repair as necessary. 2. Check electrode adjustment. Is electrode properly adjusted? (Yes) Proceed to Step 3. (No) Adjust as necessary. 3. Inspect module board. Make sure the insulator covering the electrode wire connection on the coil of the module board is in place and the insulator behind the module board is in place. Is the module board or electrode wire "shorting" to other furnace parts? (Yes) Repair as necessary. (No) Proceed to Step 4. 4. Check electrode and sensor wire (if applicable). Are connections good? (Yes) Proceed to Step 5. (No) Repair as necessary. 5. Inspect 12-volt wires. Wires should not pass over module board. Reroute as necessary. Proceed to Step 6. 6. Make sure duct connections to furnace are airtight. Seal duct collar connections to the furnace cabinet with duct tape as necessary to prevent hot air leaks.

Condition	Course of Action
9. Unit goes into lockout intermittently.	1. Check electrode and burner air adjustments. Is electrode in proper position and burner adjusted properly? (Yes) Proceed to Step 2. (No) Adjust as necessary. 2. Inspect sail switch. Does it move freely? (Yes) Proceed to Step 3. (No) Replace defective switch. 3. Inspect the furnace return air and warm air discharge for obstructions or restrictions. Is there sufficient airflow to engage the sal switch each time? (Yes) Proceed to Step 4. (No) Repair as necessary. 4. Remove electrode and burner. Clean them thoroughly. If furnace continues to go into lockout, proceed to Step 5. 5. At this point in diagnosis, one should suspect a faulty gas supply. Using a manometer connected to the pressure tap on the furnace gas valve. Watch for significant pressure drop during the time the thermostat calls for heat. Is there a large pressure drop? (Yes) Inspect LP gas system for cause of pressure drop. Repair as necessary. (No) Proceed to Step 6. 6. Isolate the furnace from the coach gas system by connecting to a known good regulated gas supply. Does furnace operate properly? (Yes) Proceed to Step 7. 7. Corrective measures to remedy a faulty gas supply: - Move vehicle outdoors to a well ventilated area with NO open flames or spark hazards. - Shut off vehicle engine. DO NOT operate generator, plug into shore power, or operate electrical loads. - Close valve on LP tank. Remove regulator. - Bleed off tank. - Disconnect and blow out LP gas lines. - Reconnect gas lines and regulator. - Have tank filled and drying agent added. Half pint of methanol alcohol per 100-pound bottle capacity is recommended.

Local Flame Sensing (Single Spark and Sense)

With power off, connect a DC microammeter (D'Arsonval movement type) as shown in Figure 1. (The meter should be protected from high voltage surges which could damage the meter movement. A 1.5 F 200-Volt film capacitor across the meter terminals or lead wires will provide adequate protection.) The lead wires and terminals must be isolated from other surfaces to prevent the H.V. signal from arcing to ground during the trial-for-ignition period.

Apply power. Once the flame is established and the sparks shut off, a flame sense current of 1.5 A DC minimum is required for proper operation.



CAUTION: Due to possible shock conditions, do not touch the microammeter or lead wires during the flame sense test. Always remove power before making any adjustments.

FURNACE

Furnace Removal:

CAUTION: Before removing furnace, the liquid propane must be turned OFF at the tank.

1. Remove (2) furnace face plate retaining screws. Remove face plate.
2. Disconnect LP line at furnace.
3. Remove (2) furnace retaining screws.
4. Slide furnace out of compartment a few inches.
5. Disconnect 12-volt wires at plug near furnace.
6. Slide furnace free of compartment.

Furnace Replacement:

1. Slide furnace partially into compartment and align in proper position.
2. Connect 12-volt wires at plug near furnace.
3. Slide furnace completely into compartment.

IMPORTANT: The furnace must be properly aligned with the air intake/vent tubes.

NOTE: Make sure the LP line is in the proper position, but do not tighten at this time.

4. Secure furnace with (2) retaining screws.
5. Connect and tighten LP gas line. Turn LP on at bottle, test connections for leaks with soapy water solution. See "Soapy Solution Leak Test" in LP Gas Fuel System Section.
6. Test furnace operation.
7. Install furnace face plate. Secure with (2) retaining screws.

FURNACE VENT

The furnace vent is located on the left sidewall. It allows intake air to flow into the furnace and exhaust air to leave the furnace. NEVER obstruct or modify this vent!

FURNACE VENT REMOVAL

1. Remove (4) retaining screws.
2. Carefully cut sealant around vent with a putty knife.
3. Pull vent away from sidewall and furnace intake and exhaust tubes.
4. Remove old sealant from sidewall and vent.

FURNACE VENT REPLACEMENT

1. Position vent into furnace intake and exhaust tube.
2. Push vent tight to sidewall.
3. Install (4) vent retaining screws.
4. Cap seal vent perimeter with sealant. (Winnebago part #034552-02-000)

NORCOLD MODEL 3163 REFRIGERATOR

SPECIFICATIONS		CURRENT DRAWS	
AC Mode:	132-Volts AC Max., 108 Volts AC Min.	AC Heating Element -	1.3 amps @ 110 Volts AC 1.4 amps @ 120 Volts AC
DC Mode:	15.4-Volts DC Max., 11.5-volts DC Min.	DC Heating Element -	11.7 amps @ 12 Volts DC 13.6 amps @ 14 Volts DC
Gas Mode:	11" W.C. Max., 10.5" W.C. Min.		
Ratings		**Fuse Replacement Data**	
LP Gas Mode:	640 BTU/Hr. Input 11" W.C. Gas Supply .010" Orifice (LP10)	AC Circuit:	3 amp Type 3AG (1/4" x 1/4" Norcold Part No.
AC Mode:	110-Volts AC, 140 Watts	DC Circuit	20 amp Type 3AG (1/4" x 1/4") Norcold Part No.
DC Mode:	12-Volts DC, 140 Watts	Gas Circuit	20 Amp Type 3AG (1/4" x 1/4") Norcold Part No.

GENERAL INFORMATION

WARNING

This refrigerator is not intended to be operated as a Free-Standing refrigerator (i.e., where the products of combustion are not completely sealed off from the living area) or installed in such a way as to conflict with information in these instructions. Unapproved installations could result in safety risks or performance problems.

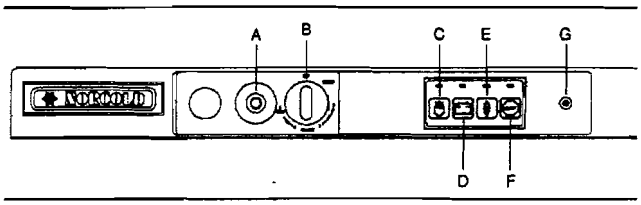
The Model 3163 is designed for built-in installation and operates on propane gas, 120-volts AC or 12-volt DC.

The propane gas mode of operation design is that of a sealed combustion unit. A sealed combustion installation utilizes a single fresh vent-air intake/exhaust assembly to supply fresh air to the burner and to remove the products of combustion. This insures the products of combustion are isolated from the living area of the vehicle. The vent-air intake/exhaust assembly is routed through the vehicle's outside wall and is connected to refrigerator's burner assembly and exhaust flue tube by flexible piping.

The vent-air intake/exhaust assembly used for this installation has been certified for this refrigerator and **must not** be modified.

Location of Operating Controls

The refrigerator's operating controls are located in a cluster above the refrigerator door.



(A) Safety Valve

The safety valve is designed so that any loss of flame will stop the gas flow to the burner. It is controlled by means of a thermocouple that is positioned in the flame. As long as a flame is detected by the thermocouple, the valve will remain open. Upon flame failure, the valve closes, shutting off the gas flow to the burner. During the gas ignition process, the safety valve button must be held in until a flame is established at the burner.

(B) Thermostat

The thermostat on the Norcold refrigerator controls both the gas and AC electric operations, thereby eliminating the necessity of resetting each time a different power source is selected. Rotate the thermostat knob clockwise to make the refrigerator cabinet colder.

(C) 120-Volts AC Operation

Pressing button (C) selects the AC mode of operation. The refrigerator is equipped with a cartridge heater. When the AC mode is selected and AC voltage is supplied to the refrigerator, the refrigerator will operate on 120 volts AC.

(D) 12 Volts DC Operation

Pressing button (D) selects the DC mode of operation. The refrigerator is equipped with cartridge heater. When DC is selected and DC is available to the refrigerator, the refrigerator will operate at full cooling power. The DC operation is a continuous run (no thermostat control) mode.

(E) Gas Operation

Pressing button (E) selects the Gas mode of operation. The refrigerator is equipped with electronic ignition. When the gas mode is selected, the electronic ignition is energized and sparking is generated at the burner (NOTE: Push safety valve button in and hold until flame is present at burner). Sparking will continue until a flame is present at the burner. When a flame is sensed by the electronic ignition module, the sparking ceases and the flame indicator (G) illuminates indicating the refrigerator is operating on gas.

(F) Off

Pressing button (F) will interrupt all power sources and cease operation of the refrigerator.

(G) Flame Indicator Light

Lights when refrigerator is operating on LP gas.

Lighting and Start-Up Instructions

The lighting and start-up instructions are located on the top portion of the interior door liner.

Refer to Figure above for location of the operating controls.

Gas Operation

1. Set thermostat (B) to the start setting.
2. Place the mode selector button (E) to the gas position. Ignition spark will be present at the burner.
3. Push and hold the safety valve button (A) until the indicator lamp (G) glows steady. Continue to hold the safety valve button in for 15 seconds and then release. The indicator lamp should remain a steady glow. If the lamp turns off, repeat this step.

NOTICE: On ignition start-up, it may take longer for the burner to light because of air being purged from the gas supply line.

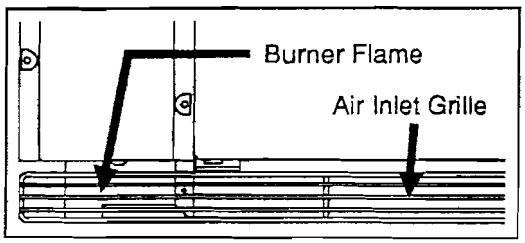
WARNING

Do not hold gas valve in more than 30 seconds. If the flame is not incidated within this time, turn the gas at the selector (F) off, wait two minutes and retry. Continuing to hold the gas valve in will cause gas to build up in the burner area and can result in an explosion which can cause property damage or severe personal injury.

4. Set thermostat to desired temperature setting.

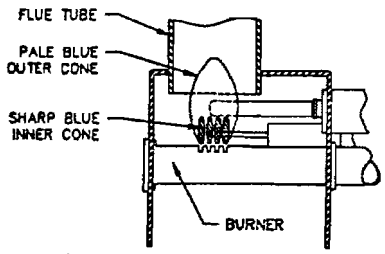
Gas Burner Flame

The gas operation of the refrigerator is controlled by the correct burner flame which supplies the heat input to the refrigerator's cooling system. The correct burner flame is dependent upon correct input gas pressure and the burner and burner orifice being clean. The propane gas piping and the supply pressure must be inspected and tested at least twice a year. All inspections and tests must be performed by the propane gas supplier or a qualified service agency.



A visual check of the burner flame should be made regularly. The burner flame can be observed through the air inlet grille as shown in Figure A.

The flame should be sharp blue as illustrated in Figure B with a stable burning appearance. When there is a constant yellow component observed or if the flame appears erratic and unstable, contact your dealer, gas supplier, or a Norcold authorized service center. Also observe the position of the flame; it must be centered under the flue tube without touching the inner wall of the tube. Norcold strongly recommends that any required adjustments be performed by your dealer or a Norcold authorized service center.



Check Out of Flame Failure Safety Device

1. To verify operation of the flame failure safety device, start the refrigerator in the gas mode (refer to lighting instructions) and verify the presence of a flame.
2. Turn off the gas at the manual shut-off valve or at the main gas supply tank.
3. The flame will go out and within three minutes, the flame safety device will automatically close (an audible click will be heard as this device closes.)
4. Turn the gas on at the manual shutoff valve.
5. Attempt to light the burner by placing the mode selection button to the gas mode. Do not push in the safety valve.
6. If the burner does not relight without holding the safety valve in, the flame failure safety device has operated correctly.

AC Operation

1. Place the model selection button (C) to the AC position.

2. Set the thermostat (B) to the coldest (maximum) setting. Allow to operate at maximum setting for six to eight hours before setting to mid-range.

DC Operation

1. Place the mode selection button (D) to the DC position. There is no need to set thermostat to any setting. The DC operation is a continuous run (no thermostat control) mode.

Shut-Down: All Modes

1. Place the mode selector button to the off position. This will interrupt all AC and DC power and stop operation of the refrigerator.

Main Index Section Index Print

Important Safety Information

WARNING

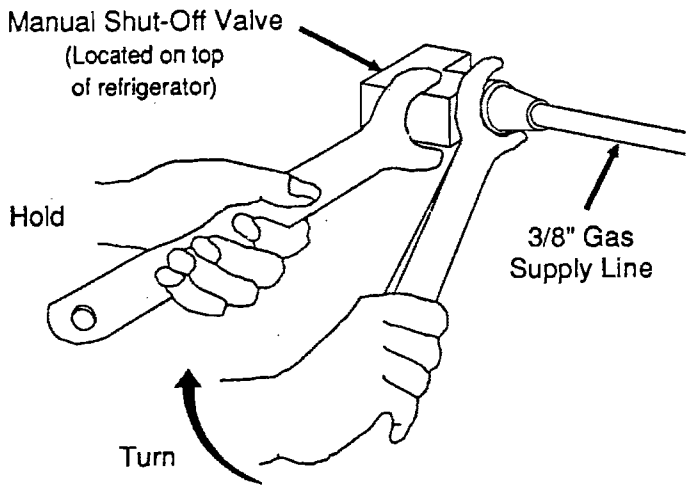
Read this information before attempting to perform service on this refrigerator.

The troubleshooting portion contains wiring pictorials and diagrams. Review both the wiring pictorials and diagrams to understand the electrical circuits, and the circuit relationship to the individual components.

Understand the service procedures before performing the service.

Always apply the safety precautions listed below when servicing this refrigerator. Failure to follow these safety precautions can result in substantial property damage, severe personal injury, or death.

- Hazardous voltage can cause property damage, severe personal injury, or death. Disconnect both the AC and DC electrical sources to the refrigerator before performing service.
- Connect the positive battery lead to the refrigerator first, then the negative lead, to prevent short circuits.
- The 120 VAC circuit must be properly grounded. Never cut or remove the round grounding prong from the refrigerator's AC power cord. Do not use a two-prong adapter. Do not use an extension cord.
- The use of improper rated fuses can lead to an electrical fire. In the event of a circuit overload, replace blown fuses with a fuse specified by Norcold. Fuse specifications are found in the "Specification" section of this manual. The correct fuse size is printed on the refrigerator adjacent to the fuse.
- Keep liquids away from electrical connections. Many liquids are electrically conductive and could cause serious arching damage and, in some cases, fires.
- Never bend, drop, drill, weld, or hammer the cooling unit. Doing so can cause the cooling unit to rupture, releasing chemicals under high pressure. Contact with these chemicals will cause irritation to the eyes or skin.
- Never attempt to repair or recharge the cooling unit. A defective cooling unit must be replaced.
- Hazardous vapors. Propane gas can cause an explosion resulting in property damage, severe personal injuiry, or death. Use caution when working with or near a propane gas system. Do not smoke. Do not create sparks or use an open flame to check gas supply lines or gas connections.
- To prevent gas leaks and damage to the gas supply lines and fittings, use two wrenches when connecting or disconnecting gas fitting (See Figure below).



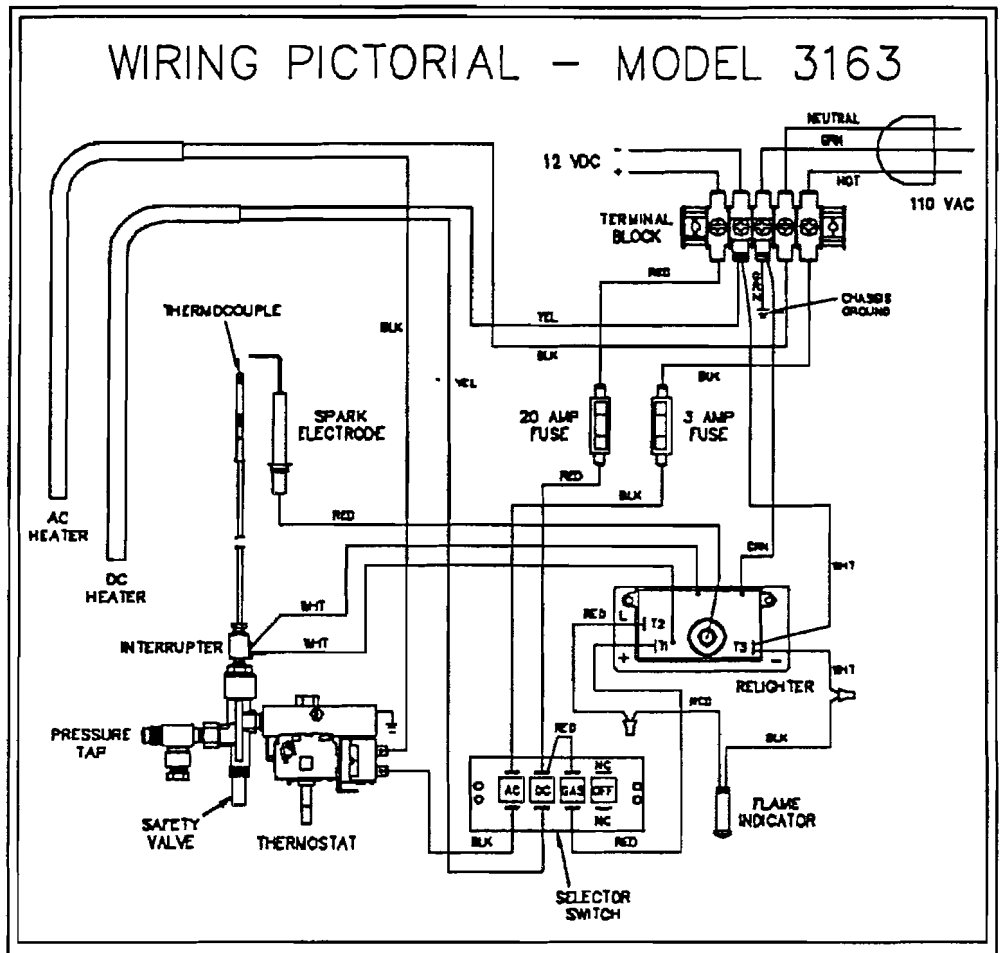
Double Wrenching Gas Fittings

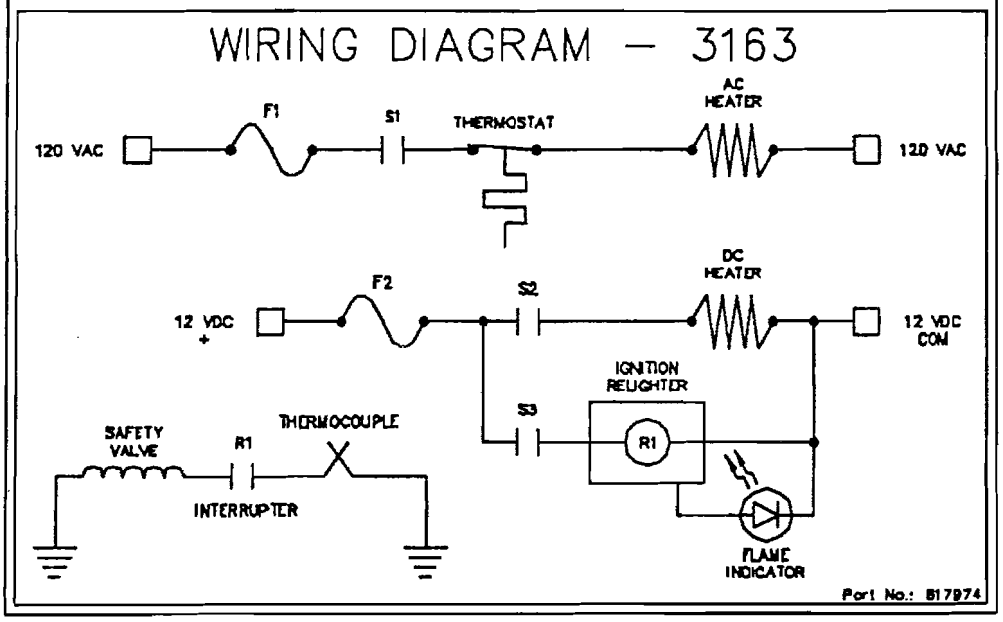
DIAGNOSING COOLING PROBLEMS

1. Make sure the cooling problem occurs while operating the refrigerator in each mode of operation. If not, the cooling problem is not the cooling unit. Refer to "Trouble Shooting" to determine cause for insufficient cooling on identified mode of operation.
2. Make sure the interior venting is not obstructed and is providing air circulation across the cooling unit's absorber coils and condenser fins.
3. An off-level situation, if the infraction is marginal, will allow the refrigerator to continue to operate at a reduced level of cooling until the refrigerator is leveled. Greater off-level situations will stop the refrigerant circulation and cease cooling. Normal vehicle leveling to provide comfort for the occupants is within the refrigerator's operating limits. The model 3163 installed in the EuroVan operating limits are 3 degrees off-level front-to-back and 6 degrees off-level side-to-side. Operating the refrigerator outside of these operating limits for an extended time will cause irreparable damage to the cooling unit.
4. Check the input voltages and gas pressure to insure correct heat input and voltage limits. The specifications are as follows:
   a. 120 VAC - 108 VAC min. to 132 VAC max.
   b. 12 VDC - 11.5 VDC min. to 15.4 VDC max.
   c. Gas - 10.5" W.C. min. to 11" W.C.

   Correct input voltages and propane gas supply are critical for the cooling unit to function properly.
5. Check the area of the cooling unit for refrigerant leaks. The smell of ammonia is a positive sign of a refrigerant leak. When an ammonia smell is detected, the cooling unit must be replaced. Another sign of a refrigerant leak is the appearance of a yellow powder in the vicinity of the cooling unit. When this powder is observed, the cooling unit must be replaced.
6. Check the absorber coils; the bottom coil will be warm and the top coil will be cooler. If the coils are cold and the flue enclosure is too hot to touch, there is a blockage in the cooling unit and the cooling unit must be replaced.

Main Index Section Index Print


WIRING PICTORIAL – MODEL 3163
NEUTRAL
GRN
HOT
110 VAC
12 VDC
TERMINAL BLOCK
CHASSIS GROUND
THERMOCOUPLE
SPARK ELECTRODE
20 AMP FUSE
3 AMP FUSE
AC HEATER
DC HEATER
INTERRUPTER
RELIGHTER
PRESSURE TAP
SAFETY VALVE
THERMOSTAT
FLAME INDICATOR
SELECTOR SWITCH
AC
DC
GAS
OFF
WHT
BLK
RED
YEL
GRN


WIRING DIAGRAM – 3163
120 VAC
F1
S1
THERMOSTAT
AC HEATER
120 VAC
12 VDC
+
F2
S2
DC HEATER
12 VDC COM
IGNITION RELIGHTER
S3
R1
SAFETY VALVE
R1
THERMOCOUPLE
INTERRUPTER
FLAME INDICATOR
Part No.: 817974

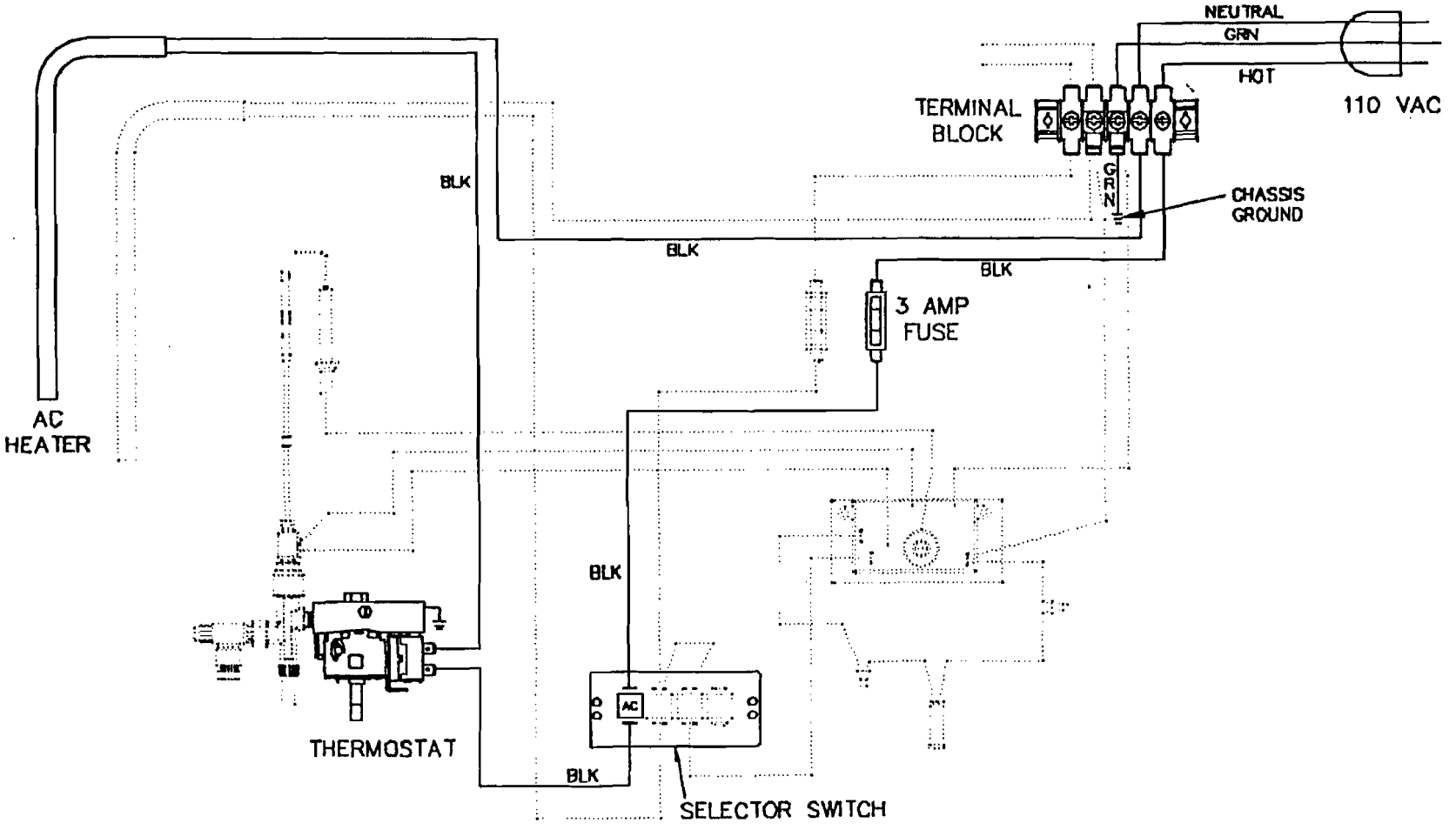
TROUBLESHOOTING

Condition	Course of Action
1. Refrigerator will not operate on AC. Specifications: AC Voltage: 108-132 VAC Current Draw: 1.3 - 1.4 amps Heater Resistance: 81.7 - 90.3 ohms	1. Is the selector switch in the AC position? (Yes) Proceed to Step 2. (No) Set selector switch to AC. 2. Is thermostat at mid-range or higher? (Yes) Proceed to Step 3. (No) Set thermostat to mid-range or higher. 3. Check 15-amp AC circuit breaker. Reference "Load Center" in Electrical Section. Is breaker "tripped"? (Yes) Reset circuit breaker. (No) Proceed to Step 4. 4. Check GFI assembly. Reference "Power Cord with GFI Assembly" in Electrical Section. Is the GFI "tripped"? (Yes) Reset. (No) Proceed to Step 5. 5. Remove monitor panel to access top of refrigerator. See "Monitor Panel Removal" in Electrical Section. NOTE: It is not necessary to disconnect any wiring to the panel. Lift panel out and up and secure. Look through monitor panel opening to inspect the 110 AC cord. Is it plugged into the 110AC receptacle? (Yes) Proceed to Step 6. (No) Plug cord into receptacle. 6. Disconnect vehicle from 110 AC shoreline power. Inspect 3-amp AC fuse in black wire located on top of refrigerator. Is fuse good? (Yes) Proceed to Step 7. (No) Replace fuse. 7. Check for loose wire connections at terminal block located on top of refrigerator. Are connections tight? (Yes) Proceed to Step 8. (No) Tighten connections. 8. Connect vehicle to 110 AC shoreline power. Check for 110 AC voltage on AC wires at terminal block. Is voltage present? (Yes) Proceed to Step 10. (No) Proceed to Step 9. 9. Check for 110 AC voltage at 110-volt AC refrigerator receptacle. Is voltage present? (Yes) Replace 110-volt AC cord on refrigerator. (No) Troubleshoot circuit back to 15-amp breaker to determine cause of voltage loss. Repair as necessary.

Main Index Section Index Print

	10. Access AC heater element. See "Refrigerator Removal" in this section. NOTE: Stop at removal Step 11. Check for 110-volt AC at AC heater leads. Is voltage present? (Yes) Replace AC heater. (No) Proceed to Step 11. 11. Check for 110-volt AC on black wire into selector switch. Is voltage present? (Yes) Proceed to Step 12 (No) Inspect black wire back to terminal block to determine cause of voltage loss. Repair as necessary. 12. Check for 110-volt AC on black wire out of selector switch. Is voltage present? (Yes) Proceed to Step 13. (No) Replace selector switch. 13. Check for 110-volt AC on black wire at input to thermostat. Is voltage present? (Yes) Proceed to Step 14. (No) Inspect black wire back to selector switch to determine cause of voltage loss. Repair as necessary. 14. Check for 110-volt AC on black wire at output of thermostat. Is voltage present? (Yes) Replace AC heater. (No) Replace thermostat.

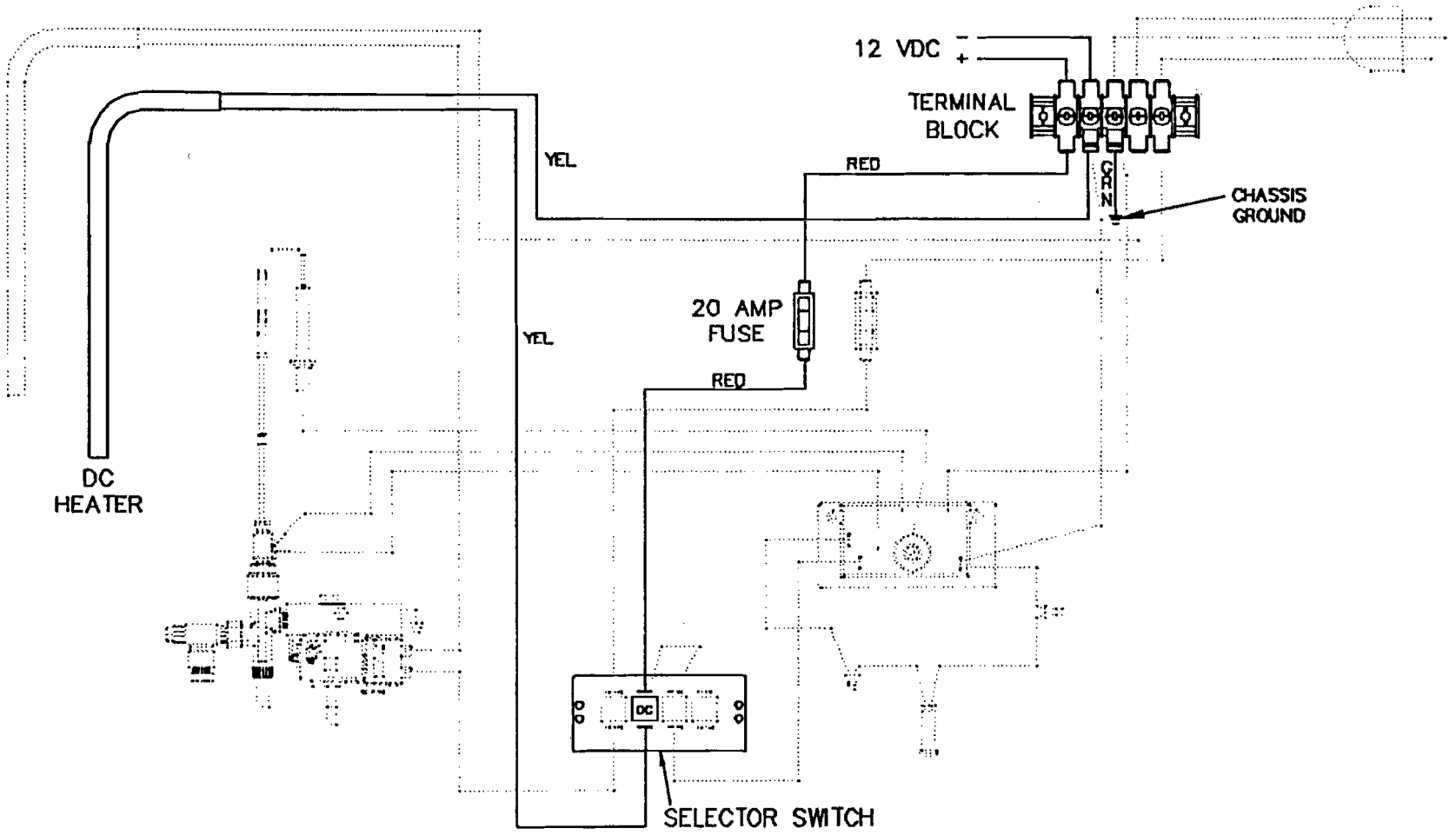
WIRING PICTORIAL – AC CIRCUIT
MODEL 3163



Main Index
Section Index
Print

Condition	Course of Action
2. Refrigerator will not operate on DC electric. Specifications: DC Voltage: 11.5 - 15.45 VDC Current Draw: 11.7 - 13.6 amps Heater Resistance: .95 - 1.05 ohms	1. Is the selector switch set to DC? (Yes) Proceed to Step 2. (No) Set switch to DC. 2. Check 15-amp DC breaker that feeds ET wire. Reference "Load Center" in Electrical Section. Is breaker "tripped"? (Yes) Reset (No) Proceed to Step 3. 3. Remove monitor panel to access top of refrigerator. See "Monitor Panel Removal" in Electrical Section. NOTE: It is not necessary to disconnect any wiring to the panel. Lift panel out and up and secure. Check for loose 12-volt wire connections at terminal block on top refrigerator. Are connections tight? (Yes) Proceed to Step 4. (No) Tighten connections. 4. Check for 12-volt DC between red and yellow wires at terminal block. Is voltage present? (Yes) Proceed to Step 5. (No) Troubleshoot wires ET and EU to determine cause of voltage loss. Repair as necessary. 5. Check for 12-volt DC at input to 20-amp in-line fuse located on top of refrigerator. Is voltage present? (Yes) Proceed to Step 6. (No) Troubleshoot red wire back to terminal block to determine cause of voltage loss. Repair as necessary. 6. Check for 12-volt DC at output of 20-amp in-line fuse. Is voltage present? (Yes) Proceed to Step 7. (No) Replace 20-amp fuse. 7. Check for 12-volt DC on red wire feeding from 20-amp fuse at selector switch. Is voltage present? (Yes) Proceed to Step 8. (No) Troubleshoot red wire back to fuse holder to determine cause of voltage loss. Repair as necessary. 8. Check for 12-volt DC at yellow wire out of selector switch. Is voltage present? (Yes) Replace DC heater. (No) Replace selector switch.

WIRING PICTORIAL – DC CIRCUIT
MODEL 3163



Main Index
Section Index
Print

Condition	Course of Action
3. Refrigerator does not operate on gas. No spark at burner. Specifications Gas Pressure: 10.5" W.C. - 11" W.C. DC Voltage: 10.5 - 15.4 VDC	1. Is the selector switch set to gas? (Yes) Proceed to Step 2. (No) Set selector switch to gas. 2. Check 15 amp. D.C. circuit breaker feeding the refrigerator. Breaker is located in the load center. Refer to "Wiring Diagram Body" in the Electrical section. Is the breaker "tripped"? (Yes) Reset circuit breaker. (No) Proceed to Step 3. 3. Remove monitor panel to access top of refrigerator. See "Monitor Panel Removal" in the Electrical section. Check for 12 volts D.C. on wire ET at terminal block on top of refrigerator. Is voltage present? (Yes) Proceed to Step 4. (No) Troubleshoot wire ET back to the load center to determine cause of voltage loss. Repair as necessary. 4. Check for 12 volts D.C. at input of 20 amp. fuse located on top of refrigerator. Is voltage present? (Yes) Proceed to Step 5. (No) Troubleshoot red wire back to terminal block to determine cause of voltage less. Repair as necessary. 5. Check for 12 volts D.C. at output of 20 amp fuse located on top of refrigerator. Is voltage present? (Yes) Proceed to Step 6. (No) Replace fuse. 6. Check for 12 volts D.C. on red wire at input to selector switch. Is voltage present? (Yes) Proceed to Step 7. (No) Troubleshoot red wire back to 20 amp fuse to determine cause of voltage loss. Repair as necessary. 7. Check for 12 volts DC on red wire at output from selector switch. Is voltage present? (Yes) Proceed to Step 8. (No) Replace selector switch. 8. Check for 12 volt D.C. between terminals T1(+) and T3(-) of the relighter. Is voltage present? (Yes) Proceed to Step 9. (No) Troubleshoot red wire back to selector switch and white wire to ground to determine cause of voltage loss. Repair as necessary. 9. Remove spark electrode wire from relighter. Install a short jumper wire from relighter to within 1/8" of ground. Attempt to light the refrigerator. Does the relighter spark? (Yes) Proceed to Step 10. (No) Replace relighter.

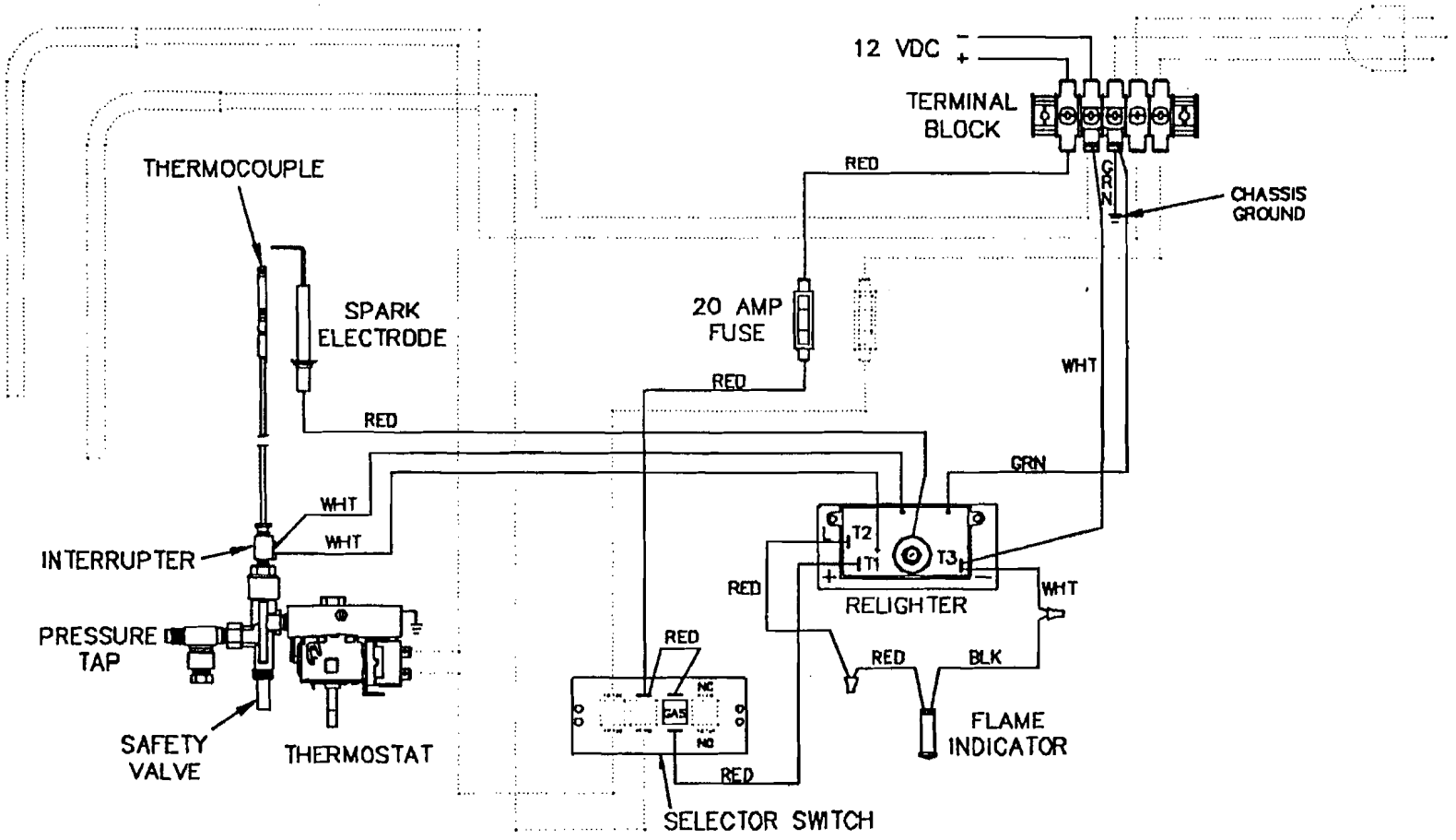
Condition	Course of Action
	10. Remove refrigerator. See "Refrigerator Removal" in this section. Place refrigerator on bench. Hook up LP gas and 12 volt electrical connections. Check electrode alignment. Electrode should be positioned between 1/16" to 1/8" above the burner. Is electrode within specification? (Yes) Proceed to Step 11. (No) Adjust electrode. 11. Disconnect electrode from relighter. Perform a continuity test on the electrode. Reading must be infinity. If reading is not infinity, replace the electrode.

Rialta

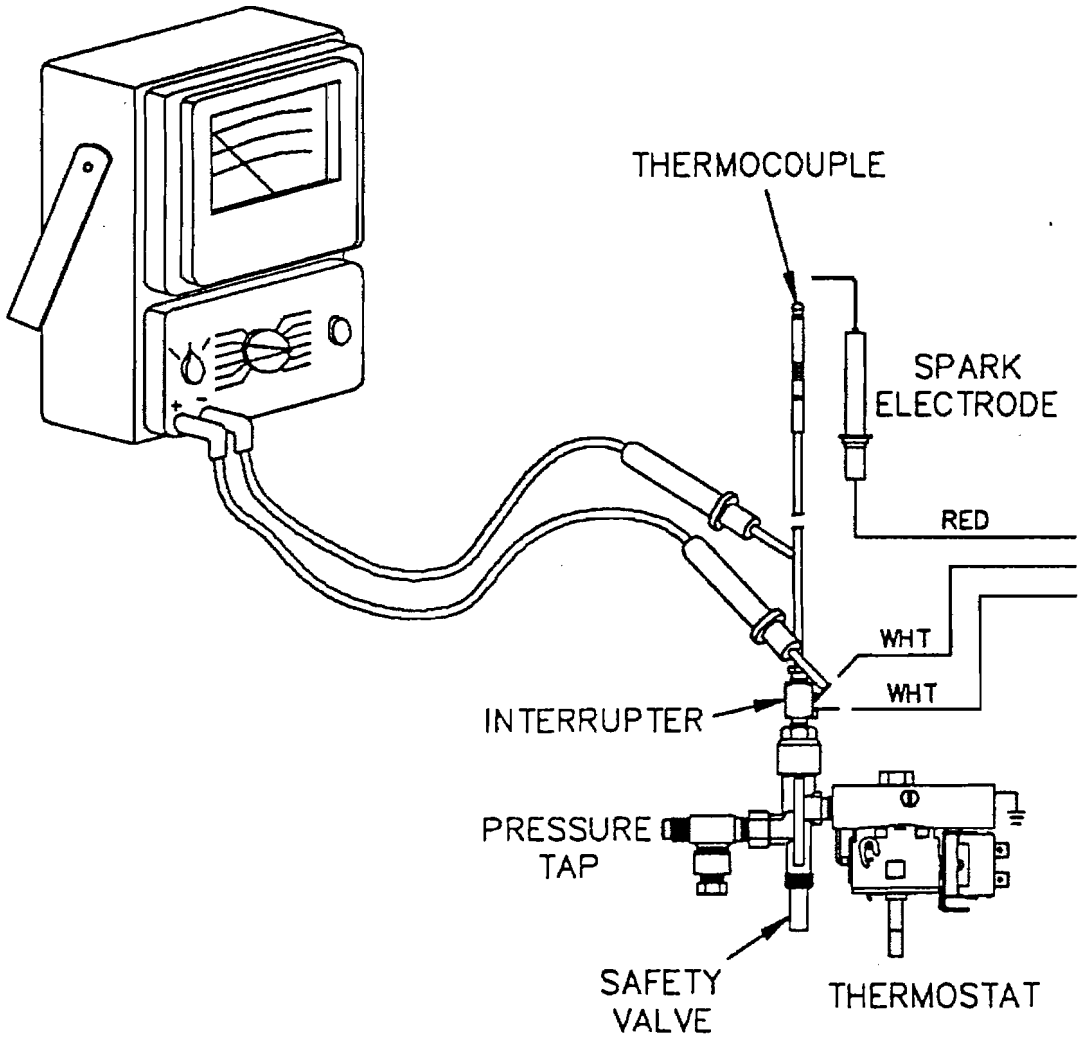
Condition	Course of Action
4. Refrigerator does not operate on gas. Burner ignites but flame will not hold.	1. Remove monitor panel to access top of refrigerator. Refer to "Monitor Panel Removal" in the Electrical Section. Check for D.C. voltage between wires EU and ET at terminal block on top of refrigerator. Is reading between 10.5 and 15.4 volts D.C. (Yes) Proceed to Step 2. (No) Troubleshoot wires EU and ET to determine cause of voltage loss. Repair as necessary. 2. Check valve at LP tank. Is it "on"? (Yes) Proceed to Step 3. (No) Turn on gas supply. 3. Check manual shut-off valve on top of refrigerator. Is it "on"? (Yes) Proceed to Step 4. (No) Turn on manual valve. 4. Check vent terminal housing. Is it free from obstructions? (Yes) Proceed to Step 5. (No) Clean as necessary. 5. Check main gas pressure at line feeding into thermostat. Is pressure between 10.5" - 11" water column? (Yes) Proceed to Step 6. (No) Adjust main gas pressure. 6. Set thermostat to maximum setting. Check gas pressure at pressure tap tee. Is pressure between 10.5" - 11" water column? (Yes) Proceed to Step 7 (No) Replace thermostat. 7. Remove refrigerator. See "Refrigerator Removal" in this section. Place refrigerator on bench. Hookup LP gas and 12 volt electrical connections. Check thermocouple. Tip of thermocouple should be free of carbon and physically located in the flame. Is thermocouple clean and properly positioned? (Yes) Proceed to Step 8. (No) Clean and/or adjust as necessary. 8. Check thermocouple connection at the interruptor. Is it tight? (Yes) Proceed to Step 9. (No) Tighten connection.

Condition	Course of Action
	9. Check interrupter connection at the safety valve. Is it tight? (Yes) Proceed to Step 10. (No) Tighten connection. 10. Inspect (2) white wires from relighter to interrupter. Are they secure, tight, and undamaged? (Yes) Proceed to Step 11. (No) Secure, tighten, or repair as necessary. 11. Remove (2) white wires from the interrupter. Connect a jumper wire across the interrupter terminals. Does the flame hold? (Yes) Replace relighter. (No) Proceed to Step 12. 12. Check for mili-volts at terminals of interrupter. (See Figure "Checking Milli-Volts") • If there are no milli-volts present on both terminals. Proceed to Step 13. • If there are 10-15 milli--volts present on both terminals. Proceed to Step 14. • If there are 16-30 milli-volts present on one terminal and 0 milli-volts on the other. Proceed to Step 15. • If there are 16-30 milli-volts present on both terminals. Proceed to Step 14. 13. Replace thermocouple. 14. Replace safety valve. 15. Replace interrupter.

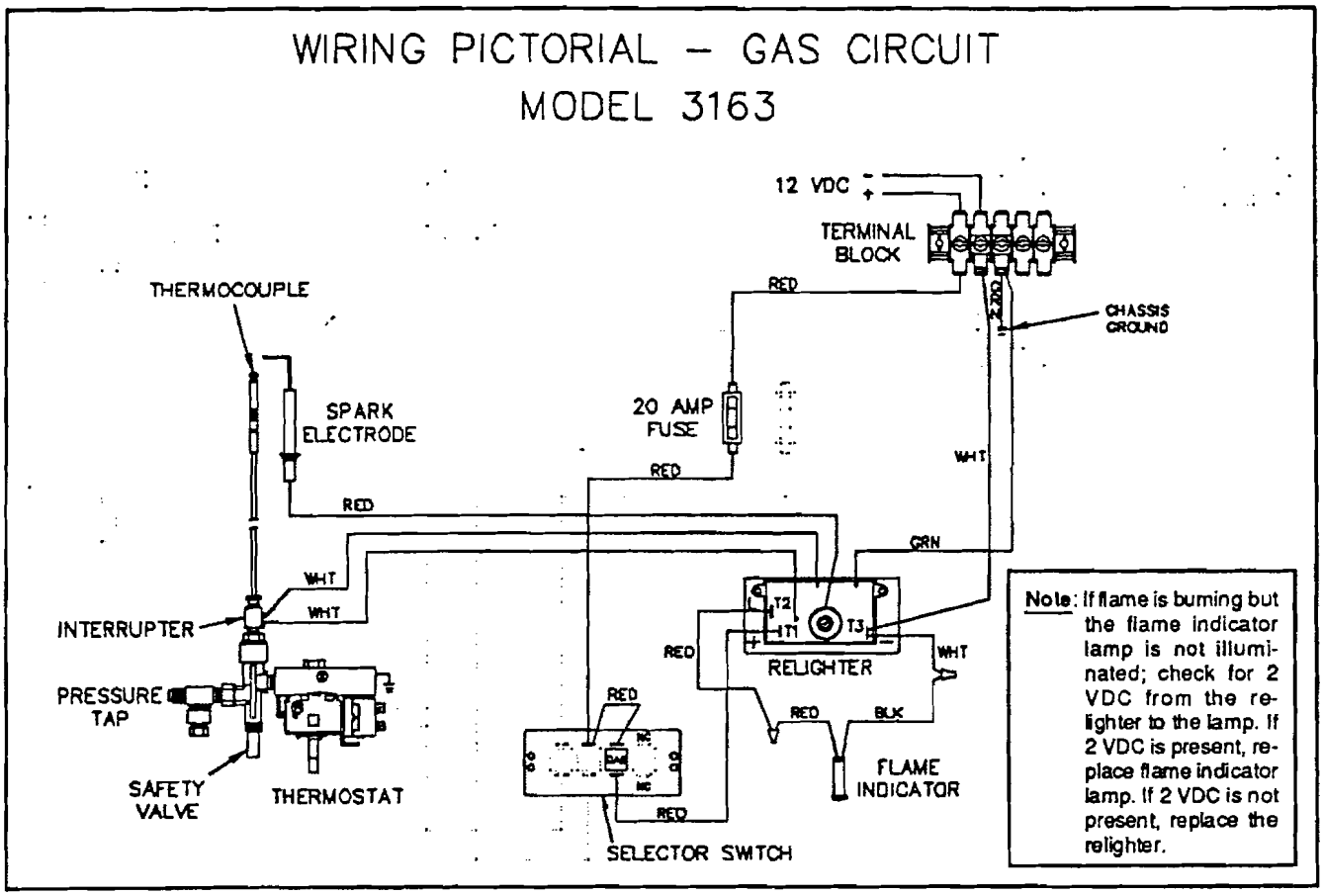
WIRING PICTORIAL – GAS CIRCUIT
MODEL 3163



Main Index
Section Index
Print


THERMOCOUPLE
SPARK ELECTRODE
RED
WHT
WHT
INTERRUPTER
PRESSURE TAP
SAFETY VALVE
THERMOSTAT

Condition	Course of Action
5. Flame is burning but flame indicator lamp is not illuminated.	1. Remove monitor panel. See "Monitor Panel Removal" in Electrical Section. 2. Check for 2 volts DC at terminal T2 of the relighter. Is voltage present? (Yes) Replace indicator lamp. (No) Replace lighter.



Main Index Section Index Print

Refrigerator Removal:

1. Turn "OFF" gas supply at the main tank and turn refrigerator to "OFF".
2. Remove refrigerator's sytem cover on left front of refrigerator by removing (5) retaining screws.
3. Remove (5) refrigerator retaining screws.
4. Remove drawer directly above the refrigerator.
5. Turn the refrigerator's manual shutoff valve "OFF" and disconnect the LP gas supply piping at the manual shutoff valve located on top of the refrigerator.
6. Disconnect the 12-volt supply wires to the terminal block located on top of the refrigerator.
7. Disconnect the refrigerator's AC power cord from the receptacle.
8. Open the cabinet door to the left of the refrigerator. Remove access panel at the rear of the cabinet. This allows access to the flexible piping of the vent system.
9. Remove the hex head screw of retaining washer which secures the flexible piping to the vent terminal housing. Remove retaining washer.
10. Remove both flexible piping from the vent terminal housing by pulling forward. Care should be taken as to not damage the "o" ring seal upon removal.
11. Remove right dinette assembly cover panel to access refrigerator retaining bracket. Reference "Right Dinette Assembly Cover Panel Removal" in Interior Section.
12. Loosen and remove refrigerator retaining screws located at rear base of refrigerator.
13. Remove the refrigerator from vehicle.

Refrigerator Replacement:

1. Place refrigerator into enclosure and slide back to permanent location.

2. Secure refrigerator retaining bracket with screws.

3. Install right dinette assembly cover panel. Reference "Right Dinette Assembly Cover Panel Replacement" in Interior Section.

4. Connect the refrigerator's flexible piping to vent terminal housing and secure with retaining washer and screw.

   CAUTION: Insure the correct location of piping. The pipe with insulating material must be connected to the bottom opening of the vent terminal housing.

5. Reinstall the cabinet access panel.

6. Connect the AC power cord into the receptacle.

7. Connect the 12-volt supply to the refrigerator's terminal block.

8. Connect the LP gas supply to the refrigerator's manual shutoff valve and turn valve "ON". Turn on gas at main supply tank. Leak test connection at the manual shutoff valve. See "Soapy Solution Leak Test" in Liquid Propane Section. **Do not test for leaks with an open flame.**

9. Secure refrigerator with (5) retaining screws.

10. Reinstall refrigerator's system cover with (5) screws.

11. Restart refrigerator.

Main Index Section Index Print

ELECTRIC WATER HEATER

The electric water heater utilizes a 110-volt power supply which is supplied to a heating element inside the tank. The element heats the water which is then supplied to the galley and bathroom faucets and the shower.

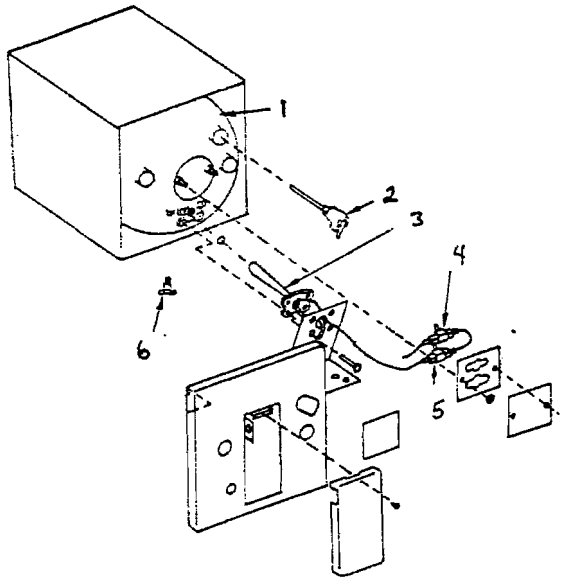
The water heater also contains the motoraid function. Which allows warmed engine coolant to pass around the water tank. This function only applies when the vehicle engine is running.

Major components include:

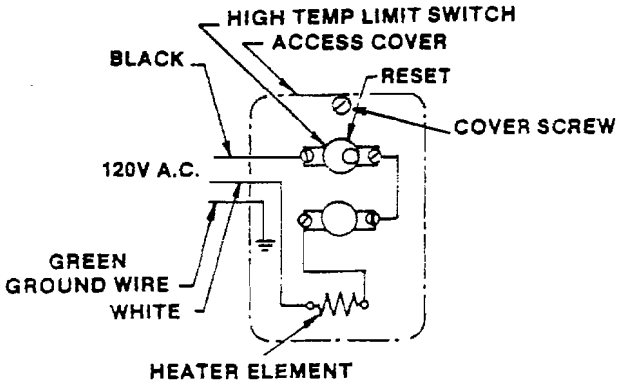
1. Tank
2. Relief Valve
3. Heating Element
4. Hi-Limit Switch
5. Thermostat
6. Drain Plug
7. On/Off Switch

Sequence of operation:

- Remote switch is placed in the "on" position. 110-volt current is then supplied to the thermostat.
- The thermostat senses the temperature of the water. If it is below the set value, the thermostat allows current to pass to the heating element.
- Current passes through the heating element warming the water. When the thermostat senses that water temperature passes above the set value, current to the element is shut off.
- If the thermostat fails to cut off current to the heater element when the water temperature exceeds the set value, the hi-limit switch will cut off power to the element when the water temperature reaches approximately 190°F. *The hi-limit switch has a manual reset button.
- In the event that both the thermostat and the hi-limit switch should fail; the pressure temperature relief valve will open at approximately 210°F or 125 psi.



TROUBLESHOOTING

Condition	Action
1. No heating of water.  	1. Check for 110-volt AC on black wire feeding the hi-limit switch. Is 110-volt AC present? (Yes) Proceed to Step 2. (No) Trace line back to 110-volt AC source to find reason for power loss. Repair as necessary. 2. Manually reset the hi-limit switch by: A. Placing the remote switch to the "off" position. B. Depressing the red button on the hi-limit switch. C. Placing the remote switch in the "on" position. Does the water heater produce heated water? (Yes) Proceed to Step 3. (No) Proceed to Step 4. 3. Disconnect 110-volt AC. Remove thermostat from water heater. Use a heat gun to carefully heat thermostat to 140°F. Take a resistance reading across thermostat terminals. Does test indicate any "open"? (Yes) Reinstall thermostat and place water heater back in service. (No) Replace defective thermostat. 4. Check for 110-volt AC at the thermostat end of wire between hi-limit switch and thermostat. Is 110-volt AC present? (Yes) Proceed to Step 5. (No) Replace defective hi-limit switch. 5. Check for 110-volt AC at wire leading from thermostat to heating element. Is 110-volt AC present? (Yes) Proceed to Step 7. (No) Proceed to Step 6. 6. Disconnect 110-volt AC power. Allow water heater to cool down below 100°F. Check for continuity through the thermostat. If there is no continuity, replace defective thermostat. 7. Disconnect 110-volt AC power. Disconnect wires from terminals on heating element. Take a resistance reading across element terminals. Does test indicate an "open"? (Yes) Replace defective element. (No) Visually inspect white wire leading from element for damage.

Main Index Section Index Print

Condition	Action
2. Excessive water temperature.	1. Please note that before beginning diagnosis, it should be determined that the excessive water temperature condition is occurring when the heater is using 110-volt AC power. On units equipped with the motoraid option, the occurrence of excessively hot water is possible after the vehicle has been driven for two hours. If the condition is not thought to be caused by extended driving, proceed to Step 2. 2. Check thermostat to see if it is loose. Is the thermostat making firm contact with the tank? (Yes) Proceed to Step 3. (No) Tighten thermostat retaining nuts. 3. Disconnect 110-volt AC power. Disconnect and remove thermostat. Using a heat gun, carefully heat the thermostat terminals. Does this test indicate an open circuit? (Yes) Thermostat is operating properly. To lower water temperature, replace thermostat with a lower rated thermostat. (No) Replace defective thermostat.

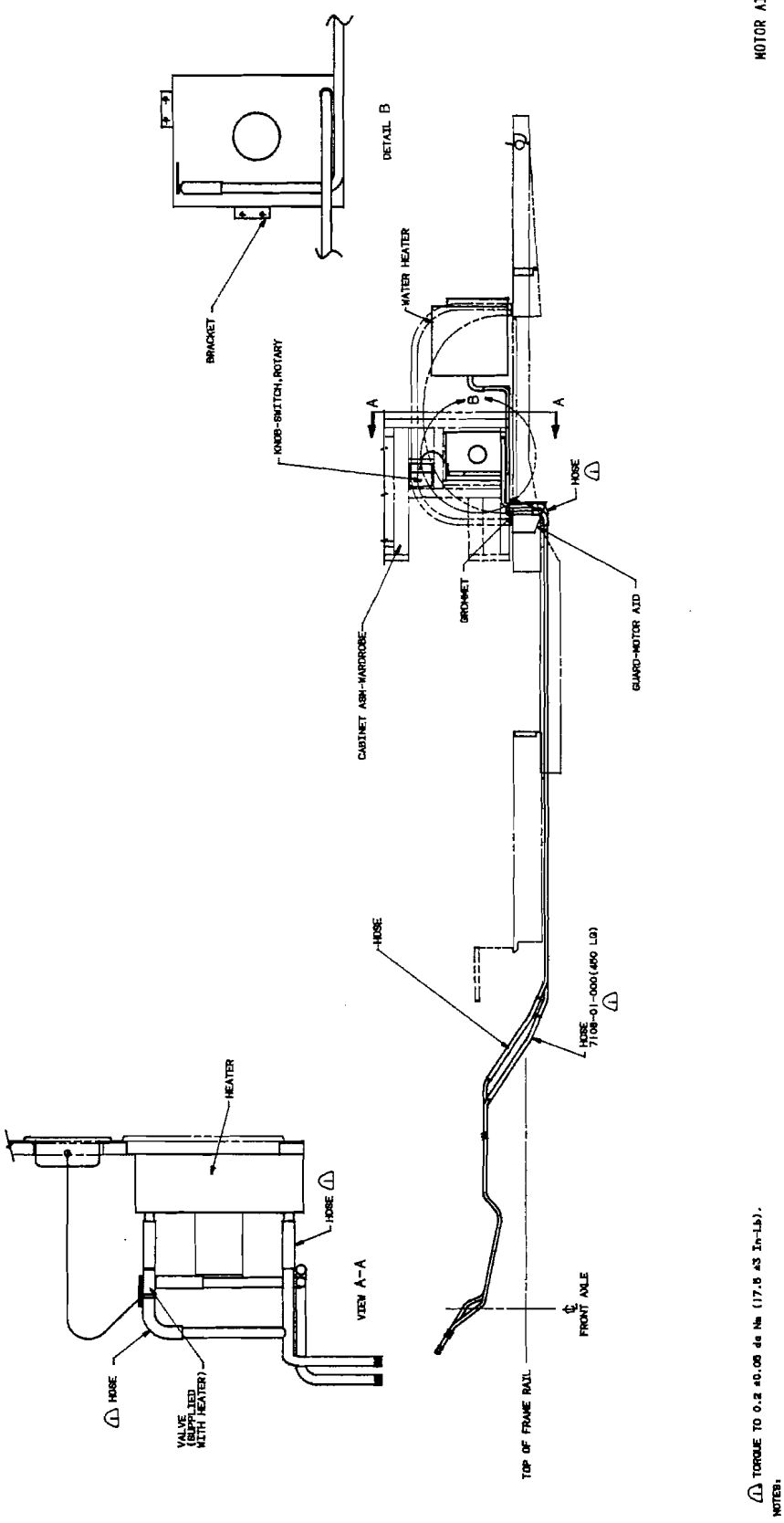
Condition	Action
3. The relief valve leaks or drips.	1. Weeping or dripping of the relief valve during water heater operation does NOT indicate a defective relief valve. The water heater tank is designed with an internal air gap at the top of tank. In time, the normal expansion caused by heating water allows the air cushion to be absorbed. To remedy a weeping or dripping valve, perform the following steps: A. Turn off water heater. B. Turn off incoming water supply. C. Open a faucet in the coach. D. Pull handle of relief valve straight out and allow water to flow until it stops. E. Allow relief valve to snap, close faucet, turn on water supply.

WATER HEATER REMOVAL:

1. Disconnect vehicle from 110-volt AC power.
2. Turn water pump off.
3. Allow water heater to cool off.
4. Remove the left dinette seat. Reference "Dinette Seat Removal" in interior section.
5. Remove water heater access panel. Note location of wire connections for ease of later installation. Disconnect 110-volt AC wires.
6. Open a hot water faucet to relieve pressure in water heater. Open water heater drain petcock and drain water heater. (Drain located under converter.)
7. Disconnect water inlet and outlet lines.
8. Disconnect water heater drain line.
9. Disconnect hose from relieve valve.
10. Disconnect (2) motor-aid lines from water heater and clamp them off.
11. Remove (4) water heater retaining screws.
12. Remove water heater.

WATER HEATER REPLACEMENT:

1. Place water heater in position under left dinette.
2. Secure with (4) retaining screws.
3. Connect (2) motor-aid lines and secure with hose clamps.
4. Connect hose to relief valve. Secure with hose clamp.
5. Connect water heater drain line. Make certain drain is closed.
6. Connect inlet and outlet water lines.
7. Connect 110-volt AC wires as noted in Step 5 of Water Heater Removal. Replace water heater access cover.
8. Replace left dinette seat. Reference "Dinette Seat Replacement" in Interior Section.



Main Index
Section Index
Print

MOTOR AID HEATER

The motor aid heater uses heat generated by the vehicle engine to provide heated air to the cabin of the vehicle.

The motor aid unit receives heated engine coolant. The coolant passes through a heater core. Where a fan blows air across the core which warms the air. Coolant is then returned to engine cooling system.

Coolant flow into the motor aid unit is controlled by a heater control valve. The control for the valve is located on the face of the wardrobe cabinet.

The blower motor is controlled by a switch in the dash.

MOTOR AID HEATER REMOVAL

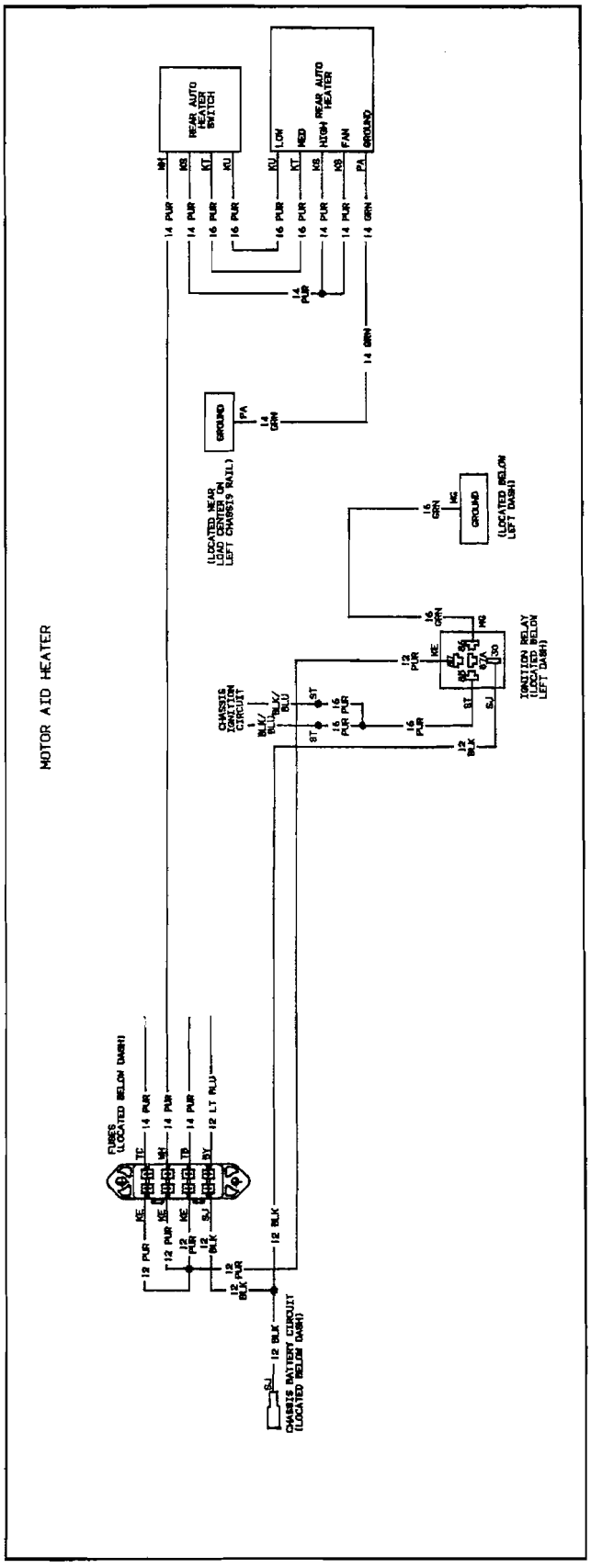
CAUTION

Allow vehicle engine coolant system to cool down before attempting any repairs to the motor aid system.

1. Remove the upper shelf from the wardrobe cabinet by gently pulling upward to release the retaining velcro.
2. Remove (6) lower wardrobe cabinet shelf retaining screws. Remove the lower shelf from the wardrobe cabinet.
3. Clamp off the coolant intake and outlet hoses at the motor aid unit with locking pliers.
4. Loosen hose clamps and remove coolant intake and outlet hoses.
5. Disconnect 12 volt DC wiring at connector near motor aid unit.
6. Remove (4) motor aid retaining screws. Lift motor aid unit up and out of cabinet.

MOTOR AID HEATER REPLACEMENT

1. Place motor aid unit in proper position inside the wardrobe cabinet.
2. Secure motor aid unit with (4) retaining screws.
3. Connect 12 volt DC wiring at connector at motor aid unit.
4. Install coolant inlet and outlet hoses to motor aid unit. Secure with hose clamps.
5. Release locking pliers.
6. Install lower shelf in wardrobe cabinet and secure with (6) retaining screws.
7. Install upper shelf in wardrobe cabinet. Secure by firmly pressing down to seat the velcro.



Main Index
Section Index
Print

TROUBLESHOOTING REAR MOTOR AID

Condition	Course of Action
1. No low speed fan operation. Other fan speeds normal.	1. With ignition key "on" and heater switch in "low" position. Check for 12 volts DC on wire "KU" at the switch. Is voltage present? (Yes) Proceed to Step 2. (No) Replace switch. 2. With ignition key "on" and heater switch in "low" position. Check for 12 volts DC on wire "KU" at the resistor pack on heater. Is voltage present? (Yes) Replace resitor pack. (No) Troubleshoot wire "KU" to determine cause of voltage loss. Repair or replace as necessary.
2. No medium speed fan operation. Other fan speeds normal.	1. With ignition key "on" and heater switch in the "medium" position. Check for 12 volts DC on wire "KT" at the switch. Is voltage present? (Yes) Proceed to Step 2. (No) Replace switch. 2. With ignition key "on" and heater switch in the "medium" position. Check for 12 volts DC on wire "KT" at the resistor pack on heater. Is voltage present? (Yes) Replace the resistor. (No) Troubleshoot wire "KT" to determine cause of voltage loss. Repair or replace as necessary.
3. No high speed fan operation. Other fan speeds normal.	1. With ignition key "on" and heater switch in "high" position. Check for 12 volts DC on wire "KS" at the switch. Is voltage present? (Yes) Troubleshoot wire "KS" to splice near rear heater to determine cause of voltage loss. Repair or replace as necessary. (No) Replace switch.

TROUBLESHOOTING REAR MOTOR AID

Condition	Course of Action
4. No fan operation at any speed.	1. With ignition key "on" check for 12 volts DC on wire "WH" at the heater switch. Is voltage present? (Yes) Proceed to step 2. (No) Troubleshoot wire "WH" to determine cause of voltage loss. Repair or replace as necessary. 2. With ignition key on and heater switch in high position, check for 12 volts DC on wire "KS" at switch. Is voltage present? (Yes) Proceed to step 3. (No) Replace switch. 3. With ignition key on and heater switch in high position, check for 12 volts DC on wire "KS" at blower motor. Is voltage present? (Yes) Proceed to Step 4. (No) Troubleshoot wire "KS" to determine cause of voltage loss. Repair or replace as necessary. 4. With ignition key on and heater switch in high position, jumper a wire from wire "PA" connection at motor to a known good ground. Does fan operate? (Yes) Troubleshoot wire "PA" to determine cause for loss of ground. Repair or replace as necessary. (No) Replace motor.
5. Heater continually radiates heat.	1. Is heater control knob in the "off" position. (Yes) Proceed to Step 2. (No) Place knob in "off" position. 2. Adjust heater control valve to allow it to completely close.

Main Index Section Index Print

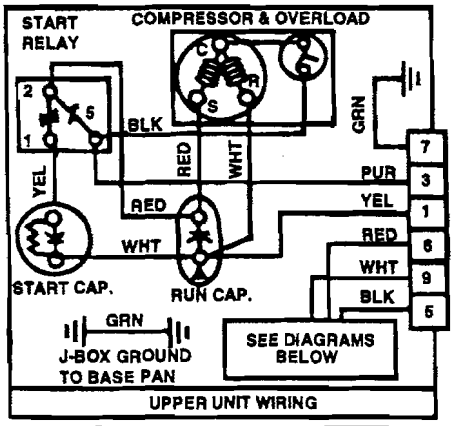
ROOF AIR CONDITIONER

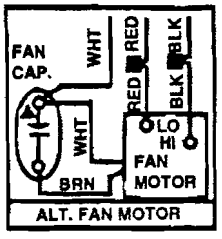
The roof air conditioner is a self contained unit that is powered by 110 volt AC. It provides cooled air to the interior of the vehicle.

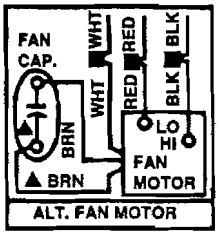
The following service information is intended for professional air conditioning technicians who are properly certified as outlined in Section 608 of the Clean Air Act. Do NOT attempt to service the air conditioning unit if you are not properly trained and certified.

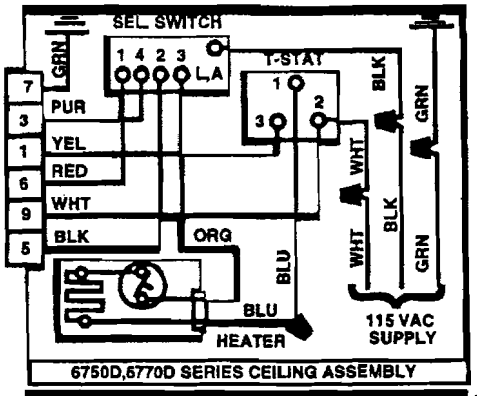
IMPORTANT: It is the technicians responsibility to be aware of federal, state, and local regulations regarding the servicing of air conditioning sytem.

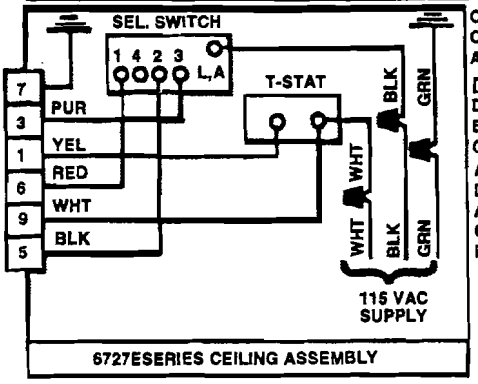
FOR 6727D700; 6727-800; 6727A800; 6727-730; 6759D700; 6759E707; 6750-800; 6770D700; 6770-717; 6770A717











R.V. PRODUCTS, INC,
P.O. BOX 4020
WICHITA,KS 67204

USE	MAXIMUM
TIME DELAY FUSE OR	20 AMPS
CIRCUIT BREAKER U.L.H.A.C.R. TYPE	20 AMPS
C.S.A.	20 AMPS

SUPPLY WIRES 12 AWG MIN.
USE COPPER CONDUCTORS

▲ INDICATES IDENTIFIED TERMINAL AND WIRING.

CHECK TERMINAL LOCATIIONS FOR CORRECT CONNECTIONS AND SPACING BEFORE OPERATING.

DANGER' SHOCK HAZARD'
DISCONNECT POWER SUPPLY BEFORE SERVICING AND ELECTRICAL COMPONENT.

AVIS.
DEBRANCHES LES FILS ELECTRIQUES AVANT LENTRETIEN ET LE DE TOUT COMPARTMENT OU ORANGE ELECTRIQUES.

Main Index Section Index Print

TROUBLESHOOTING

Condition	Course of Action
1. Roof A/C inoperative. No fan or compressor operation.	1. Check for 115-volts AC between the black wire (Hot) feeding into the selector switch and the white wire (Neutral) feeding into the thermostat. (See appropriate wiring diagram.) Is voltage present? (Yes) Proceed to Step 3. (No) Proceed to Step 2. 2. Check for 115-volts AC between black wire feeding selector switch and ground. Is voltage present? (Yes) Inspect white wire from thermostat back to the control center to determine cause of voltage loss. Repair as necessary. (No) Inspect black wire back to control center for cause of voltage loss. Repair as necessary. 3. Check for 115-volts AC between the high speed fan wire at the control switch and the white wire feeding into the thermostat. Is voltage present? (Yes) Check white wire connections at thermostat. Clean and repair as necessary. (No) Proceed to Step 4. 4. Check for 115-volts AC between high speed fan wire at the control switch and ground. Is voltage present? (Yes) Check white wire connections at the thermostat. Clean and repair as necessary. (No) Replace defective control switch.

TROUBLESHOOTING

Condition	Course of Action
2. Inadequate cooling. Compressor and fan run*. *As long as the approximate 15- to 20-degree temperature difference is being maintained, the air conditioner is working at capacity. When the air conditioner is working at capacity and the desired inside temperature cannot be maintained, then the RV is absorbing or gaining heat faster than the air conditioner is designed to remove it. Parking the vehicle in a shaded area, keeping windows and doors shut, and avoiding the use of heat producing appliances will help to reduce the heat gain. If more cooling capacity is desired, then the use of a larger air conditioner, or the addition of a second one is required. When measuring the air temperature difference, all air conditioning components must be installed. Such as: duct collar, ceiling assembly, and the ceiling assembly plastic shroud. Temperature readings must be taken at the ceiling assemblies plastic shroud return air openings and discharge air openings. The ability of the air conditioner to maintain the desired inside temperature depends on the heat gain of the recreational vehicle. The size of the vehicle, amount of window area, amount of insulation, amount of direct exposure to the sun, outside temperature, and the number of people in the vehicle may increase the heat gain to such an extent that the capacity of the air conditioner is exceeded. As a general rule, air entering the ceiling assembly return air grills will be cooled between 15 to 20 degrees (this varies due to fluctuating outdoor temperatures and humidity conditions). For example, if the air entering the ceiling assembly return air grills at 80°F, the air leaving the ceiling assembly discharge openings will be cooled to between 60°F and 65°F.	1. Check control switch, place switch in high cool position, operate air conditioner for 15 minutes, remove shroud, and observe suction line. Is it frosted? (Yes) Evaporator is not picking up the heat load. Proceed to Step 2. (No) Suspect a low charge or a plugged cap tube. 2. Check filters. Are they clean and unrestricted? (Yes) Proceed to Step 3. (No) Clean or replace as necessary. 3. Check for dirt build-up on the evaporator coil. Is the evaporator clean? (Yes) Proceed to Step 4. (No) Carefully clean evaporator with compressed air. If compressed air does not sufficiently clean the evaporator, the unit may be removed from the vehicle and the evaporator washed with detergent and water. (Cover the fan motor and electrical controls with a plastic sheet to protect them.) After system is cleaned, allow several hours for drying time before operation. 4. Check blower wheel for proper operation. Is blower wheel loose or wobbly? (Yes) Repair or replace as necessary. (No) Blower motor may not be coming up to speed, proceed to Step 5. 5. Check for shorted or open fan capacitor. Refer to Capacitor Test Procedure in Appendix E. 6. Check for partially burned motor windings. Refer to Fan Motor Check Procedure in Appendix D.

Main Index Section Index Print

TROUBLESHOOTING

Condition	Course of Action
3. Fan runs on high or low cool, but compressor does not run or hum.	1. Set thermostat to coldest setting. Make sure coach is at room temperature of higher (72°F +). Refer to appropriate wiring diagram. Disconnect plug from control assembly, perform a continuity between Pins 2 and 3 of the thermostat. Does test indicate continuity? (Yes) Proceed to Step 2. (No) Replace defective thermostat. 2. Place control switch in the high or low cool position. Check for 115-volts AC on purple wire at switch. Is voltage present? (Yes) Proceed to Step 3. (No) Replace defective switch. 3. With control switch in the high or low cool position, check for 115-volts AC on common terminal of the compressor. Is voltage present? (Yes) Test compressor. Refer to Appendix A, replace as necessary. (No) Proceed to Step 4. 4. Check for 115-volts AC on black wire feeding compressor overload. Is voltage present? (Yes) replace overload. (No) Trace circuit back to control switch to determine cause of voltage loss. Repair as necessary.

TROUBLESHOOTING

Condition	Course of Action
4. Fan runs on high or low cool, compressor hums.	1. Check voltage: a. Check the voltage between #1 on the overload switch and the R terminal of the compressor while it is not humming. This voltage must be 115 volts plus or ninis 10%. b. Check the voltage from 'C' to 'R' of the compressor while it is humming (trying to start). The latter reading will probably be lower, but it still must be 103.5 volts minimum (115 volts - 10%). If the first reading is above 103.5 volts and the second is under 103.5 volts, there is too much voltage drop in the lines - a situation which must be corrected for the air conditioner to perform safely and satisfactorily. Is voltage within specifications? (Yes) Proceed to Step 2. (No) Repair as necessary. 2. Check compressor start capacitor (refer to Capacitor Test Procedure in Appendix E). Does capacitor pass test? (Yes) Proceed to Step 3. (No) Replace capacitor. 3. Check potential start relay (refer to Appendix A). Does relay pass test? (Yes) Proceed to Step 4. (No) Replace relay. 4. Check for "open" or "grounded" compressor start winding (refer to Compressor Motor Check Procedure in Appendix L). Does compressor pass test? (Yes) Proceed to Step 5. (No) Replace compressor. 5. Compressor is mechanically stuck, attempt to free using an "Annie" Model 12 or equivalent.

Main Index Section Index Print

TROUBLESHOOTING

Condition	Course of Action
5. Breaker trips when compressor operation is requested.	1. Check collar connecting blower outlet to ceiling assembly. Is collar allowing ducted air to escape? (Yes) Repair or replace. (No) Proceed to Step 2. **CAUTION** Whenever taking an ohm reading, power to the circuit must be turned off. 2. Check resistance on compressor power wire (refer to appropriate wiring diagram). Disconnect compressor power wire from selector switch and Terminal 'C' of the compressor. Take an ohm reading on the power wire. Does test indicate a high resistance? (Yes) Inspect wire to find short. Repair or replace as necessary. (No) Proceed to Step 3. 3. Check for shorted compressor motor winding. Refer to Appendix L Compressor Motor Check Procedure. Does compressor pass test? (Yes) Proceed to Step 4. (No) Replace compressor. 4. Check compressor run and start capacitors. Refer to Appendix E Capacitor Test. Do capacitors pass test. (Yes) Proceed to Step 5. (No) Replace faulty capacitor(s). 5. Disconnect wires from 'S' and 'R' terminals at compressor and from terminals on compressor start and run capacitors. Ohm check wires. Does test indicate high resistance on any wires? (Yes) Repair or replace wires as necessary. (No) Proceed to Step 6. 6. Ohm check wire from compressor run capacitor to thermostat, perform an ohm test on wire. Does test indicate high resistance? (Yes) Inspect wire to determine cause of short. Repair or replace as necessary. (No) Proceed to Step 7. 7. At this point, suspect a faulty circuit breaker. Replace breaker.

TROUBLESHOOTING

Condition	Course of Action
6. Compressor cycles on and of resulting in inadequate cooling.	1. Check thermostat bulb. Is it touching metal? (Yes) Reposition to clear any metal. (No) Proceed to Step 2. 2. Inspect collar connecting blower outlet to ceiling assembly. Is collar too short or bent, allowing ducted air to escape? (Yes) Repair or replace as necessary. (No) Proceed to Step 3. 3. Check compressor amp draw. Take amp reading on black wire from potential relay to compressor with compressor running. Compare reading to FLA rating on air conditioner specification tag. Is amp draw within specification? (Yes) Proceed to Step 4. (No) Proceed to Step 8. 4. When compressor has cycled off, check for AC voltage at Terminal C of the compressor. Is voltage present? (Yes) Proceed to Step 4. (No) Proceed to Step 8. 5. Check thermostat calibrations. While the compressor is not running and with power on, check for voltage between terminals #2 (white wires) and #3 (yellow wires) on A models - between the two terminals on B or dash models. If the meter reads 115 volts, the thermostat is out of calibration and it must be replaced. If thermostat passes test, proceed to Step 6. 6. Inspect yellow wire from thermostat to compressor run capacitor for an intermittent open, pay close attention to connector. Repair or replace as necessary. 7. Suspect a low charge or plugged capillary tube. The compressor is dependent on a good supply of cool suction gas for cooling.If the system charge is low, there will be less than a normal amount of refrigerant passing through the compressor, less compressor heat will be carried away by the refrigerant; and therefore, the compressor will overheat.

Main Index Section Index Print

TROUBLESHOOTING

Condition	Course of Action
	NOTE: LOW CHARGE WILL NOT CAUSE OVER CURRENT. It will, in fact, cause the current to be low. Indicators of low charge are: a. The evaporator will be starved for liquid refrigerant so the suction line and a portion of the evaporator coil will be warmer than normal. This is the condition we refer to as too much super heat. How much of the evaporator coil will be starved for liquid refrigerant depends on the degree of under charge. b. The active portion of the evaporator coil which does have some liquid refrigerant will be colder than normal and many times will frost because the suction pressure will be low. How much of the coil is active also depends on the degree of under charge. c. The discharge temperature will be noticeably higher than normal. d. The compressor temperature will be noticeably higher than normal. NOTE: Unless the thermal current overload switch saves the system, these last two indicators (C and D) are sure to burn the system out. The high temperature at the discharge port will destroy the refrigerant and oil, and the high compressor temperature will burn up the compressor motor windings. 8. Check voltage between C and R terminals of the compressor while it is running. Is AC voltage between 103.5 volts and 126.5 volts? (Yes) Proceed to Step 9. (No) Remedy cause of high or low voltage. 9. Check condenser coil. Is it ''dirty'' or obstructed? (Yes) Clean as necessary. (No) Proceed to Step 10. 10. Check condenser fan for looseness and damage. Repair as necessary. Does condenser fan operate at proper speed? (Yes) Proceed to Step 11. (No) Test fan motor (reference Fan Motor Check Procedure in Appendix D). Test fan capacitor (reference Capacitor Test in Appendix E). Replace as necessary.

TROUBLESHOOTING

Condition	Course of Action
	11. Suspect an overcharge or non-condensables (air) in the system. Either an overcharge of refrigerant or non-condensables in the system will cause high head pressure and consequently excessive current. Be especially suspicious of one or both of these conditions if you discover evidence of the system having been open (service valves in the system, extra pinch off marks, etc.). The indications of overcharge are: a. Over current. b. Cooler than normal suction line. With an over-charge, the suction line will usually sweat all the way to the comressor and even the compressor housing cfan sometimes sweat. c. Cooler than normal discharge line. The discharge line should be highly superheated and, therefore, at high temperature. When the outdoor temperature is above 85°, and the system has been in operation for ten minutes or longer, if you touch the discharge line and it burns your figures, that is as it should be. If you can hold on to it for a second or two with any degree of comfort, it is probably too cool because the system is over-charged and the compressor is running flooded. This condition will nearly always accompany a cooler than normal suction line. Feeling lines with your fingers is a very inexact method of gathering information and cannot be considered accurate. So use this information only to form judgement in your diagnosis of trouble and consider as many indicators as possible in coming to a conclusion. The indications of non-condensables in the system are: a. Over current. b. Higher than normal discharge line temperature. c. Higher than normal liquid line temperature. d. Higher than normal compressor temperature.

TROUBLESHOOTING

Condition	Course of Action
7. Fan will not run regardless of switch setting. Compressor runs on high or low cool.	1. Check for 115-volts AC on high speed fan wire leading from selector switch (refer to appropriate wiring diagram). Is voltage present? (Yes) Proceed to Step 2. (No) Proceed to Step 3. 2. Check for 115-volts AC on 'H' terminal of fan motor. Is voltage present? (Yes) Proceed to Step 6. (No) Inspect wire back to selector switch to determine cause of voltage loss. Repair as necessary. 3. Check for 115-volts AC on low speed fan wire. Is voltage present? (Yes) Proceed to Step 4. (No) Replace switch. 4. Check for 115-volts AC on 'L' terminal of fan motor. Is voltage present? (Yes) Proceed to Step 5. (No) Inspect wire back to selector switch to determine cause of voltage loss. Repair as necessary. 5. Condenser fan. Is fan tight on shaft and free of damages? Does fan spin freely and stop smoothly? (Yes) Proceed to Step 6. (No) Replace or repair as necessary. 6. Check fan motor windings (refer to Fan Motor Check Procedure in Appendix D). Does motor pass test? (Yes) Proceed to Step 7. (No) Replace motor. 7. Check fan capacitor (refer to Capacitor Test in Appendix E). Does capacitor pass test? (Yes) Inspect wires between capacitor and motor, also, between capacitor and thermostat for damage. Repair or replace as necessary. (No) Replace capacitor.

Rialta

PRESSURE TEMPERATURE RELATIONSHIP FOR R22 AT SATURATION

°F	PSIG
-40	.6
-35	2.7
-30	5.0
-25	7.5
-20	10.3
-15	13.4
-10	16.6
-5	20.2
0	24.1
1	24.9
2	25.8
3	26.6
4	27.5
5	28.3
6	29.2
7	30.1
8	31.1
9	32.0
10	32.9
11	33.9
12	34.9
13	35.9
14	36.9
15	37.9
16	39.0
17	40.1
18	41.1
19	42.2
20	43.3
21	44.5
22	45.6
23	46.8
24	47.9
25	49.1
26	50.3
27	51.5
28	52.7
29	53.9

°F	PSIG
30	55.2
31	56.5
32	57.7
33	59.0
34	60.2
35	61.4
36	62.9
37	64.4
38	65.9
39	67.5
40	69.0
41	70.5
42	72.0
43	73.6
44	75.1
45	76.6
46	78.2
47	79.8
48	81.5
49	83.1
50	84.7
51	86.4
52	88.1
53	89.8
54	91.5
55	93.2
56	95.1
57	96.9
58	98.8
59	100.6
60	102.5
61	104.4
62	106.3
63	108.2
64	110.1
65	112.0
66	114.1
67	116.2

°F	PSIG
68	118.3
69	120.4
70	122.5
71	124.8
72	127.0
73	129.3
74	131.5
75	133.8
76	136.0
77	138.3
78	140.5
79	142.8
80	145.0
81	147.6
82	150.2
83	152.8
84	155.4
85	158.0
86	160.4
87	162.8
88	165.3
89	167.7
90	170.1
91	173.0
92	176.0
93	178.9
94	181.9
95	184.8
96	187.4
97	190.0
98	192.7
99	195.3
100	197.9
101	200.9
102	204.0
103	207.0
104	210.1
105	213.1

°F	PSIG
106	216.2
107	219.3
108	222.5
109	225.6
110	228.7
111	232.2
112	235.6
113	239.1
114	242.5
115	246.0
116	249.3
117	252.6
118	256.0
119	259.3
120	262.6
121	266.2
122	269.8
123	273.3
124	276.9
125	280.5
126	284.2
127	287.8
128	291.5
129	295.1
130	298.8
131	302.6
132	306.4
133	310.3
134	314.1
135	317.9
136	321.9
137	325.9
138	329.9
139	333.9
140	338.0
141	342.3
142	346.6
143	350.9
144	355.3

Main Index Section Index Print

ROOF TOP AIR CONDITIONER REMOVAL

CAUTION

Disconnect vehicle electrical system from 110 volt AC power.

1. Remove (2) screws retaining interior cover. Remove interior cover.
2. Remove control box access panel by removing (2) retaining screws.

NOTE: 110 volt AC wire connections to ease later installation.

3. Disconnect 110 volt AC wires. Remove cable clamp at control box. Pull 110 volt AC wires free of control box. Unplug wire book going to roof top unit at connector on control box.
4. Remove (4) ceiling assembly retaining bolts. Remove ceiling assembly and duct collar.
5. Remove (4) exterior air conditioner shroud retaining nuts. Remove shroud.
6. Carefully lift and remove air conditioner assembly from vehicle.

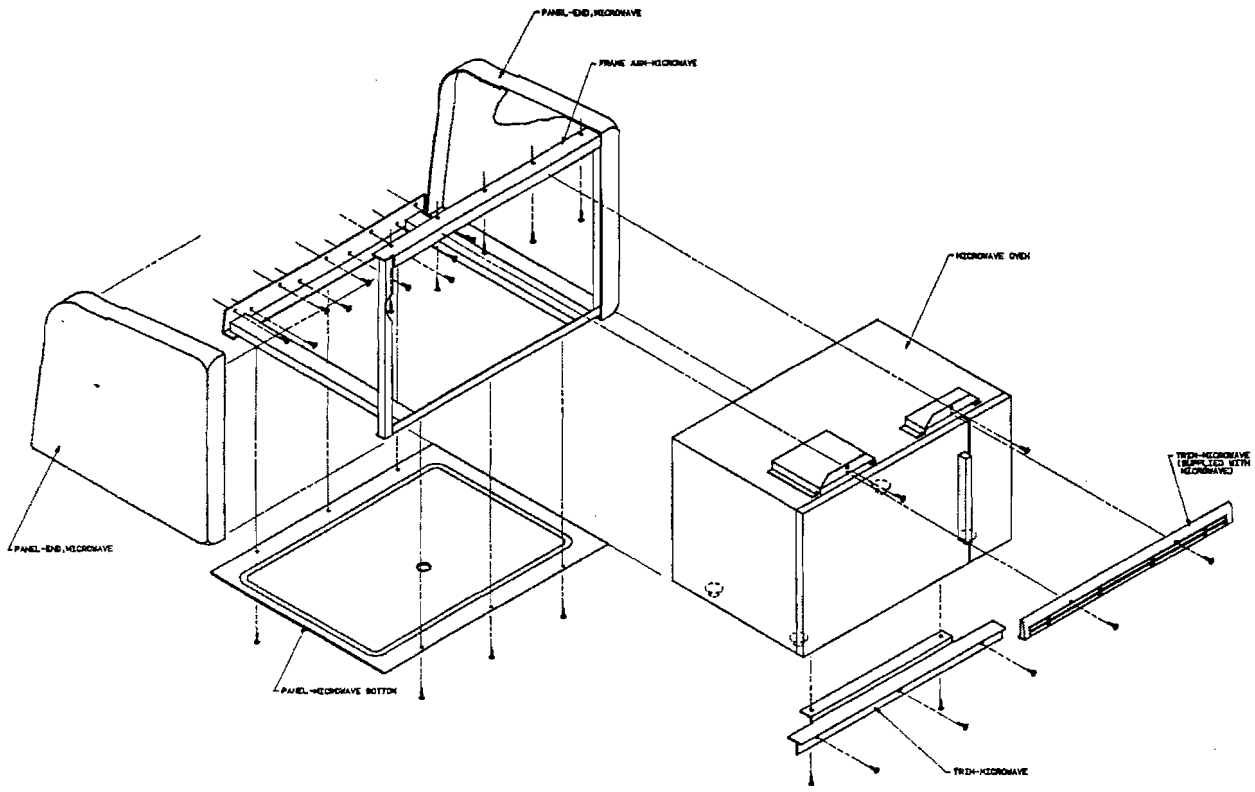
ROOF TOP AIR CONDITIONER REPLACEMENT

CAUTION
Disconnect vehicle electrical system from 110 volt AC power.

1. Place air conditioner assembly in proper position in roof opening.
2. Install duct collar and ceiling assembly. Secure with (4) retaining bolts.

Tighten retaining bolts until springs are just about completely compressed. Do NOT over tighten.

3. Make 110 volt AC connections at control box. Secure cable with connector at box. Connect wire loom from roof top unit at connector on control box. Replace control box access cover. Secure with (2) retaining screws.
4. Install interior cover. Secure with (2) retaining screws.



MICROWAVE REMOVAL

1. Remove upper trim piece by removing (2) retaining screws.
2. Remove (3) lower trim retaining screws.
3. Remove (2) upper mounting brackets retaining screws.
4. Carefully pull microwave partially out of cabinet to access 110 volt AC receptacle. Disconnect microwave cord from receptacle.
5. Remove microwave.

> NOTE: If you will be installing a new microwave, it will be necessary to remove the lower trim piece from the microwave by removing (2) retaining screws and installing it on the new microwave.

MICROWAVE INSTALLATION

> NOTE: If you are installing a new microwave, it will be necessary to remove the lower trim from the old microwave and install it on the new unit with (2) retaining screws.

1. Place microwave partially into cabinet.
2. Connect microwave power cord to 110 volt AC receptacle.
3. Slide microwave completely into cabinet.
4. Secure upper mounting brackets to cabinet with (2) screws.
5. Secure lower trim piece to cabinet with (3) retaining screws.
6. Install upper trim and secure with (2) retaining screws.

TELEVISION ANTENNA REMOVAL

1. Remove crank handle by loosening handle set screw.

NOTE: Two washers and a spring will also come loose.

2. Remove directional handle and "ceiling" plate by removing (4) retaining screws from the directional handle.
3. Disconnect coax cable at roof.
4. Remove (6) antenna base retaining screws.
5. Carefully cut sealant around base of antenna. Lift antenna from the roof to remove.

TELEVISION ANTENNA REPLACEMENT

1. Apply sealant to the bottom of the antenna base. (Winnebago part #034552-02-000).
2. Place antenna in proper position on roof. Secure with (6) retaining screws.
3. Cap seal screws and perimeter of base with sealant. (Winnebago part #108716-01-000).
4. Attach coax to connector at roof. Seal boot with sealant. (Winnebago part #034552-02-000).
5. If you are installing a new antenna. Fill the non-used cable hole with sealant. (Winnebago part #034553-02-000).
6. Install directional handle and ceiling plate. Secure with (4) retaining screws.
7. Install crank handle with two washers and a spring. Secure with set screws.

WARNING
Once set screw touches shaft. Only tighten if 1/4 turn more.