
Foreword

This service manual is the result of the dedication of The Dometic Corporation and its engineers in giving service people the necessary instruction for making accurate analyses of certain conditions. Provided is a diagnostic chart leading a qualified mechanic into the service manual pages to locate and solve symptoms which may occur. Dometic has continued its commitment in providing service people with this, the most up-to-date information about servicing Dometic RV accessories.

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This program will address the most common system problems associated with the AMES/AES Refrigerator Models including S1521, S1531, S1621, S1631, S1821, S1831, RM 2607, RM 2611, RM 2807, RM 2811, RM 3607 and RM 3807 and also the ROYALE/ELITE Refrigerator Models including RM3662, RM3663, RM3862, RM3863, RM4872 and RM4873 supplied by The Dometic Corporation. Our intent is to provide you with a guideline of checks to make, should you encounter one of the following symptoms.

SYMPTOM	CAUSE	REFER TO	STEP
REFRIGERATOR SECTION			
1. No operation - no panel lights	Operation DC Volts Fuse Wiring Upper Circuit Board Lower Circuit Board	1.1,1.2,1.3,1.4 or 1.5 4 5.11 8.1 & 8.2 5.8 5.9	A
2. No operation - has panel lights	Operation DC Volts Thermistor Fuses Upper Circuit Board Wiring Lower Circuit Board	1.1,1.2,1.3,1.4 or 1.5 4 5.2 5.11 5.8 8.2 5.9	A,B,C,D
3. No AC operation - operates on other mode(s)	Operation AC Volts Fuse Heating Element Upper Circuit Board Wiring Lower Circuit Board	1.1,1.2,1.3,1.4 or 1.5 2 5.11 3 5.8 8.2 5.9	A, B
4. No DC operation - operates on other mode(s)	Operation DC Volts Fuse Heating Element Upper Circuit Board Wiring Lower Circuit Board	1.1,1.2,1.3,1.4 or 1.5 4 5.11 5.1 5.8 8.2 5.9	A, C
5. No Gas operation - operates on other mode(s)	Operation LP Gas Manual Gas Valve Igniter High Voltage Cable Electrode Solenoid Upper Circuit Board Wiring Lower Circuit Board	1.1,1.2,1.3,1.4 or 1.5 8 7.1 5.5 5.8 5.7 5.4 5.8 8.2 5.9	A, D
6. Insufficient cooling on all modes.	Ventilation Leveling Ambient Temperature Air Leaks Thermistor Cooling Unit Thermistor Adjuster	9.2 9.1 9.5 9.3 5.2 9.8 5.3	

SYMPTOM	CAUSE	REFER TO	STEP
7. Insufficient cooling on AC - cools properly on other mode(s).	AC Volts Heating Element Lower Circuit Board	2 3 5.9	A, B
8. Insufficient cooling on DC - cools property on other mode(s).	DC Volts Heating Element Wiring Lower Circuit Board	4 5.1 8.2 5.9	A, C
9. Insufficient cooling on Gas - cools properly on other mode(s).	LP Gas Orifice Flue Baffle Flue Tube Flue Cap (if equipped) Burner Lower Circuit Board	8 7.2 7.5 7.7 7.8 7.4 5.9	A, D
10. Freezes.	Thermistor Thermistor Adjuster Lower Circuit Board Upper Circuit Board	5.2 5.3 5.9 5.8	A,B,C,D
11. Changes preset mode.	Operation DC Volts Wiring Upper Circuit Board Lower Circuit Board	1.1,1.2,1.3,1.4 or 1.5 4 8.1 5.8 5.9	A
12. Check light on.	DC Volts Wiring LP Gas Manual Gas Valve Solenoid Orifice Burner Lower Circuit Board Thermocouple	4 8.2 8 7.1 5.4 7.2 7.4 5.9 7.3	A, C
13. Interior light on when door is closed.	Wiring Door Switch Door Position	8.2 5.10 9.4	
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15. Water on frame.	Interior Liner to Frame High Humidity Air Leaks Climate Control Heater	9.9 9.8 9.3 5.12	
ICE MAKER SECTION			
16. Ice Maker fails to start.	Operation Arm in Up Position AC Voltage Water Valve Ice Maker Cycle	10 11.4 2 11.7 11.8	

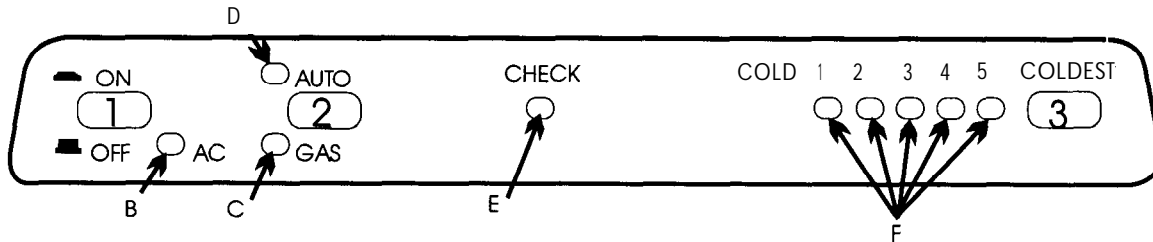


SYMPTOM	CAUSE	REFER TO	STEP
17. Ice Maker won't make ice.	Blades Frozen in Ice AC Voltage Water Valve Ice Maker Cycle	12.1 2 11.7 11.8	
18. Keeps making ice and won't shut off.	Shut-off arm	11.4	
19. Not making enough ice.	Operation Mold Thermostat Cube Size Ice Maker Cycle	10 11.3 12.1 11.8	
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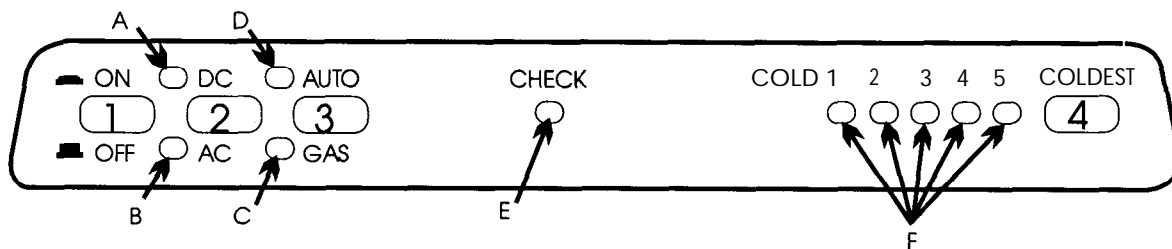
SECTION 1

1.1 AMES REFRIGERATOR OPERATION

S-WAY DISPLAY PANEL



3-WAY DISPLAY PANEL



MODELS INCLUDE: S1521, S1531, S1621, S1631, S1821, S1831, RM2607, RM2611, RM2807, RM2811

AUTO MODE

When operating in the AUTO mode, the AUTO mode indicator lamp (D) will illuminate. The control system will automatically select between AC and GAS operation with AC having priority over GAS. Either the AC indicator lamp (B) or the GAS indicator lamp (C) will illuminate depending on the energy source selected by the control system. If the control system is operating with AC energy and it then becomes unavailable, the system will automatically switch to GAS. As soon as AC becomes available again, the control will switch back to AC regardless of the status of GAS operation.

GAS MODE

When operating in the GAS mode, the AUTO mode indicator lamp (D) will not be illuminated. This mode provides LP gas operation only. The control system will activate the ignition system and will attempt to light the burner for a period of approximately 45 seconds. If unsuccessful, the CHECK indicator lamp (E) will illuminate and the GAS mode indicator lamp (C) will turn off.

To restart GAS operation, press the main power ON/OFF button (1) to the OFF and then ON position. The control system will attempt a new 45 second ignition sequence.

If the refrigerator has not been used for a long time or the LP tanks have just been refilled, air may be trapped in the supply lines. To purge the air from the lines may require resetting the main power ON/OFF button (1) three or four times. If repeated attempts fail to start the LP gas operation, check to make sure that the LP gas supply tanks are not empty and all manual shutoff valves in the lines are open.

If the control is switched to AC or DC operation while the CHECK indicator lamp is on, it will function properly, but the CHECK indicator lamp will not go off until the main power, ON/OFF button is pressed to the OFF then ON position.

DC MODE (3-Way Models Only)

When operating in the DC mode, the DC mode indicator lamp (A) will be illuminated. All other mode lamps will be off. The DC mode overrides all other operating modes. If one of the other operating modes is desired, the DC selector button (2) must be in the UP (OFF) position.

SPECIAL FEATURES OF OPERATION

This control system contains a feature where it will continue to operate the cooling system in the event of a failure of a major operating component. Two different modes of operation can occur in this category.

If the display module becomes nonfunctional, the control system will revert to full automatic operation selecting the best energy source available with AC, DC (3-way only) and GAS priority. The temperature of the refrigerator will be maintained at the MID position within normal temperature tolerances. The power module will continually attempt to reestablish operation of the display module.

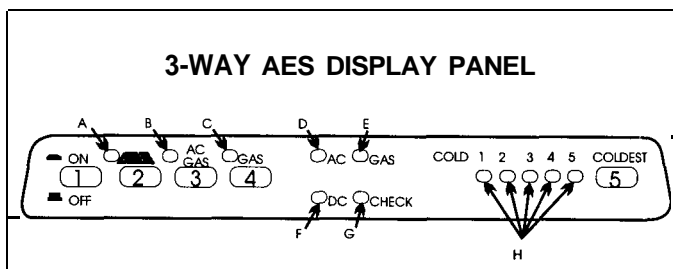
The second Special Feature of operation will execute when a failure of the temperature sensing device or associated electronic circuitry occurs. If this should occur, the control system will operate on the energy source selected via the control panel. The cooling unit will run continuously on the selected energy source. The refrigerator will continue to operate in this mode indefinitely or until a new sensor is installed and the system is reset.

NOTE: The operational range of these refrigerators is 46" to 35" ± 3°F.

1.2 AES REFRIGERATOR OPERATION

Models Include: RM3607 and RM3607

AES MODE



The AES mode of operation takes priority over all other operating modes. If more than one mode selector button (2) (3) or (4) is in the down position, the priority is from left to right.

When operating in the AES mode, the AES mode indicator lamp (A) will illuminate. In this mode the control system will automatically select the energy source with AC having top priority, DC second priority and GAS third priority. If the control system has selected a particular energy source such as AC, and then it becomes unavailable, it will automatically seek out the next available energy source.

AC/GAS MODE

When operating in the AC/GAS mode the AC/GAS mode indicator lamp (B) will illuminate.

In this mode of operation the control system will automatically select between the AC and GAS energy sources with AC having first priority.

GAS MODE

When operating in the GAS mode, the mode indicator lamp (E) will illuminate.

The GAS mode provides LP gas operation only. The control system will activate the ignition system and will attempt to light the burner for a period of approximately 45 seconds. If unsuccessful, the CHECK indicator lamp (G) will illuminate and the gas mode indicator lamp (C) will turn off.

To restart GAS operation, press the main power ON/OFF button (1) to the OFF and then ON position. The control system will attempt a new 45 seconds ignition sequence.

If the refrigerator has not been used for a long time or the LP tanks have just been refilled, air may be trapped in the supply lines. To purge the air from the lines may require resetting the main power ON/OFF button (1) three or four times. If repeated attempts fail to start the LP gas operation, check to make sure that the LP gas supply tanks are not empty and all manual shutoff valves in the lines are open.

If the control is switched to the AES or AC/GAS mode of operation while the CHECK indicator lamp is on, it will function properly on AC or DC, but if the CHECK indicator lamp is on, it will not go off until the main power ON/OFF button is pressed to the OFF then ON position.

BATTERY PROTECTION SYSTEM

The control system is equipped with a battery protection system. If AC power is not available, the control will switch to the DC energy source. If the input voltage at the terminal block connections is below 12.8 volts, the control system will bypass the DC energy source and attempt GAS operation. If the GAS energy source is available, CHECK lamp is on, the control system will return to the DC energy source. The control will operate in the DC mode for a maximum of 10 minutes.

If the input voltage has not returned above 12.8 volts within this time, the control will terminate DC operation and turn off the DC lamp (F) and start gas operation if GAS energy source is available and check light is not on.

The input battery voltage must rise above 12.8 volts for 25 minutes before DC operation can resume.

As soon as the input voltage rises above the required 12.8 volts, the DC mode lamp (F) will illuminate; however, the control system will remain in the 25 minute delay mode and operate on gas. This delay is to allow sufficient time for the vehicle charging system to re-charge the battery. If 120 volt AC becomes available during the 25 minute delay, the control will automatically switch energy source.

SPECIAL FEATURES OF OPERATION

This control system contains a feature where it will continue to operate the cooling system in the event of a failure of a major operating component. Two different modes of operation can occur in this category.

If the display module becomes nonfunctional, the control system will revert to full automatic operation selecting the best energy source available with AC, DC and GAS priority. The temperature of the refrigerator will be maintained at the MID position within normal temperature tolerances.

The power module will continually attempt to reestablish operation of the display module.

The second Special Feature of operation will execute when a failure of the temperature sensing device or associated electronic circuitry occurs. If this should occur, the control system will operate on the energy source selected via the control panel. The cooling unit will run continuously on the selected energy source and could freeze. The refrigerator will continue to operate in this mode indefinitely or until a new sensor is installed and the system is reset.

NOTE: The operational range of these refrigerators is 46°F to 35°F ± 3".

1.3 ROYALE REFRIGERATOR OPERATION

MODELS INCLUDE: RM3662, RM3663, RM3862 and RM3863

AUTO MODE (2-WAY MODEL)

Press the AUTO mode selector button (2) to the DOWN position. If 120 volts AC is available, the AC mode indicator lamp (B) will illuminate indicating AC operation. If 120 volts AC is not available, the GAS mode

indicator lamp (C) will illuminate and the control system will automatically switch to GAS operation.

If the CHECK indicator lamp (E) illuminates and the GAS mode indicator lamp (C) is OFF, the controls have failed to ignite the burner in the GAS mode. GAS operation may be reset by pressing the main power ON/OFF button (1) to the OFF then ON position. (See GAS MODE.)

Press the TEMPERATURE SELECTOR button (3) until the lamp at the desired position is illuminated.

GAS MODE (2-WAY MODEL)

Move the AUTO mode selector button (2) to the UP position. The GAS mode indicator lamp (C) will illuminate. After 45 seconds the burner should be ignited and operating normally.

On the initial refrigerator start-up, it may take longer than 45 seconds to allow air to be purged from the gas line. If the gas does not ignite within 45 seconds, the CHECK indicator lamp (E) will illuminate and the GAS mode indicator lamp (C) will go off. To reset when the CHECK indicator lamp (E) is illuminated, press the main power ON/OFF button (1) to the OFF and then ON position.

NOTE: DO NOT continue to reset GAS operation if the CHECK indicator lamp continues to be illuminated after several tries.

Press the TEMPERATURE SELECTOR button (3) until the lamp (F) at the desired position is illuminated.

AUTO MODE (3-WAY MODEL)

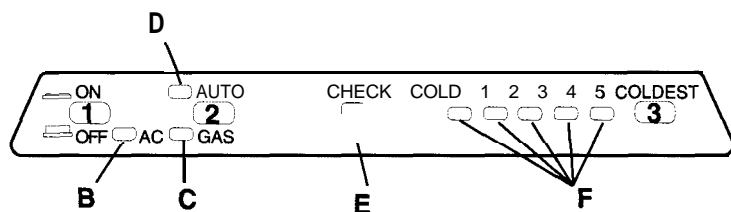
Press the DC mode selector button (2) to the UP (OFF) position.

Move the AUTO mode selector button (3) to the DOWN position. If 120 volts AC is available, the AC

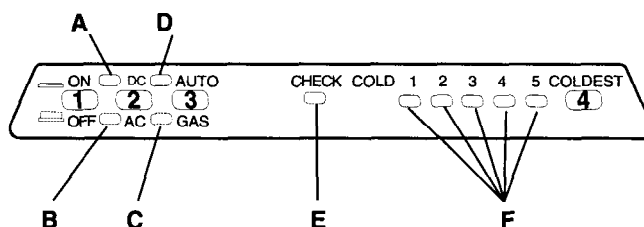
mode indicator lamp (B) will illuminate indicating AC operation. If 120 volts AC is not available, the GAS mode indicator lamp (C) will illuminate and the control system will automatically switch to GAS operation.

If the CHECK indicator lamp (E) illuminates and the GAS mode indicator lamp (C) is off, the controls have failed to ignite the burner in the GAS mode. GAS operation may be reset by pressing the main power ON/OFF button (1) to the OFF then ON position. (See GAS MODE).

2-WAY DISPLAY PANEL



3-WAY DISPLAY PANEL



Press the TEMPERATURE SELECTOR button (4) until the lamp (F) at the desired position is illuminated.

GAS MODE (3-WAY MODEL)

Press the DC mode button (2) to the UP (OFF) position. Move the AUTO mode selector button (3) to the UP position. The GAS mode indicator lamp (C) will illuminate. After 45 seconds the burner should be ignited and operating normally.

On the initial refrigerator start-up, it may take longer than 45 seconds to allow air to be purged from the gas line. If the gas does not ignite within 45 seconds, the CHECK indicator lamp (E) will illuminate and the GAS mode indicator lamp (C) will go off. To reset when the CHECK indicator lamp (E) is illuminated, press the main power ON/OFF button (1) to the OFF and then ON position.

NOTE: DO NOT continue to reset GAS operation if the CHECK indicator lamp continues to be illuminated after several tries.

Press the TEMPERATURE SELECTOR button (4) until the lamp (F) at the desired position is illuminated.

DC MODE (3-WAY MODEL ONLY)

Press the DC mode indicator button (2) to the DOWN position. (Lamp [A] will light).

Press the TEMPERATURE SELECTOR button (4) until the lamp (F) at the desired position is illuminated.

The refrigerator will continue to operate in the DC mode until switch (2) is moved to the UP position.

CAUTION

Turn off the refrigerator or move the DC selector button (2) to the UP/OFF position. The DC mode over-rides all the other operating modes. Discharging of the battery will occur if the vehicle engine is not running.

TEMPERATURE SELECTOR

The temperature selector on the refrigerator controls both the gas and electric operation, thereby eliminating the necessity of resetting each time a different energy source is employed.

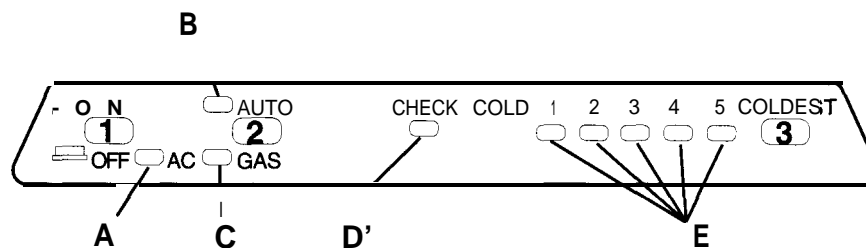
After the initial start-up, the temperature selector should be moved from "COLDEST" to the desired temperature setting, which is usually about mid-setting.

TO SHUT OFF THE REFRIGERATOR

The refrigerator may be shut off while in any mode of operation by pressing the main power ON/OFF button (1) to the UP (OFF) position. This shuts off all DC power to the refrigerator, including the interior light.

1.4 ELITE REFRIGERATOR OPERATION (P-WAY) MODELS INCLUDE: RM4872

2-WAY DISPLAY PANEL



AUTO MODE

Press the Auto mode selector button (2) to the DOWN position. Lamp (B) will illuminate. If 120 volts is available, the AC mode indicator lamp (A) will illuminate indicating AC operation. If 120 Volts AC is not available, the GAS indicator lamp (C) will illuminate, indicating the control has automatically switched to the GAS mode.

If the CHECK indicator lamp (D) illuminates and the GAS mode indicator lamp (C) is off, the controls have failed to ignite the burner in the GAS mode. GAS operation may be reset by pressing the main power ON/OFF button (1) to the OFF then ON position. (See Step 2 under GAS MODE).

Press the TEMPERATURE SELECTOR button (3) until the lamp at the desired position is illuminated.

GAS MODE

Move the mode selector button (2) to the UP position. The GAS mode indicator lamp (C) will illuminate. After 45 seconds the burner should be ignited and operating normally.

On the initial refrigerator start-up, it may take longer than 45 seconds to allow air to be purged from the gas line. If the gas does not ignite within 45 seconds, the CHECK indicator lamp (D) will illuminate and the GAS mode indicator lamp (C) will go off.

NOTE: Do not continue to reset GAS operation if the CHECK indicator lamp continues to be illuminated after several tries.

Press the TEMPERATURE SELECTOR button (3) until the lamp at the desired position is illuminated.

TEMPERATURE SELECTOR

The temperature selector on the refrigerator controls both the gas and electric operation, thereby eliminating the necessity of resetting each time a different energy source is employed.

After the initial start-up, the temperature selector should be moved from "COLDEST" to the desired temperature setting, usually about mid-setting.

TO SHUT OFF THE REFRIGERATOR

The refrigerator may be shut off while in any mode of operation by pressing the main power ON/OFF button to the UP (OFF) position. This shuts off all DC power to the refrigerator, including the interior light.

DESCRIPTION OF OPERATING MODES

AUTO MODE

When operating in the AUTO mode, the AUTO mode indicator lamp (B) will illuminate. The control system will automatically select between AC and GAS operation with AC having priority over GAS. Either the AC indicator lamp (A) or the GAS indicator lamp (C) will illuminate depending on the energy source selected by the control system. If the control system is operating with AC energy and it then becomes unavailable, the system will automatically switch to GAS. As soon as AC becomes available again, the control will switch back to AC regardless of the status of GAS operation.

GAS MODE

When operating in the GAS mode, the AUTO mode indicator lamp (B) will be off and the GAS mode indicator lamp (C) will be illuminated. This mode provides LP gas operation only. The control system will activate the ignition system and will attempt to light the burner for a period of approximately 45 seconds. If unsuccessful, the CHECK indicator lamp (D) will illuminate and the GAS mode indicator lamp (C) will turn off.

To restart GAS operation, press the main power ON/OFF button (1) to the OFF and then ON position. The control system will attempt a new 45 second ignition sequence.

If the refrigerator has not been used for a long time or the LP tanks have just been refilled, air may be trapped in the supply lines. To purge the air from the lines may require resetting the main power ON/OFF button (1) three or four times. If repeated attempts fail to start the LP gas operation, check to make sure that the LP gas supply tanks are not empty and all manual shutoff valves in the lines are open.

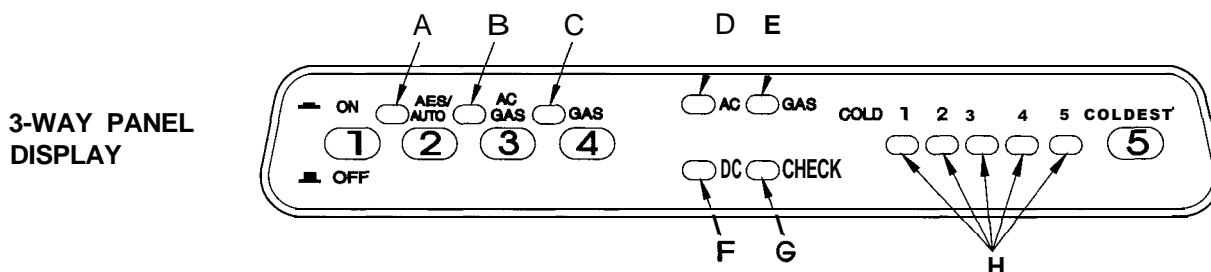
SPECIAL FEATURES OF OPERATION

This control system contains a feature where it will continue to operate the cooling system in the event of a failure of a major operating component. Two different modes of operation can occur in this category.

If for some reason the display module becomes non-functional, the control system will revert to fully automatic operation - selecting the best energy source available with AC and GAS priority. The temperature of the refrigerator will be maintained at the MID position within normal temperature tolerances. The power module will continually attempt to reestablish operation of the display module.

The second standby mode of operation will execute when a failure of the temperature sensing device or associated electronic circuitry occurs. If this should occur, the control system will operate on the energy source selected via the control panel. The cooling unit will run continuously on the selected energy source. The refrigerator will continue to operate in this mode indefinitely or until a new sensor is installed and the system is reset.

1.5 ELITE REFRIGERATOR OPERATION (3-WAY) MODELS INCLUDE: RM4873



AES/AUTO MODE

The AES/AUTO mode of operation takes priority over all other operating modes. If more than one mode selector button (2), (3) or (4) is in the down position, the priority is from left to right.

When operating in this mode, the AES/AUTO mode indicator lamp (A) will illuminate. In this mode the control system will automatically select the energy source with AC having top priority, DC second priority and GAS third priority. If the control system has selected a particular energy source such as AC, and then it becomes unavailable, it will automatically seek out the next available energy source.

Press the AES/AUTO mode selector button (2) to the DOWN position. Indicator lamp (A) should illuminate. Indicator lamp (D), (E) or (F) should also illuminate indicating which energy source the control has selected.

Press the TEMPERATURE SELECTOR button (5) until the lamp at the desired position is illuminated.

AC/GAS MODE

Press the AC/GAS mode selector button (3) to the DOWN (ON) position. Mode indicator lamp (B) should illuminate.

In this mode of operation the control system will automatically select between the AC and GAS energy sources with AC having first priority.

The AES/AUTO mode selector button (2) must be in the UP (OFF) position.

Indicator lamp (D) or (E) should also illuminate indicating which energy source the control has selected. If the CHECK indicator lamp (G) illuminates, see GAS MODE for further instructions.

Press the TEMPERATURE SELECTOR button (5) until the lamp at the desired position is illuminated.

GAS MODE

When operating in the GAS mode, the AES/AUTO (2) and AC/GAS (3) mode selector buttons must be in the UP (OFF) position.

The GAS mode provides LP gas operation only.

Press the GAS mode indicator button (4) to the DOWN (ON) position.

Indicator lamps (C) and (E) should illuminate indicating GAS operation. After 45 seconds the burner should be ignited and operating normally.

On the initial refrigerator start-up, it may take longer than 45 seconds to allow air to be purged from the gas line. If the gas does not ignite within 45 seconds the CHECK indicator lamp (G) will illuminate and the GAS indicator lamp (C) and (E) will go off.

To reset when the CHECK indicator lamp (G) is illuminated, press the main power ON/OFF button (1) to the OFF then ON position.

NOTE: Do not continue to reset GAS operation if the CHECK indicator lamp continues to be illuminated after several tries. If repeated attempts fail to start the LP gas operation, check to make sure that the LP gas supply tanks are not empty and all manual shutoff valves in the lines are open.

Press the TEMPERATURE SELECTOR button (5) until the lamp (H) at the desired position is illuminated.

If the control is switched to the AES/AUTO or AC/GAS mode of operation while the CHECK indicator lamp is on, AC or DC will function properly, but the CHECK indicator lamp will not go off until the main power ON/OFF button is pressed to the OFF then ON position.

TEMPERATURE SELECTOR

The temperature selector on the refrigerator controls both the gas and electric operation, thereby eliminating the necessity of resetting each time a different energy source is employed.

After the initial start-up, the temperature selector should be moved from "COLDEST" to the desired temperature setting, usually about mid-setting.

TO SHUT OFF THE REFRIGERATOR

The refrigerator may be shut off while in any mode of operation by pressing the main power ON/OFF button to the UP (OFF) position. This shuts off all DC power to the refrigerator.

DESCRIPTION OF OPERATING MODES

AES/AUTO MODE

The AES/AUTO mode of operation takes priority over all other operating modes. If more than one mode selector button (2) (3) or (4) is in the down position the priority is from left to right.

When operating in the AES/AUTO mode, the AES/AUTO mode indicator lamp (A) will illuminate. In this mode the control system will automatically select the energy source with AC having top priority, DC second priority and GAS third priority. If the control system has selected a particular energy source such as AC, and then it becomes unavailable, it will automatically seek out the next available energy source.

AC/GAS MODE

When operating in the AC/GAS mode, the AC/GAS mode indicator lamp (B) will illuminate.

In this mode of operation the control system will automatically select between the AC and GAS energy sources with AC having first priority.

GAS MODE

When operating in the GAS mode, the GAS mode indicator lamp (C) will illuminate.

The GAS mode provides LP gas operation only. The control system will activate the ignition system and will attempt to light the burner for a period of approximately 45 seconds. If unsuccessful, the CHECK indicator lamp (G) will illuminate and the GAS mode indicator lamp (C) will turn off.

To restart GAS operation, press the main power ON/OFF button (1) to the OFF and then ON position. The control system will attempt a new 45 second ignition sequence.

If the refrigerator has not been used for a long time or the LP tanks have just been refilled, air may be trapped in the supply lines. To purge the air from the lines may require resetting the main power ON/OFF button (1) three or four times. If repeated attempts fail to start the LP gas operation, check to make sure that the LP gas supply tanks are not empty and all manual shutoff valves in the lines are open.

If the control is switched to AES/AUTO or AC/GAS mode of operation while the CHECK indicator lamp is on, it will function properly, but the CHECK indicator lamp will not go off until the main power ON/OFF button is pressed to the OFF then ON position.

BATTERY PROTECTION SYSTEM

The control system is equipped with a battery protection system. If AC power is not available the control will switch to the DC energy source. If the input voltage at the terminal block connections is below 12.8 volts the control system will bypass the DC energy source and attempt GAS operation. If the GAS energy source is available, CHECK lamp is on, the control system will return to the DC energy source. The control will operate in the DC mode for a maximum of 10 minutes.

If the input voltage has not returned above 12.8 volts within this time, the control will terminate DC operation and turn off the DC lamp (F) and start gas operation if GAS energy source is available.

The input battery voltage must rise above 12.8 volts for 25 minutes before DC operation can resume.

As soon as the input voltage rises above the required 12.8 volts, the DC mode lamp (F) will illuminate. However the control system will remain in the 25 minute DC delay mode and operate on gas. This delay is to allow sufficient time for the vehicle charging system to recharge the battery. If 120 volt AC becomes available during the 25 minute delay, the control will automatically switch to the AC energy source.

STANDBY MODE OF OPERATION

This control system contains a feature where it will continue to operate the cooling system in the event of a failure of a major operating component. Two different modes of operation can occur in this category.

If for some reason the display module becomes non-functional, the control system will revert to fully automatic operation - selecting the best energy source available with AC and GAS priority. The temperature of the refrigerator will be maintained at the MID position within normal temperature tolerances. The power module will continually attempt to reestablish operation of the display module.

The second standby mode of operation will execute when a failure of the temperature sensing device or associated electronic circuitry occurs. If this should occur, the control system will operate on the energy source selected via the control panel. The cooling unit will run continuously on the selected energy source. The refrigerator will continue to operate in this mode indefinitely or until a new sensor is installed and the system is reset.

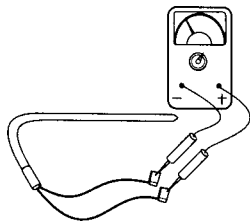
**SECTION 2
AC VOLTAGE REQUIREMENTS**

The refrigerator is a 120 volt AC, 60 Hz appliance. The proper operating range is 100 to 132 volts. Check the AC volts at the receptacle where the refrigerator is attached. If voltage is outside of the proper operating range, correct the power source problem.

If voltage drops below 100 volts, cooling efficiency will decrease with voltage decrease. The refrigerator will not switch to another mode of operation until all **AC power is lost**.

**SECTION 3
AC COMPONENTS-
HEATING ELEMENT**

The heating element is designed to deliver a predetermined - amount of heat to the cooling unit. To check a heating element, remove the heater leads from the lower circuit board and measure for proper resistance across the two leads with a properly calibrated ohm meter. This check is to be done with the heating element at room temperature.



You should obtain the following readings, ±10%:

	WATTS	VOLTS	OHMS
S1521	185	120	78
S1531	185	120	78
S1621	325	120	44
S1631	325	120	44
S1821	325	120	44
S1831	325	120	44
RM2607	295	120	48
RM2611	295	120	48
RM2807	325	120	44
RM2811	325	120	44
RM3607	295	120	48
RM3807	325	120	44
RM3662	325	120	44
RM3663	325	120	44
RM3862	325	120	44
RM3863	325	120	44
RM4872	325	120	44
RM4873	325	120	44

**SECTION 4
DC VOLTAGE REQUIREMENTS**

For the refrigerator to operate on any mode, DC voltage must be supplied to the terminals at the rear of the refrigerator.

The operational range of the unit is a minimum of 9.6V DC to a maximum of 22V DC. At 22V DC, the unit will automatically shut down until voltage has decreased to 18V DC. The refrigerator requires at least 9.6V DC for

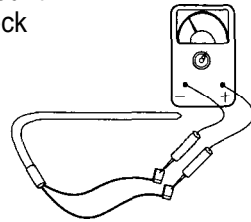
proper operation; however, the panel lights will continue to illuminate until voltage has dropped to 4V DC or below.

Connecting the refrigerator to an unregulated converter can result in improper operation of the refrigerator. Do not use the body or chassis of the RV as a substitute for either of the two conductors. Proper polarity is crucial for refrigerator operation. Check for proper DC voltage at the positive and negative terminals at the back of the unit. If the voltage is outside the operational range correct the power supply problem.

SECTION 5
DC COMPONENTS

5.1 HEATING ELEMENT

The heating element is designed to deliver a predetermined amount of heat to the cooling unit. Check the heating element with ohms resistance using a properly calibrated ohm meter. This check is to be done with the element at room temperature.



You should obtain the following readings, ± 10%:

	WA-ITS	VOLTS	OHMS
s1531	175	12	.82
S1631	215	12	.67
S1831	215	12	.67
RM2607	215	12	.67
RM2611	215	12	.67
RM2807	215	12	.67
RM2811	215	12	.67
RM3607	215	12	.67
RM3807	215	12	.67
RM3663	215	12	.67
RM3863	215	12	.67
RM4873	215	12	.67

NOTE: It will take a very precise ohm meter to accurately read this measurement. If a precise ohm meter is not available, a continuity reading will indicate an open or complete circuit. If an open circuit is the test result, replace the element.

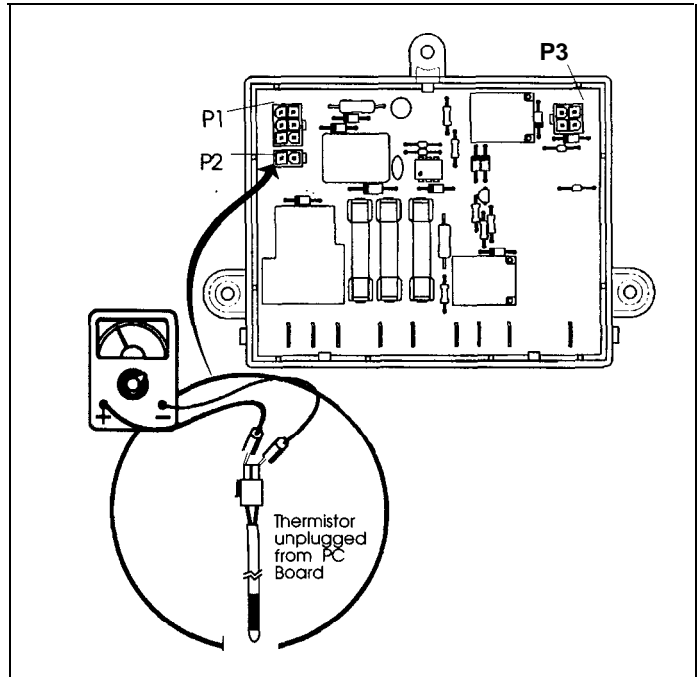
5.2 THERMISTOR

To determine if the temperature sensor is functioning properly, perform the following test.

Remove the cover from lower circuit board. Disconnect the thermistor harness from the P2, 2-pin terminal on

the lower circuit board. Place the thermistor in a glass of ice water. Wait 2 to 3 minutes. Using an ohm meter, place a probe on each terminal point. You should get a reading of approximately 7,000 to 10,000 ohms.

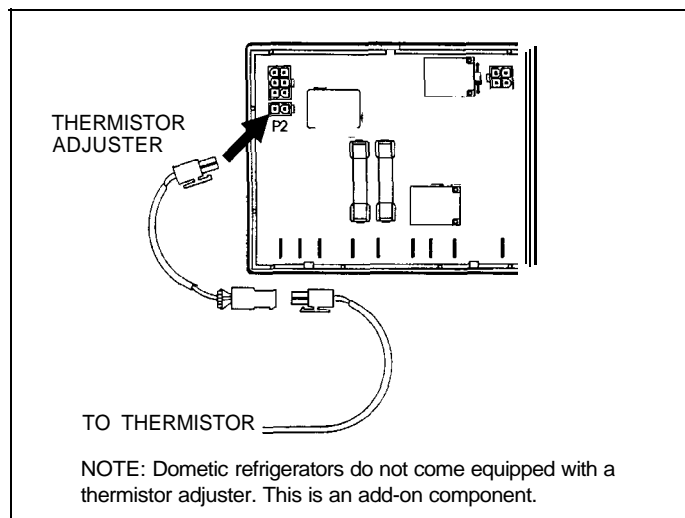
Normal failure for this type of device is to have a very high resistance. A defective thermistor could cause an overcooling condition on all modes.



5.3 THERMISTOR ADJUSTER

The thermistor adjuster is a resistor-type component that attaches between the thermistor and the lower board. Its function is to allow the refrigerator to reach temperatures below the normal 46" to 35°F. range (setting 1 through 5 on upper circuit board).

To determine if the thermistor adjuster is operating properly, do an ohms resistance check across the terminals. Proper ohms reading is approximately 23,200 ohms ± 10%.

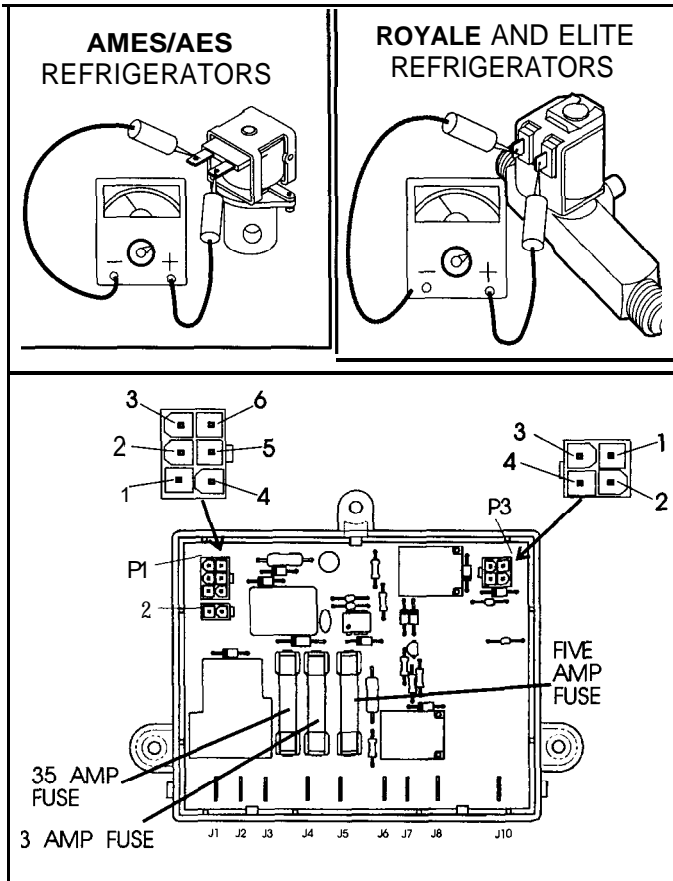


5.4 SOLENOID VALVE

When the refrigerator selects LP gas operation, DC volts are sent to the solenoid coil which opens the internal valve.

Check the solenoid coil with a properly calibrated ohm meter. Remove the connector from the solenoid and measure the resistance across the terminals. The proper reading would be 49 ohms with tolerance range of ten percent.

Next, hook up a manometer at the test port. Then check for DC volts at gas valve terminals while the unit is in trial-for-ianition (approximately 45 seconds). If DC volts are present and pressure is low, replace the valve. If DC volts are not present at the valve while the unit is in trial-for-ianition (approximately 45 seconds), verify that the wire at Plug 3, Terminal 2 on lower circuit board has DC volts (9 or more). If the valve chatters, check for low input voltage to the valve (below 9 volts DC).



5.5 IGNITER

The igniter is an electronic device that produces high voltage to create a spark at the burner, only on gas mode.

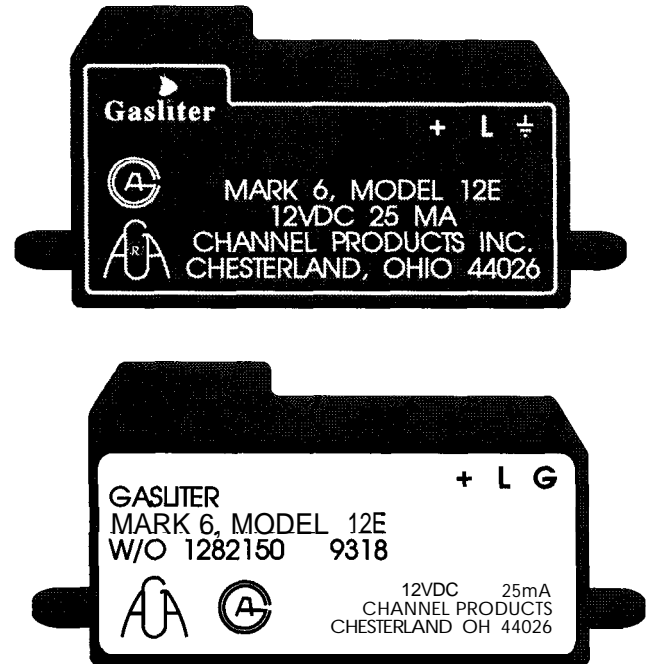
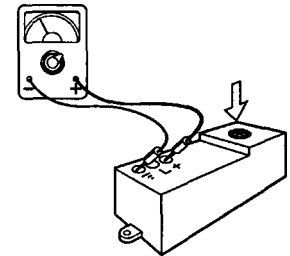
First verify proper voltage at the positive (+) and ground (-) terminals of the igniter. The reading should be within one volt of incoming voltage at the main terminal block during trial-for-ianition (approximately 45 seconds). A voltage drop of more than one volt would

indicate a loose connection (see Sec. 8.2) or a circuit board problem.

Next, disconnect DC power at the refrigerator terminal block. Remove high voltage cable from igniter. Reconnect DC power -the igniter should produce a sparking sound, during trial-for-ianition (approximately 45 seconds). If not, replace the igniter. If sparking sound, the igniter is good.

The igniter installed on the refrigerators as original equipment is part number 2931132019 Gas Model 679). This igniter is rated 50 MA. This igniter may also be used on any other model.

DO NOT install the Channel Mark 6, Model 12E igniter (shown below) as a service replacement part.



Installing the Channel Mark 6, Model 12E, rated 25 MA can result in failure to ignite on gas if the DC power supply is below 12.5 volts DC. The igniter will see low voltage and not produce a spark, resulting in flame failure lockout.

Installation of the Channel Products, Inc., Gasliter Mark 6, Model 12E, will **VOID** the Warranty on the refrigerator.

5.6 HIGH VOLTAGE CABLE

Disconnect DC power at the refrigerator terminal block. Disconnect high voltage cable from electrode. Reconnect DC power. If sparking starts during trial-for ignition, the cable is good. If there is no sparking during trial-for-ignition, disconnect DC power and disconnect high voltage cable at the igniter. Reconnect DC power. If there is a sparking sound from the igniter during trial-for-ignition, then replace high voltage cable.

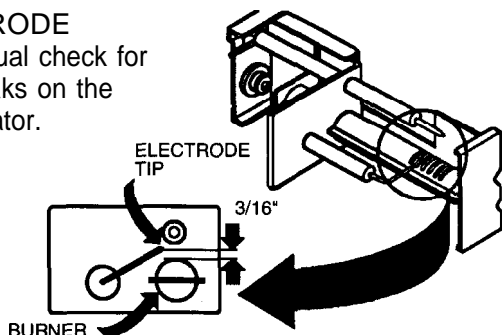
5.7 ELECTRODE

First, do a visual check for cracks or breaks on the ceramic insulator.

Verify the mounting bracket is attached properly to the electrode. If ei-

ther of the above is found, replace the electrode. The spark gap must be set at three sixteenths (3/16") of an inch and tip of electrode above the slots in the burner.

If igniter (see Sec. 5.5) and high voltage cable (see Sec. 5.6) are good and there is no spark at the tip of the electrode, replace the electrode.



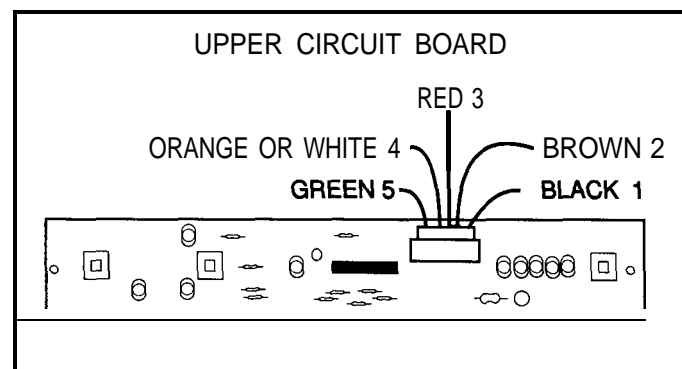
5.8 UPPER CIRCUIT BOARD

NOTE: The PAL tester will allow for proper testing of the integrity of the upper and lower circuit boards. PAL is available from your Dometic parts distributor.

NOTE: Each of the following tests should be done according to pin locations. The wire colors may vary.

With main ON/OFF switch on display panel in OFF position:

Check for DC voltage at Plug 1, Terminal 4 (orange or white wire) and terminal 5 (red wire) negative (-) DC on the **lower circuit board**. If no voltage, then check fuse condition. Replace if blown.



Check for DC voltage between J4 and J10 terminals on the lower circuit board. If fuse is good and there is battery voltage at J4, remove and replace lower circuit board.

Next, check for DC voltage at the upper circuit board between terminal 4 (orange or white wire) and terminal 3 (red) which is negative (-) DC. If no voltage, and your previous check proved voltage at the lower circuit board between these wires, replace the cable assembly. If DC volts are present, proceed to the next check.

With main ON/OFF switch on display panel in ON position:

Check for DC volts between terminal 3, red wire (-) negative and terminal 5 (green wire) and terminal 1 (black wire). If there is no voltage, the ON/OFF switch on upper circuit board is defective. Replace the upper circuit board. If voltage is present, the ON/OFF switch is good.

Next, do the same voltage test at the lower circuit board. (-) negative plug 1, terminal 5 (red wire), plug 1, terminal 1 (green wire) and plug 1, terminal 3 (black wire). If there is no voltage and you had voltage on previous test, the cable assembly is defective and you must replace it. If voltage is present, the ON/OFF switch on the upper circuit board and cable assembly is good.

DIAGNOSTIC MODE

NOTE: The PAL tester will allow for proper testing of the integrity of the upper and lower circuit boards. PAL is available from your Dometic parts distributor.

This control system has an integral Diagnostic/ Test sequence.

Access to the diagnostic sequence unit is by means of the ON/OFF Power Switch and the Temperature Selector Switch. With the Power Switch in the OFF position, hold the Temperature Selector Switch in the DOWN position. While keeping the Temperature Selector Switch in the DOWN position, move the main power ON/OFF Switch to the ON (DOWN) position. Hold the Temperature Selector Switch DOWN for three (3) seconds. The control will indicate that the diagnostics have been entered by illuminating each of the Mode Indicator Lamps and the Temperature Indicator Lamps one at a time in sequence. Each lamp is illuminated twice. The Check Lamp will then flash ON and OFF and #1 position Temperature Indicator will remain illuminated. The test sequence can be operated automatically or

manually. For AUTO step sequence, press the AUTO/GAS Mode Selector Switch to the DOWN position. The AUTO Mode Indicator will illuminate.

If each lamp illuminates during the check, the display circuit board is good.

In automatic test mode, each load is activated for approximately four (4) seconds then released. The control system will automatically exit the diagnostic sequence in approximately four (4) minutes or when power is turned OFF.

The Temperature Indicator Lamps are used to indicate which part of the control system is being tested. When position #1 is illuminated, the control is in an idle position with all output loads off. To activate the first load simply push the Temperature Selector Switch.

All of the checks listed below are done on the lower circuit board.

The manual test sequence is as follows:

- Position #1 : Idle Position, all loads off.
- Position #2: Activate AC Heater. Check for AC volts at terminals J7 and J8.
- Position #3: Activate Gas Solenoid. Check for DC volts at Gas Solenoid white wire (-) and yellow wire (+).
- Position #4: Activate DC heater. Check for DC volts between J1 (+) and J10 (-).
- Position #5: Activate spark ignition system. Check for DC volts to (+) terminal of igniter and ground.

If you experience a problem on any of the above checks, verify the fuses on the lower circuit board are good.

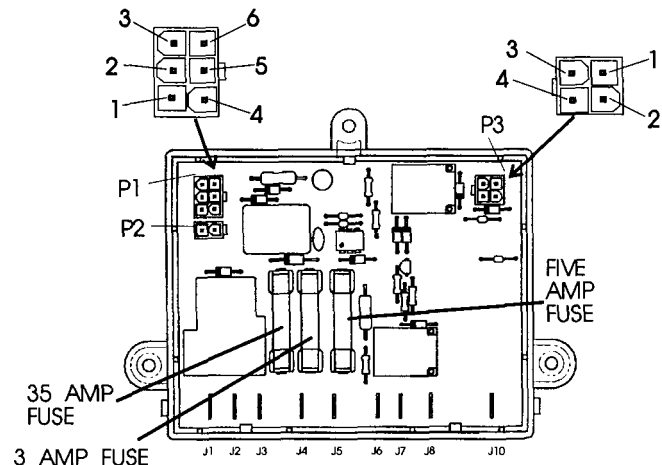
If all checks prove to be good, and the refrigerator does not operate on electric mode, replace the lower circuit board. It has been damaged by AC volts in excess of 180 volts.

5.9 LOWER CIRCUIT BOARD

NOTE: The PAL tester will allow for proper testing of the integrity of the upper and lower circuit boards. PAL is available from your Dometic parts distributor.

A. DC VOLT: ALL TESTS ARE TO BE DONE WITH THE REFRIGERATOR IN THE COOLING MODE.

Before any checks are made, make sure the board is receiving proper DC volts (see Sec. 4). Measure volts between terminal J4 and the ground strip. Voltage should be the same as at the positive (+) and negative (-) on the terminal block. If not, check for loose connections.



B. AC MODE: **NOTE:** The PAL tester will allow for proper testing of the integrity of the upper and lower circuit boards. PAL is available from your Dometic parts distributor.

ALL TESTS ARE TO BE DONE WITH THE REFRIGERATOR IN THE COOLING MODE.

For AC heating element operation, check that incoming AC voltage is present at terminals J5 and J6 on the circuit board. If voltage is below 100 volts.

Check for voltage at the heating element connection terminals J7 and J8 on the circuit board. If no voltage is present, check the 5 amp AC and 3 amp DC fuses. If fuse is defective, replace the fuse. If fuses are good, replace the circuit board.

NOTE: Before installing a new circuit board, determine and correct the cause of the failure. If voltage is present, do not change the circuit board. Check the AC heating element (see Sec. 3).

C. DC MODE: **NOTE:** The PAL tester will allow for proper testing of the integrity of the upper and lower circuit boards. PAL is available from your Dometic parts distributor.

ALL TESTS ARE TO BE DONE WITH THE REFRIGERATOR IN THE COOLING MODE.

For DC heating element operation (on 3-way models only), check for voltage between terminal J4 on the circuit board and the ground strip. If voltage is 12.8 volts DC or above, check for DC volts between the heating element (J1) connection and the ground strip. If there is no voltage present, check the fuses (see Sec. 5.11) and the DC heating element (see Sec. 5.1). If these check good, change the circuit board.

NOTE: If DC volts are below 12.8V DC, see Operation, Sec. 1 .1 through 1.5.

D. **GAS MODE:** NOTE: The PAL tester will allow for proper testing of the integrity of the upper and lower circuit boards. PAL is available from your Dometic parts distributor.

ALL TESTS ARE TO BE DONE WITH THE REFRIGERATOR IN THE COOLING MODE.

Before checking the circuit board for gas operation, verify that the following components are good: Upper Circuit Board (see Sec. 5.8) Thermistor (see Sec. 5.2) and 3 Amp Fuse (See Sec. 5.11)

NOTE: Each of the following tests should be done according to pin locations. The wire colors may vary.

First, check for voltage during trial-for-ignition (approximately 45 seconds) at Plug 3, Terminals 1 (white wire) and 2 (yellow wire) to the solenoid. If no voltage is present, change the circuit board. If voltage is present, check for voltage at the solenoid. If voltage is not present, check the wires and connections.

Next, check for voltage to the igniter. If no voltage is present, check the wires. If good, then change the circuit board. If voltage is present, this portion of the board is good.

NOTE: When millivolts to the lower circuit board are 10 ± 3 , the power to Plug 3, Terminal 4 (blue wire) will be shut off. If flame extinguishes during the cooling mode, the circuit board will not supply voltage to Plug 3, Terminal 4 (blue wire) again until the millivolts have decreased to 10 ± 3 . This process could take up to 15 seconds or longer.

To check the flame sense circuit of the lower circuit board, operate the refrigerator on GAS mode, then measure the millivolts between J3 terminal and the other wire connection from the thermocouple. The millivolt meter should read between 25 to 35 millivolts with the gas flame burning. Next, turn the manual shutoff valve to OFF and watch the millivolt reading as it drops. Note the millivolt reading when Plug 3, Terminal 4 (blue wire) receives power. It should be 10 ± 3 millivolts or 7 to 13.

Repeat this test several times. If the igniter fails to spark on any test sequence, it should be replaced.

If the millivolt readings vary more than 1 to 2 MV from one test to the other when power is supplied to Plug 3, Terminal 4 (blue wire), replace the lower circuit board.

NOTE: Verify all connections are clean and tight before replacing either component.

5.10 DOOR SWITCH (Only on Models Equipped with Interior Lights)

The door switch is an open switch when the switch arm is depressed (interior light should be off). When the refrigerator door is open the switch is closed (interior light should be on). Check that the switch assembly is properly aligned and that it is not broken. Check the switch assembly for continuity.

To do a continuity check, first be sure all power is disconnected or OFF to the refrigerator. Second, remove all wires from the switch assembly, then check the switch. After the check, be sure the switch assembly is wired properly per the wiring diagram.

When the switch arm is depressed, there should not be continuity. When the switch arm is NOT depressed, there should be continuity. If any of these checks are incorrect, replace the switch.

5.11 FUSES

The fuses are to protect the circuit board and the integrity of the heater circuit(s) against shorts.

The 3 amp DC fuse is designed to protect the circuit board from internal shorts. The 5 amp AC fuse is designed to protect the integrity of the AC heater circuit from shorts. On 3-way models only, the 35 amp DC fuse is designed to protect the DC heater circuit integrity.

To check the fuses, remove from the holder and do a continuity check. If no continuity, replace with a proper amperage fuse.

NOTE: Determine the cause of the fuse failure and correct before replacing fuse.

5.12 CLIMATE CONTROL HEATER

The climate control is a switch operated DC electric heater. Its primary function is to warm the frame of the refrigerator during high temperature/high humidity conditions. This prevents the formation of condensation on the metal frame.

To check the switch, disconnect the wires and do a continuity check. In the OFF position, there should be no continuity. In the ON position, there should be a continuity reading.

To check the heater itself, do an ohms resistance reading on the heater wire by using a properly calibrated ohm meter. The proper ohms reading is 24 ohms $\pm 10\%$. The approximate amp draw is less than .5 (1/2) amp.

NOTE: The climate control will draw DC power continuously. It should be turned off when charging source is not available.

SECTION 6

LP GAS REQUIREMENTS

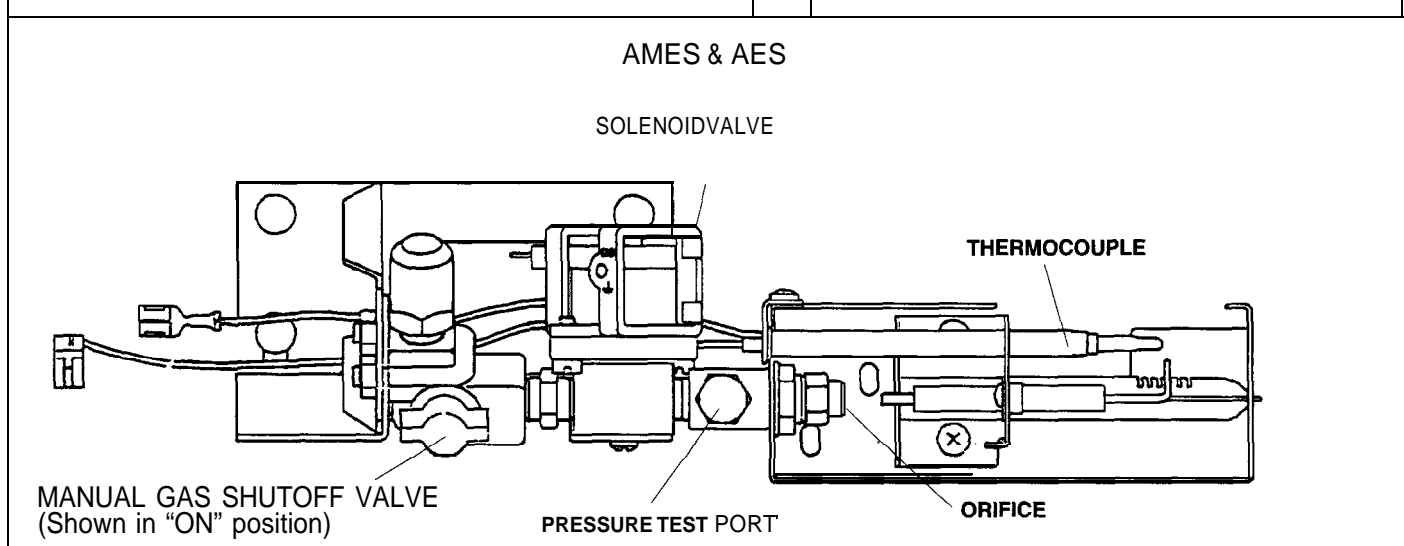
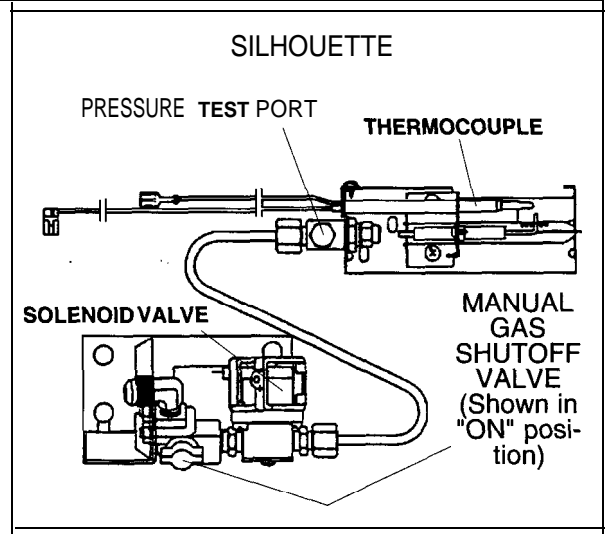
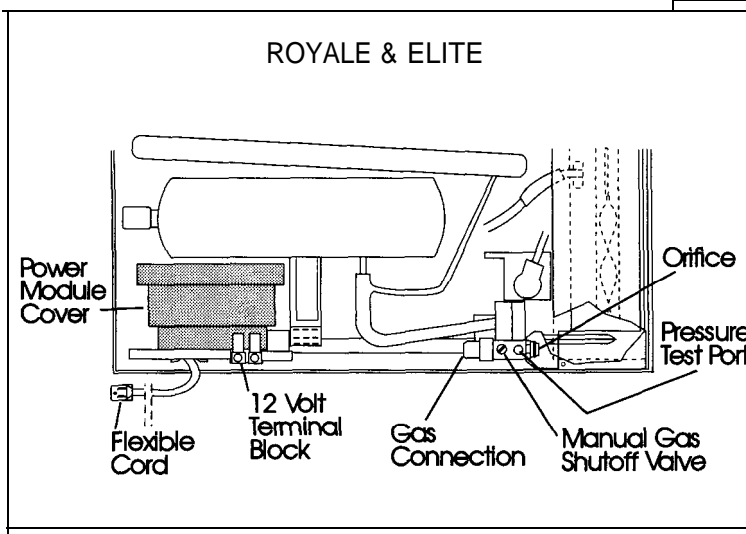
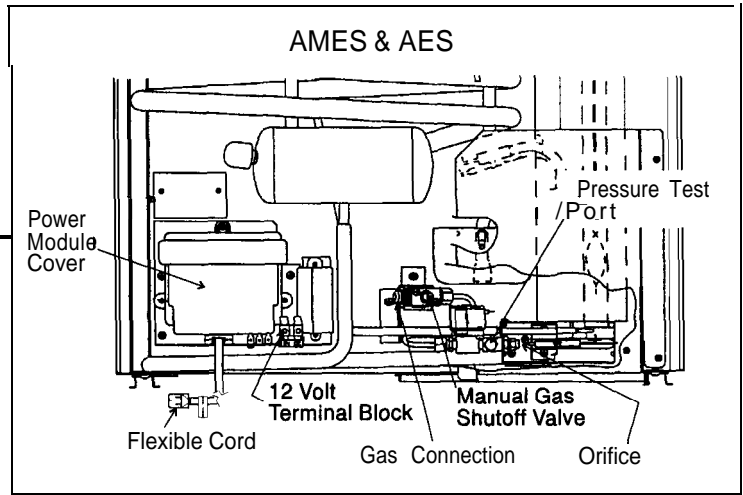
The LP gas pressure to the refrigerator should be 11 inches water column with half of all BTU's of the RV turned on. With all other appliances off, the pressure to the refrigerator should not exceed 12 inches water column. To check the gas pressure when the refrigerator is operating, there is a pressure test port on the solenoid.

SECTION 7

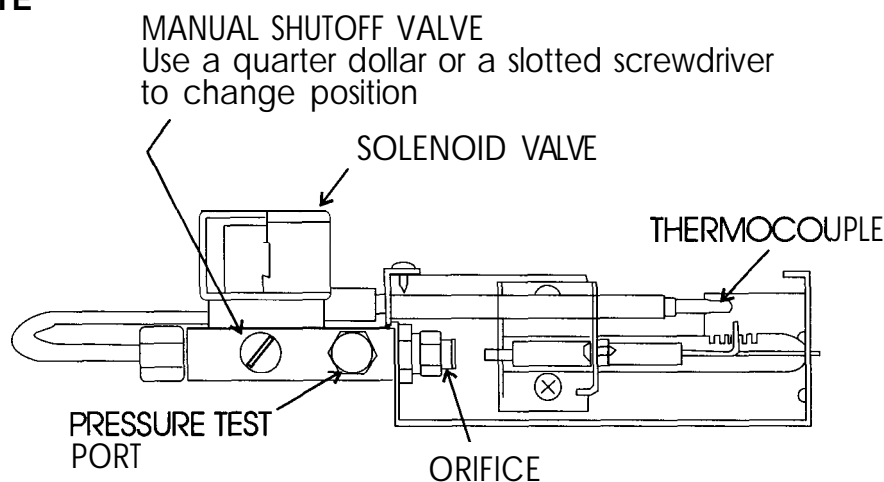
LP GAS COMPONENTS

7.1 MANUAL GAS SHUTOFF VALVE

The manual gas shutoff valve is where the incoming LP gas supply is attached. To check the shutoff valve, remove and inspect for any obstructions. The valve must be turned to "ON" before any gas operation can occur. NOTE: If gas pressure is within proper range at test port (See Sec. 6) the shutoff valve is good.



ROYALE AND ELITE MODELS



7.2 ORIFICE

The orifice is a small brass fitting that has a ruby membrane that is laser beam drilled and is mounted on the gas line just prior to the burner. The orifice is cleaned by using an alcohol based solvent and allowing to air dry.

IMPORTANT

NEVER USE A DRILL BIT OR JET TIP CLEANER TO CLEAN ANY ORIFICE AS THESE DEVICES WILL DAMAGE THE FACTORY MACHINED PART AND CREATE A POTENTIALLY DANGEROUS CONDITION.

If there is a lack of cooling on gas operation, verify the orifice is the proper size per the chart below:

S1521 #43	RM2607 #53	RM3662 #58
S1531 #43	RM2611 #53	RM3663 #58
S1621 #58	RM2807 #58	RM3862 #58
S1631 #58	RM2811 #58	RM3863 #58
S1821 #58	RM3607 #53	RM4872 #58
S1831 #58	RM3807 #58	RM4873 #58

7.3 THERMOCOUPLE

The thermocouple is a component extending above the burner assembly so the tip is in the path of the flame. During normal gas operation, the thermocouple should produce 25 to 35 millivolts when connected to the lower circuit board. Any reading below 18 millivolts could cause erratic gas operation. NOTE: A reading of 18 or less could be caused by low gas pressure or improper thermocouple location.

7.4 BURNER

The burner is a slotted metal tube located below the flue tube on the cooling unit. It should be level, and the slots in the burner should be directly below the flue tube. The burner should be cleaned periodically, at least once a year. To clean the burner, remove from the refrigerator and check for any foreign residue that could cause a deflection of the gas flow or the flame. Next, soak the burner in an alcohol based solvent and allow to air dry. After cleaning, reinstall in the refrigerator.

7.5 FLUE BAFFLE

The flue baffle is designed to concentrate the heat (from the gas flame) at a certain area of the flue tube. It should be cleaned periodically, at least once a year. To clean, remove from the flue tube and check for any damage, then clean thoroughly.

The length of the flue baffle assembly (flue baffle and wire) should be as follows:

S1521 18-3/16	RM2607 31-9/16
S1531 18-3/16	RM2611 31-9/16
S1621 31-9/16	RM2807 37-1/8
S1631 31-9/16	RM2811 37-1/8
S1821 37-1/8	RM3607 31-9/16
S1831 37-1/8	RM3807 37-1/8
RM3662 31-5/8	
RM3663 31-5/8	
RM3862 38	
RM3863 38	
RM4872 38	
RM4873 38	

The proper position of the baffle above the burner should be as follows:

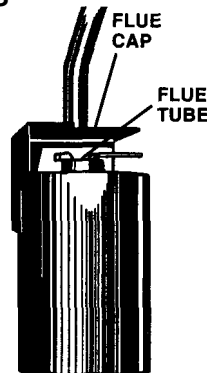
s1521	2-1/4"	RM2607	1-5/8"
s1531	2-1/4"	RM2611	1-5/8"
S1621	1-5/8"	RM2807	1-3/4"
S1631	1-5/8"	RM2811	1-3/4"
S1821	1-5/8"	RM3607	1-5/8"
S1831	1-5/8"	RM3607	1-3/4"
RM3662	1-7/8"		
RM3663	1-7/8"		
RM3862	1-7/8"		
RM3863	1-7/8"		
RM4672	1-7/8"		
RM4873	1-7/8"		

The flue baffle itself should measure as follows:

s1521	3/4" wide	4" long
s1531	3/4" wide	4" long
S1621	3/4" wide	5-1/4" long
S1631	3/4" wide	5-1/4" long
S1821	3/4" wide	6" long
S1831	3/4" wide	6" long
RM2607	3/4" wide	5-1/4" long
RM2611	3/4" wide	5-1/4" long
RM2607	3/4" wide	6" long
RM2811	3/4" wide	6" long
RM3607	3/4" wide	5-1/4" long
RM3807	3/4" wide	6" long
RM3662	13/16" wide	5-3/16" long
RM3663	13/16" wide	5-3/16" long
RM3662	13/16" wide	5-3/16" long
RM3663	13/16" wide	5-3/16" long
RM4872	13/16" wide	5-3/16" long
RM4673	13/16" wide	5-3/16" long

7.6 FLUE CAP (AMES/AES MODELS ONLY)

The flue cap is located at the top of the flue tube and is attached with a screw. It must be properly attached or flame outage could occur.



7.7 FLUE TUBE

The flue tube is a component of the cooling unit. It must be cleaned periodically, at least once a year

To clean, remove flue cap and flue baffle, then cover the burner and clean by using a flue brush, Dometic Part No. 0151404001. If the flue tube becomes coated with scale or residue from combustion of LP gas, the efficiency of gas operation decreases.

NOTE: After cleaning be sure to reinstall the flue baffle and flue cap.

SECTION 8 WIRING

8.1 EXTERNAL WIRING

1.120 Volts AC Connection

The refrigerator is equipped with a three-prong (grounded) plug for protection against shock hazards and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug.

2. 12 Volt DC Connection

Connection is made to the main terminal block. The refrigerator must be connected to the battery circuit with two wires of adequate capacity to avoid voltage drop.

The wire gauge should be chosen in accordance with the Table shown below.

Do not use the body or chassis of the vehicle as a substitute for either of the two conductors. No other electrical equipment or lighting should be connected to the refrigerator circuit.

At 12 volts DC, a refrigerator equipped with a climate control and interior light will draw approximate 1.2 amps maximum with the climate control and interior light on. Refrigerators equipped with a climate control only will draw approximately .5 amps maximum.

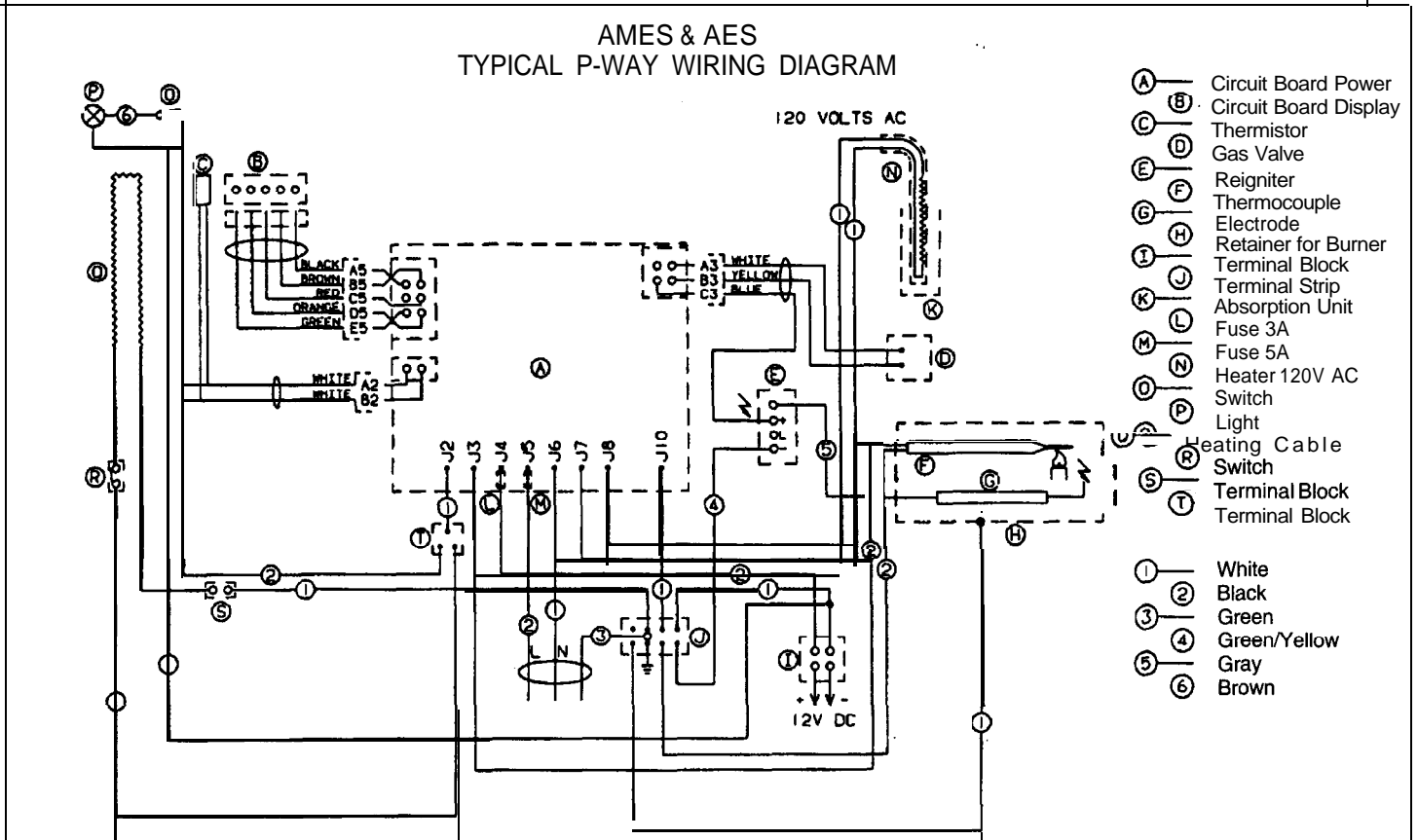
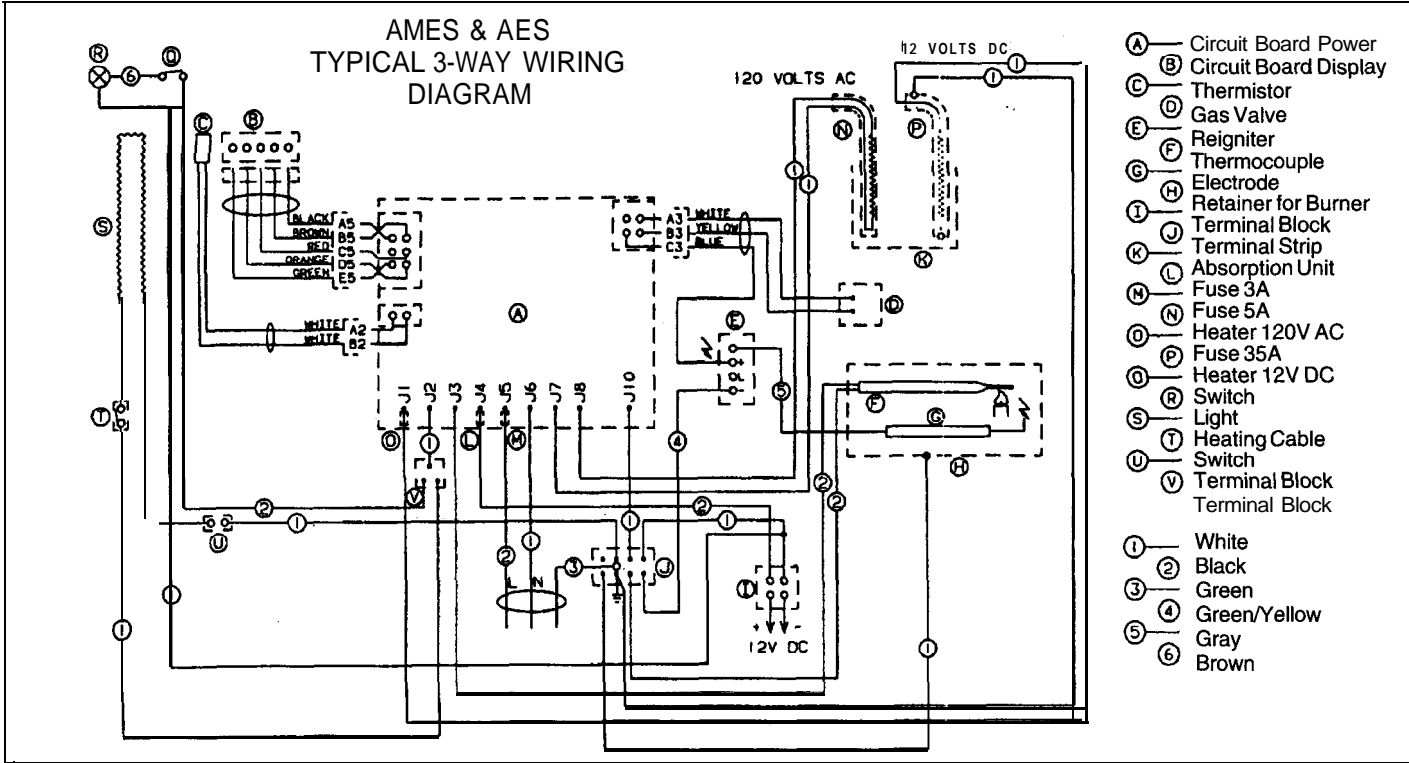
MAXIMUM CONDUCTOR WIRE LENGTH IN FEET										
AWG	S1521 S1531	S1621 S1631	S1821 S1831	RM2607 RM2611	RM2607 RM2811	RM3607	RM3607	RM3662 RM3663	RM3662 RM3663	RM4672 RM4673
8	—	27	27	27	27	27	27	27	27	27
10	19	17	17	17	17	17	17	17	17	17
12	12	—	—	—	—	—	—	—	—	—

8.2 INTERNAL WIRING

Check all wires at the connectors to be sure of a proper and tight connection. Also verify the refrigerator is wired per the wiring diagram for the exact model you

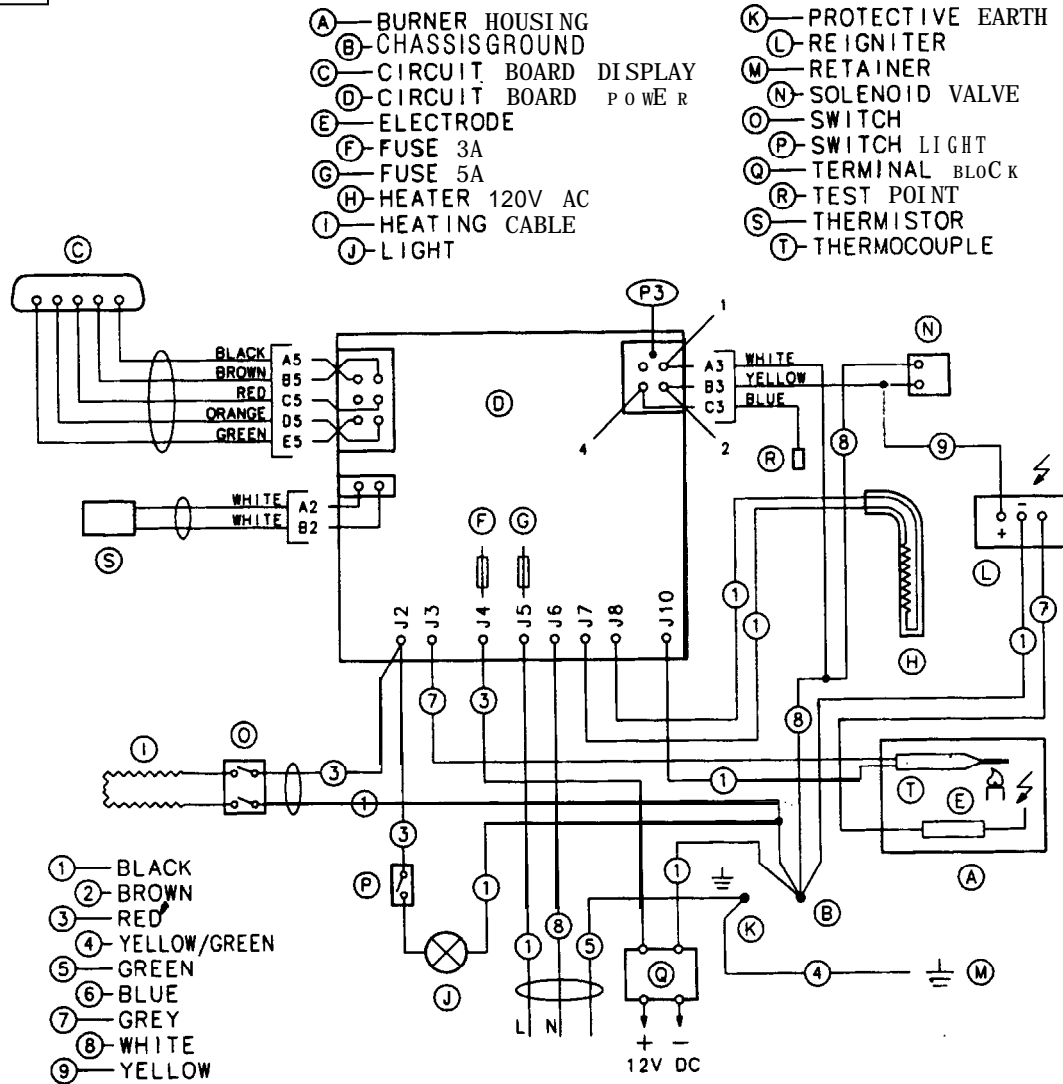
are working on. See the following typical wiring diagrams.

NOTE: Improper wiring at the lower circuit board could cause erratic operation and lower circuit board failure.

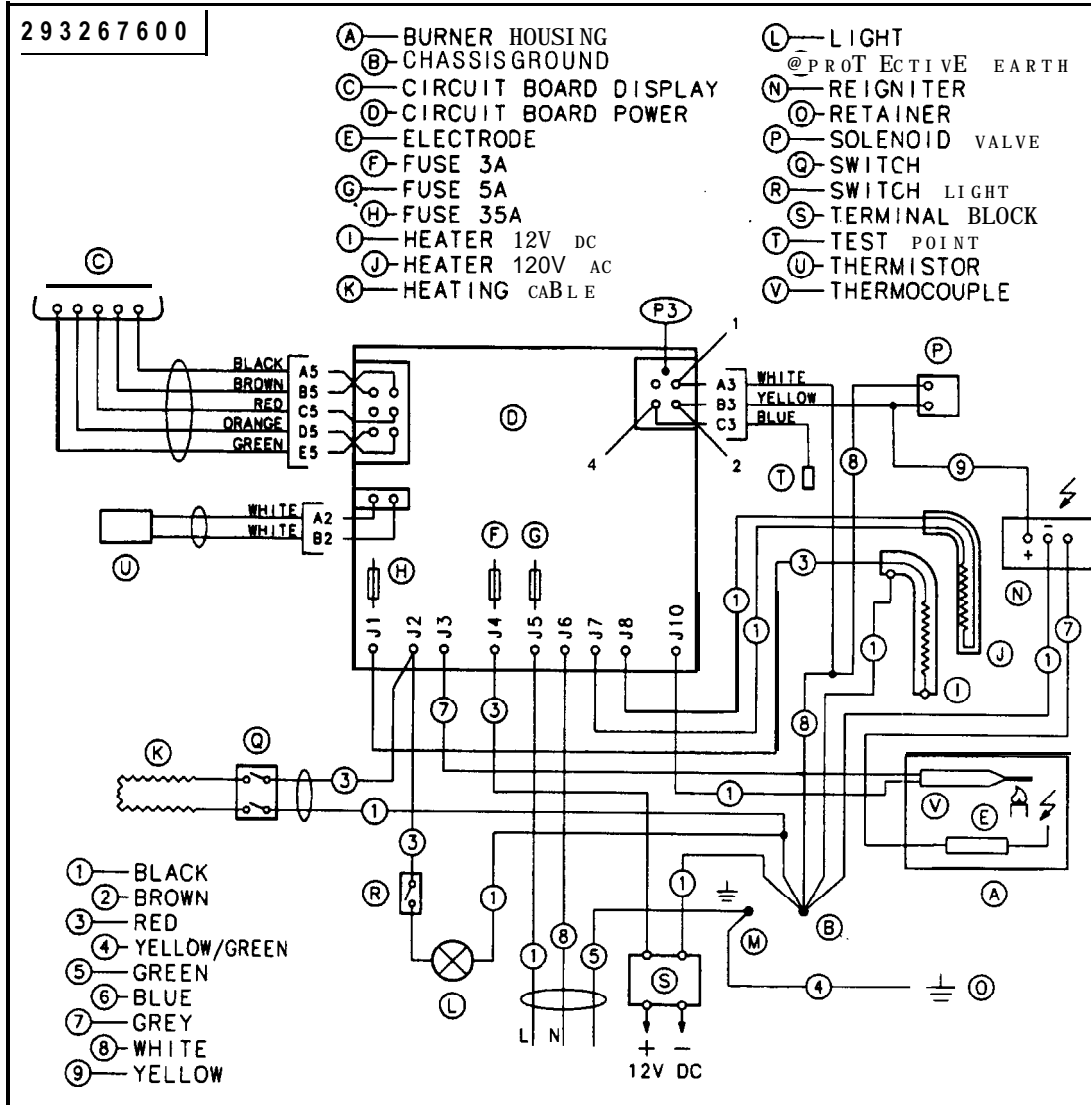


ROYALE & ELITE TYPICAL 2-WAY WIRING DIAGRAM

293267500



ROYALE & ELITE TYPICAL 3-WAY WIRING DIAGRAM



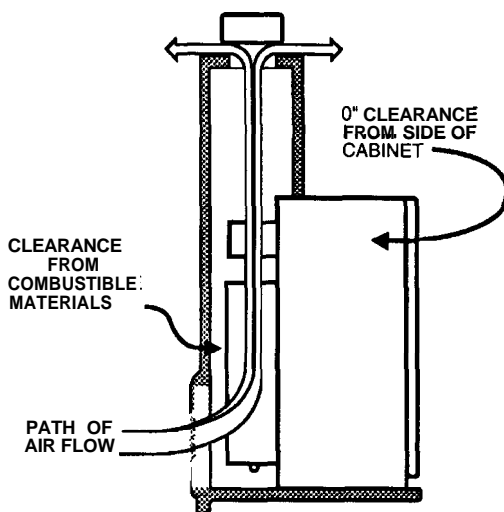
SECTION 9
OTHER

9.1 LEVELING

Leveling is one of the requirements for proper operation with absorption refrigerators. The absorption design utilizes no mechanical pumps or compressors to circulate the refrigerant within the system, so proper leveling must be maintained to provide the correct refrigerant flow. Without proper leveling refrigerant within the cooling unit will collect and stagnate at certain areas. Without proper refrigerant flow, the cooling process will stop. Both Dometic and Silhouette brand refrigerators have a type of cooling unit that utilizes an enclosed pump tube surrounded by a solution to protect the assembly. To ensure proper leveling with these models, the vehicle needs to be leveled so it is **comfortable to live in** (no noticeable sloping of floor or walls). When the vehicle is moving, leveling is not critical as the rolling and pitching movement of the vehicle will pass to either side of level, keeping the refrigerant from accumulating in the piping.

9.2 VENTILATION

Ventilation is one of the requirements for proper cooling unit operation. The coach vent system must be able to provide a way to direct the hot air produced by the action of the cooling unit, out away from the installation of the refrigerator. The refrigerator extracts heat from the interior of the refrigerator cabinet and dissipates the heat out through the vent system. In a proper installation there should be as little open space as possible surrounding the sides and top of the refrigerator to achieve proper air flow. All potential dead air pockets should be blocked or baffled to ensure that heat won't be trapped in these spaces and reduce efficiency.



NOTE: Refrigerators should be installed in accordance with appropriate installation instructions received with the refrigerator.

9.3 AIR LEAKS

Check the gasket on the doors to be sure of a positive air seal. A simple method to check gaskets is to close the door on a dollar bill, then pull the dollar bill out. If no resistance is felt, the gasket is not sealing properly. This should be done on all four sides of the door. If a gasket is not sealing properly, first warm the gasket material with a hair drier.



DO NOT OVERHEAT AS YOU CAN MELT THE MATERIAL.

Then close the door and the magnetic strip should pull the gasket to the metal frame. Leave door closed until the material has cooled. Then recheck for a positive seal. If a positive seal cannot be achieved, replace the gasket. Also check that the cooling unit is installed properly. The cooling unit's foam block, the portion that surrounds the evaporator coils, must be flush to the cabinet at the back of the refrigerator and have a positive seal. If the cooling unit is not installed properly, remove and install properly.

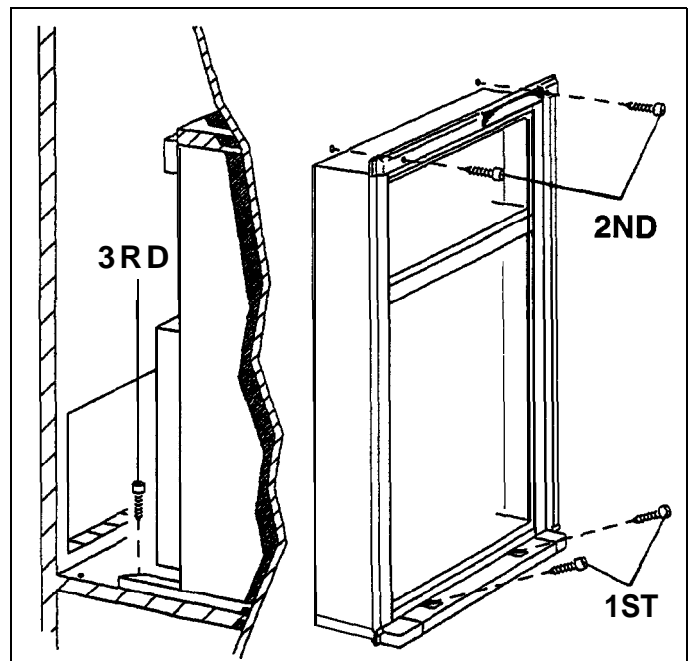
AMES/AES MODELS:

The refrigerator is secured in the enclosure with six screws and they must be installed in the following order:

- First Two Screws** installed on front base;
- Second Two Screws** installed in the top frame;
- Third Two Screws** installed in the rear base.

Failure to follow the sequence in securing refrigerator in enclosure can cause leakage between the frame and cabinet.

NOTE: Air leaks will cause insufficient cooling as well as rapid formation of frost.



ROYALE AND ELITE MODELS:

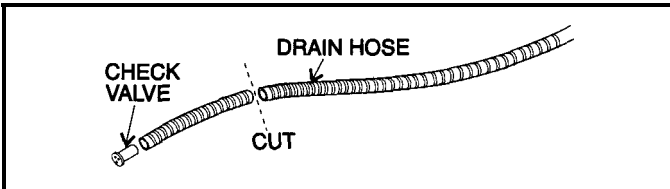
CONDENSATE WATER DRAIN HOSE: A 3/4" hole must be drilled through the flooring in the opening of the base plate on the rear of refrigerator. The installer must make sure that the hose does not kink when run through the floor. Seal around the hose where it goes through the hole. If a longer hose is required, follow the illustration shown on below.

OPTION A:

- 1) Remove black water check valve from hose.
- 2) Add additional hose
- 3) Reinstall black water check valve

OPTION B:

- 1) Cut drain hose at location shown below.
- 2) Install new drain hose between pieces cut.



NOTE: Black water check valve must be reinstalled to ensure proper refrigerator operation. DO NOT KINK HOSE.

OPTION C:

In vehicles where routing the drain hose through the floor is not possible, a metal clip is available. The clip is used to drain water out through the side vent.

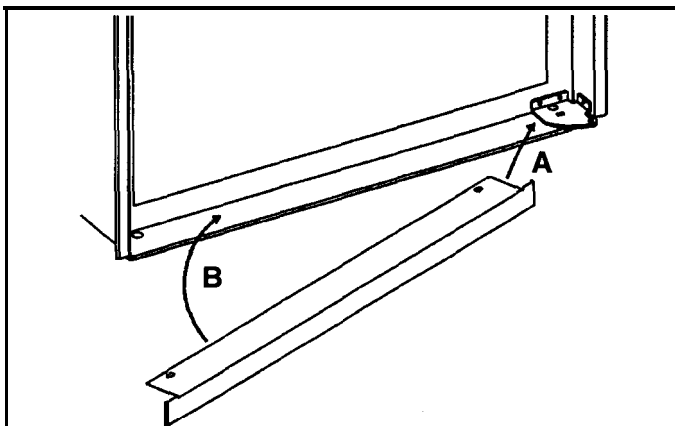
Part No. 3106590.015 Clip for plastic side vent

Part No. 3106559.010 Clip for metal side vent

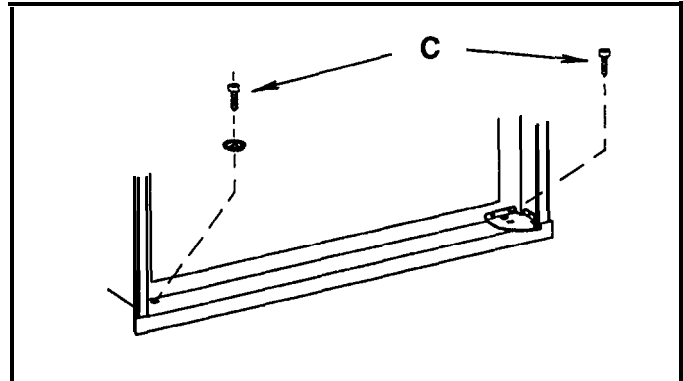
The refrigerator is secured in the enclosure with six screws. They must be installed in the following order:

First: Two screws are installed in front decoration strip and through the front base.

- A. The front strip is to be installed after the refrigerator is set into the alcove. The strip is shipped as a loose part.
- B. Install the lower front strip by sliding it under the bottom hinge plate as shown. The hinge plate can be on the right or left side depending on the door swing.



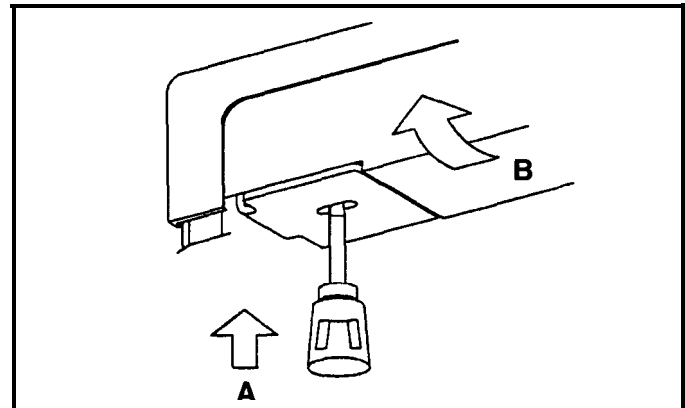
- C. When the front strip is in place, install one screw through the hinge and into the floor. The second screw is installed with a washer on the opposite side.



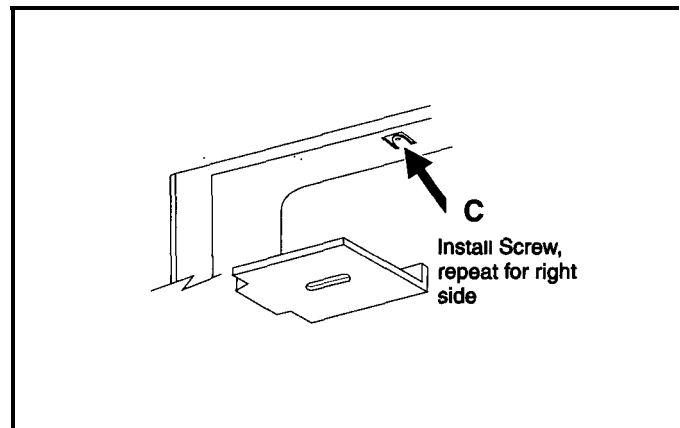
Second: Install the two screws in the top frame.

- A. The top decoration panel must be removed from the refrigerator before the screws can be installed. Open refrigerator door and gently push the tabs out of the hole in the hinge with flat blade screwdriver.

- B. Carefully tilt the top decoration panel and lift up to remove from top frame.

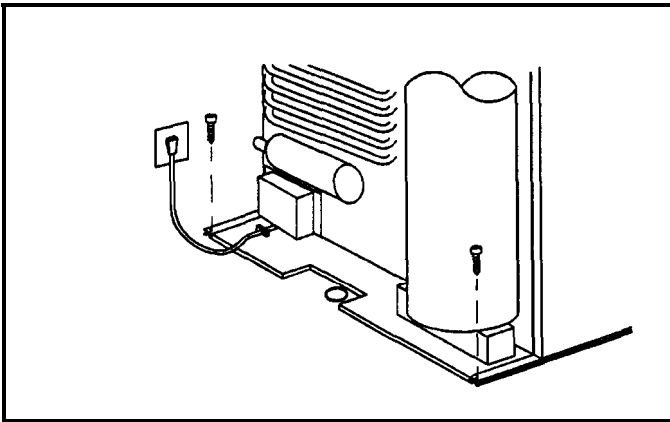


- C. Install the second two screws in the top frame as shown.



D. Replace the top decoration panel. Be careful not to pinch the wires. Make sure the tabs snap back into the holes in the hinge plate.

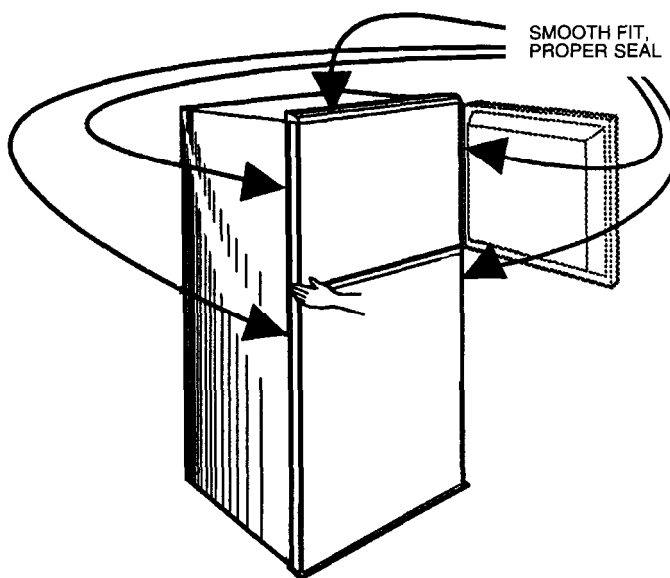
Third: Two screws installed as shown in rear base.



Failure to follow the sequence in securing the refrigerator in the enclosure can cause leakage between the frame and cabinet.

9.4 DOOR POSITION

The door position can be checked by observing any misalignment of the door in relation to the frame.



NOTE: On refrigerators equipped with an interior light, improper position of the lower door can cause the interior light to stay on when the door is closed.

To adjust either door, loosen the hinge bracket screws, reposition the door then tighten the hinge bracket screws.

To adjust up or down, remove the door and add or remove washers from the lower hinge pin. Reinstall door and check for correct clearances.

9.5 AMBIENT TEMPERATURE

This is the temperature surrounding the recreational vehicle, as well as the temperature of air at the back of the refrigerator. As the ambient temperature increases, the air temperature in the area of the cooling unit increases. The double door refrigerators should maintain approximately 43 degrees food storage temperature at 110 degree ambient temperature. As the ambient temperature increases, it is possible for the interior temperature of the refrigerator to increase. This means proper installation, ventilation and leveling are important for proper operating temperature of the refrigerator.

9.6 COOLING UNIT

The cooling unit is a self-contained, hermetically sealed set of coils where the refrigeration process takes place. The chemicals involved in the cooling process include hydrogen, ammonia, water and a rust inhibiting agent. There are no repairs recommended on the cooling unit. If it is defective, replace with a new cooling unit.

To check the cooling unit, first verify the AC heating element is good (see Sec. 3). Then place approximately one gallon of water inside the refrigerator and place a thermometer in one of the containers of water. Next, supply 115 volts direct to the AC heating element and operate for at least 12 hours. Then check the temperature on the thermometer. It should be at 45 degrees or lower depending on test conditions (see Sec. 9.2 and 9.5). If so, the cooling unit is good. If the temperature of the water is above 45 degrees, replace the cooling unit.

9.7 FOOD STORAGE

Proper refrigeration requires free air circulation within the food storage compartment. Restricted air circulation within this compartment will cause higher cabinet temperatures. To remedy this situation, simply rearrange your food items. It is also essential that the shelves are not covered with paper or large storage containers. Always remember to allow for proper air circulation.

Odorous or highly flavored foods should always be stored in covered dishes, plastic bags or wrapped in foil or waxed paper to prevent food odors. Vegetables, lettuce, etc., should be covered to retain their crispness. **NEVER PUT HOT FOOD INTO THE REFRIGERATOR.**

To reduce frost formation in and on the freezing compartment, cover stored liquids and moist foods and do not leave the door open longer than necessary.

When the refrigerator is heavily loaded, it takes longer to lower the refrigerator temperature, and longer to make ice. A very heavy load may also cause defrosting.

9.8 HIGH HUMIDITY

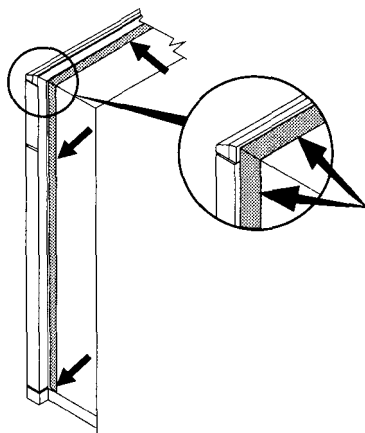
High humidity may cause a small amount of condensation to form on the frame of the refrigerator. In extreme cases, the condensation may actually run off the frame. As the humidity is reduced, the "sweating" will decrease. High humidity can also be a factor in rapid formation of frost.

Some refrigerators have climate controls installed (see Sec. 5.12). Use of the climate control will reduce the formation of condensation on the frame.

9.9 INTERIOR LINER SEAL TO FRAME

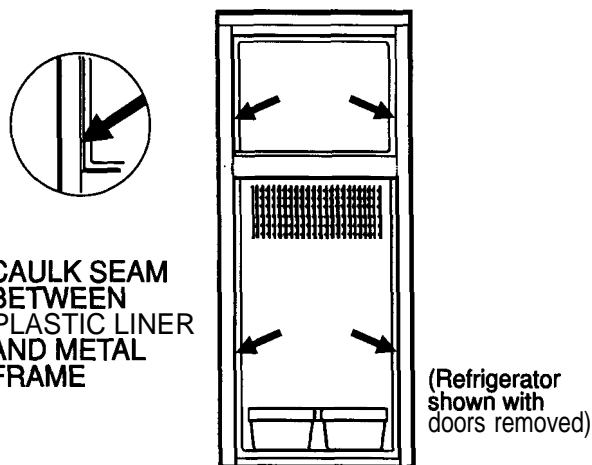
There is a seal that is applied to the liner in the area where the metal frame makes contact with the interior liner. If this seal is incomplete, cold air can migrate out to the metal frame. If this happens, condensation could form on the frame and could promote rapid formation of frost. If you suspect an improper seal, apply a small bead of silicone all the way around the perimeter where the frame meets the interior liner.

Remove all screws securing the refrigerator into the cabinet and slide the refrigerator out approximately 2-4 inches. Clean the metal frame and foil-backed insulation around the refrigerator. Apply a foil-backed adhesive tape to the joint between outer frame and foil-backed refrigerator insulation.



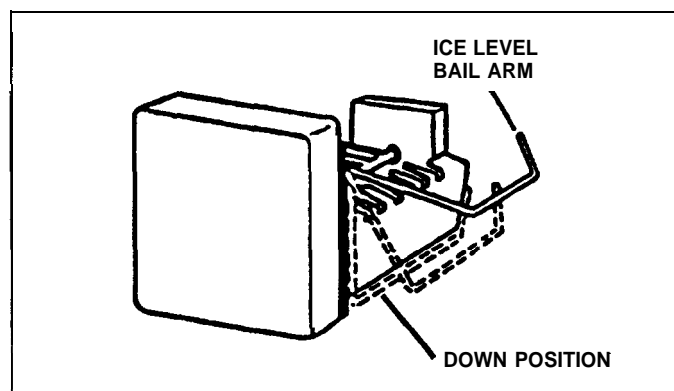
Make sure the refrigerator is dry and that the surface temperatures are above 50°F. Use a clear silicon caulking compound and seal the seam between the refrigerator's plastic liner and the metal frame. See Apply the silicon in a continuous bead around both the refrigerator freezer and food compartments.

NOTE: TO FORM A PROPER SEAL, IT IS IMPORTANT NOT TO LEAVE ANY GAPS.



SECTION 10 ICE MAKER OPERATION

The refrigerator must be allowed to precool properly before starting the ice maker. The refrigerator has to be connected to 120 volts AC before the ice maker can operate. The water line manual shutoff valve must be open. To start making ice, move the ice level bail arm to DOWN position.



When the ice maker thermostat senses the preset temperature for ejection of the ice cubes, the fingers will start to rotate - dumping any ice cubes and filling the mold with water.

When the storage container is full of ice, the ice level bail arm can not return to the DOWN position. This will stop further production of ice until the container is emptied and the bail arm is returned to the down position.

The absorption system will keep the compartment at the proper temperature for storage of ice. Ice making is accelerated if the thermostat is set to the coldest position. It is a good idea to do this a few hours before you anticipate a need for ice.

NOTE: IF THE ICE MAKER WAS CLEANED AND DRAINED, NO ICE CUBES WILL BE DUMPED INTO THE STORAGE CONTAINER DURING THE FIRST CYCLE.

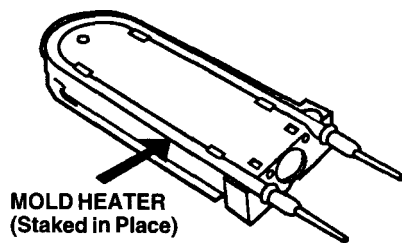
The first few cycles may have small cubes due to air trapped in the water lines. The first container of ice cubes should be dumped if the water system has been winterized or not used for several weeks.

SECTION 11

ICE MAKER COMPONENTS

11.1 MOLD HEATER

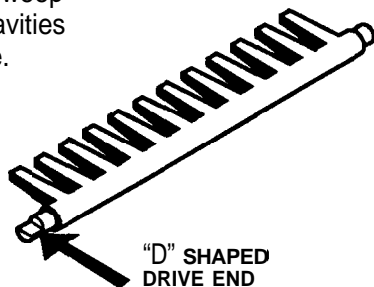
The mold heater uses 165 watts to thaw the ice free from the mold. It is wired in series with the thermostat which also acts as a safety device. With power to the appliance off, check for resistance between the two leads to the heater element. You should obtain a reading of approximately 80 ohms. If the heater is found to be defective, the manufacturer recommends replacement of the entire ice making unit for proper operation.



11.2 ICE EJECTOR

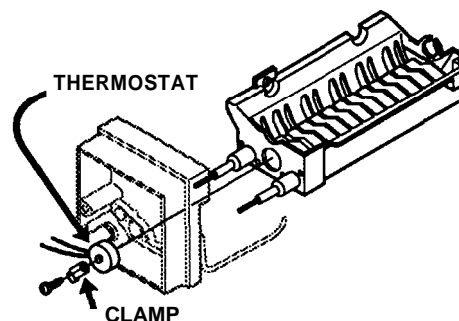
The ice ejector blades sweep the ice from the mold cavities during the ejection cycle.

The drive end of the ejector is "D" shaped for positive coupling. The bearings at both ends are lubricated with silicone grease. If the ejector blades are frozen into the ice, defrost the ice maker and manually cycle the ice making unit, making sure the ejector stops at the right location.



11.3 MOLD THERMOSTAT

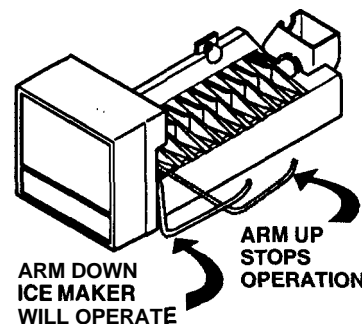
This is a single-pole, single-throw, bimetal switch. It starts an ejection cycle by closing at $18^{\circ}\text{F} \pm 5^{\circ}$. The reset temperature is $50^{\circ}\text{F} \pm 5^{\circ}$. The thermostat is in series with the mold heater and acts as a safety against overheating in case of a mechanical failure. If the thermostat is defective, replace it.



11.4 SHUTOFF ARM

The shutoff arm is cam driven. It operates a switch to control the quantity of ice produced. During the ejection cycle the arm is raised and lowered during each of the two revolutions of the timing cam. If the shutoff arm comes to rest on top of the ice in the storage bin during either revolution, the switch will remain open and stop the ice maker at the end of that revolution. The arm has a manual shutoff built into the linkage; by raising the arm as high as possible, it will lock in that position until forced down.

If the arm and switch do not operate properly, check for damage and repair or replace parts as necessary.



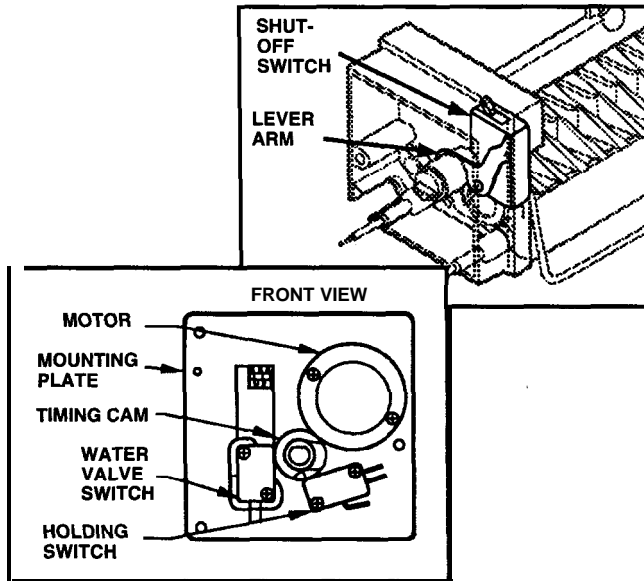
11.5 MOLD SWITCHES

These three switches are single-pole, double-throw style. They are identical and interchangeable.

The holdina switch assures completion of a revolution once a cycle has started.

The water valve switch opens the water valve during the fill stage of the cycle. NOTE: This is the only adjustable component of the ice maker. If you use a double-throw switch, DO NOT use the N.O. terminal.

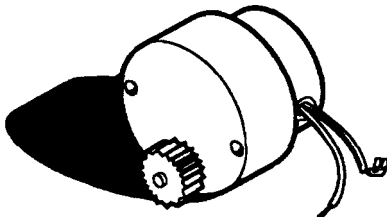
The shutoff switch stops the ice maker's operation when the storage bin is full.



11.6 TIMING MOTOR

This is a low-wattage, stall-type motor which is geared to the timing cam and ice ejector. It is a one RPM motor.

To check the motor, disconnect power to the appliance and test for continuity between the two leads. If you DO NOT have continuity, replace the motor. If you have continuity and the motor runs, DO NOT replace.



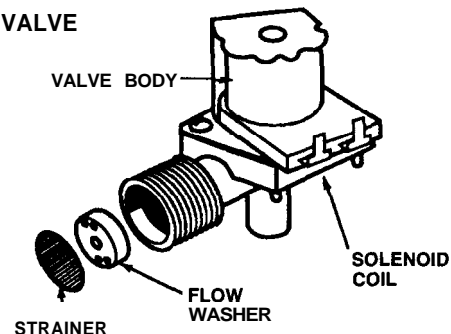
11.7 WATER VALVE

This valve is solenoid operated. When it is open, it releases water from the source to the mold. The amount of water is proportional to the length of time the water valve switch is held closed by its timing cam.

Disconnect power to the appliance, remove the wires to the valve solenoid coil, and check for continuity between the two terminals. If you have continuity, the solenoid is good. It takes 10-15 watts to energize the solenoid coil. The mold heater and coil are in series. When the mold heater is activated, this causes the voltage to drop to about 105 VAC at the coil.

The valve has a flow washer inside which acts as a pressure regulator. A strainer is installed to prevent dirt, rust, etc. from entering the valve. Check for any debris which might obstruct the flow of water, or prevent the valve from closing completely when the circuit is not energized. Remove any obstructions. If the valve still fails to operate properly, replace it.

WATER VALVE



11.8 ICE MAKER ASSEMBLY

It may be necessary to replace the entire ice maker assembly.

Disconnect power to the appliance. Disconnect the leads inside the ice maker unit. Check each wire for continuity to make sure the wiring is good before replacing the ice maker unit. If there is no continuity on any of these wires, replace or repair them as necessary and recheck the ice maker unit to determine whether the problem was, in the wiring or the unit itself.

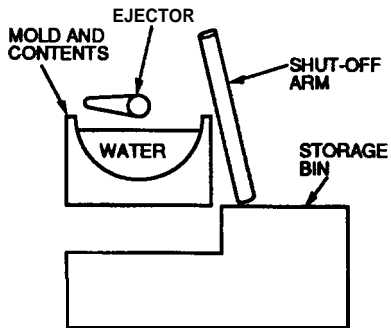
OPERATION

While the operation of the ice maker is fairly simple, an understanding of its cycle is necessary for the service technician to diagnose specific problems.

The following series of electrical schematics (on the following pages) will show a typical cycle, and the positions of various components during the cycle: the mold and its contents, the ejector, the shutoff arm and the storage bin.

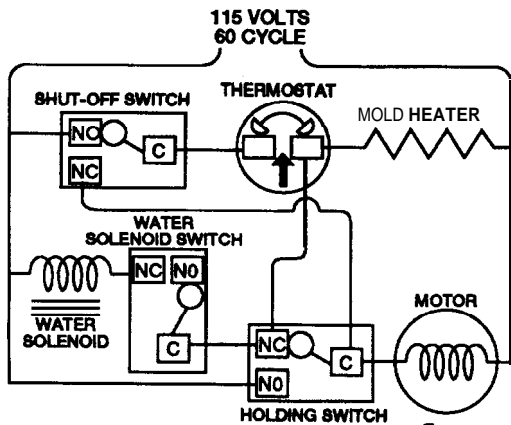
NOTE: If you have difficulty in reading schematics and circuit diagrams, please enroll in a basic electrical course at your local school or college.

NOTE THE RELATIVE POSITION OF THESE COMPONENTS IN THE FOLLOWING SCHEMATICS



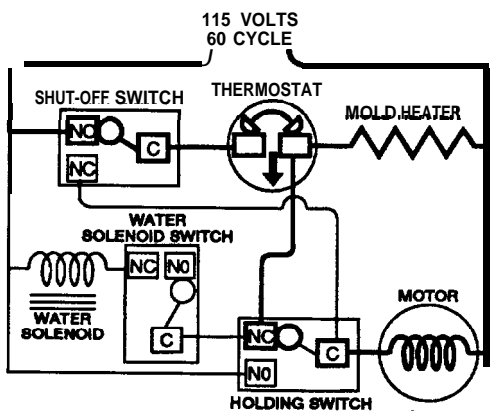
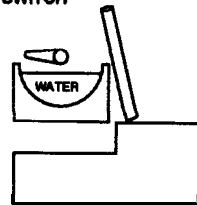
1

NON ENERGIZED CIRCUIT
ENERGIZED CIRCUIT



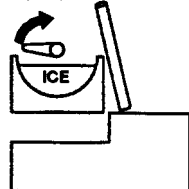
2

This is a freeze cycle. The mold is filled with water. The thermostat is open. All components are de-energized.

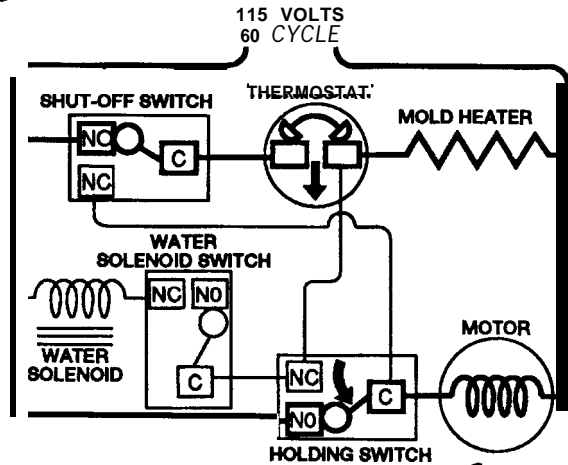


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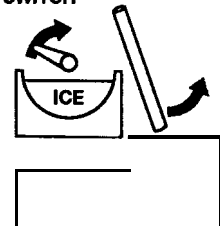
This is the start of an ejection cycle. The thermostat switches to its closed position after being sufficiently cooled by the ice in the mold. The mold heater and motor are now energized. The ejector blades begin to turn



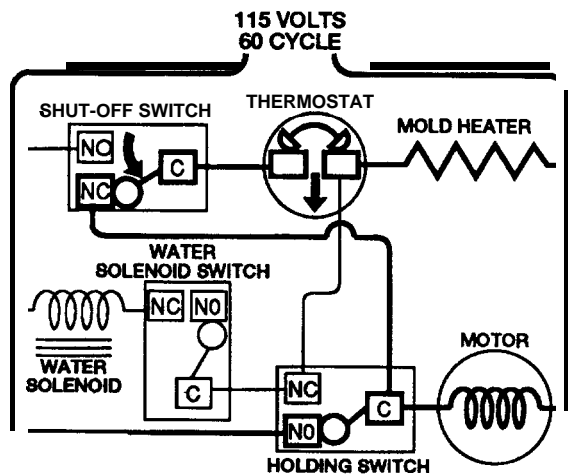
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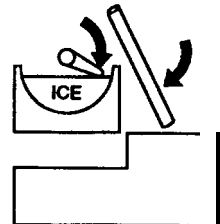
After a few degrees of motor rotation, the timing cam switches the holding switch to its normally open position; this assures completion of the cycle. The mold heater remains energized through the thermostat circuit. During the first half of the cycle, the shut-off arm is raised and lowered by the timing cam and operates the shut-off switch.



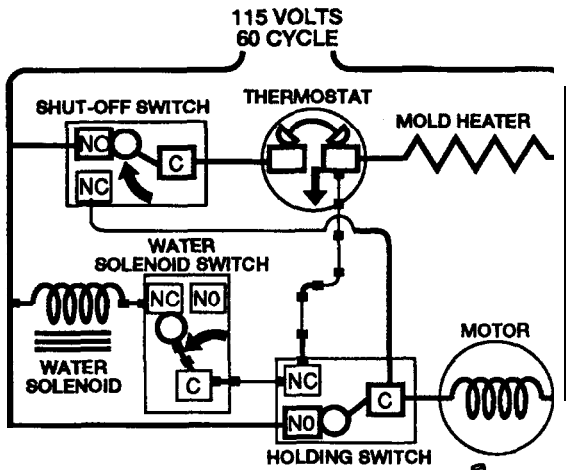
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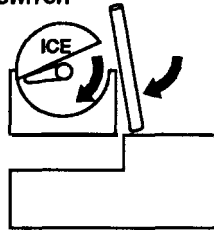
When the ejector blades reach the ice in the mold, the motor will stall. It will remain in this position until the ice has thawed loose. During this time the mold heater remains energized.



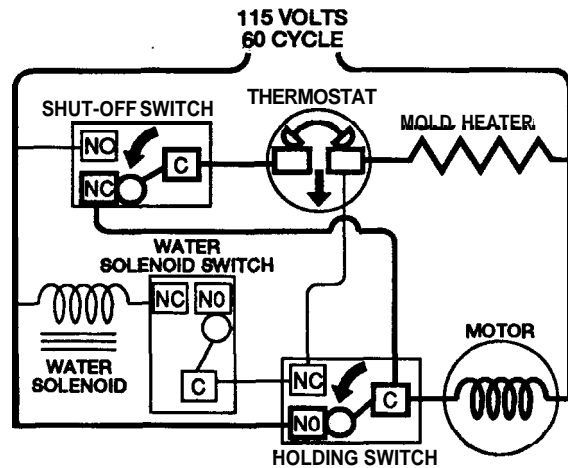
6



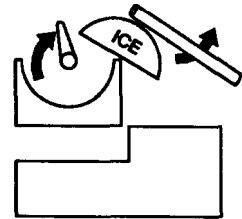
Near the completion of the first revolution, the timing cam doses the water valve switch. However since the thermostat is still closed the mold heater circuit is energized. Current will not pass through the water valve solenoid end its switch. (Electrical current follows the path of least resistance.)



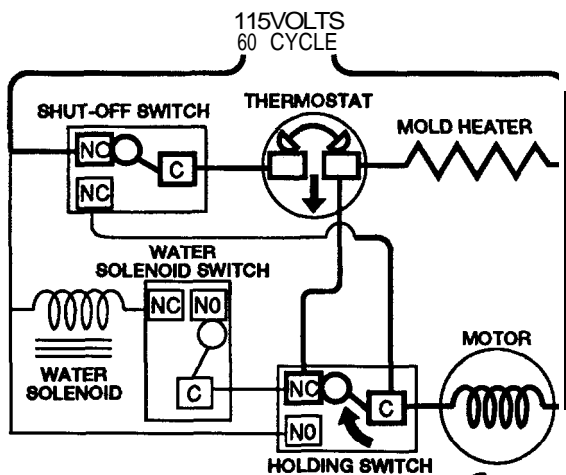
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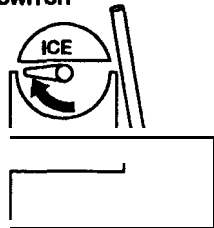
Once again after a few degrees of rotation the timing cam closes the holding switch providing a circuit that will assure completion of this revolution. The mold heater remains energized. The shut-off arm will raise and lower again operating its switch. The ice that was ejected during this first revolution is dumped into the storage bin.



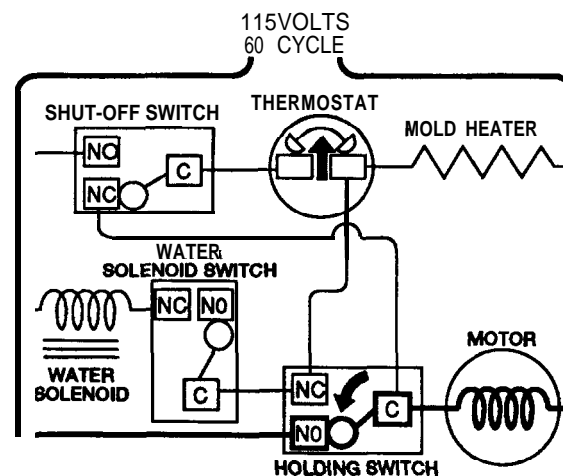
7



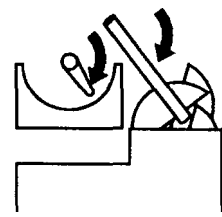
At the end of the first revolution the timing cam opens the holding switch. However, since the thermostat is still closed a second revolution begins.



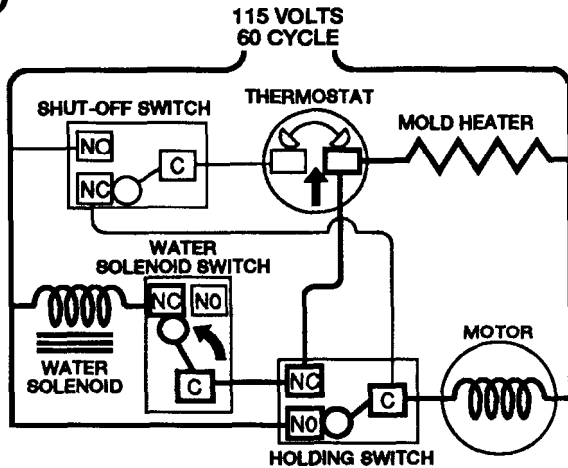
9



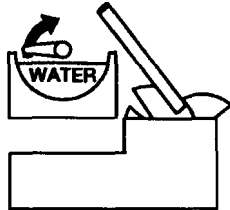
Some time during the second revolution the mold heater resets the thermostat. At this time, the mold heater is de-energized. If the storage bin is full, the shut-off arm will remain in a raised position



10



Near the completion of the second revolution the timing cam again closes the water valve switch. This time a circuit is completed through the water valve solenoid, its switch and the mold heater. The water valve solenoid received about 105 volts. The remaining 10 volts to the mold heater are not noticeable. When the water valve solenoid is energized, the valve opens and water refills the mold.



SECTION 12 ICE MAKER – OTHER

12.1 WATER FILL ADJUSTMENT

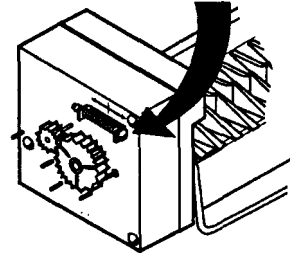
The correct water level in the mold is important for the proper production of ice. The size of the ice cubes depends on the amount of water which enters the mold. The cubes should be approximately 1/2" wide, 3/4" high and 2-1/2" long.

If the water overflows in the mold, first check to see if the ice maker unit is level in the appliance. Next ensure that the appliance is installed level in the RV.

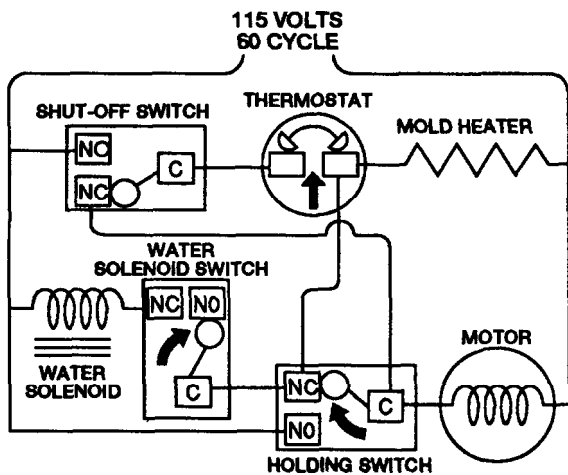
If there is still water overflow, adjustment of the water fill screw is necessary. Locate the screw on the ice maker assembly. Turn the screw as necessary toward the "+" or "-" side. One full turn of the screw will make an 18cc change in the amount of water. DO NOT turn the screw more than one full turn at a time.

If the water level is too high, it can also cause the ejector blades to become frozen in the ice. Follow the procedures above to correct the problem.

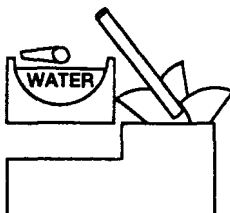
**WATER FILL ADJUSTING SCREW
1 FULL TURN = 18 cc's CHANGE**



11



The ejection cycle ends the moment that the holding switch is switched by the timing cam. The water valve switch is also opened. If the storage bin is full, as shown here, additional cycles will not start until sufficient ice is used to lower the shut-off arm, thus operating its switch.



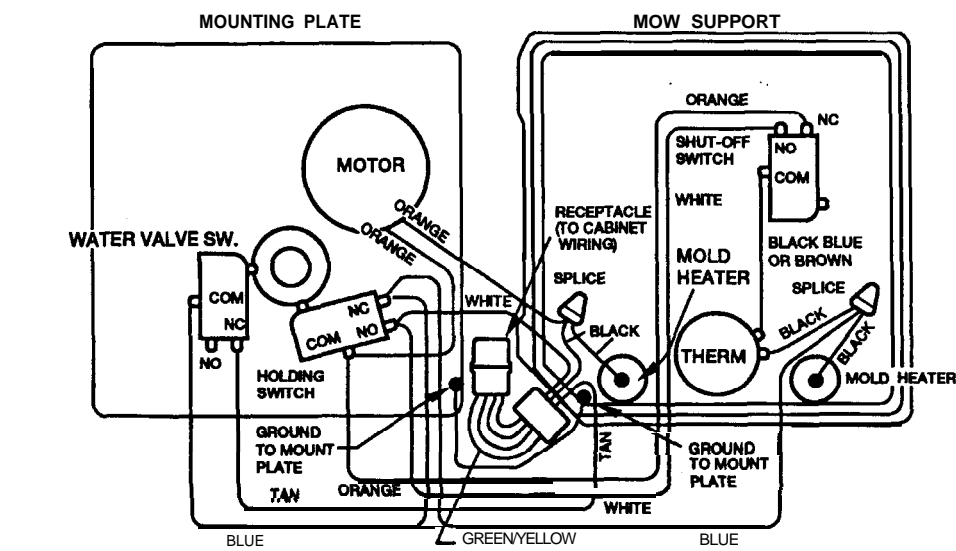
12.2 WIRING

Refer to the wiring diagram supplied with the unit you are working on, and make sure all wiring connections are correct and tight.

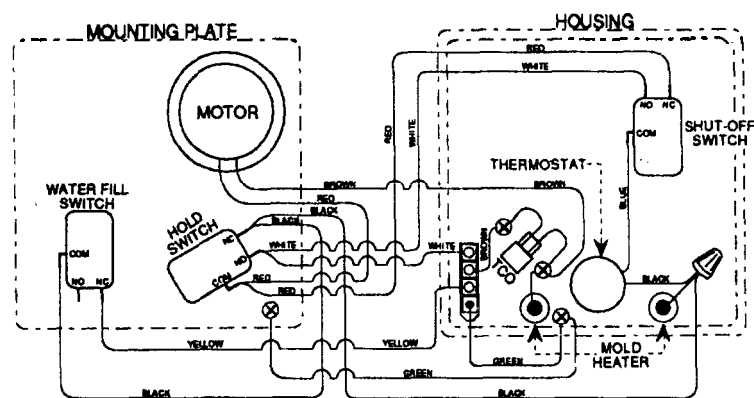


**THIS IS AN ENERGIZED CIRCUIT. ELECTRICAL SHOCK CAN OCCUR.
BEFORE CHECKING THESE COMPONENTS BE SURE THERE IS NO POWER TO THE APPLIANCE.**

AMES & AES ICE MAKER TYPICAL WIRING DIAGRAM



ROYALE/ELITE ICE MAKER TYPICAL WIRING DIAGRAM



12.3 WATER SUPPLY

To operate properly, the water pressure in the water supply line must be between 15 lbs. PSI and 125 lbs. PSI.

Lower water pressure, water turned off, or obstructions or air in the water line can cause low or no ice production.

First check to see that the water supply is fully turned on. Visually check the line for kinks, etc. which might obstruct the flow of water.

To remove trapped air, loosen the connection at the solenoid water valve of the appliance. Ensure that pressurized water is reaching this point, and bleed off any air in the line. Retighten the connection, making sure there are no leaks.