SERVICE MANUAL
FOR
6537 & 6538 SERIES TWO TON
HIGH EFFICIENCY
PACKAGED HEAT PUMPS
TABLE OF CONTENTS

1. Warnings .......................................................... 2
2. Accessibility Of Appliance .................................................. 3
3. Unit Dimensions And Specifications ........................................ 3
4. Unit Specifications And Identification ...................................... 3
5. Unit Depiction Figures ..................................................... 4
6. General Information ........................................................ 6
7. Thermostat Specifications .................................................... 6
8. A Typical Cooling Cycle Of The Heat Pump ............................... 10
9. A Typical Heating Cycle Of The Heat Pump (Electric Heat Mode) ........ 10
10. Wirebox Component Checkout ............................................... 11
11. Service Problems And Possible Solutions ................................. 12
12. Electrical Diagnostic Flow Charts ........................................... 13
   A. Heat Pump Operation Sequence Cooling Mode ......................... 14
   A.1 No Cooling - Cooling Mode (Green L.E.D. Light Circuit) ............ 15
   A.2 No Indoor Blower Low Speed - Cooling Mode .......................... 16
   A.3 No Indoor Blower High Speed - Cooling Mode .......................... 17
   A.4 Compressor #1 Checkout - Cooling Mode ................................. 18
   A.5 Compressor #2 Checkout - Cooling Mode ................................. 19
   B. Heat Pump Operation Sequence Heating Mode ......................... 20
   B.1 No Heating - Electric Heat Mode (Green L.E.D. Light Circuit) ...... 21
   B.2 No Indoor Blower - Electric Heat Mode .................................. 22
   B.3 Compressor #1 Checkout - Electric Heat Mode ......................... 23
   B.4 Compressor #2 Checkout - Electric Heat Mode ......................... 24
   B.5 No Reversing Valve Operation - Electric Heat Mode .................. 25
   C. Outdoor Blower Motor - Heating Or Cooling Mode .................... 26
   C.1 No Outdoor Blower Low Speed ............................................ 26
   C.2 No Outdoor Blower High Speed ............................................ 27
13. Wiring Diagram .......................................................... 28

1. WARNINGS

IMPORTANT NOTICE

These instructions are for the use of qualified individuals specially trained and experienced in installation of this type equipment and related system components.

Installation and service personnel are required by some states to be licensed. PERSONS NOT QUALIFIED SHALL NOT INSTALL NOR SERVICE THIS EQUIPMENT.

SHOCK HAZARD

TO PREVENT THE POSSIBILITY OF SEVERE PERSONAL INJURY, DEATH OF EQUIPMENT DAMAGE DUE TO ELECTRICAL SHOCK, ALWAYS BE SURE THE POWER SUPPLY TO THE APPLIANCE IS DISCONNECTED BEFORE DOING ANY WORK ON THE APPLIANCE. THIS CAN NORMALLY BE ACCOMPLISHED BY SWITCHING THE BREAKER FOR THE AIR CONDITIONER TO “OFF”, DISCONNECTING ALL EXTERNAL ELECTRICAL CONNECTIONS AND CORDS, SWITCHING ON BOARD ELECTRICAL GENERATORS AND INVERTERS TO “OFF” AND REMOVING THE CABLE FROM EACH POSITIVE TERMINAL ON ALL STORAGE AND STARTING BATTERIES.

CAREFULLY FOLLOW ALL INSTRUCTIONS AND WARNINGS IN THIS BOOKLET TO AVOID DAMAGE TO THE EQUIPMENT, PERSONAL INJURY OR FIRE.

WARNING

Improper installation may damage equipment, can create a hazard and will void the warranty.

The use of components not tested in combination with these units will void the warranty, may make the equipment in violation of state codes, may create a hazard and may ruin the equipment.
2. ACCESSIBILITY OF APPLIANCE

The accessibility of this appliance will vary from one installation to another. It shall be left to the service technicians judgement, the best method of attaining access to perform service.

3. UNIT DIMENSIONS AND SPECIFICATIONS

PACKAGE AIR CONDITIONER MODEL NUMBER BREAKDOWN FOLLOWS:

6 5 3 X - X 7 1

Model Series

Revision Letter

4. UNIT SPECIFICATIONS AND IDENTIFICATION

<table>
<thead>
<tr>
<th>Circuit #1</th>
<th>Circuit #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.7 RLA</td>
<td>8.7 RLA</td>
</tr>
<tr>
<td>58 LRA</td>
<td>58 LRA</td>
</tr>
<tr>
<td>8.9 BCSC</td>
<td>8.9 BCSC</td>
</tr>
</tbody>
</table>

USE THERMOSTAT 6535B335
ELECTRICAL RATINGS: 115 VAC, 60 HZ, 1 PHASE

<table>
<thead>
<tr>
<th>Component</th>
<th>FLA</th>
<th>Minimum Circuit Capacity</th>
<th>Maximum Overcurrent Protective Device</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.8</td>
<td>17.3</td>
<td>20</td>
</tr>
<tr>
<td>I.D. Blower Motor Data Horsepower 1/3</td>
<td>N/A</td>
<td>14.9</td>
<td></td>
</tr>
<tr>
<td>O.D. Blower Motor Data Horsepower 1/3</td>
<td>3.7</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>R-22 Charge Weight</td>
<td>25.75</td>
<td>25.75</td>
<td>20</td>
</tr>
<tr>
<td>MINIMUM EXTERNAL STATIC PRESSURE</td>
<td>4 IN H2O</td>
<td>4 IN H2O</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conductor Gauge (Copper)</th>
<th>Minimum Supply Conductor Gauge Utiliser des fils d'alimentation en curvent</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#12 0'-25'</td>
<td>0'-25' #12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#10 25'-40'</td>
<td>25'-40' #10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#8 40'-63'</td>
<td>40'-63' #8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. UNIT DEPICTION FIGURES

FIGURE 1

FIGURE 2
UNIT DEPICTION

6538
6. GENERAL INFORMATION

This packaged heat pump mounts below the floor of the vehicle. The innovative design makes it possible to maintain a smooth, free-flowing roof line for the vehicle. It also relocates all noise and condensate drainage off the roof to below the floor of the vehicle.

The heat pump contains a dual compressor system. It combines the capacity of two roof mounted units into one highly efficient and compact package.

Each compressor is connected to a separate refrigeration circuit. The system can be operated with a single compressor when the air conditioning requirement is low, or with two compressors when maximum performance is required.

This heat pump operates a two-stage system. The first compressor and refrigeration circuit is referred to as “1st Stage”. The second compressor and refrigeration circuit is referred to as “2nd Stage”. First and second stage will operate as indicated below.

1st stage (the first compressor and refrigeration circuit), will operate when:

1) The thermostat is demanding cooling or electric heating,
2) The vehicle is being powered by either shore line or the on-board generator.

2nd stage (the second compressor and refrigeration circuit), will operate when:

1) The thermostat senses room temperature that is 2 degrees or higher than the setpoint temperature on the thermostat.

Switching and control of 1st and 2nd stage cooling is automatic. When the cooling demand does not require that both systems operate, stage two will shut down leaving stage one in operation. Heat operation always energizes both stages, however, only stage one operates if power is not available to circuit #2.

7. THERMOSTAT - 6535*3352 COLEMAN-MACH SERIES THERMOSTAT

The display indicates room temperature and the word ROOM is shown on the LCD until the temperature selector is pressed; at which time the display temporarily indicates the setpoint temperature and the word SET is shown on the LCD. Each time the UP arrow is pressed, the setpoint will decrease. Once the temperature selector button is no longer pressed for a few seconds, the room temperature will again be displayed, and the word ROOM will be displayed on the LCD.

In electric heat mode, if the heat pump is unable to satisfy the thermostat, DIFF will flash on the thermostat LCD when 2nd stage heating is required to satisfy the thermostat.

In gas heat mode, the gas furnace will provide the only source of heat and the heat pump is locked out.

NOTE

The temperature displays in degrees Fahrenheit as a factory set default (See Figure 2). To display in degrees Celius, move the jumper marked “F” and “C” to bridge between middle pin and position “C”.

6535*3352 THERMOSTAT OPERATION
### 6535*3352 Heat Pump Thermostat Example To Bring On Gas Furnace As 2\textsuperscript{nd} Stage Heat

<table>
<thead>
<tr>
<th>Setpoint</th>
<th>Indoor Temp.</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>70+</td>
<td>No functions occur</td>
</tr>
<tr>
<td>69</td>
<td>69</td>
<td>Heat Pump turns on (Primary heat source)</td>
</tr>
<tr>
<td>71</td>
<td>65</td>
<td>Heat Pump turns off (Thermostat satisfied)</td>
</tr>
<tr>
<td>69</td>
<td>65</td>
<td>Heat Pump turns on</td>
</tr>
<tr>
<td>65</td>
<td>65</td>
<td>Gas Furnace turns on (Heat Pump not able to satisfy Thermostat)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(First strike for 2\textsuperscript{nd} stage heat counter)</td>
</tr>
<tr>
<td>71</td>
<td>69</td>
<td>Heat Pump and Gas Furnace turn off (Thermostat satisfied)</td>
</tr>
<tr>
<td>69</td>
<td>65</td>
<td>Heat Pump turns on</td>
</tr>
<tr>
<td>65</td>
<td>65</td>
<td>Gas Furnace turns on (Heat Pump is again unable to satisfy Thermostat), (2\textsuperscript{nd} stage heat counter reaches 3\textsuperscript{rd} strike and Heat Pump is locked out for 2 hours), \textbf{2\textsuperscript{nd} stage heat counter is reset if Heat Pump is running for more than 20 minutes and does not call for 2\textsuperscript{nd} stage heat}</td>
</tr>
<tr>
<td>71</td>
<td>69</td>
<td>Gas Furnace turns off (Thermostat satisfied)</td>
</tr>
<tr>
<td>69</td>
<td>69</td>
<td>Gas Furnace turns on (Becomes Primary heat source)</td>
</tr>
<tr>
<td>71</td>
<td>69</td>
<td>Gas Furnace turns off (Thermostat satisfied)</td>
</tr>
<tr>
<td>69</td>
<td>69</td>
<td>\textbf{After 2 hour lockout}</td>
</tr>
<tr>
<td>65</td>
<td>65</td>
<td>Heat Pump turns on (Resumes as Primary heat source)</td>
</tr>
<tr>
<td>71</td>
<td>69</td>
<td>Gas Furnace turns on (Becomes Primary heat source)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Heat Pump is locked out for another 2 hours)</td>
</tr>
<tr>
<td>71</td>
<td>69</td>
<td>Gas Furnace turns off (Thermostat satisfied)</td>
</tr>
<tr>
<td>69</td>
<td>69</td>
<td>\textbf{After 2 hour lockout}</td>
</tr>
<tr>
<td>71</td>
<td>71</td>
<td>Heat Pump turns on (Resumes as Primary heat source)</td>
</tr>
<tr>
<td>71</td>
<td>71</td>
<td>Heat Pump turns off (Thermostat satisfied)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\textbf{(2\textsuperscript{nd} stage heat counter is reset any time Heat Pump satisfies thermostat setpoint and does not need Gas Furnace)}</td>
</tr>
</tbody>
</table>

The word “DIFF” will flash on LCD when 2\textsuperscript{nd} stage heat is operating.

There is a 30 second delay between Stage 1 and Stage 2 Heat Pump operation.

There is also a 3 minute anti-short cycle delay time of 3 minutes for cooling.
The thermostat operation switches the 12 VDC + to all output terminals.
<table>
<thead>
<tr>
<th>Mode Switch</th>
<th>Fan Mode Switch</th>
<th>Fan Speed Switch</th>
<th>Calling</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cool</td>
<td>Auto</td>
<td>Lo</td>
<td>No functions occur in this mode</td>
</tr>
<tr>
<td>2</td>
<td>Cool</td>
<td>Auto</td>
<td>Lo</td>
<td>ID fan low, compressor #1 and OD blower low cycle as needed</td>
</tr>
<tr>
<td>3</td>
<td>Cool</td>
<td>Auto</td>
<td>Lo</td>
<td>ID fan low, compressors #1 and #2 and OD blower high cycle as needed</td>
</tr>
<tr>
<td>4</td>
<td>Cool</td>
<td>On</td>
<td>Lo</td>
<td>ID fan low continuous</td>
</tr>
<tr>
<td>5</td>
<td>Cool</td>
<td>On</td>
<td>Lo</td>
<td>ID fan low continuous, compressor #1 and OD blower low cycle as needed</td>
</tr>
<tr>
<td>6</td>
<td>Cool</td>
<td>On</td>
<td>Lo</td>
<td>ID fan low continuous, compressors #1 and #2 and OD blower high cycle as needed</td>
</tr>
<tr>
<td>7</td>
<td>Cool</td>
<td>Auto</td>
<td>Hi</td>
<td>No functions occur in this mode</td>
</tr>
<tr>
<td>8</td>
<td>Cool</td>
<td>Auto</td>
<td>Hi</td>
<td>ID fan high, compressor #1 and OD blower low cycle as needed</td>
</tr>
<tr>
<td>9</td>
<td>Cool</td>
<td>Auto</td>
<td>Hi</td>
<td>ID fan high, compressors #1 and #2 and OD blower high cycle as needed</td>
</tr>
<tr>
<td>10</td>
<td>Cool</td>
<td>On</td>
<td>Hi</td>
<td>ID fan high continuous</td>
</tr>
<tr>
<td>11</td>
<td>Cool</td>
<td>On</td>
<td>Hi</td>
<td>ID fan high continuous, compressor #1 and OD blower low cycle as needed</td>
</tr>
<tr>
<td>12</td>
<td>Cool</td>
<td>On</td>
<td>Hi</td>
<td>ID fan high continuous, compressors #1 and #2 and OD blower high cycle as needed</td>
</tr>
<tr>
<td>13</td>
<td>Off</td>
<td>Auto</td>
<td>Lo or Hi</td>
<td>No functions occur in this mode</td>
</tr>
<tr>
<td>14</td>
<td>Off</td>
<td>On</td>
<td>Lo</td>
<td>ID fan low continuous</td>
</tr>
<tr>
<td>15</td>
<td>Off</td>
<td>On</td>
<td>Hi</td>
<td>ID fan high continuous</td>
</tr>
<tr>
<td>16</td>
<td>Gas Heat</td>
<td>Auto or On</td>
<td>Lo or Hi</td>
<td>No functions occur in this mode</td>
</tr>
<tr>
<td>17</td>
<td>Gas Heat</td>
<td>Auto or On</td>
<td>Lo or Hi</td>
<td>Heater will be energized to run</td>
</tr>
<tr>
<td>18</td>
<td>Gas Heat</td>
<td>Auto or On</td>
<td>Lo or Hi</td>
<td>There is no provision for 2nd stage heat when operating in the gas heat mode</td>
</tr>
<tr>
<td>19</td>
<td>Elec Heat</td>
<td>Auto or On</td>
<td>Lo or Hi</td>
<td>No functions occur in this mode</td>
</tr>
<tr>
<td>20</td>
<td>Elec Heat</td>
<td>Auto or On</td>
<td>Lo or Hi</td>
<td>Heat pump will run ID fan high, both compressors, OD fan high and both reversing valves</td>
</tr>
<tr>
<td>21</td>
<td>Elec Heat</td>
<td>Auto or On</td>
<td>Lo or Hi</td>
<td>Heat pump will run ID fan high, both compressors, OD fan high and both reversing valves plus the heater will be energized to run</td>
</tr>
</tbody>
</table>
8. A TYPICAL COOLING CYCLE OF THE HEAT PUMP

1. Begins with a call from the wall thermostat for High or Low Fan (customer choice).
2. Indoor fan starts on the selected speed.
3. Within a few seconds, the thermostat will call for cooling.
4. Compressor #1 starts.
5. Outdoor fan starts 2 seconds later (Low Speed).
6. 1 minute later the thermostat calls for second stage cool (subject to 2 degree temperature differential).
7. Compressor #2 starts, the outdoor fan goes off (subject to available 115 volt power supply).
8. Outdoor fan starts again 2 seconds later (High Speed).
9. Both systems operate to satisfy the thermostat.
10. Both compressors shut off at setpoint temperature.
11. When the thermostat calls for cooling again, it will start by calling for stage 1 only.
12. If the heat pump is unable to keep up with the load, stage 2 will start again when the indoor temperature is 2 degrees above the setpoint.

9. A TYPICAL HEATING CYCLE OF THE HEAT PUMP

(Electric Heat Mode)

1. Begins with a call from the wall thermostat for Electric Heat.
2. Indoor fan starts on High Speed.
3. Both reversing valves switch to heat mode.
4. Compressor #1 starts.
5. Outdoor fan starts 2 seconds later (Low Speed).
6. 30 seconds later the Heat Pump circuit board will energize the Compressor Relay #2, Compressor #2 starts, the outdoor fan goes off (subject to available 115 volt power supply).
7. Outdoor fan starts again 2 seconds later (High Speed).
8. Both systems operate to satisfy the thermostat.
9. Both compressors shut off at setpoint temperature.
10. If the Heat Pump is unable to maintain the coach temperature, the thermostat will automatically cycle the furnace on. The new True-Air Thermostats (Electric Heat Mode) will call for second stage (Furnace) heating operation anytime the temperature inside the coach is more than 5 degrees cooler than the customers chosen setpoint temperature. It is entirely possible the furnace and heat pump may both operate at the same time to satisfy the thermostat.
10. WIREBOX COMPONENT CHECKOUT
6537 & 6538 Model Printed Circuit Board

---

Diagram showing various components and connections labeled with numbers and notes such as:

- T11 - 12VDC (+) from "B" on thermostat
- T10 - 12VDC (+) from "B" in heating mode on thermostat
- T9 - 12VDC (+) from "B" in cooling mode and "W" in heating mode on thermostat
- T8 - 12VDC (+) from "B" in cooling mode and "W" in heating mode on thermostat
- T7 - Indoor Blower Low 12 VDC Coil Energized from "UL" on thermostat, cooling mode and "W" in heating mode
- T6 - Resistor Value
- T5 - System III Common Lead to O.D. Blower Relay Low Speed from Normally Closed Contact on Switching Relay
- T4 - System III Common Lead to O.D. Blower Relay High Speed from Normally Closed Contact on Switching Relay
- T3 - Resistor Values (2)
- T2 - 12VDC (+) from "B" in heating mode and "W" in heating mode on thermostat
- T1 - Indicate Blower Low 12VDC Coil Energized from "UL" on thermostat, heating mode and "W" in heating mode

Additional text and labels are present but not fully transcribed due to the nature of the image.
# 11. SERVICE PROBLEMS AND POSSIBLE SOLUTIONS

## COOLING MODE

<table>
<thead>
<tr>
<th>Problems</th>
<th>Possible Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nothing Runs - Cooling Mode</td>
<td>No A/C Voltage, No 12 VDC, Thermostat, Wiring, P.C. Board, High Pressure Switch Open</td>
</tr>
<tr>
<td>2. IDFM* Runs, No Compressor, No ODFM*</td>
<td>Cooling Freeze Thermister - (Insufficient Indoor Air Flow), Thermostat, Wiring, Compressor, Contactor, P.C. Board</td>
</tr>
<tr>
<td>3. IDFM* Runs, ODFM* Runs, No Compressor</td>
<td>Insufficient Voltage To Unit, Run Capacitor, Start Device, Overload, Wiring, Compressor</td>
</tr>
<tr>
<td>5. Compressor Runs, ODFM* Runs, No IDFM*</td>
<td>Thermostat, Run Capacitor, Wiring, Fan Motor, P.C. Board,</td>
</tr>
<tr>
<td>7. Compressor, ODFM*, IDFM* Runs, Unit Is Heating While In Cool Mode</td>
<td>Thermostat, Wiring, P.C. Board, Reversing Valve</td>
</tr>
</tbody>
</table>

## HEATING MODE

<table>
<thead>
<tr>
<th>Problems</th>
<th>Possible Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. IDFM* Runs, No Compressor, No ODFM*</td>
<td>Heating Freeze Thermister, Low Outdoor Ambient Conditions, Wiring, Compressor, Contactor, P.C. Board</td>
</tr>
<tr>
<td>3. IDFM* Runs, ODFM* Runs, No Compressor</td>
<td>Insufficient Voltage To Unit, Run Capacitor, Start Device, Overload, Wiring, Compressor</td>
</tr>
<tr>
<td>5. Compressor Runs, ODFM* Runs, No IDFM*</td>
<td>Run Capacitor, Fan Motor, Wiring, P.C. Board</td>
</tr>
<tr>
<td>7. Compressor, ODFM*, IDFM*, Unit Is Cooling While In Heat Mode</td>
<td>Wiring, P.C. Board, Reversing Valve</td>
</tr>
</tbody>
</table>

* IDFM - Indoor Fan Motor  
* ODFM - Outdoor Fan Motor
12. ELECTRICAL DIAGNOSTIC FLOW CHARTS
6537 & 6538 SERIES

With the use of these flow charts, you will be able to quickly identify a non-working problem. Determine if the problem is high or low voltage and then solve the problem.

IMPORTANT NOTICE

When using a jumper wire to diagnose a low voltage problem, Never Short Any Positive Terminal to Ground or the Terminal Marked “B”. Serious thermostat or p.c. board damage may occur.

To use these flow charts, start at the top left corner. Check what is indicated in that box. If the answer to what is indicated is No, work horizontally until you find the problem. When the answer is Yes or OK, work the chart downward until you locate the problem. Do Not Move Downward on any chart until all preceding steps have been confirmed good. Do Not start in the middle of any chart without knowing everything previous (upward on the chart) is OK or you may replace the wrong part.

! WARNING - SHOCK HAZARD

To prevent the possibility of severe personal injury, death or equipment damage due to electrical shock, always be sure the power supply to the appliance is disconnected before doing any work on the appliance. This can normally be accomplished by switching the breaker for the air conditioner to off, disconnecting all external connections and cords, switching on board electrical generators and inverters to off and removing the cable from each positive terminal on all storage and starting batteries.

DANGER

SOME DIAGNOSTIC TESTING MAY BE DONE ON ENERGIZED CIRCUITS. ELECTRICAL SHOCK CAN OCCUR IF NOT TESTED PROPERLY. TESTING TO BE DONE BY QUALIFIED TECHNICIANS ONLY.
12A. HEAT PUMP OPERATION SEQUENCE

COOLING MODE

- Green LED High Or FC Sound: NO
- Refer to Checkout No Green LED High - Cool Mode

Thermostat Call

Indoor Blower
- NC Low: NO
- Refer to Indoor Low Checkout - Cool Mode

Compressor
- High: NO
- Refer to Indoor High Checkout - Cool Mode

Refer to #1 Checkout - Cool Mode: NO
- Comp #1

1 Minute Thermostat Time Delay

- 2 Second Delay O.D. Blower Low: NO
- O.D. Blower Low LED

- O.D. Blower Low: NO
- Refer to Outdoor Blowers Low

- O.D. Blower High: NO
- Refer to Outdoor Blowers High

Comp #2
- NO
- Refer to #2 Operation - Cool Mode

O.D. Blower Low OFF 2 Second Delay Then O.D. Blower High
12A.1 NO COOLING - COOLING MODE

NO GREEN L.E.D. LIGHT
F/FY CIRCUIT TO THE THERMOSTAT

* Outdoor Thermostat is Ignored In The Cooling Mode When "Y" Is Energized
12A.2 NO INDOOR BLOWER LOW SPEED COOLING MODE

Thermostat Set To Low Cool

Note: All operating functions subject to thermostat time delays.

[Diagram with flowchart showing steps for troubleshooting and testing related to thermostat settings and connections.]
12A.3 NO INDOOR BLOWER HIGH SPEED COOLING MODE

Thermostat Set To High Cool

Note: All operating functions subject to thermostat time delays.
12A.4 COMPRESSOR #1 CHECKOUT

COOLING MODE

Thermostat Calling For Cooling

Note: All operating functions subject to thermostat time delays.
12A.5 COMPRESSOR #2 CHECKOUT
COOLING MODE

Thermostat Calling For Cooling

Note: All Operating Functions Subject To Thermostat Time Delays

- Check 115 VAC to Circuit #2 and to Compressor #2 Relay
  - OK: Restore 115 VAC
  - NO:

- System #1 Compressor Operating
  - OK: See Compressor #1 Checkout
  - NO: Replace Thermostat If System #2 Should Be Calling And Is Not According To Operation Manual.

- 12 VDC to Y2&B at Thermostat
  - OK: Check All Pin Terminals and Connections from Thermostat. Replace Lifeline If Necessary.
  - NO: Replace Relay If 12 VDC Is Present And Relay Won’t Close Or If Relay Is Welded.

- Check Compressor #2 Relay Operation
  - OK: Reconnect Wiring Or Replace Components As Necessary
  - NO: Reconnect Wiring Or Replace Components As Necessary

Note:
Some coach manufacturers connect their energy management systems in series with the 12 VDC call for compressor #2. This is usually done between the output terminals on the p.c. board and the compressor #2 relay coil.
12B. HEAT PUMP OPERATION SEQUENCE
HEATING MODE

Green L.E.D. Light On P.C. Board

N O

Refer To Checkout. No Green L.E.D. Light, Heat Mode

Thermostat Call

Indoor Blower High Fan

N O

Refer To I.D. Blower Checkout Heat Mode

Compressors

5 Second Delay On Make Energizes 1st & 2nd Stage Reversing Valves

N O

Refer To Reversing Valve Checkout

Compressor #1

Refer To Compressor #1 Checkout Heat Mode

2 Second Delay O.D. Blower Low

O.D. Blower Low L.E.D.

N O

Refer To O.D. Blower Low Checkout

O.D. Blower Low Speed

Refer To Compressor #2 Checkout Heat Mode

30 Second Delay On Make And Compressor #2 Is Energized

O.D. Blower Low Off 2 Second Delay O.D. Blower High

O.D. Blower High L.E.D.

O.D. Blower High Speed

N O

Refer To O.D. Blower High Checkout
12B.1 NO HEATING - ELECTRIC HEAT MODE
(Green L.E.D. Light Circuit)
F/FY Circuit Open To The Thermostat

- Green L.E.D. Light
  - YES
  - NO
- 115 VAC To Circuit #1 High Voltage Board
  - YES
  - NO
- Use Jumpert Wire Across Heat Thermistor Terminals T17 & T16
  - YES
  - NO
- If Green Light Comes On, Check The Outdoor Coil For Freeze Situation. Warm Coil Temperature Above 45 Degrees F.
  - N
  - O
- If Green L.E.D. Will Still Not Remain On After Coil Temperature Is OK, Check Thermistor For Continuity. (Caution: It May Have A Very High Resistance) Replace Thermistor If Open.
- Check 12 VDC To Pin Connectors R & B On P.C. Board.
  - YES
  - NO
- Check For 12 VDC To R (+) & B (-) At The Thermostat
  - NO
  - YES
- Replace P.C. Board If All The Above Checks Out OK And Green Light Does Not Come On.
  - YES
  - NO
- Check All Pin Connectors At Thermostat, Lifeline And P.C. Board Replace Defective Parts As Necessary.

* Indoor Thermostat Is Ignored When "W" Is Energized.
12B.2 NO INDOOR BLOWER
ELECTRIC HEAT MODE

Note: Only High Fan Speed Is Energized In The Heating Mode.
All Operating Functions Subject To Thermostat Time Delays.

115 VAC To System 1 T1 & T5 On P.C. Board

NO

12 VDC To W & B At Thermostat

NO

Check 12 VDC To R&B At Thermostat.

OK

NO

Replace Thermostat

Check 12 VDC To Pin Connects W/B On P.C. Board

OK

NO

Check All Pin Connections And Connections From Thermostat. Replace Line If Necessary.

115 VAC To N.O. Contact On The High Speed Indoor Fan Relay Or Terminal T6 Indoor Blower Cut Out On The 6557 Module.

OK

NO

Replace P.C. Board

Check Wiring To Motor.
Check capacitor And Motor Windings For Open Or Ground.

Reconnect Wires Or Replace Capacitor Or Motor As Necessary.
12B.3 COMPRESSOR #1 CHECKOUT
ELECTRIC HEAT MODE

Note: All Operating Functions Subject To Thermostat And P.C. Board Time Delays.
Thermostat Or Sub-base Must Be In The Electric Mode.

- Is The Outside Fan Motor Running?
  - Yes
    - Check For 12VDC Between T7 & T8 On The P.C. Board
  - No
    - No 115VAC To Circuit #1, Also T1 & T5 On The P.C. Board
      - Yes
        - Check For 12VDC Between W&B At The Fan Connector On The P.C. Board
      - No
        - Recall 115VAC Power

- Thermostat Check: Thermostat And Or Sub-base Switch Must Be In Electric Position And The Indoor Of Vehicle Must Be Above 45 Degree F
  - Yes
    - Check For 12VDC Between W(White) & B(Blue) Wires On The Thermostat
  - No
    - Replace Sub-base

- Open Wire Or Bad Connection Between P.C. Board And Relay
  - Yes
    - Check For 12VDC Between W(White) & B(Blue) Wires On The Thermostat
  - No
    - Replace Relay

- Check For 115VAC Between The N.O. Position On Compressor Relay #1 And The White Wire On Circuit #1 High Voltage Terminal Board
  - Yes
    - Check Compressor #1 Start Device
      - Check For Proper Wiring To The Compressor
        - Check Compressor Run Capacitor
          - Check Motor Windings For Open Or Ground
  - No
    - Replace Relay
12B.4 COMPRESSOR #2 CHECKOUT
ELECTRIC HEAT MODE

Note: All Operating Functions Subject To Thermostat And P.C. Board Time Delays. Thermostat Or Sub-base Must Be In The Electric Mode.

- Is Compressor #1 Running?
  - NO: Refer To Compressor #1 Heat Checkout
  - YES: Continue

- Check For 115 VAC To System #2
  - NO: Restore 115 VAC To A.C System #2
  - YES: Continue

- Check For 12 VDC Between T10 & T3 On P.C. Board
  - NO: Replace P.C. Board
  - YES: Continue

- Check Compressor #2 Relay Operation
  - NO: Replace Relay If 12 VDC Is Present And Relay Won't Close Or If Relay Is Welded
  - YES: Continue

- Check Compressor Start Device
  - Check For Proper Wiring To Compressor #2
  - Check Compressor Run Capacitor, Check Compressor Motor Windings For Open Or Ground
  - NO: Repair Or Replace Components As Necessary
  - YES: Continue

Note: Some coach manufacturers connect their energy management systems in series with the 12 VDC call for compressor #2. This is usually done between the output terminals on the p.c. board and the compressor #2 relay coil.
12B.5 NO REVERSING VALVE OPERATION
ELECTRIC HEAT MODE

Note: All Operating Functions Subject To Thermostat And P.C. Board Time Delays. Thermostat And/Or Sub-base Must Be In The Electric Mode.

Note: If The Compressors Or Fan Motors Are Not Running, Refer To Proper Checkouts.

Diagram:

- Thermostat In Heat Position
  - OK
  - Check 115 VAC Between T18 & T19
    - OK
    - Reversing Solenoid Coil Open Or Valve Is Stuck
    - NO
      - Check 12 VDC Between W&B
        - OK
          - Replace P.C. Board
        - NO
          - Refer To Compressor Checkout Heat Mode

Note: Reversing valve solenoid is energized in the electric heat mode. Once the reversing valve solenoid has energized, the p.c. board locks the valve into an energized position until the wall thermostat is placed in the cool position and actually has a demand for cooling.
12C. OUTDOOR BLOWER MOTOR
HEATING OR COOLING MODE

12C.1 No Outdoor Blower Low Speed

null

Check For 115 VAC To Terminal
T4 And T5 On P.C. Board. This
Is Line Power From Compressor
#1 Relay.

Refer To Compressor #1
Checkout.

Replace P.C. Board.

Rewire To Motor Or
Replace Components As
Necessary.

Check Wiring To O.D. Blower,
Check Capacitor. Check Motor For
Ground Or Open.
12C. OUTDOOR BLOWER MOTOR
HEATING OR COOLING MODE

12C.2 No Outdoor Blower High Speed

- Outdoor Blower System #2
  Red L.E.D. High Speed
  NO

  Check For 115 VAC To Terminals T8 & T9 On P.C. Board. This Is Line Power
  From Compressor #2 Relay.
  NO
  Refer To Compressor #2 Checkout
  OK

  115 VAC To T12 & T13 On P.C. Board
  NO
  Replace P.C. Board.
  OK

  Check Fuse On Motor
  Black Wire II Equipped.
  Bad Fuse

  If No Fuse

    Check Wiring To O.D. Blower,
    Check Capacitor. Check Motor For
    Open Or Ground.
    OK

  Remove O.D. Motor Leads, Red And Black Wires From
  P.C. Board And Check P.C. Board For 115 VAC To Both
  Motor Speeds At The Same Time; T12 & T13 High
  Speed, T11 & T13 Low Speed.

  Replace Fuse II Only T12 & T13 High Speeds Are
  Energized.
  OK

  Replace P.C. Board And Fuse II
  Both High And Low Speeds Are
  Powered From The P.C. Board.
  OK

  Rewire To Motor Or Replace
  Components As Necessary.
13. WIRING DIAGRAM

FROM 2-STAGE WALL THERMOSTAT ASSEMBLY

- 1 COMPRESSOR START CAPACITOR
- 2 COMPRESSOR RUN CAPACITOR 30/370
- COMPRESSOR P.T.C.R.
- 1 COMPRESSOR RELAY
- 2 COMPRESSOR START CAPACITOR
- 2 COMPRESSOR RUN CAPACITOR 30/370
- 2 COMPRESSOR P.T.C.R.
- 2 COMPRESSOR RELAY