Installation Manual

Aqua-Hot
An AIRXCEL Brand

Aqua-Hot Floor Heating Kit

For the 100 Series Heating Systems:

PXE-100-001

GLENWOOD FLOORING SYSTEM
By Aqua-Hot

Glenwood Flooring System

For Mercedes Sprinter 144, 170, 170X:

GFE-MBZ-17X
GFE-MBZ-170
GFE-MBZ-144

Ford Transit 148, 148L:

GFE-FRD-LNG
GFE-FRD-STD

Ram Promaster 136, 159, 159X:

GFE-RAM-15X
GFE-RAM-159
GFE-RAM-136

GLENWOOD FLOORING SYSTEM
By Aqua-Hot

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Caution Notes

As you read this information, take particular note of the NOTICE, CAUTION, WARNING, and DANGER symbols when they appear. This information is important for safe and efficient use of the Aqua-Hot system.

NOTICE signals a situation where potential damage to the Aqua-Hot could occur.

NOTICE

CAUTION signals a situation where potential harm or risk of minor or moderate injury could occur if you do not follow instructions.

⚠ CAUTION

WARNING signals a hazardous situation where potential harm, risk of serious injury, or death could result if instructions are not followed.

⚠ WARNING

DANGER signals a situation where immediate risk of serious injury or death will result if instructions are not followed.

⚠ DANGER

NOTE: This manual will also use notes sections similar to this one to draw attention to features and practices which must be observed.

Read all instructions before installing the Aqua-Hot floor heat kit. Aqua-Hot Heating Systems is not liable for damage resulting from failing to follow instructions contained in this, and any other Aqua-Hot documentation relevant to this unit.

- Read this manual before installing or using the Aqua-Hot System to reduce the risk of injury to persons or damage to the equipment.
- The product identity label contains specifications of the unit, to what standards it has been tested, and important safety notices.
- Disconnect electric wiring to the Aqua-Hot System before welding or plasma cutting the RV to avoid damage to equipment.
- This floor heating kit is only available for use in the AHM-125 & AHE-125 Series Heaters. Maximum testing air pressure to the tank and heating loop must not exceed 18 PSI. Exceeding this rating will cause internal damage to the Aqua-Hot.

⚠ CAUTION

- Use caution when working on or near any propane/diesel fuel system.
- DO NOT connect the 12-volt DC power to the Aqua-Hot if the vehicle requires welding.
- At maximum operating temperature, the coolant will be very hot and scalding. Hot vapor or coolant may cause serious burns or injury. Be aware of hot surfaces.
- Use special caution when children are present. Children must not be allowed to play with the heater or perform cleaning and maintenance.
- Installation and repairs may only be carried out by an authorized, factory-trained Aqua-Hot technician. The heating system must be installed in accordance with local codes, or in accordance with the Standard for Recreational Vehicles, (RVIA) ANSI A 119.2/NFPA 501C, NFPA 1192.
- At maximum operating temperature, the hot air outlet will be very hot that may result in serious burns or injury. Be aware of hot surfaces.

⚠ WARNING

If the information in this manual is not followed exactly, a fire or explosion may result, causing property damage, personal injury or death.

Hydronic In-Floor Heating Kit

PXE-100-001

The in-floor heating accessory kit includes:

- Mixing Valve (adjustable)
- Quiet, powerful circulation pump
- Non-return check valve
- Clamps and fittings needed for install

Figure 1

Additional Accessories available: (Not included in kit)

- Clamps (½", ¾", ⅝")
- Hose (¾", ⅝")
- 90° Formed Hose (¾")
- Thermistor

Glenwood Flooring System

GFE-MBZ-17X (Mercedes Sprinter 170X)
GFE-MBZ-170 (Mercedes Sprinter 170)
GFE-MBZ-144 (Mercedes Sprinter 144)
GFE-FRD-LNG (Ford Transit 148L)
GFE-FRD-STD (Ford Transit 148)
GFE-RAM-15X (Ram Promaster 159X)
GFE-RAM-159 (Ram Promaster 159)
GFE-RAM-136 (Ram Promaster 136)

The flooring system includes:

- Base panels
- Top panels
- Aluminum heat spreaders
- Base panel connector keys
- Top panel mounting screws

⚠ WARNING

Aqua-Hot recommends a professional installer to insulate the floor of the van to prevent heat loss through the floor.

Failure to properly insulate the van will result in diminished performance from both the Glenwood Flooring system and the Aqua-Hot unit itself.

System Overview

The in-floor heating accessory kit uses the Aqua-hot heating system to provide auxiliary heat from the existing heating loop to heat the RV floor.

The in-floor coolant loop is independent of the interior heating zone. The kit may be used in the 100/125 Series hydronic Aqua-Hot models.

The Aqua-Hot floor heating kit creates a second coolant loop that branches off the heating zone loop. Reference the Aqua-Hot 100/125 Series manual for more information on that heating system.

Important Notes:

- A qualified installer or service technician must perform equipment installation or service. Contact Aqua-Hot for Factory Authorized Service Centers or Certified Technicians located near you at www.aquahot.com/service-help, or call us at (800) 685-4298 or (303) 651-5500.
- Warranty work must be performed by an Aqua-Hot Authorized Service Center.
- Please read this manual and follow instructions to avoid injuries during installation and/or operation.

NOTE: The diagrams below are simply reference/ illustration for the layout of the floor heating loop.

See the appendices starting on page 13 for the layouts to specific van model.

Heated Floor Structure Example

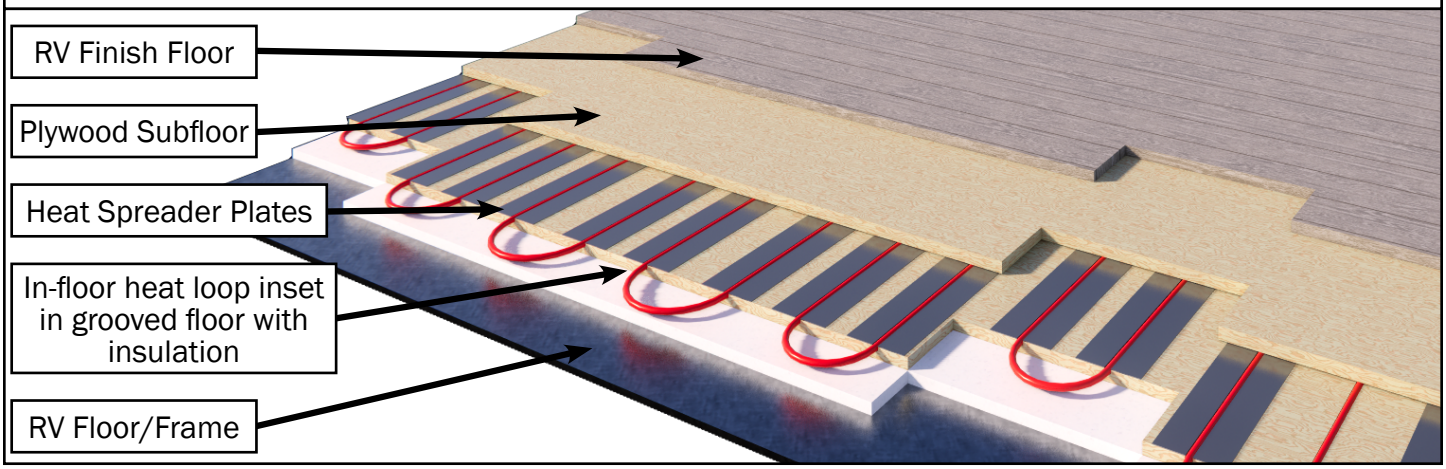


Figure 2

Glenwood Flooring System

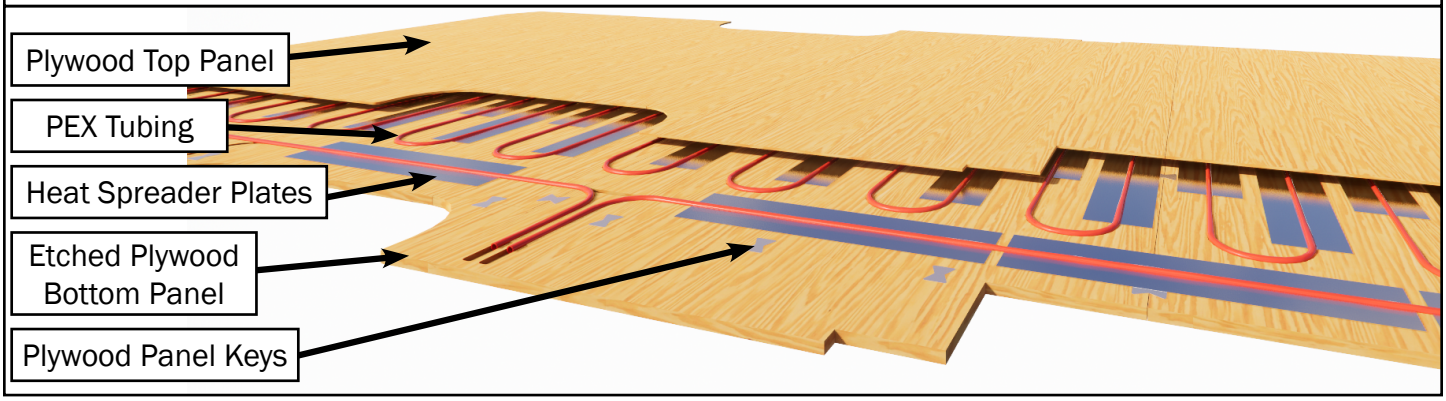


Figure 3

Aqua-Hot In-Floor Heating System

1. Boiler Tank (100/125 Series)
2. Non-Return Check Valve
3. Final Cozy Heat Exchanger
4. Mixing Valve
5. Circulation Pump
6. In-Floor Heat Loop

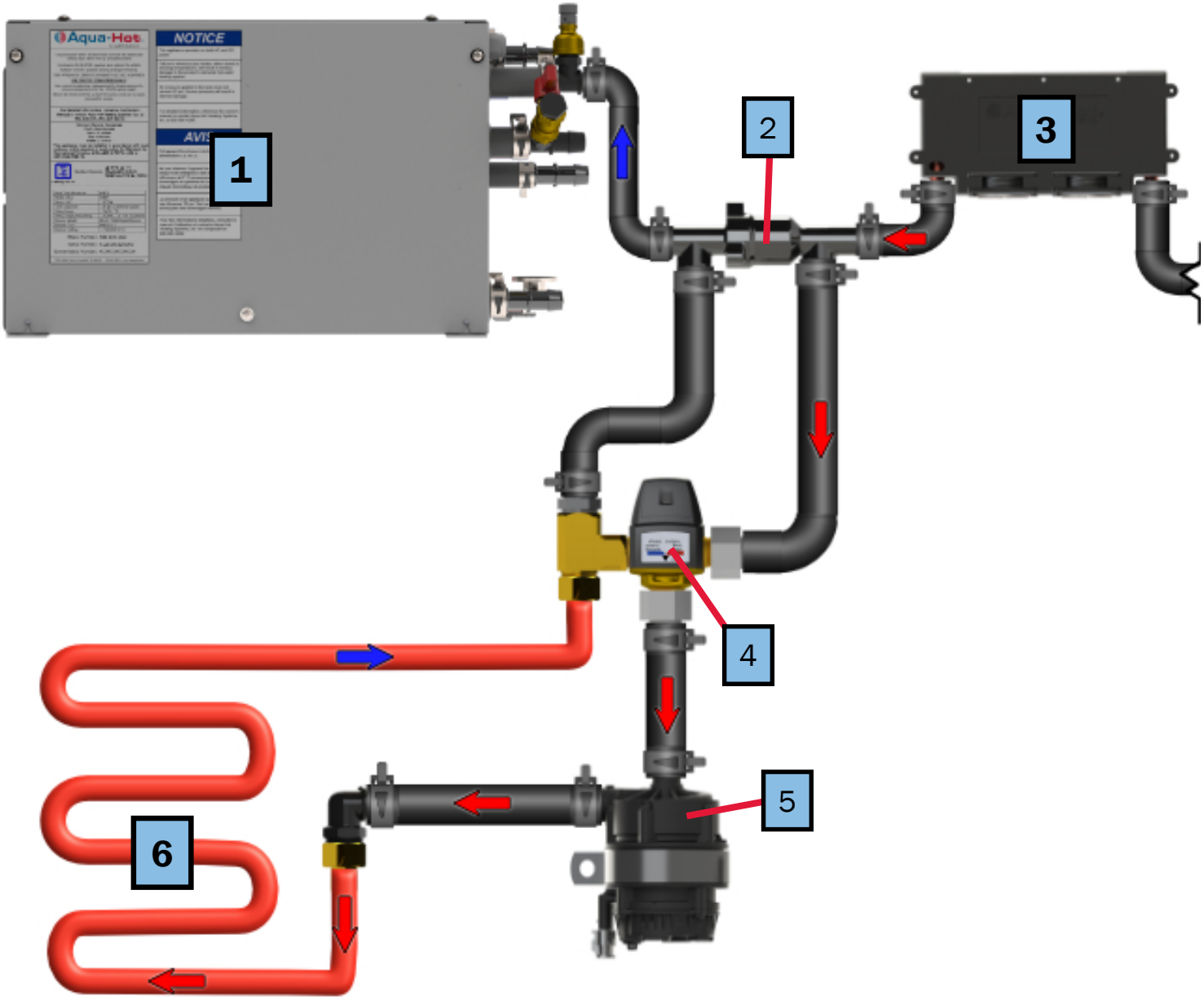


Figure 4

Glenwood Flooring System

The Glenwood Flooring System is a van specific floor heating kit that works with the Aqua-Hot heater.

This flooring system is purchased separately from the Aqua-Hot in-floor heating system.

Please reference the appendices for the van specific layout on page 13.

Insulation

NOTE: Aqua-Hot recommends a professional installer to insulate the floor of the van to prevent heat loss through the floor.

Failure to properly insulate the van will result in diminished performance from both the heater floor and the Aqua-Hot unit itself.

Considerations:

- The insulation should have a minimum R-value of 10.
- Water resistant insulation is recommended.
- Aqua-Hot will recommend and sell one option of insulation, but installers can use other options within the minimum recommended requirements.
- Aqua-Hot part number: **MSX-5MM-001**

Base Panels

The base panels will hold the heat spreaders and PEX tubing.

NOTE: The installer should reference the appendix (pages 13-20) to find the diagrams for their specific van model.

Base panels can be assembled in the van or outside of the van and moved in once assembled.

Considerations:

- Be sure the panels are laid out according to model-specific diagram (see appendix pages 13-20)
- Use included ¼" plywood keys to link panels and press them into the provided slots.
- All keys must be fully pressed into the provided slots to fully secure the floor panels together. Do not skip any.

NOTE: A small number of spare keys will be included in the kit. Additional keys can be ordered if needed.

- Ensure all PEX channels line up before moving on to next step.

Heat Spreaders

NOTE: Failure to install the heat spreaders may result in poor performance of the floor.

The aluminum heat spreaders help to evenly distribute the heat coming from the PEX tubing. These are ***vital*** to the performance of the floor.

Considerations:

- Heat spreaders should be evenly spaced.
- Heat spreaders should be offset to balance heat as shown

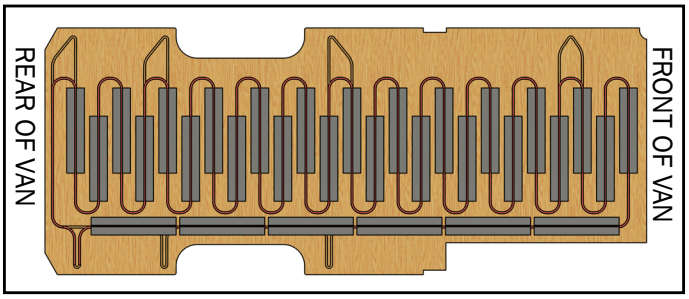


Figure 5

- Heat spreaders should be secured to wood with thermal tape.

Installation:

- Heat spreaders should be fully seated in PEX channel

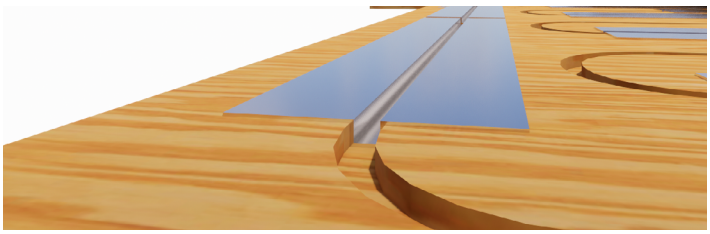


Figure 6

PEX Tubing

PEX Tubing should be connected to the Aqua-Hot Floor heating kit.

Considerations:

- Floor loops must use ⅜" PEX tubing.
- PEX tubing must be in contact with the bottom of the sub-floor.
- All PEX tubing must be oxygen barrier type tubing.
- PEX tubing and PEX adapter fittings are not included in the kit.
- Lay tubing as flat as possible. Avoid any undulations in the loop.

Installation:

1. Ensure there is enough PEX for entire run as there is not room in channels to splice the PEX.
2. Select the port location in the floor closest to where the Aqua-Hot will be installed.
3. Leave 2+ feet of extra PEX where you want to install the Aqua-Hot to make plumbing easier.
4. Feed PEX into slot and follow channel through the entire floor.
   - Be sure to seat PEX fully in channel and heat spreaders
5. Return to the same port location as started and leave an additional 2+ feet of PEX to make installation easier.

Top Panels

Top panels will cover the heating channels and provide an outline of routing underneath.

Considerations:

- Top Panels are not a 1-for-1 match to the bottom panels.
- See diagram for top panel layout specific to your van model (see appendix pages 13-20)

Installation:

1. Using the diagram for your model, lay out top panels with channel outline facing UP.
2. Secure each panel to the base.
    - Panels should be attached using the included #8-15 1" Wood Screws (Aqua-Hot Part Number: HDX-GFE-199)
    - Each panel has screw locations that are safe to attach to the base.
    - Secure each panel using *6 screws minimum*.
    - If you select a location with a heat spreader underneath it, a pilot hole may be required to penetrate the aluminum.

Securing Floor to Van

The assembled floor can now be secured to the van floor.

Considerations:

- Ensure floor is laying evenly in van
- Floor will be through bolted to van.
- Attachment hardware not included.
- Identify 8-10 safe locations to drill through floor.
    - Floor top panels show where is safe to avoid hitting PEX.
    - Holes can be drilled through the heat exchanger plates if needed as long as it does not damage the PEX.
    - Installer is responsible for identifying safe locations on van to drill
- Through bolts should be M8 or larger size, length dependent on customer requirements.

Installation:

1. Lay floor in van on top of insulation
2. Drill through floor and van in safe locations.
3. Secure floor using M8 bolts and medium-strength (blue) thread-lock.

Finish Floor

The floor may be covered with personal choice of material

Considerations:

- Floor covering should be water resistant and seal floor well.
- Improper floor covering can lead to damage to the floor from exposure to water.
- Installer is responsible for ensuring floor is properly protected from all elements.

Aqua-Hot In-Floor Heating Kit

The Aqua-Hot floor heating kit creates a second coolant loop that branches off the heating zone loop.

The Aqua-Hot floor heating kit is separate from the Glenwood Flooring System and can be installed in any van/vehicle.

Mounting Components

Install the components in a compartment which protects the unit and components, and allows service access. Make the following considerations when supporting the components to ensure its most optimal operation and location.

Mixing Valve

The mixing valve regulates the temperature of the coolant in the floor heating loop to ensure proper, safe heating.

Considerations:

- Must be located below the boiler tank.
- Must be in a cabinet to prevent contact with hot parts.
- Choose a location that simplifies plumbing and limits undulations.

Mounting (Figure 7):

1. Wrap the provided P-clamps around the fittings on the mixing valve.
2. Using two fasteners, screw the P-clamps to the mounting location.

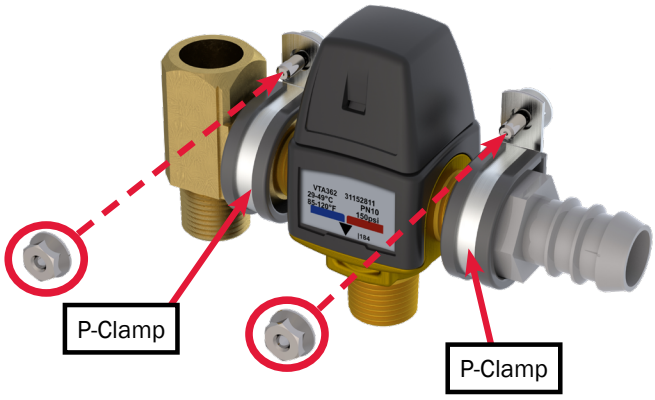


Figure 7

Circulation Pump

The floor loop pump cycles on and off to circulate hot coolant through the floor loop when the zone calls for heat.

Considerations:

- Must be located below the boiler tank.
- The wiring between the pump and the controller must not exceed 4ft in length.
- Choose a location that simplifies plumbing and limits undulations.

Mounting (Figure 8):

1. Using the supplied pump mount, fasten the pump to the mounting location.

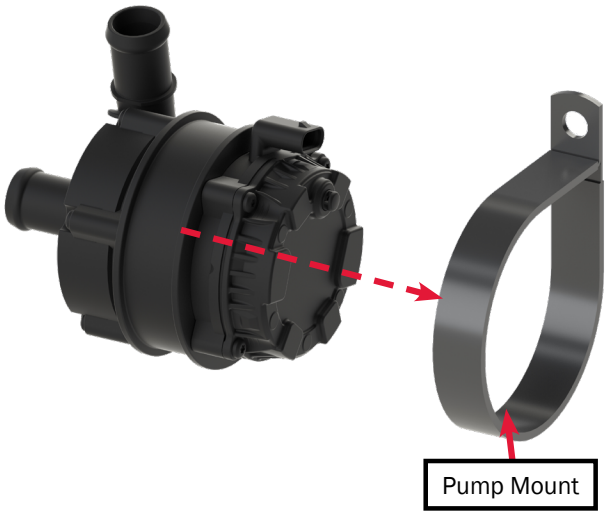


Figure 8

Plumbing

The floor heating kit creates a second coolant loop that branches off the zone heating loop.

Considerations:

- The 4-port check valve must be located at the end of the cozy loop between the final cozy and the return port to the boiler tank.

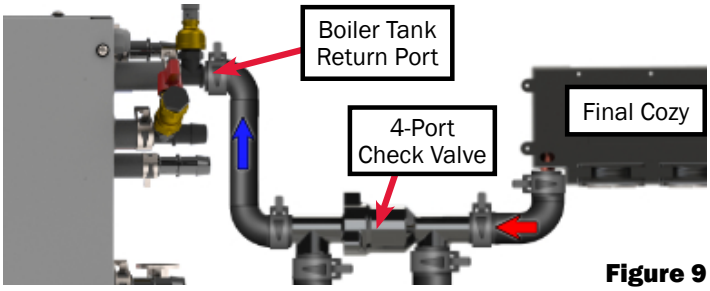


Figure 9

- The plumbing must match the diagram (Figure 4) in order to properly and safely heat the floor. Failure to do so could result in damage to the floor or burner.
- Floor loops up to 200ft may use ⅜" PEX tubing. Greater than 200ft must use ½" PEX.
- Floor loops must not be longer than 300ft.
- PEX tubing must be in contact with the bottom of the sub-floor.
- Heat spreader plates are recommended.
- Insulation must be installed beneath the floor loop tubing.
- All PEX tubing must be oxygen barrier type tubing.
- **PEX tubing and PEX adapter fittings are not included in the kit.**
- Lay tubing as flat as possible. Avoid any undulations in the loop.
- Consult an expert in hydronic floor heat to ensure efficient performance.

Plumbing Procedure (Figures 10-13)

1. Connect port 1 of the check valve to the exit of the final heat exchanger in the zone loop.
2. Connect port 2 of the check valve to the Zone return port of the Aqua-Hot.
   - For Modular units, connect port 2 of the check valve to the "stir" port of the 3-way valve and the "coolant in" port of the tank using the tee fitting provided with the heater.
3. Connect port 3 of the check valve to the hot port of the mixing valve. The hot port is denoted by a red line on the label of the mixing valve (Figure 13).
4. Connect port 4 of the check valve to the tee fitting on the cold port of the mixing valve. The cold port is denoted by a blue line on the label of the mixing valve (Figure 13).
5. Connect the remaining port of the mixing valve, the mixed port, to the in-port of the pump.
6. Connect the out port of the pump to the supplied ¾" barb to ½" NPT fitting.
7. Connect the ¾" barb to ½" NPT fitting to the floor loop PEX tubing using an appropriate adapter fitting.
   - The PEX to ½" NPT adapter fitting must be compatible with ethylene glycol and rated for 180°F minimum.
8. Connect the return side of the PEX loop to the tee fitting on the cold port of the mixing valve using an appropriate adapter fitting.
   - The PEX to ½" NPT adapter fitting must be compatible with ethylene glycol and rated for 180°F minimum.

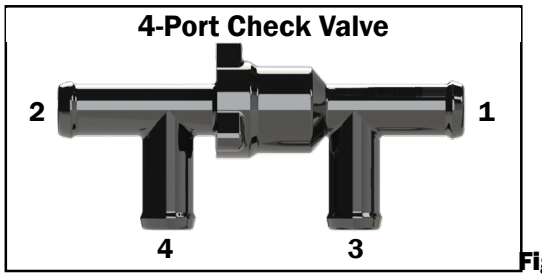


Figure 10

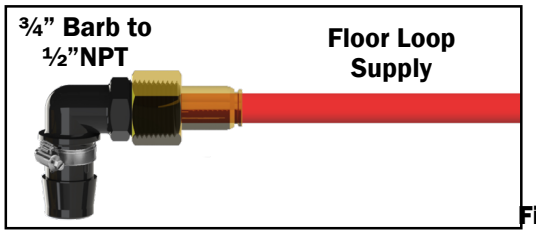


Figure 11

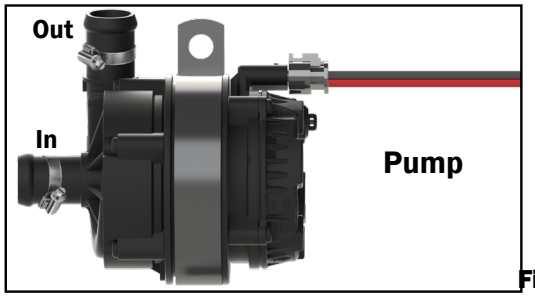


Figure 12

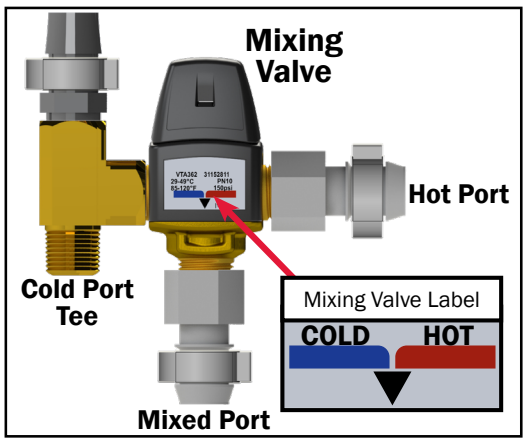


Figure 13

Wiring

The floor loop pump is controlled by the zone output of the controller. When the zone thermistor reads a temperature below the set point, the controller turns the pump on. The pump then circulates hot coolant until the zone thermistor reads higher than the set point.
The floor loop must be configured and wired to zone 2 with no cozies. This zone must have a dedicated thermistor or thermostat controlling it.

NOTE: It is important to not wire any cozies to zone 2 as it will over-current the output.

Cozies are necessary to properly heat the RV, but they must be wired to either zone 1 or zone 3.

Pump:

1. Decide which climate zone will control the floor loop.
2. Connect the red and black wires on the pump to the appropriate zone output pin. Red is positive, black is negative.
   - Zone 2: J7-2(+) | J7-5(-)

Thermistor:

1. Connect the thermistor or thermostat to the appropriate zone input, these are not polarity dependent.
   - Zone 2: J8-4 | J8-5

Configuring the Zone:

1. Following the zone configuration section of the install manual for your heater, configure any air heating zones.
2. Locate zone 2.
3. Set the zone label to “Floor” (Figure 14 A)
4. Choose the correct temperature input: thermistor or thermostat (Figure 14 B).

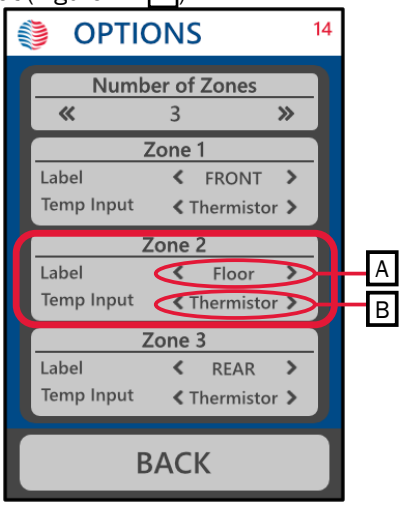


Figure 14

Fill Procedure

AHE-125 Heaters

1. Refer to the procedure detailed in the installation manual for your heater.
2. Before activating the external fill pump, navigate to the testing page on the LCD screen.
3. Under the “Fans” testing section, locate the fan 2 output.

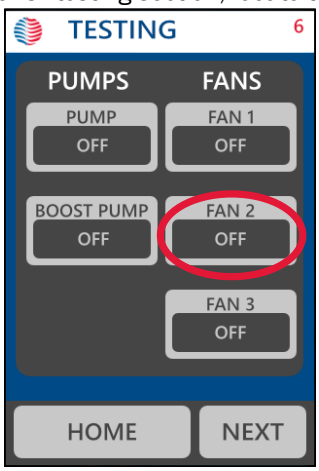


Figure 15

4. Activate the fan 2 output.
5. Continue the fill procedure detailed in the installation manual.

AHM-125 Heaters

Vacuum Method

1. Follow the procedure in the installation manual.
2. After filling the heater navigate to the testing page.
3. Under the “Fans” testing section, locate the fan 2 output (Figure 15).
4. Activate the corresponding fan output and the pump.
5. Let the system circulate coolant to flush any remaining air out of the system.

Alternate Method

1. Follow the procedure in the installation manual.
2. When activating the three-way valve and pump, also activate the fan 2.
3. Continue with the fill procedure in the installation manual.

Setting Temperature

Hydronic floor heating systems pump hot coolant through the floor to provide heat. The Aqua-Hot system can heat the coolant to 180°F or higher. These high temperatures could cause burns and damage the interior of the vehicle. To avoid this, the floor heating kit includes an adjustable mixing valve. This valve regulates the temperature of the floor to ensure proper, safe heating.

NOTE: The temperature setting of the mixing valve will be different for every vehicle and must be set by the installer.

- The temperature of the floor surface must never exceed 85°F.
- The recommended temperature of the floor surface is 5°F above the expected zone set-point.

Adjusting the Mixing Valve:

1. Locate the mixing valve and remove the black cap.
   - A screwdriver can be used to depress the clips on the cap during removal. (Figure 16)
   - A twisting motion can also be used to remove the cap.
2. Following the chart below, set the mixing valve to the expected temperature needed.
   - The surface of the floor will be 10-20°F cooler than the coolant temperature.

Mixing Valve Setting	1	2	3	4	5	6
Coolant (°F)	75	90	105	120	135	160

3. At the LCD screen, turn the burner on, and tap to activate “interior heat priority”. (Figure 17)
4. On the LCD screen, set the floor zone temperature to 86° and turn the zone on. (Figure 17)
   - If thermostats are used, adjust the thermostat to the maximum temperature and turn it on.
5. Let the unit run to heat the floor.
6. After the floor has heated up, measure the surface temperature in several locations.
7. Adjust the mixing valve to increase or decrease the surface temperature as needed.
8. Let the floor temperature stabilize and measure the surface temperature again.
9. Repeat until the desired temperature is achieved.

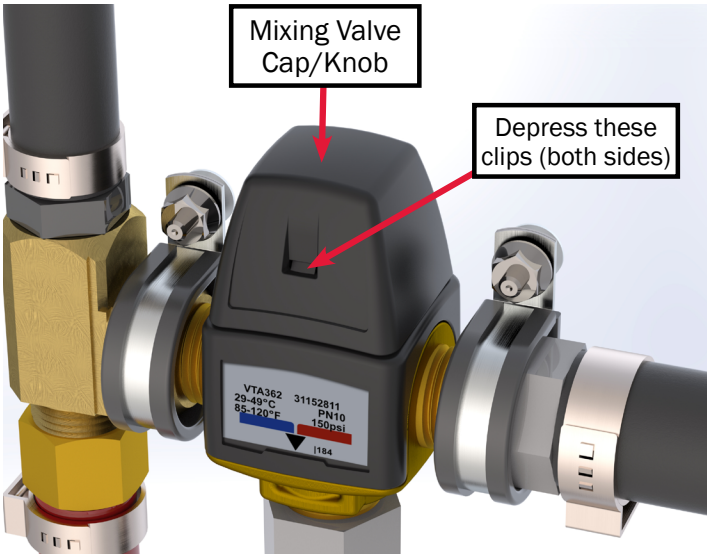


Figure 16

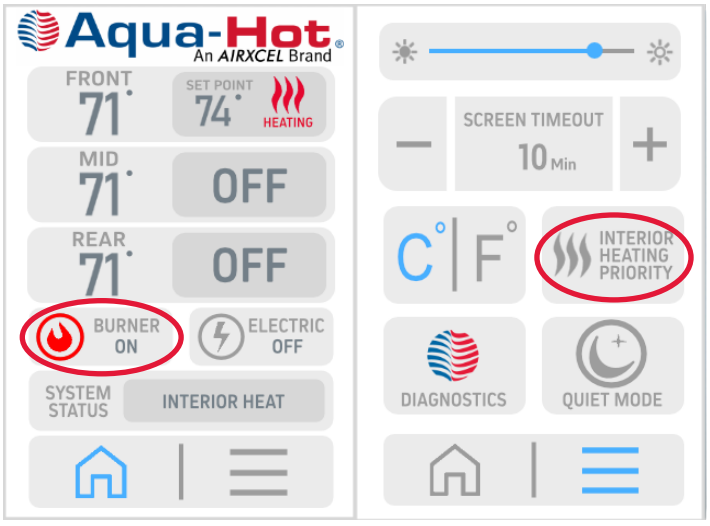


Figure 17

Electrical Schematic

The schematic below shows the floor loop connected to zone 2. The floor loop MUST be connected to zone 2.

- Installation must be performed by a qualified, professional according to current national regulations. Reference A119.2/ NFPA 501C Standard on Recreational Vehicles 1993 Edition for relevant national regulatory information.

⚠ CAUTION

DO NOT connect 12V DC power to the Aqua-Hot if the vehicle requires welding. Electrical welding will cause serious, irreversible damage to the Aqua-Hot.

Pump

- Zone 2: | J7-2(+) | J7-5(-) |

Thermistor

- Zone 2: | J8-4 | J8-5 |

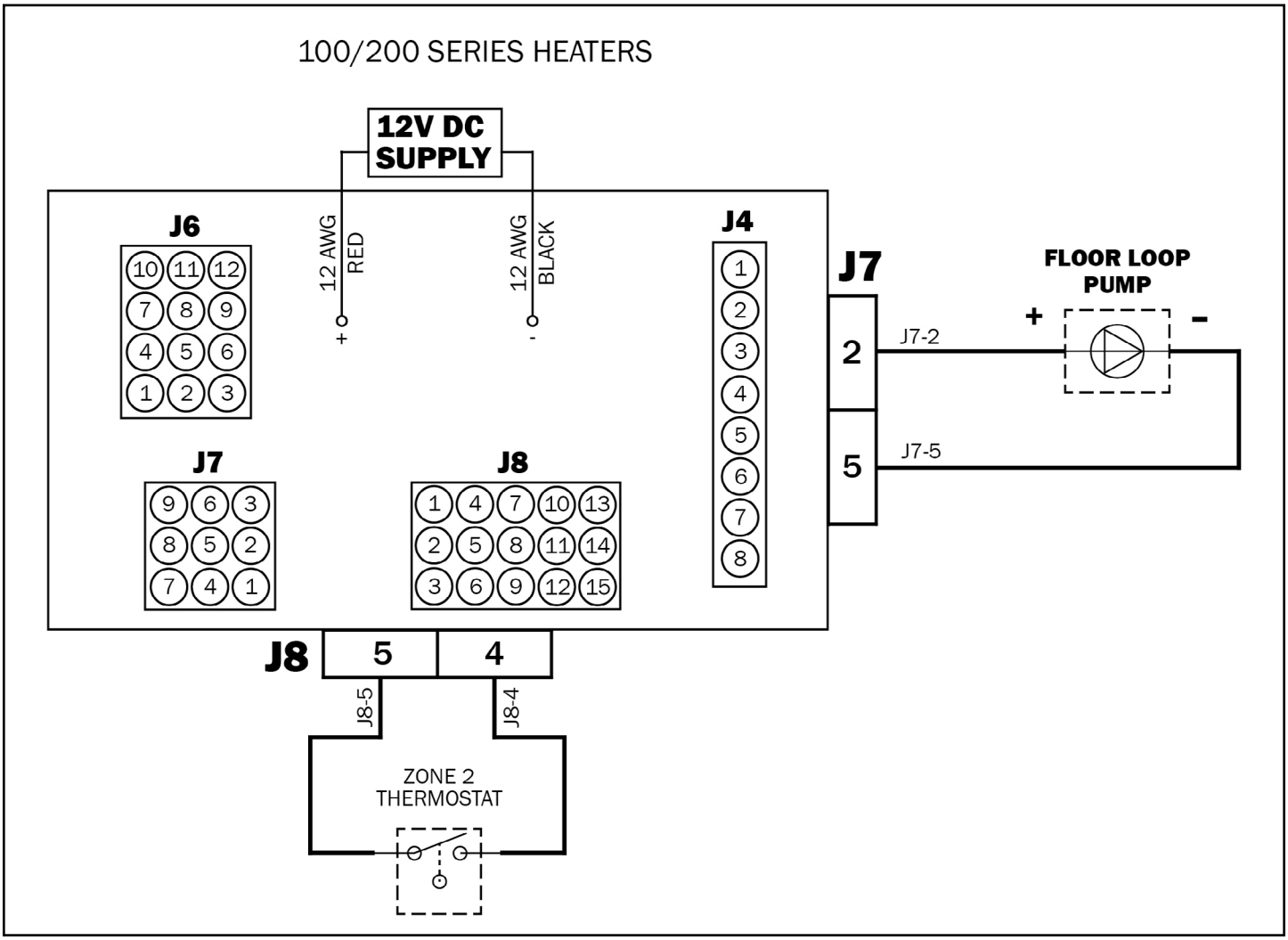
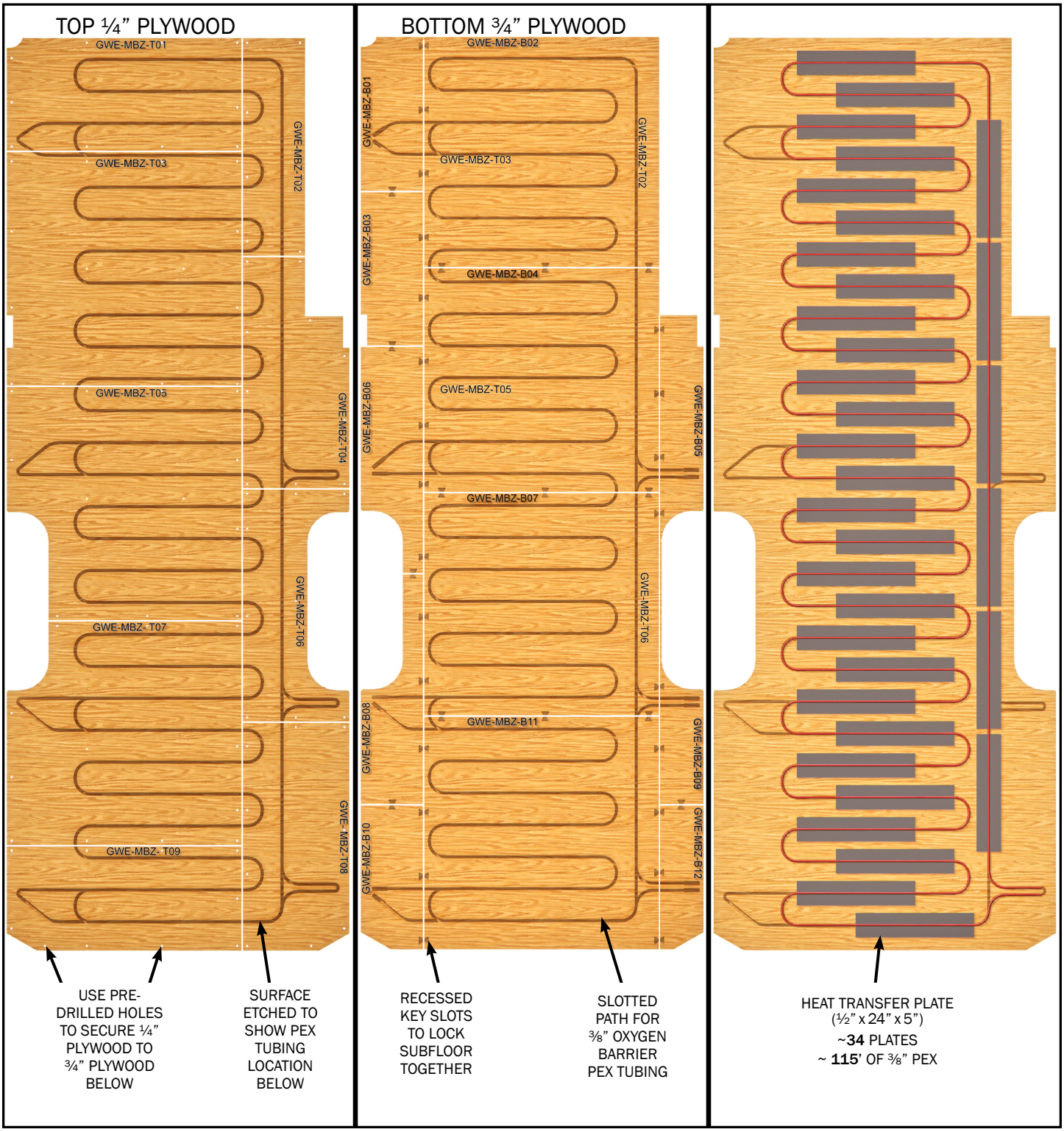


Figure 18

Glenwood Flooring System Diagrams

MERCEDES SPRINTER 170 EXT

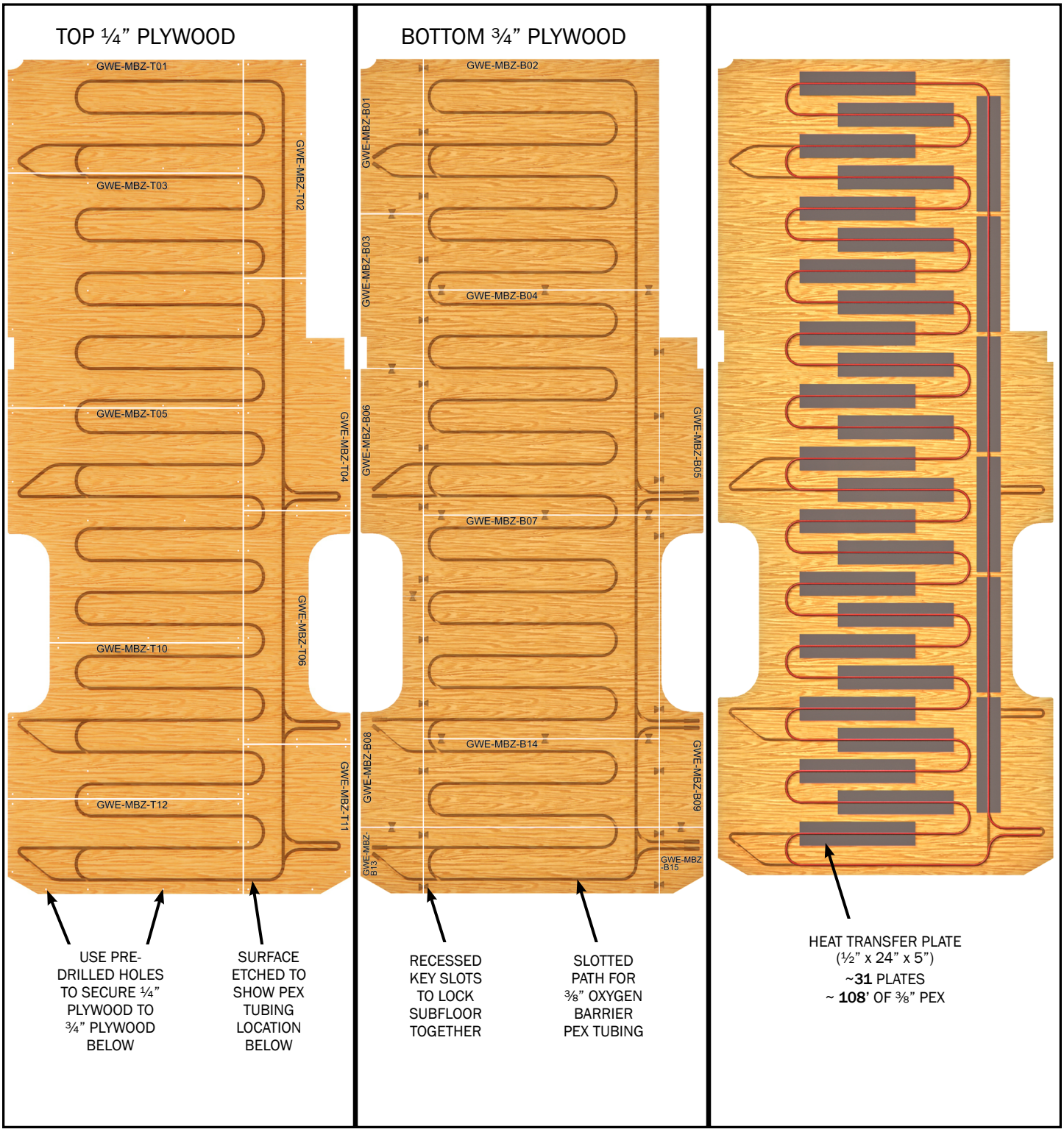
GFE-MBX-17X



Glenwood Flooring System Diagrams

MERCEDES SPRINTER 170

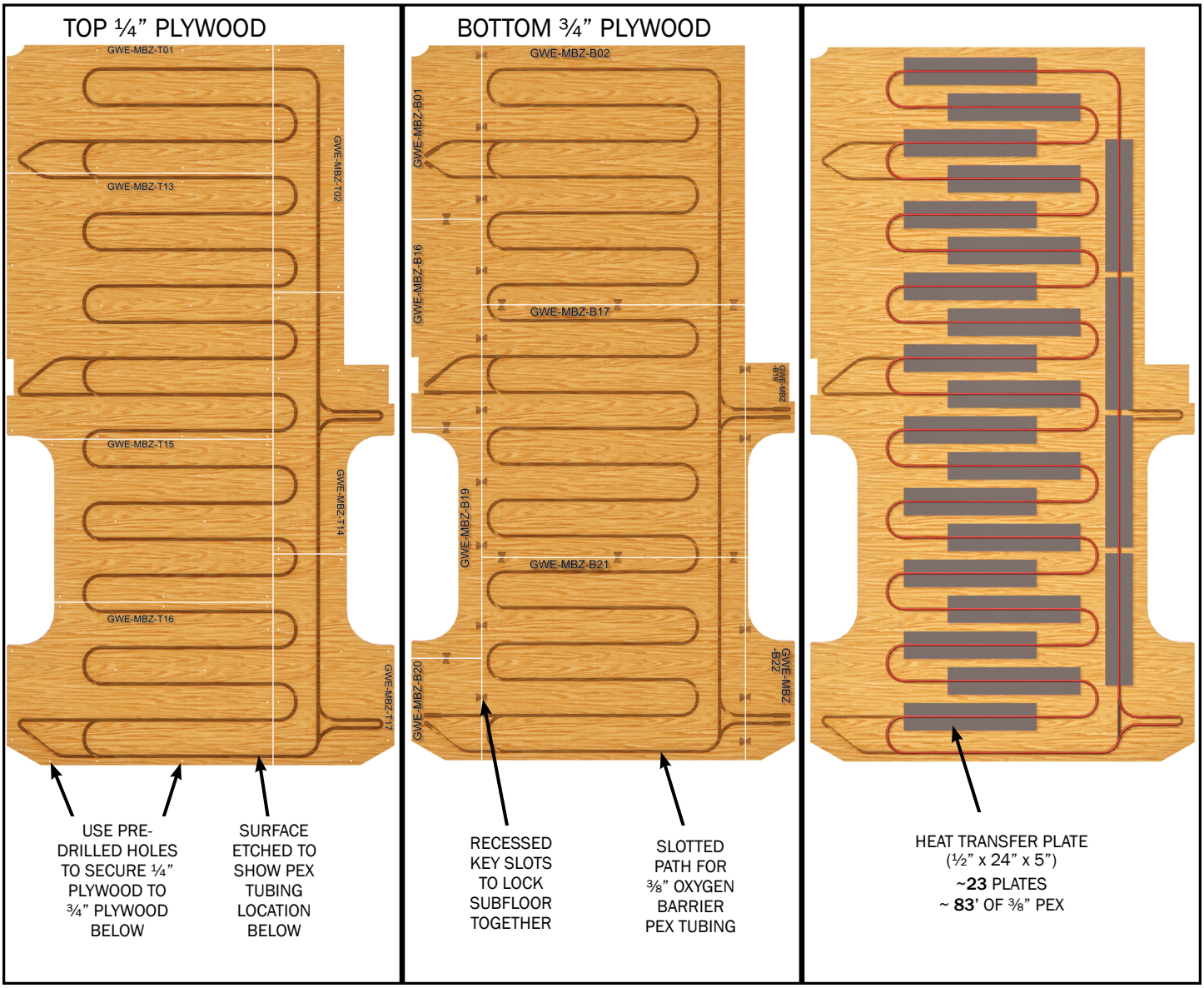
GFE-MBX-170



Glenwood Flooring System Diagrams

MERCEDES SPRINTER 144

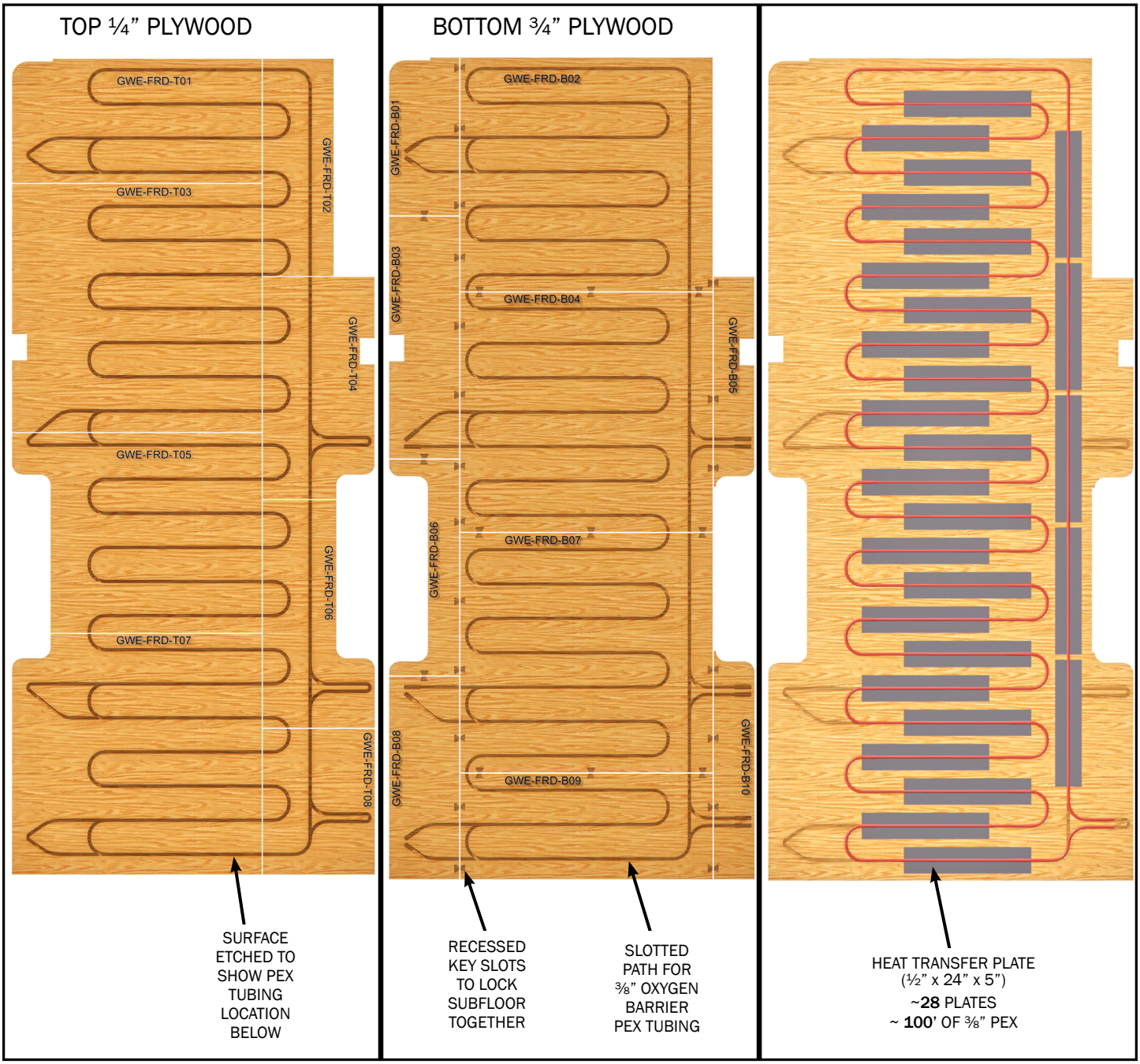
GFE-MBX-144



Glenwood Flooring System Diagrams

FORD TRANSIT 148 EL

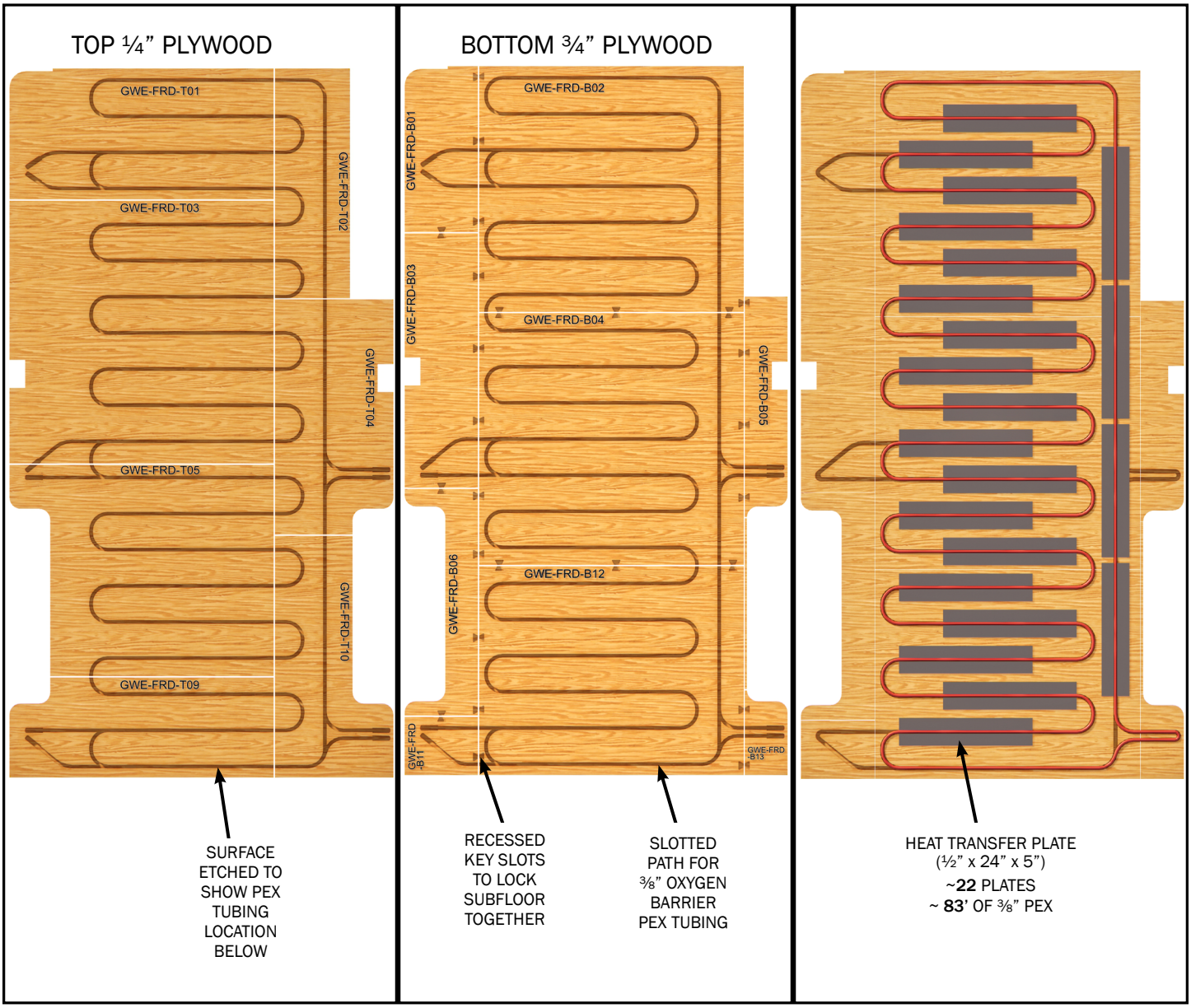
GFE-FRD-LNG



Glenwood Flooring System Diagrams

FORD TRANSIT 148

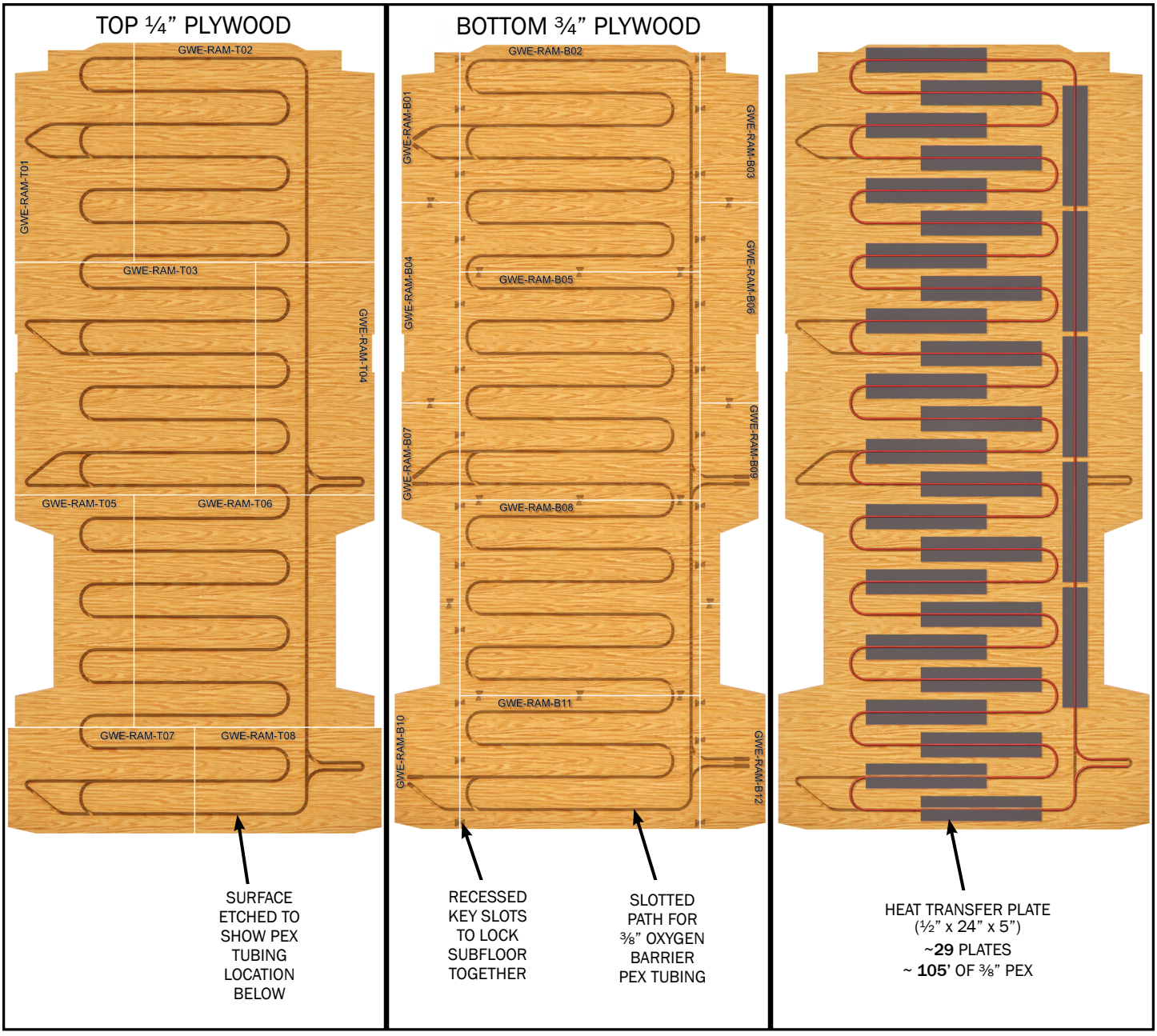
GFE-FRD-STD



Glenwood Flooring System Diagrams

RAM PROMASTER 159 EXT

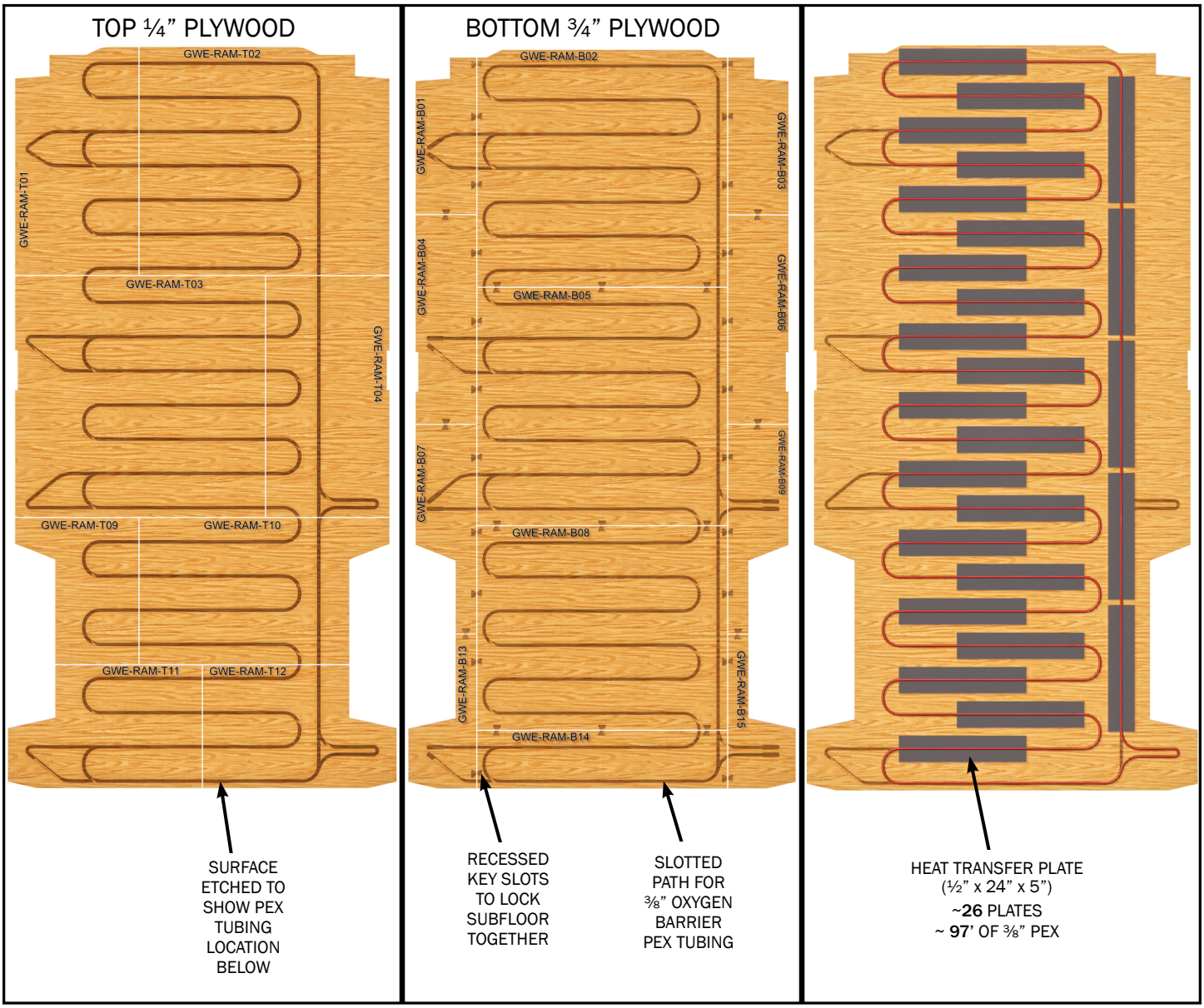
GFE-RAM-15X



Glenwood Flooring System Diagrams

RAM PROMASTER 159

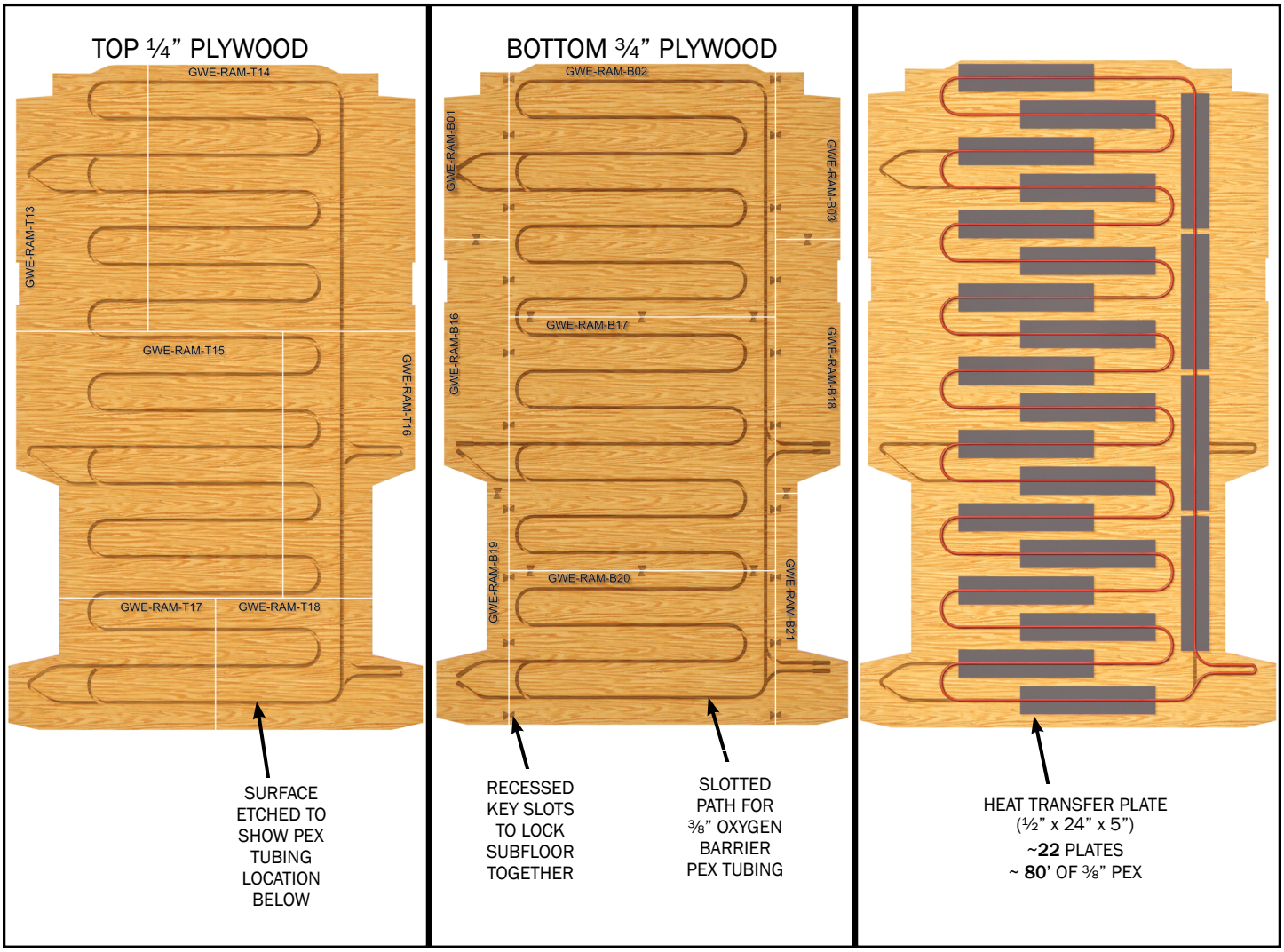
GFE-RAM-159



Glenwood Flooring System Diagrams

RAM PROMASTER 136

GFE-RAM-136



Aqua-Hot®
An AIRXCEL Brand

AQUA-HOT™ (2) YEAR LIMITED WARRANTY

Aqua-Hot Heating Systems Inc. warrants the AQUA-HOT heater to the original owner to be free from defects in material and workmanship under normal conditions of designed usage and service as outlined in the installation and operator manuals for a period of two (2) years covering both parts and labor beginning on the date of purchase of the vehicle by the original owner. Replacement parts are covered for the remainder of the heating systems warranty. All purchased replacement parts will carry a six months, (180) days warranty.

This warranty does not apply to scheduled maintenances items such as fuel filters and fuel nozzles, damage or failure of the AQUA-HOT heater or the vehicle into which it was installed due to improper installation, assembly, maintenance, abuse, neglect, accident, or the use of parts not supplied by Aqua-Hot Heating Systems, Inc. Aqua-Hot Heating Systems is not responsible for incidental or consequential damages.

The intent of this warranty is to protect the end user of the heating system from such defects, which might have occurred in the manufacture of the product. The warranty is not intended to protect the end user from problems, which are outside the ability of Aqua-Hot Heating Systems control.

To obtain a warranty repair authorization or information, please contact the Tech Support Department at 1-800-685-4298 (7:00am to 4:00pm Mountain Standard Time).

My Comfort Zones are On-Board
Vehicle:

Purchased From:
Dealer Information:
Name:
Location:
Phone Number:

Heating System:
Serial Number:

Scan the QR code on the right with your mobile device to take you to the website to register your Aqua-Hot product.

Installation Manual

Aqua-Hot
An AIRXCEL Brand

Aqua-Hot Floor Heating Kit

For the 100 Series Heating Systems:

PXE-100-001

GLENWOOD FLOORING SYSTEM
By Aqua-Hot

Glenwood Flooring System

For Mercedes Sprinter 144, 170, 170X:

GFE-MBZ-17X
GFE-MBZ-170
GFE-MBZ-144

Ford Transit 148, 148L:

GFE-FRD-LNG
GFE-FRD-STD

Ram Promaster 136, 159, 159X:

GFE-RAM-15X
GFE-RAM-159
GFE-RAM-136

GLENWOOD FLOORING SYSTEM
By Aqua-Hot

Aqua-Hot Heating Systems, LLC
7755 Miller Drive, Frederick, CO 80504

Visit us online at www.aquahot.com
Call us at (800) 685-4298 or (303) 651-5500