



K-SERIES HP2000 APU

# Installation and Operator's Manual

Manual For HP2000



Keeps you cool, warm and powered up!



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**About Parks Industries LLC**

Parks Industries L.L.C. has been in the business of designing and manufacturing auxiliary power units since 2004. We provide our APU technology to airports, military applications, emergency vehicles, trucking companies, as well as construction equipment. Our goal is to provide a quality and efficient auxiliary power unit for all of these industries.

**Trademarks**

HP2000

**Exclusion for Documentation**

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## INTRODUCTION

Congratulations on your purchase of your new HP2000 K-Series Auxiliary Power Unit- your fuel and maintenance savings begin today! As you may already know, the HP2000 consists of a powerful yet lean Kohler diesel engine along with a revolutionary HVAC system to keep you warm, cool and powered up. With over a decade in development and on-road testing and usage, the HP2000 Auxiliary Power Unit is designed specifically for the transportation industry. It is designed and built to handle the extreme temperatures drivers' battle every day. By eliminating the need for the truck's engine to idle, fuel usage is reduced significantly while allowing the driver to enjoy all of the comforts that are usually associated with an idling engine.

## WARRANTY AND REGISTRATION

### ENGINE WARRANTY

The Kohler Company warrants to the original retail consumer that each new Kohler diesel engine sold will be free from manufacturing defects in materials or workmanship in normal service for a period of three years or 3000 hours, whichever comes first from the date of purchase, provided it is operated and maintained in accordance with Kohler Company's instructions and manuals. Please refer to your Kohler engine manual for more details. If no hour meter is installed as original equipment then eight hours of use per day and five days per week will be used to calculate hours used.

Even though Parks Industries offers engine components for sale, they can't be used for Kohler Warranty purposes and will not be reimbursed by Parks Industries, LLC. The components that we offer are for out of warranty replacement only and are strictly customer pay. To find the nearest Kohler Authorized Warranty repair center, go to the following web page and follow the instructions: <http://www.kohlerengines.com> and click on "Service and Dealer Locator".

### PARKS INDUSTRIES, LLC

Parks Industries, LLC, provides a two year, 2000 hour warranty (whichever comes first) on the following components: A/C Compressor, Condenser, Condenser Check Valve Assembly, Condenser Fan Assembly, Evaporator Check Valve Assembly, Auto Controller, Condenser Fan, Evaporator, 12V Evaporator Blower, Reversing Valve Assembly, Hose & Tube Assembly, High Pressure Switch, Low Pressure Switch and Compressor Belt. Warranty does not cover: oil, shop supplies, miscellaneous materials, etc. Refrigerant is only covered if a covered component fails and the refrigerant is lost. Refrigerant is reimbursed as outlined in the SRT Guide. Parks Industries does not pay miscellaneous supplies and /or Hazardous Material Charges. Make yourself aware of the maintenance and customer responsibility portion of the manual, lack of maintenance and neglect are not covered under the warranty. For more information please see the Policy and Procedures Manual.

**IMPORTANT!** Without registration, your HP2000 is not covered under warranty. It is important that you have a copy of your registration card.

## MANUAL OVERVIEW

This manual covers the topics of installation, operation, general maintenance and troubleshooting for the HP2000 K-Series APU by Parks Industries.

The patented design of the HP2000 makes it the leader in the auxiliary power unit industry. Its unique features set it apart from any other unit currently available on the market today. It provides solutions to many of the problems faced by the transportation industry on a daily basis, yet actually reduces overall costs. You will immediately notice the fuel savings produced by the HP2000. In addition, the HP2000 saves wear and tear on major truck components, cuts down on costly oil changes and increases battery life.

By following the proper installation, service and warranty procedures, your new HP2000 will provide years of comfort and service.



## SAFETY

Tips and safety warnings are listed throughout this manual. These tips and safety warnings alone cannot eliminate all hazards that can occur. Pay close attention to instructions and use common knowledge during maintenance procedures to prevent unnecessary accidents and injuries.

### NOTICE:

- Hazards or unsafe practices could result in injury or death.
- Persistent inhalation of exhaust fumes may cause serious injury and/or death. Anyone suspected of suffering from carbon monoxide inhalation should be removed from the hazardous area and given immediate medical attention.
- Exercise extreme caution when working near fuel.
- Moving parts can cause severe injury and/or death. Before working on any unit, shut it off, and be sure that the power supply is disconnected.
- If the power is not disconnected the unit could automatically start up without warning. This could cause serious injury.
- Never use the APU to provide power for sensitive electrical or medical equipment.

## SYSTEM COMPONENTS POWER UNIT

### POWER UNIT

The power unit consists of the diesel engine, A/C components and electrical controls. This unit is typically mounted on the frame rail of the truck. A/C lines, water lines, power and fuel must all be routed to the APU in order to provide heating, cooling and battery charging.

In the next section we will discuss the proper installation procedure for the power unit. Proper installation is critical in guaranteeing proper operation of the APU system. Installation will vary slightly depending on the make and model of the truck used.



### EVAPORATOR ASSEMBLY

The evaporator is mounted somewhere inside of your cab and provides hot or cold air depending on your needs. Typically the evaporator is mounted underneath the bunk. A/C lines and a power supply will need to be routed from the evaporator to the APU to supply heating and cooling and evaporator control.



### APU CONTROLLER (NEW AND PRIOR MODELS)

The APU controller is the brain of the APU. It is responsible for triggering the relays which power and control the APU. Both the new and prior versions of the controller offer fully automatic climate control in which the user sets the temperature and the APU will heat or cool to maintain it. Both controllers also track and manage the charging cycle for onboard truck batteries.

Please see the "Controllers" section for more detail and instruction for each control system.



## CONTROLLER OPERATION

### 2011 – 2013 CLIMATE CONTROL MODULE (LEGACY CONTROLLER)

The prior model controller contains many of the basic features found in the new controller. This includes climate control and battery monitor mode. The controller also keeps track of engine hours and oil hours.



1. Press to display number of runtime hours.
2. Change unit between On -> Off-> Battery Monitor Mode
3. Lower desired temperature
4. Raise desired temperature
5. Change fan speed, High->Low

### 2013 – CURRENT CLIMATE CONTROL MODULE

The new, touch screen APU Commander\* provides all previous features plus several new ones. Calendar start, storage mode, new error screens, error log, firmware updates, comprehensive fan speeds, time and date and telematics support are just a few of the new features.



\*See "APU Commander" Section for Controller Operating instructions

## LEGACY CONTROLLER

The legacy APU controller provides two different functions: Battery Monitor Mode (Battery Charge Only) and Climate Control Mode (Charge+Climate). Other features include oil hour meter and unit hour meter.

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### CLIMATE CONTROL MODE

Press the mode button until the screen reads "Climate Control". Using the up/down arrow, select your desired temperature. The APU will automatically enter the startup process. After a short warm-up cycle, the APU will start and continue to run until the mode button is used to select a different function. Depending on your temperature setting, the APU will heat or cool to achieve the desired temperature.

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### BATTERY MONITOR MODE

Press the mode button until the screen reads "Battery Monitor Mode". In this mode, the APU will only run when the voltage is deemed to be low (Below 12.6V). Once low voltage is detected, the APU will automatically start and enter a 30 minute charge period. Every thirty minutes the APU will shut down and check battery voltage. If at the end of three 30 minute periods the battery voltage is still low, the APU will indicate a charging system failure.

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### OFF MODE

Pressing the mode button again will disable the unit. The display will read "OFF". This mode is desired if the vehicle is entering an extended storage period or if it is in need of service.

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### OIL TIMER RESET PROCEDURE

Once the oil has reached 600 hours, the display will read, "Oil Change Reqr'd". This indicates that the APU oil needs changed. Once a service has been performed, it is necessary to reset the oil hour timer. To do so:

1. Press "Hour Meter" to display oil hours.
2. Press and hold "Hour Meter" and temperature up button for 15 seconds or until the display reads "Oil Tmr Reset".

## 2013 APU COMMANDER

The touch screen APU Commander has all of the features described in the Legacy Controller plus many additional new features.

### GETTING STARTED

The APU Commander has three basic functions, Climate Control, Battery Monitor Mode and Storage Mode. To access these modes, press "Start" and select the desired mode. More details on each mode as well as other settings can be found in this section.

### STOP, BACK, MORE AND SETTINGS BUTTONS

A button labeled "MORE" and "STOP" will be displayed at all times during APU operation. "SETTINGS" however, will only be displayed when the APU is in the "OFF" mode.

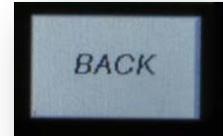
#### STOP BUTTON

At any point during APU operation, press the "Stop" button in the bottom left corner to stop the APU and return to the off screen.



#### BACK BUTTON

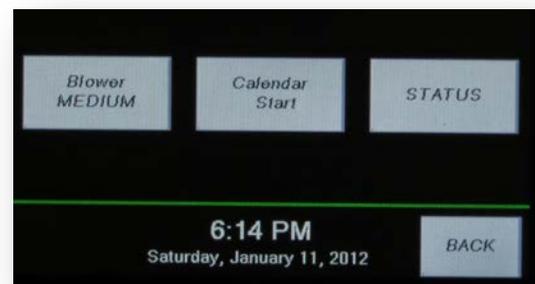
At any point during controller operation, press the "Back" button in the bottom right corner to return to the previous screen.



#### MORE BUTTON

Press "MORE" at any time to access Fan Speed, Fan Mode, Calendar Start or APU Status.

- By pressing the blower button, the blower fan settings will rotate through Low, Medium, High, Always Low, Always Medium and Always High. "Always" indicates the evaporator fan will run continuously even when the temperature is met.
- Pressing "Calendar Start" will enter the calendar start setup screens. See the "Calendar Start" section for complete instructions.
- Press "Status" to display APU status details and access the error log. See the "Status" section for complete instructions.

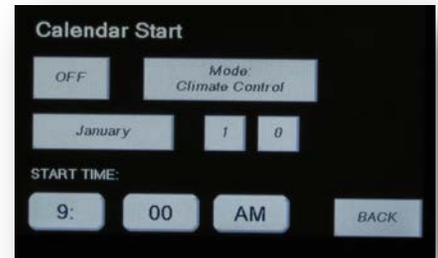


## CALENDAR START

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Calendar Start is designed to allow for the APU to start in a specific mode at a set time on any day of the year. This is a useful feature if you plan to store your truck and return to it on a specific day. Using this feature will preheat your engine, charge your batteries and, if you wish, cool or heat your cab in advance.

- Access Calendar Start settings through the “MODE” button.
- By pressing the “OFF” button, you can toggle this feature on and off. Once ON the button will be green.
- Press the “MODE” button to cycle through the mode you wish to resume. Whenever activated, the setting that was last used for this feature is what will be recalled. For example, if you select “Climate Control” as the calendar start mode, and you last had climate control set to hold at 70°F, when the calendar start is initiated the temperature will again be at 70°F. This holds true for settings in the battery monitor as well as the storage modes.
- To adjust the start time and date, press each value to advance it.



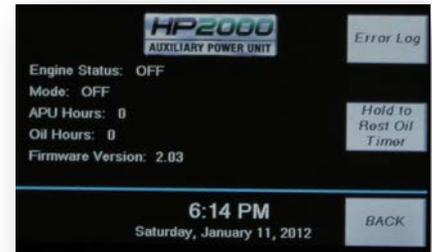
Once the calendar stop operation has been performed, the calendar start feature will return to off. This prevents any unintentional starting for the next calendar year.

## STATUS

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The status screen displays useful information about the current operating parameters of the APU.

- Access the status screen through the “MODE” button.
- “Engine Status” will display heating, cooling, running, or charging depending on the current function.
- “Mode” displays the function currently in use.
- “APU hours” displays the total engine hours on the APU.
- “Oil Hours” displays the number of hours since the timer has been reset and the oil has been changed.
- “Firmware Version” is displayed here. To update the firmware version see the “Firmware Update” section.



## OIL TIMER RESET

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You can access the oil timer reset button through the "Status" screen. To reset the oil timer, hold the "Hold to Reset Oil Timer" button until "APU Oil Hours" goes to 0.

## ERROR LOG

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The error log keeps track of any error events as well as some of the external conditions when the event occurred.

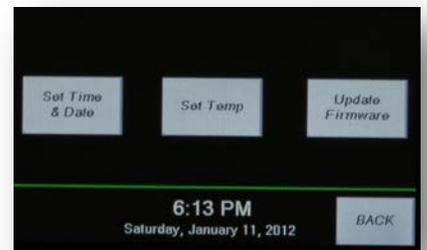
The error log can be exported to a USB drive in order to have a diagnosis performed at a remote location. To do so, insert a USB memory drive into the USB slot on the right side of the controller and select "Export". The APU will read "Done" in the top right hand corner once this is complete. Press page up and page down to navigate through multiple entries.



## SETTINGS

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The settings button is only available from the OFF mode screen. Use this page to set the time and date, set temperature units and update the firmware.



### SET TIME AND DATE

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To adjust the time and date, depress each value to advance it. Once you have reached the correct time and date, press "Back" to save your settings and return to the previous screen.

### SET TEMP

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To select between Celsius and Fahrenheit, tap the symbol to alternate it.



## UPDATE FIRMWARE

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From time to time a firmware update may be available to add new features or offer solutions to software issues. Performing this update is simple; however it is a very sensitive process. Failure to follow these instructions carefully can cause permanent damage to the controller.

1. Format a USB thumb drive using FAT32.
2. Copy and paste the firmware file you wish to update onto the controller.
  - a. "RLYxxxx" is a relay firmware file "DSPxxxx" is for the display.
  - b. Only one file of each prefix should exist on the thumb drive at a time.
3. From the settings screen, select "Update Firmware".
4. Insert the thumb drive.
5. Select "Update Controller" or "Update Display" as directed by the firmware's specifications.
6. Within 5 minutes, the firmware update will complete and the controller will return to the main screen.

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## CLIMATE CONTROL

Climate Control mode is designed to provide heating or cooling as needed to maintain a certain set temperature. During climate control the APU is constantly monitoring the battery bank charge. The APU will run continuously to maintain a full battery charge.

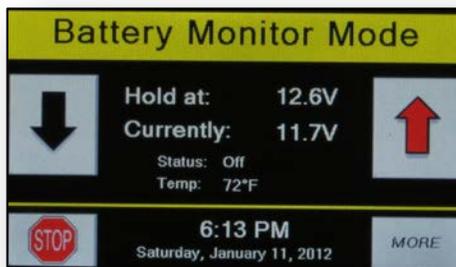
- Use the up and down arrows to select the desired temperature.
- The current temperature will be displayed at all times next to "Currently".
- Press "Stop" at any time to stop the APU
- Press "More" to access more settings. See the "More" section for complete instructions.




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## BATTERY MONITOR

Battery monitor mode is used in situations where battery charging is needed but A/C or heating is not. Using this mode, the APU will maintain the battery voltage above a set point. If the voltage drops below this point the APU will provide a charge for a period of 30 minutes. At the end of the cycle the APU will begin monitoring again and provide additional charging if necessary.



- To specify the desired battery voltage, use the up and down arrow to raise or lower the set point.

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## COLD STORAGE

Cold Storage mode is designed to keep the batteries charged and the truck cabin from freezing in times of truck storage. With this mode, the controller allows you to set a voltage set point different from battery monitor mode and a temperature separate from climate control that the APU will maintain. Both set values represent low limits and the APU will run in order to keep the two parameters above these set points.

- To adjust the low temperature limit, set the "Keep Temp Above" using the up and down arrows.
- To set the low voltage limit, set the "Keep Voltage Above" using the up and down arrows.



## 10-STEP INSTALLATION

### INSTALLATION OVERVIEW:

Before beginning installation of your HP2000, take time to inspect the unit and the desired area of installation. If you believe you are missing a part, please consult the included checklist. Before you begin, perform an inspection of the truck and installation area. Be sure that all batteries are fully charged and in good condition. We recommend that you load test your battery bank prior to installation. Take your time to look over the area where you plan to install the HP2000 and make necessary measurements to ensure proper installation. Make sure that you have at least 21" of free frame rail space for power unit installation. Also, make sure you have the necessary space available under the bunk for the evaporator unit and cable pass through.

Before you get started, un-package your new system and all components. Inspect all components to make sure they were not damaged during shipping. Examine your truck thoroughly, both inside and out, to locate the best place to mount the APU. The diesel engine, A/C components and electrical controls are all contained in the frame-mounted power unit enclosure, which measures 23.5 inches in height, by 19.5 inches in width, by 23 inches in depth. It is important to remember that the APU location should not interfere with the driver's access to other vital areas. Also, the location you choose should not crowd any wires, air or fuel lines that may be nearby.

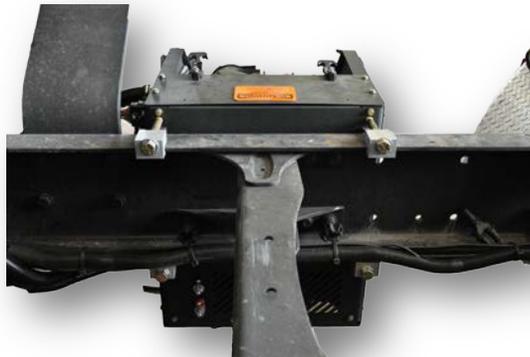
### REQUIRED TOOLS CHECKLIST

½" drive ratchet with 15/16" socket	Tubing cutter
15/16" wrench	3" hole saw
Hose cutter	3 ½" hole saw
4 hose clamps	Battery cable end crimper
7/16" wrench	Teflon tape
9/16" wrench	Refrigerant leak lock (Part #7012)
Crescent wrench	Lift cart or fork truck
Channel locks	Torque wrench to tighten mounts on truck
¼" nut driver	System to vacuum and charge the A/C unit
5/16" nut driver	Shop vac
3/8" drive ratchet with 7/16" and ½" socket	1 5/8" hole saw to install controller cable
Wire ties	Cut-off wheel
Drill	R134-A Refrigerant

## STEP 1: MOUNTING THE APU

You are now ready to install the APU. Begin by mounting the APU to the frame rail. On most installations, the HP2000 does not require any drilling into the frame rail. However, some trucks (such as Volvo) do not feature a frame that allows for a simple locking device. For these installations, some drilling may be required.

- Using a lift cart or fork truck, position the APU against the frame rail in the desired location. Make sure that the APU is perfectly level with the frame rail. Check the back of the APU to insure the bolt holes align with the top and bottom of the frame rail.
- Once the APU is in position, insert the rubber isolators between the frame rail and the back of the APU. Be sure to align the isolators vertically, between the two bolt holes. The smooth sides of the isolators are marked with an X and should be positioned against the frame rail.
- Slide the four mounting blocks onto the frame rail, two on top and two on bottom.
- Apply red lock tight to the thread of the mounting bolts then insert the mounting bolts and hand tighten. Install the nuts and washers from the inside.



**MAKE SURE THAT THE MOUNTING BLOCKS DO NOT INTERFERE WITH AIR LINES OR WIRING INSIDE THE FRAME RAIL.**

After confirming that the APU is level, tighten the mounting bolts to 80 ft-lbs in an X pattern. Do not tighten one bolt and then go to the next. Tighten each bolt equally in 10 ft-lb increments, using the X pattern, until all bolts have the required 80 ft-lbs. If you tighten the bolts completely to 80 ft-lbs the first time, the unit will become unlevel and internal components will be damaged. While tightening the APU to the frame, make sure the rubber isolators do not fall out of position.

**STEP 2: FUEL TANK DRAW TUBE INSTALLATION**

The fuel block must now be installed in order to provide fuel supply return and tank venting to the APU. It is important that you **DO NOT** tie into existing truck fuel lines.

- Locate the existing truck's fuel tank vent cap. Remove the cap from the tank.
- Install the fuel draw tube through the fuel block assembly.
- Using Teflon thread tape, install and screw in the fuel block assembly. This may have to be done at an angle or the draw tube may need to be bent due to low clearance.



- Once installed, adjust the height of the fuel draw tube to the desired pickup length. We recommend adjusting it to one inch off of the bottom of the tank.



The fuel draw tube is designed to vent the fuel tank as well as supply and return fuel to the APU.

The lower barb fitting on the fuel draw tube body is the fuel return, the fuel draw tube is the supply and the small hose is the vent.

Once installed, route two fuel hoses from the APU to the fuel draw tube.

Tighten the fuel hoses onto the barbs of the fuel draw tube using the worm gear clamps.

Connect the fuel supply and return to the correct barbs on the APU. Reversing the two fuel lines will not allow fuel to reach the APU. Tighten all hose connections using a work gear clamp.

**STEP 3: EVAPORATOR SYSTEM AND DUCT HOSES**

The evaporator system is designed to be mounted under the bunk in the storage area. The evaporator system measures 17 inches in length by 9 inches in height by 8 inches in depth. For the A/C hoses and power supply cable, you will need a 3-inch hole in the floor directly beneath the hose connection side of the evaporator.

Once the install location has been determined, check underneath the cab to be sure that there are no supports, wires, hoses, cables or beams where the three inch hole must be cut. This hole will serve as a pass through for cables and hoses, and also as a drain for evaporator condensation.



- Place the evaporator in the desired location.
- Draw a mark on the floor indicating where the hole should be cut.
- Remove the evaporator and drill a pilot hole.
- Using the pilot hole as center, trace a three inch hole, then cut the carpet or foam circle to prevent the material from getting caught in the hole saw.
- Once material is removed to expose the metal floor, use a hole saw to cut the 3" hole.
- Insert the included hose pass through and secure it using the self-tapping screws.
- Reposition the evaporator so that it is slanted and so that the drain is positioned just above the pass through.
- Secure the evaporator to the floor using four self-tapping screws.
- Some trucks may not have a return air supply. If this is the case, return air holes will need to be cut to allow air back to the evaporator.

Select a location for the air two ducts and louvered vents. It is recommended to position one vent high and one vent low for optimal heating and cooling. Select a location in which the 3" duct hose will be easy to conceal. A flat surface is required for through-mounting the louvered vents. Once two locations have been selected:

1. Use the 3" hole saw to cut the holes where the vents will be located. Do not cut this hole larger than 3"; the vents will not fit correctly.
2. Use a 3 1/2" hole saw to cut the holes that the ducting will pass through. Holes must be 3 1/2", 3" is not large enough for duct hose to pass through.
3. Connect each of the duct hoses to the evaporator and tighten all the hose connections using the included 3" worm gear clamps.
4. Route the hoses to the vents and tighten all of the hose connections using the included 3" worm gear clamps.

## STEP 4: CONTROLLER INSTALLATION

The APU controller is responsible for all functions of the APU. It is important that the controller is mounted upright, in an area with adequate air flow. Failure to do so will lead to inaccurate temperature readings and poor performance.

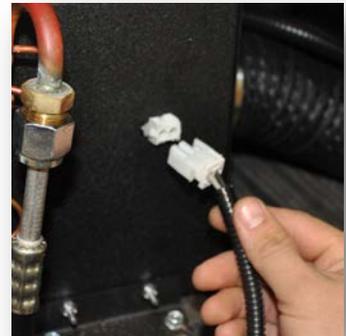
Make sure that the location selected for the controller:

1. Has a clear path to route the control cable.
2. Provides a flat surface for mounting.
3. Has decent air-flow.

Secure the APU controller to the flat surface using the short self-tapping screws. Be careful not to drill into any other wires or obstacles.

Once the controller is secured, it is time to route the control cable from the controller to the APU.

- Connect the square end into the controller.
- Using adel clamps, secure the cable to the wall.
- Route the cable out of sight, if possible.
- Track the cable back to the evaporator box.
- Push the round APU-end of the controller through the floor collar.
- From the outside of the truck, pull enough slack to reach the APU.
- Cable tie the control cable up and out of the way, being sure to leave enough length to reach the APU without leaving too much additional slack.
- Connect the power supply to the evaporator as shown in the figure to the right.



**DO NOT** connect the control cable to the APU at this point. It can cause damage to the controller or personal injury.

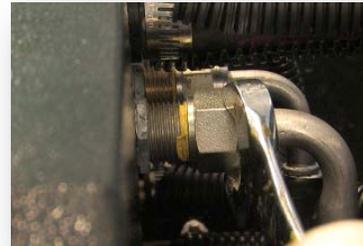
**STEP 5: A/C LINE INSTALLATION**

Two A/C lines must be run from the APU to the evaporator in order to supply Freon to the evaporator unit.

- Begin by routing the two 8' A/C lines through the 3" hole near the evaporator unit as shown in the figure to the right.
- Make sure both hoses are clean and clear of debris and that all connections contain one O-ring of the appropriate size.
- Apply a small dab of leak lock to the threads of the A/C fittings to prevent corrosion and leakage.
- Connect both ends of each hose to the corresponding fitting on the evaporator and the APU.
- Once connected, tighten the fittings. Be sure not to over-tighten fittings as this will damage the O-Rings.
- Cable tie all hoses and wires to the frame, up and out of the way.



**IMPORTANT! DO NOT OVER-TIGHTEN THE A/C LINES, AS DAMAGE TO O-RINGS MAY OCCUR.**



## STEP 6: CONNECTING POWER CABLES

You are now ready to connect the battery cables. Make sure the truck battery posts are clean, as improper connections could cause the APU to fail. Always be careful not to reverse polarity of the battery cables or touch the positive cable to ground. Doing so will cause detrimental damage to APU, and possibly the truck, and is also a fire hazard.

- Route both positive and negative battery cable to the truck's battery bank. Cable tie all slack during this process.
- Be extra careful to not let the cables rest on or come in contact with any moving parts. This could cause a short in the future.
- Once inside the battery compartment, connect the ground (black) wire to the negative battery post. Do not connect this to a frame or any other metal for ground.
- Prior to connecting the cables to the batteries to the APU, install the included MRBF fuse onto one of the positive posts on the battery. This will be the APU power supply and truck charge supply. This fuse is necessary to protect against any potential electrical hazards.
- Once the MRBF fuse is installed, connect the positive (red) lead to the top of the post and tighten the lead against the fuse. Place the rubber cap over the connection. Tape if necessary.



Heavy sparking indicates a system short. Do not continue if either post sparks. Instead, check the integrity of the cable and whether or not reverse polarity has occurred.

## STEP 7: WATER CONNECTIONS

The APU is liquid cooled and requires coolant in order to operate at a safe temperature. If your APU does not have a radiator, it is necessary to continue with the step below. If your APU does have a radiator, the water ports will already be blocked, so proceed to Step 8. If you are unsure, consult your dealer. Before beginning this step, be sure you have the proper size water T for integrating into the existing cooling system. NOTICE: Coolant temperatures can exceed 150°F, so be cautious when working with coolant lines to avoid burns.

- Lift the truck hood; take note of the current truck coolant level. In connecting this APU you will need to add approximately one gallon of coolant to make up for the additional coolant line volume.
- Locate the coolant supply and coolant return lines on the main truck engine. If unsure, check the temperature. The return line will usually be hotter than the supply line.
- Using four water line clamps, crimp both lines four inches apart. You will be cutting in-between these crimps to install the coolant T's.



- Lay out the supply and return water lines (both at the same time), being careful not to cross them.
  - We recommend marking one of the lines on both ends prior to installation to prevent accidental crossing. Crossing the lines will cause the APU to overheat.
- Connect both water lines to the APU and tighten them to the water barbs using the included  $\frac{3}{4}$ " worm gear hose clamps. Remember which line you selected for supply and which for return.
- Route the hoses to the front of the truck where they will tie in to the water T's. Be sure that the hoses are securely cable tied and out of the way.
- Once the hoses are secured and pulled into the engine compartment of the truck, determine the required length to reach the water T's.
- Mark and then trim excess hose.
- For one water T at a time:
  - Cut the coolant hose between the hose crimpers.
  - Install the water T with a hose clamp on each side.
  - Tighten the two hose clamps.
  - Install a worm gear hose clamp and connect the APU coolant hose to the clamp.
  - Tighten the worm gear hose clamp.
- Once this has been completed for both T's, check that the hoses and clamps are tight, and then remove the hose crimpers.



**STEP 8: CHARGE THE A/C SYSTEM**

Now you are ready to charge the A/C system. Before charging, check to make sure there are no leaks or system contaminates by pulling a vacuum on the system. We recommend that a 30-minute vacuum duration be performed to make sure that there are no leaks or moisture in the system. Once this step is complete, you are ready to charge this unit.

- Once the system has passed the leak test, it is time to charge the A/C system.
- Be sure to use R-134a refrigerant.
- Charge the system by adding 1.85 lbs of R-134a. Do not inject any oil into the system.



## STEP 9: SYSTEM PRIME AND SAFETY CHECK

You are almost ready to start your engine. It is now time to prepare the unit for the initial startup. Be sure that all tools are clear of the APU and that all connections are tight.

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### PRIMING THE WATER PUMP

It is necessary to run the truck engine for a period of at least five minutes in order to prime the APU water pump. Not doing so could cause the APU to overheat, causing serious and permanent damage.

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### CONNECT THE CONTROL CABLE

Check once again to be sure all tools are removed from the APU and that all connections are tight.

Now that the system has been primed and all connections have been made, you may connect the APU control cable by twisting it until it locks into place.

The APU is now ready to start.

**STEP 10: INITIAL START**

At this point you can use the controller to start APU. Press "Start" on the controller (press "Mode" on the old controller) and select "Climate Control". Set your desired temperature. At no more than 30 seconds, you will hear the APU attempt to start. The APU may fail to start on the first try due to air in the fuel lines. If this is the case, unplug the controller and bleed any air out of the fuel filter by unscrewing the top screw and allowing air to escape.

Allow the APU to run for 30 minutes to guarantee that the system is working properly. Check thoroughly for any water leaks or cable wear. If any other issues are encountered during the initial startup, check the troubleshooting guide for a solution. If no solution is available, contact your nearest dealer.

Congratulations, your new HP2000 is now fully installed!



## MAINTENANCE

By following service and warranty procedures, your new HP2000 will provide years of comfort and service. Please pay close attention to the directions for each procedure listed below.

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### WALK-AROUND INSPECTION

This inspection should only take a few minutes. A walk around should be performed during your daily pre-trip inspection. Perform this inspection to ensure maximum service life of your HP2000. Keep an eye out for things such as leaks, loose bolts and worn belts and service your APU accordingly.

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### TYPICAL INSPECTION

After the initial break in period it is important to check all A/C connections. Although the unit is leak tested at the factory, heat and strong vibrations can loosen certain components. Most A/C leaks are the result of improperly tightened components and are the responsibility of the installer. In addition, all fluid levels, coolant and oil should be checked. Electrical connections, cables and hoses should also be checked before operating the APU.

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### OIL TIMER RESET PROCEDURE

Depending on which controller you have, the oil timer reset procedure may vary. Check the "Controller Operation" section for your controller to determine the proper procedure.

### MAINTENANCE SCHEDULE

Interval Between Maintenance	Initial 50hrs	100hrs	600hrs
Change oil and oil filter	X		X
Check hoses, pipes and clamps	X		X
Check battery connections	X		X
Check belt tensions	X		X
Check muffler clamps and frame mounts	X		X
Check air filter, clean or replace as needed			X
Check/tighten isolator, compressor and cabinet bolts.		X	X
Replace alternator belt			X
Replace fuel filter			X
Check belt tensions			X
Clean debris from APU cabinet			X
Clean condenser fins. (Use only low pressure water)			X

## A/C SYSTEM MAINTENANCE

It is recommended that you check your A/C system occasionally. The system holds 1.85 lbs of R-134a refrigerant. If your APU has lost refrigerant, it has also lost oil. Only use pag-46 oil when servicing this unit. It is a good idea to perform regular inspection of both coils.

### Recommended operating pressures

A/C mode:

Low side = 20-21psi

High side = 225-270

Heat mode:

Low side = 30-31

High = 250-275

## OWNER'S RESPONSIBILITY

**For the most up to date warranty procedure information, please see the HP2000 policy and procedures information. This is available at any time from our website: [www.hp2000apu.com](http://www.hp2000apu.com)**

1. As the engine owner, you are responsible for the performance of the required maintenance listed in your Owner's Manual. We require that you retain the original purchase documentation and all receipts covering maintenance on your engine.
2. Please be aware that we may deny warranty coverage if your engine or a part has failed due to neglect, abuse, improper maintenance, improper installation, and or unapproved modifications.
3. As the owner, you are responsible for presenting your APU to an authorized service facility as soon as a problem occurs. The warranty repairs should be completed in a reasonable amount of time and following the SRT Guide (Suggested Repair Time).
4. Keep all maintenance records, dates, receipts, and parts used for all warranty claims. You may be asked to provide all maintenance records and parts used for the warranty to be effective.
5. Inspecting your equipment daily will help keep your APU working for a long time. Daily inspections should include items such as: belts, hoses, oil, bolts, mounts, etc. Dirt and debris in the evaporator or condenser coil will cause unsatisfactory heating and cooling. Please keep these cleaned at all times.
6. **WHEN FILING A WARRANTY CLAIM OR ORDERING PARTS, YOU MUST HAVE THE FOLLOWING:**
  - a. **SERIAL NUMBER AND HOURS ON APU**
  - b. **PART NUMBER AND PART DESCRIPTION**

## TROUBLESHOOTING

Problem	Possible Cause	Solution
<p>Engine turns over but will not start.</p> <p>Error displays on screen: "Low Oil Pressure"</p> <p>(Legacy Controller) Green light is blinking</p>	<ul style="list-style-type: none"> <li>• Fuel Supply clogged</li> <li>• Fuel filter dirty</li> <li>• Blown Fuse</li> <li>• Low Oil</li> </ul>	<ul style="list-style-type: none"> <li>• Check that the fuel lines are clear and that the filter is not clogged.</li> <li>• Check the fuse panel for any blown fuses.</li> <li>• Make sure the engine has proper amount of oil.</li> </ul>
<p>APU engine shut down.</p> <p>Error displays on screen: "High Engine Temp"</p> <p>(Legacy Controller) Red light is on</p>	<ul style="list-style-type: none"> <li>• The engine is overheated</li> </ul>	<ul style="list-style-type: none"> <li>• Check the truck's coolant line.</li> <li>• Check for crimps in the coolant line.</li> <li>• If coolant is sufficient, remove the coolant cap and allow the truck engine to run for at least ten minutes. This will clear any residual air bubbles from the coolant system.</li> </ul>
<p>Error displays on screen: "Charging system failure"</p> <p>(Legacy Controller) Red light is blinking.</p>	<ul style="list-style-type: none"> <li>• The charging system has failed</li> </ul>	<ul style="list-style-type: none"> <li>• Make sure all battery cables are tight and corrosion free.</li> <li>• Make sure all electrical components are securely plugged in.</li> <li>• Check the alternator belt and replace if necessary.</li> <li>• Check the fuse panel for any blown fuses</li> </ul>
<p>Error displays on screen: "High A/C Pressure Fault"</p> <p>(Legacy Controller) Yellow light is on.</p>	<ul style="list-style-type: none"> <li>• High head pressure</li> <li>• Fan is turning wrong direction or not working.</li> </ul>	<ul style="list-style-type: none"> <li>• Check condenser and evaporator for air restriction.</li> <li>• Make sure the condenser fan is running. If not, check or replace the fuse.</li> <li>• If the fan is not functioning, contact a service center near you.</li> <li>• Make sure the operating pressures are correct (A/C System Maintenance).</li> </ul>
<p>Error displays on screen: "Low A/C Pressure Fault"</p> <p>(Legacy Controller) Yellow light is on.</p>	<ul style="list-style-type: none"> <li>• Low refrigerant</li> </ul>	<ul style="list-style-type: none"> <li>• Make sure the condenser fan is running. If not, check or replace the fuse.</li> <li>• Check all hoses and fittings for refrigerant leaks.</li> <li>• Make sure the operating pressures are correct (A/C System Maintenance).</li> </ul>
<p>Problem not Listed</p>	<p>Cause Not Listed</p>	<ul style="list-style-type: none"> <li>• Contact the nearest HP2000apu dealer.</li> </ul>



## WARRANTY PROCEDURE

*Refer to dealer policy and procedures manual for warranty details.*

SPECIFICATIONS	
APU Engine	Kohler KDW702 16.8 hp
Engine Oil	1.7 US Quarts (1.6L) 15W-40
Oil Filter Part Numbers	Baldwin: HF929 Fram: PH9897 Wix: 51083
Air Filter Part Numbers	Wix: 49160
Fuel Filter Number	Napa: 3961 Wix: 33961 or 33361
Alternator	65 Amps
Weight	345 lbs
Dimensions	19.5" x 23.5" x 23"
BTU's	15,000 BTU/hr Cool, 18,000 BTU/hr Heat
Refrigerant	1.85 lbs. of R-134 A
System oil capacity	5 oz. of PAG 46
Ideal Operating range	Heat: Ambient temp of 70° to -15° Cool: Ambient temp of 70° to 115°