Willie APU Manual

Operation & Maintenance

DSE 4410 Controller

Willie Owner's Manual

Willis Power Systems
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Rev C 05/02/12
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Willis Power Systems
Owner's Manual
Willie APU & DSE 4410

Rev C 05/02/2012

NOTE

The Willie APU offers up to 50% more engine power than competitive products and its compact and lightweight design allows for easy installation. Willie™ provides the power and quality while priced competitively to meet the needs of the average driver and trucking company. Willie™ gives built-in redundancy to a big rig's critical systems.

It is designed to be serviceable and is backed by parts availability. The company provides products that achieve maximum APU-related savings in fuel and maintenance designed to offset the costs of installing emissions control equipment mandated by state idling and federal emissions laws.

Important APU Details

All parts for the Willis APU are available from the factory and authorized installation centers. Warranty repairs and service must be performed by authorized service centers unless prior authorization has been obtained.

Willis Power Systems
http://www.willisapu.com
1-800-825-4631
service@willisapu.com

Have your contact information and engine serial number ready when calling. Please leave a message with the information if the line is busy.

APU SERIAL NUMBER	APU STYLE
INSTALL REPRESENTATIVE	INSTALL DATE
INSTALL LOCATION	PHONE

Contents

Contents Cont'd

OWNER/OPERATOR SAFETY

Thank you for choosing an APU from Willis Power Systems. It is our goal to make sure you have the best unit on the market.

Willis Power Systems is proud to provide options to our customers in order to best serve individual needs on the road. Because of the customized options, different APU systems will have their own operating instructions that must be followed to ensure that you get the maximum performance from your unit.

Please read all leaflets and manuals provided with your APU in order to best understand how to properly operate your system type. If you need assistance or would like more information, contact your nearest service center or call Willis Power Systems. Visit our website to download manuals, diagrams, and other information made available for you.

Below are important instructions that apply to the use of all units, and should be followed at all times when operating an APU.

- Do not remove or replace the APU cover while the unit is running.
- If the unit is running with the cover off, stay clear of the accessory drive belt.
- The APU contains hot oil and coolant under pressure. Inspect hoses and connections frequently when the engine is NOT running for signs of leakage or damage.
- Do not insert objects in the transmission case while the APU is running. Do not leave any foreign objects in the transmission case.
- Do not work on any Willis APU components located on or near the truck engine when the truck engine or the APU is running.
- Only qualified maintenance personnel should service the Willis APU or you risk damage to the unit, yourself, or void existing warranty coverage.
- Visit Willis Power Systems online to find a service location near you, and download manuals and diagrams. You can also call WPS by phone to request service, purchase parts, or to speak with a technician.

REQUIRED MAINTENANCE SCHEDULE

Performing simple maintenance checks, and following the schedule will result in a long lasting engine that improves the performance of your APU, the life of your unit, and long term savings on the road.

Ignoring the maintenance schedule can result in a void warranty, and/or preventable engine problems.

Every 50 Hours of APU Runtime

- Check the APU engine oil level on dipstick

Every 500 Hours of Runtime

- Check and/or change thermostat batteries
- Replace the APU's engine oil and filter
- Replace the APU engine fuel filter
- Disconnect/clean ALL grounds and power connections & reseal with Plasti-Dip or equivalent.
- Check the engine air filter
- Check belts and hoses for wear
- Check wires, harnesses, clamps, & tie wraps for wear

Every 2000 Hours of APU Runtime

- Check the fuel hoses on the APU
- Check the five water hoses on the APU
- Replace the APU engine's water pump belt

Engine Oil

Use SAE 15W-40 engine oil for all temperatures. Oil should meet API classification CC/CD/CE and be replaced every 500 hours of APU runtime or when truck's oil is changed, whichever comes first.

Engine Coolant

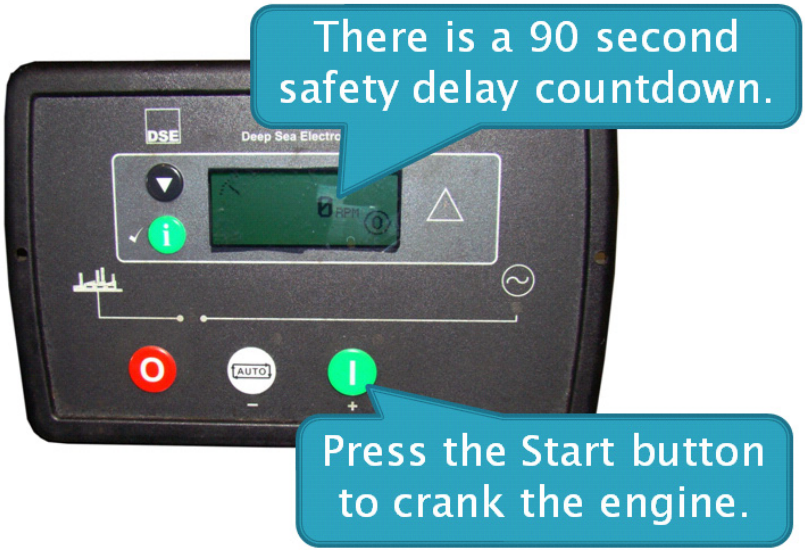
Low-silicate 40% permanent anti-freeze by volume for temperatures down to -12°F and 50% by volume below -12°F.

The Willis APU Cab Controller is mounted on the truck's instrument panel. The Cab Controller's menu screen shows all selected actions.

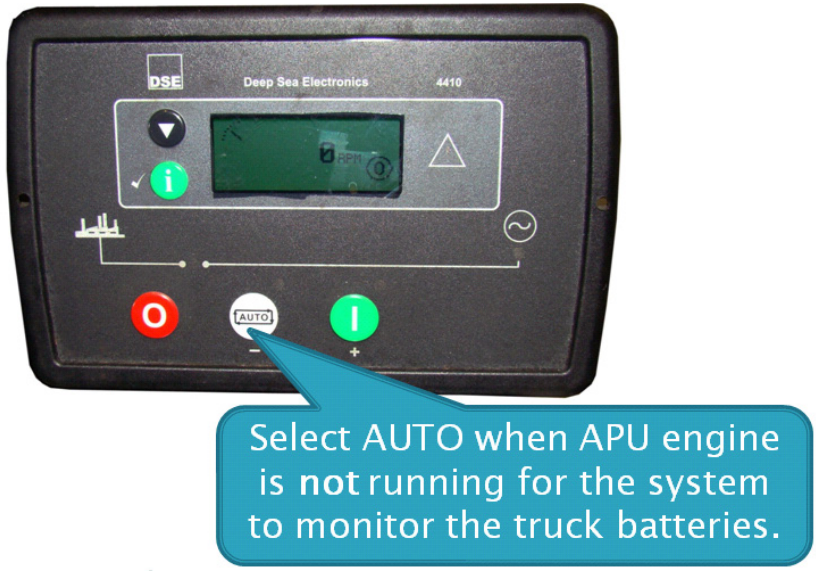
- When the APU has power, it will display a menu saying "Select Mode" or "Shutdown."
- When the Controller is not in use it will cycle between being blank and being on at half brightness. This is normal.

HOW TO START YOUR APU

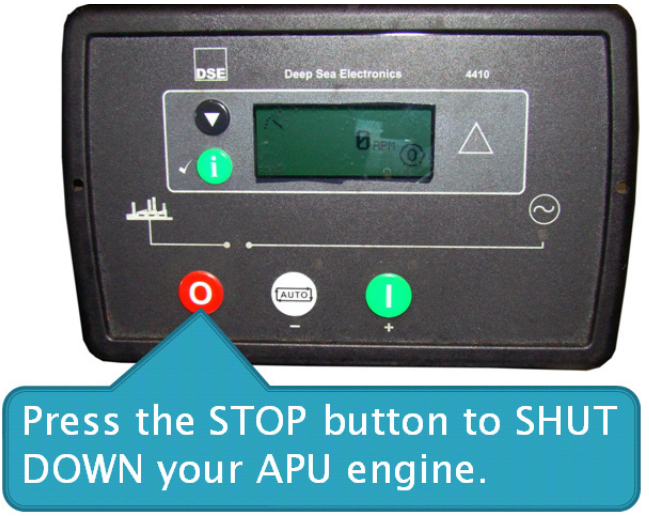
1. Select Stop for the manual mode.
2. Then press the Start button to crank the engine.
3. Select Stop/Reset to shutdown the APU



HOW TO SET AUTO BATTERY MONITOR



HOW TO STOP ENGINE



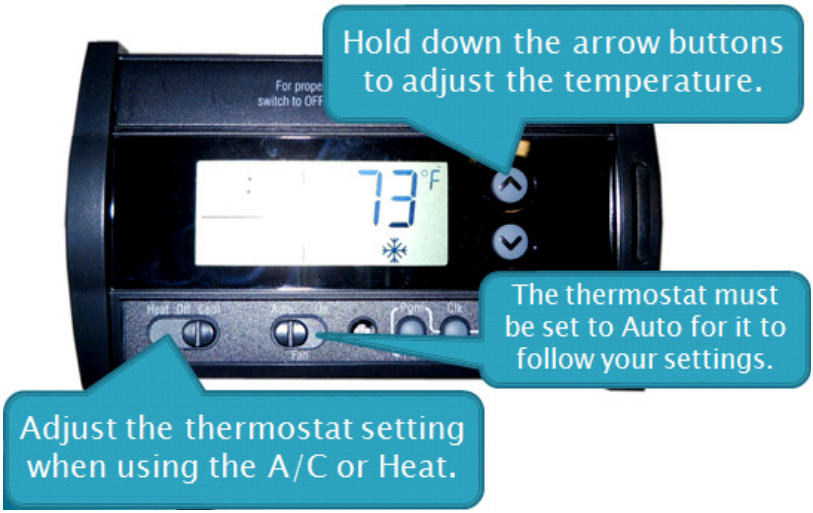
SET FAN BLOWER

1. Set the fan blower to AC or Heat.
2. Select the blower settings to adjust the airflow.
3. The system automatically cycles to the thermostat settings.
4. When you are finished with the temperature controls, or are shutting down your APU, always return the blower to the OFF position.

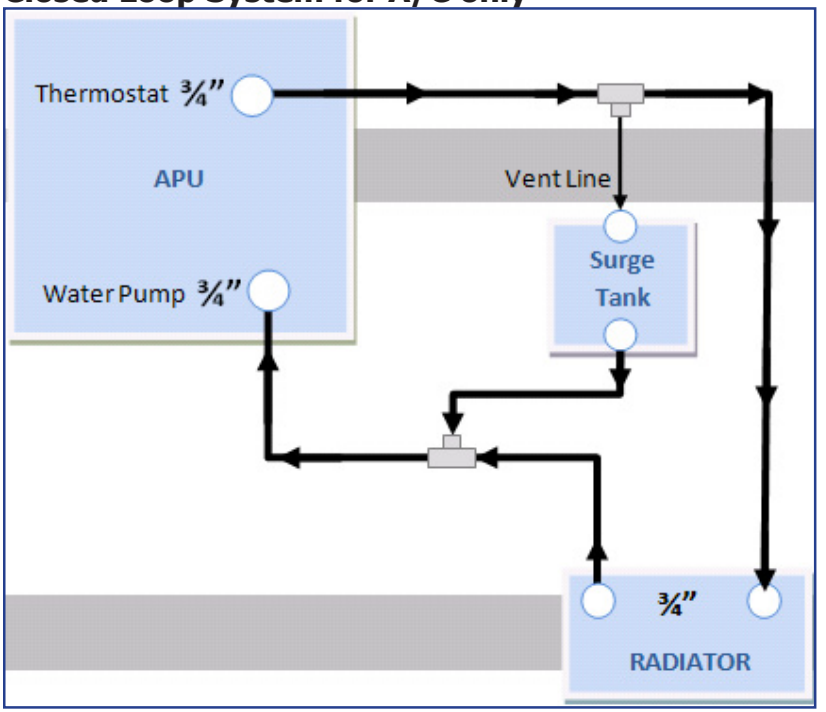
THERMOSTAT SETTINGS

1. Set the Thermostat to A/C or Heat.
2. Use the selector switch to set the fan to automatic mode (AUTO) or continuous mode (ON).
   - AUTO-The fan regulates cabin temperature according to selected temperature on the thermostat.
   - ON-The fan operates continuously and does not regulate to the selected temperature.
3. Select your temperature setting.

   The cabin temperature is normally displayed. To view the set point, press a button once. The set point & icon is displayed for 5 sec. Pressing either of the buttons more than once will change the set point Press one of the buttons until the desired temperature is displayed.



Closed Loop System for A/C only



Coolant Flow ○ *Hose Fittings* ← *Direction of Coolant Flow*

Hoses pictured above do not show the proper installation, and is provided solely as an overview of connections. Refer to your installation manual for specific instructions or contact WPS.

- The small fan only turns on when the AC is engaged to pull the heat out of the chassis that is produced by the engine and the AC compressor.
- The condenser's cooling fan should run anytime the APU is on.
- This unit alone supplies no heat whatsoever.
- The APU is designed to automatically monitor and charge the truck batteries with 150 AMP alternator.
- Leave the thermostat on AC, and set the temperature.
- Because the coolant is self contained, always change coolant yearly with 50/50 coolant premix. Remember to use the proper coolant to water ratio to prevent damage to your unit in cold temperatures.

Standard Integrated System

This system integrates the APU into the coolant flow of the truck engine, allowing the APU to heat the coolant as it circulates through your truck engine to prevent cold starts.

The sleeper heater core of the truck engine accesses the heated coolant which keeps the sleeper heater core warm for a few hours.

If you were to run your sleeper heater blowers on, you can take advantage of this heat for approximately 6 to 8 hours.

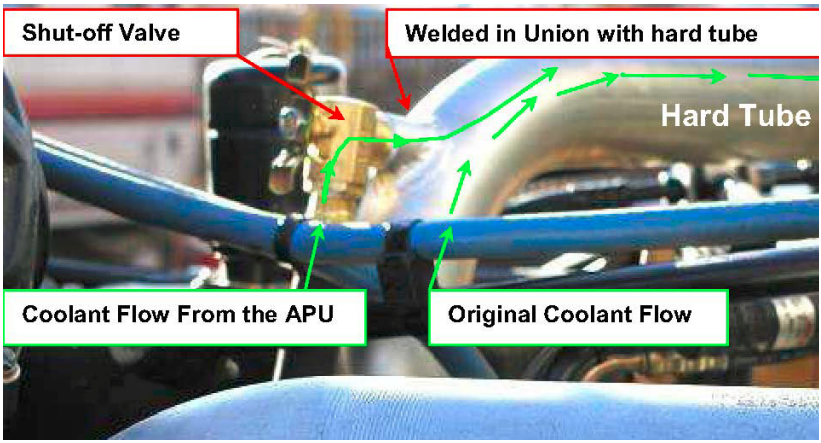
Tips for increasing heat with a Standard Integrated System:

- Start your APU, and then turn the truck key to the "On" position to power the truck blowers.
- If you need additional heat, you can close the valve located on your truck's thermostat housing block. See image below.

WARNING: This is not recommended because if you forget to turn the valves back on in summer temperatures, your APU can overheat.

- During unusually cold temperatures, the truck's engine will absorb a large amount of heat from the coolant flow before reaching your heater core & blowers. Under these circumstances, you may have to restart your truck engine for additional heat.

WARNING: The thermostat housing valve must be open during warm weather. If the valve closed during the summer, it may cause your unit to shut down.



Extreme Cold Weather System

The standard system is integrated into the truck engine's coolant flow to keep the truck engine warm at all times. Included in the standard system is a valve assembly that uses the coolant flow to produce maximum heat in cold temperatures.

Below are the instructions on how to use the valve system when you are running the A/C or the heat. Please follow these directions in order for your system to operate properly.

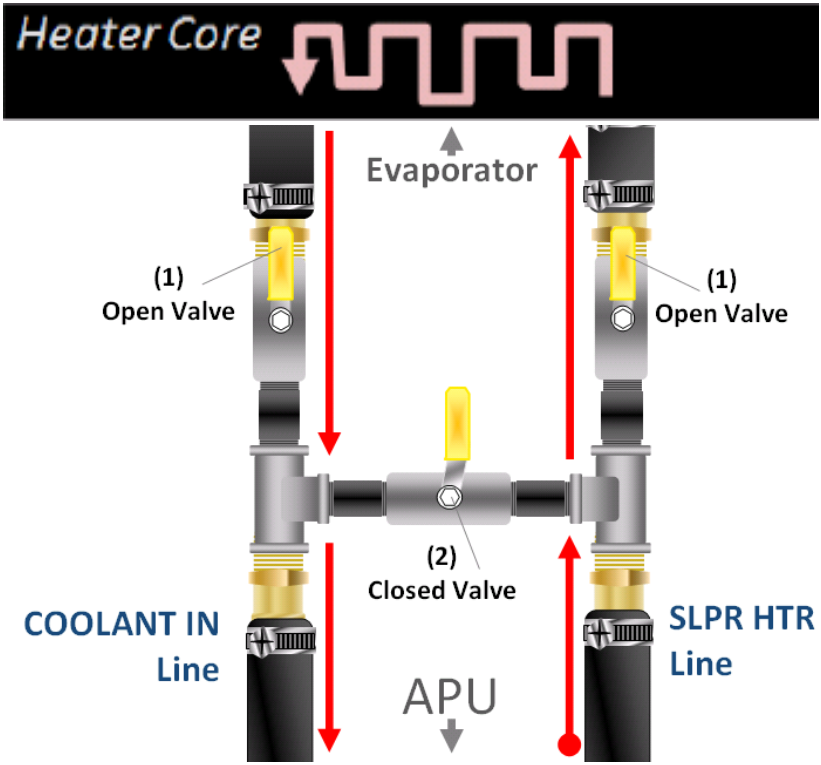
For Heat

1. Both parallel valves on the evaporator side must be open.

2. The cross valve between the two coolant lines must be closed.

This allows the hot coolant to flow into the heater core of the evaporator, and then back out to the APU.

See image below:



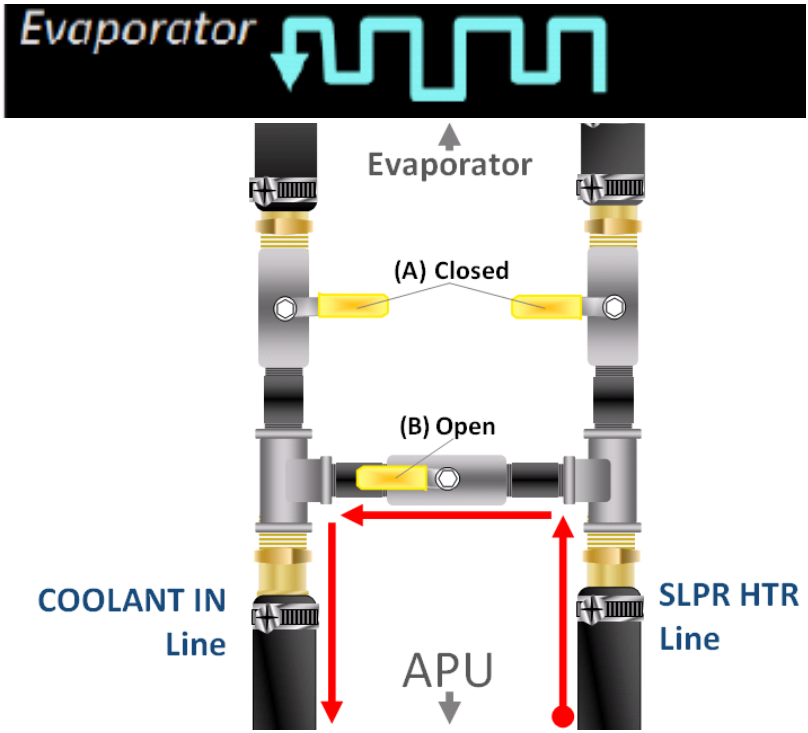
For Air Conditioning

A. Both parallel valves on the evaporator side must be closed.

B. The cross valve between the two coolant lines must be open.

This prevents the hot coolant from flowing into the heater core of the evaporator when you are running the AC.

See image below:



Stop / Reset and Manual 

1. This button places the module into its Stop/Reset Manual mode. This will clear any alarm conditions for which the triggering criteria have been removed.

2. Once in Manual mode the module will respond to the start button or Auto button, start the engine, and run off load.

3. The return delay timer operates to ensure that the starting request has been permanently removed and isn't just a short term removal.

4. Should another start request be made during the cooling down period, the set will return on load. If there are no starting requests at the end of the return delay timer, the load is removed from the generator to the mains supply and the cooling timer is initiated.

5. The cooling timer allows the set to run off load and cool sufficiently before being stopped. After the cooling timer has expired, the set is stopped.

Auto 

1. This button activates the 'Automatic' mode. The icon is displayed to indicate Auto Mode operations if no alarms are present. Auto mode will allow the APU to operate fully automatically, starting and stopping as required with no use intervention to charge the truck batteries.

2. The AUTO option can only be used when the APU is in it's Stop/Reset Manual mode (when APU is NOT running).

3. If your APU is running, press the red Stop button to shut down the APU, and then press the Auto button.

Start 

1. Pressing this button will start the engine after the 90 second safety delay. If your APU is in Auto mode and you wish to start the APU engine, press the red Stop button first and then the start button.

2. If the engine fails to fire during this cranking attempt then

the starter motor is disengaged for the crank rest duration after which the next start attempt is made. Should this sequence continue beyond the set number of attempts, the start sequence will be terminated and the display shows Fail to Start when the engine fires, the starter motor is disengaged. Speed detection is factory configured to be derived from the main alternator output frequency but can additionally be measured from a Magnetic Pickup mounted on the flywheel (Selected by PC using the 3000 series configuration software). Additionally, rising oil pressure can be used to disconnect the starter motor (but cannot detect under speed or overspeed).

3. After the starter motor has disengaged, the Safety On timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilize without triggering the fault.

4. Once the engine is running and all starting timers have expired, the animated icon is displayed. If all start requests are removed, the stopping sequence will begin.

NOTE: The load transfer signal remains inactive until the oil pressure has risen; this prevents excessive wear on the engine.

Page 

1. Toggles the display between instrumentation and event log mode. For additional information on the instrumentation icons, see the chapters Mode for Viewing Instruments and the chapter DSE Icons.

Scroll 

1. This buttons scrolls through the instruments in the currently displayed page.

Mode for Viewing the Instruments

It is possible to scroll to display the different pages of information by repeatedly operating the down button. Once selected, the page will remain on the LCD display until the user selects a different page or after a period of inactivity. The display will automatically return to the Status page if no buttons are pressed for the duration of the configurational LCD Page Timer. If an alarm becomes active while viewing the status page, the display shows the Alarms page to draw the operator's attention to the alarm condition.

Metering

Generator Voltage, 3-phase, L-L and L-N	Engine hours Run/ Oil Pressure Gauge
Generator Frequency	Engine Temperature Gauge
Mains Voltage, 3-phase, L-L and L-N	Fuel Level
Battery Voltage	Fail to Start

Indicators

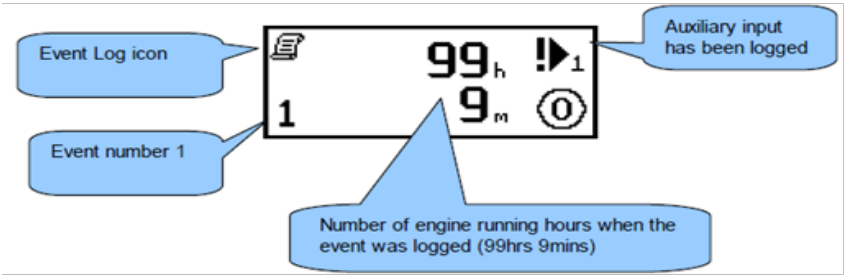
Fail to Stop	Failed to reach loading voltage
Low Oil pressure	Failed to reach loading frequency
High Engine Temp	Charge Fail
Under/Over-speed	Over Current – Warning, Shutdown or Electrical Trip
Under/Over voltage – Warning, Shutdown or Electrical Trip	Low DC Voltage; AMF indications
Emergency Stop; + CAN diagnostics	At power up, the display will display the software version and then display the default display screen, which will display Generator Frequency

EVENT LOG

The info button toggles between the display of the instrumentation and the event log. Pressing the down button will move to the previous event. A number in the bottom left indicates the event log entry currently being displayed.

There are five event log entries. When the event log is displayed, the alarm icon area indicates the alarm type at that position of the event log. The hours run at the time of the alarm will be displayed in the instrumentation area. The bottom right icon indicates the current mode as normal.

Module Display



Backlight

The backlight will be on if the unit has sufficient voltage on the power connection while the unit is turned on, unless the unit is cranking for which the backlight will be turned off.

Graphical Display

A 48x132 pixel LCD is used for the display. The display is segmented into areas for instrumentation, units, alarm icons and various other icons.

MODE ICON

An icon is displayed in the mode icon area of the display indicates the current mode of the unit.

Icon	Image	Details
Stopped		Appears when the engine is at rest and the unit is in stop mode.
Auto		Appears when the engine is at rest and the unit is in auto mode.
Manual		Appears when the engine is at rest and the unit is in manual mode.
Timer		Appears when a timer is active, for example cranking time, crank rest etc.
Running animation		Appears when the engine is running, and all timers have expired, either on or off load. The animation will be rate is reduced when running in idle mode.
Editor		Appears when the unit is in front panel editor

INSTRUMENTAL ICONS

When displaying instrumentation a small icon appears in the screen to indicate what is currently displayed. This allows you to distinguish icons for oil pressure, voltage, and coolant temperature for consistency.

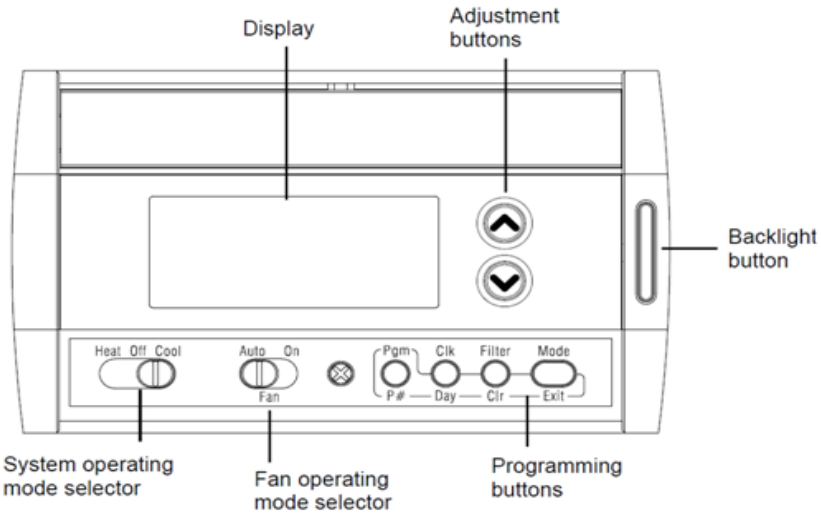
Icon	Image	Details
Generator		Used for generator voltage and frequency
Mains		Used for mains voltages and frequency. The WPS compact APU has NO generator.
Eng Speed		Engine speed instrumentation screen
Hrs Run		Hours run instrumentation screen
Battery Volt		Battery voltage instrumentation screen
Engine Temp		Coolant temp instrumentation screen
Oil Pressure		Oil pressure instrumentation screen
Sensor		Flexible sender instrumentation screen
Even Log		Appears when event log is displayed

ALARM ICONS

When current instrumentation is being displayed the icons area will be used to display currently active conditions. In instances where more than one alarm is present the icon area will transition between icons to display all active alarm conditions. When the event log is being displayed the alarm icon area will be used to indicate which alarm was logged.

Alarm	Icon
External Input Alarm	
Failed to Start	
Failed to Skip	
Low Oil Pressure	
Water Temperature	
Under speed	
Over speed	
Charge Alternator	
Low Fuel	
Plant Battery Volts (under/over)	
Under Voltage	
Over Frequency	
CAN data Fail	
ECU Warning/Fail	

Alarm	Icon
Emergency Stop	
Loss of MPU	
Flexible Sender Alarms	
MPU Open Circuit	
Mains Failure	
Mains Return	
Over Voltage	
Under Frequency	



The following information reflects the standard instructions for operating a common thermostat. Making adjustments to the settings of your controller is not recommended without reviewing the provided information. For detailed information, view the instruction guide that accompanies your thermostat.

Use the selector switch to place the system in heating mode or cooling mode or to set both modes to off.

Note: When you place the thermostat in cool mode, it may take up to five minutes before cooling can start. This is a safety feature for the compressor.

Fan Operating Mode

Use the selector switch to set the fan to auto mode or to continuous mode. The auto mode allows the fan to operate only when the heating or cooling system is on. This is a typical setting. The ON mode forces the fan to operate continuously.

Displaying the Temperature

The actual temperature is displayed on the controller display.

1. To view the set point, press the up or down arrow buttons.
2. The set point is displayed for 5 seconds with the arrow icon.

Note: Pressing either of the arrow buttons more than once will change the set point.

Setting the Temperature

Press one of the arrow buttons until the desired temperature is displayed.

Backlight

The display illuminates for 12 seconds when the backlight button or either of the arrow buttons is pressed.

Manual/Permanent Hold Mode

This mode maintains the temperature at a fixed set point. To place the thermostat in this mode, press [Mode]. The house icon will disappear.

Programmable Mode

This mode maintains the temperature according to the energy-saving schedule. To place the thermostat in this mode, press [Mode]. The current period will be displayed.

Temporary Bypass

If you modify the set point (using the arrow buttons) when the thermostat is in programmable mode, the thermostat will use the new set point for the next 2 hours.

The house icon flashed during the bypass. Afterwards, the thermostat will return to the temperature setting of the period currently underway.

Configuration Menu

1. To access the configuration menu, press the backlight button for 3 seconds.
2. To go to the next parameter (menu item), briefly press the backlight button.
3. To modify the parameter, press the up or down arrow buttons.
4. Repeat steps 2 and 3 if necessary.
5. Press the backlight button for 3 seconds to exit the configuration menu.

DISPLAY		DESCRIPTION	DEFAULT	OPTIONS
unit		Temperature display	°F	°C or °F
Hr		Time display	12 h	12 h or 24 h
ES		Early start [1]	Off	On or Off
dLS		Automatic daylight savings changeover [2]	Off	On or Off
CPH	🔥	Heating cycles per hour [3]	4	2, 3, 4, 5 or 6 [4]
	❄	Cooling cycles per hour [3]	4	2, 3, 4, 5 or 6 [5]

Setting the Time and Day

1. Press [Clk] once to set the hour, then press the up and down arrow buttons to appropriate time.
2. Press [Clk] again to set the minutes, and press the up and down arrow buttons to appropriate time.
3. Press the [Clk] button a third time to set the day (day will flash), and use the arrow buttons to set the day.
4. Press [Exit] to exit the controls.

Setting the Date

The date is needed for automatic daylight savings changeover.

1. Press [Clk] and hold down for 3 seconds to display the year.
2. Set the year using the arrow buttons, press [Clk] again to display the month.
3. Set the month using the arrow buttons, press [Clk] again to display the date.
4. Set the date using the arrow buttons, press [Exit] to exit the control settings.

Energy Savings Schedule

The schedule automatically controls your heat/cool system by switching between set points according to the preset times.

Modifying your Schedule

You can program up to 4 periods per day, each period having its own temperature settings. You can have a different program for each day of the week. For each period, you can set the start time, the heating set point and the cooling set point.

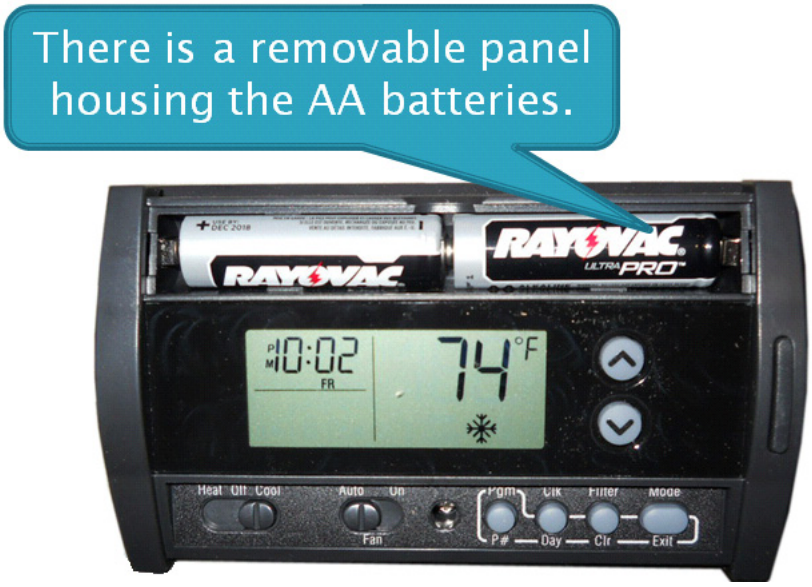
If you wish to use on 2 periods, set periods "1 and 4" or periods "2 and 3". Early start will not work if you set periods "1 and 2" or 3 and 4".

1. Press [Pgm] to display the period 1 settings.
2. During programming, to skip a period, press [CLR] while the period is displayed. For example, in the predefined energy-saving schedule, periods 2 and 3 have been skipped for Saturday and Sunday.
3. Press [Day] to select the day. Press for 3 seconds to select all 7 days.
4. Set the time (in increments of 15 minutes) using the arrow buttons.
5. Press [P#]. The heating or cooling set point flashes depending on the position of the Heat/Cool selector.
6. Set the desired temperature for the displayed period using the arrow buttons.
7. Use the Heat/Cool selector to switch to the other mode (E.g., if you were in Heating mode, switch to Cooling mode). The set point for that mode flashes.
8. Set the desired temperature using the arrow buttons.
9. Press [P#] to go to the next period.
10. Repeat steps 2 to 8 for the remaining periods.
11. Press [Exit] to exit control settings.

Battery Replacement Indicator

- Immediately install new batteries when the icon starts flashing.
- The icon flashes for 120 days before the batteries are depleted.
- You should replace batteries once a year or before leaving your thermostat unattended for more than a month even if the icon has not appeared.

WARNING: It is extremely important to keep the batteries charged in the thermostat.



- After replacing the batteries, set the time, day, and date.
- The temperature and program settings are saved and do not need to be re-entered.

WARNING: Before removing the batteries, place the system switch on the thermostat to off. Otherwise, the unit will continue to run even after the batteries are removed.

Recognizing a Blown Fuse

A blown fuse is common, although it does not happen often it is usually the first place to look when diagnosing your system.

To check a fuse, pull the fuse out of the fuse box, and look carefully at the filament inside the plastic shell. If there is a break in the filament, the fuse is blown as shown in image two below.

Image 1 - Working Fuse

Image 2 - Blown Fuse

WARNING: Do not install the incorrect fuse size.

A fuse will regulate the power to components of your APU system. It protects those components from overheating, power surges, and it keeps your system running properly. On occasion, a fuse will fail whether it is from wear over time or from other variables.

Changing a blown fuse is simple, but you must remember two very important rules before changing or installing a fuse.

1. A Fuse with Insufficient Amps is Bad

A fuse with insufficient amperage will blow more frequently and will have to be changed quite often. Because it can't handle the required power, it can blow immediately after attempting to run the system.

2. A Fuse with Too Much Amps is Worse

Installing a fuse with higher than recommended amperage can, and most likely will cause serious damage to the component. A proper size fuse prevents any electrical damage to the wiring system and to the components of the APU system.

FUSE BOX OVERVIEW

Your APU system has two main fuse boxes. The Engine Harness (EH) Fuse Box, and the A/C or A/C & Heat (AC/HT) fuse box depending on your system. The fuse box has two rows.

- The right side row is labeled from R1 to R5.
- The left row is labeled from F1 to F10.

Your relays are large square blocks with metal prongs. The only way to check a relay is by replacing and testing it with a new, working relay. A fuse requires a visual check shown on the previous page.

Inside the fuse box cover is a sticker that lists the proper fuse size, the component the fuse is protecting, and the installation location.

To Change a Fuse

Simply pull the fuse out of the fuse box slot, and insert the prongs of the new fuse into the correct slot, pressing it securely into place.

AC/HT Fuse Box & Cover

The AC/HT Fuse Box has five relays and three fuses that protect your air conditioning system.

Image 1 - AC/HT Fuse Box

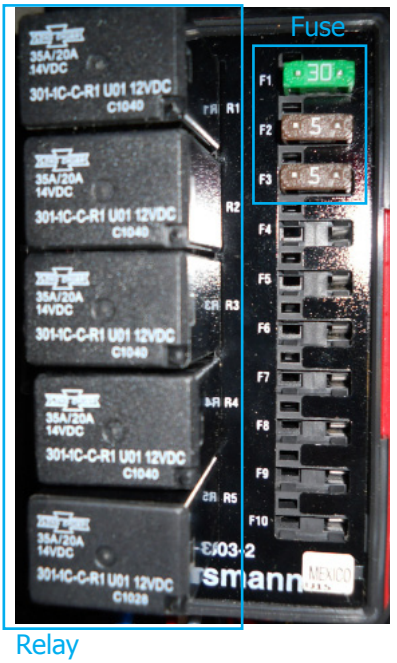
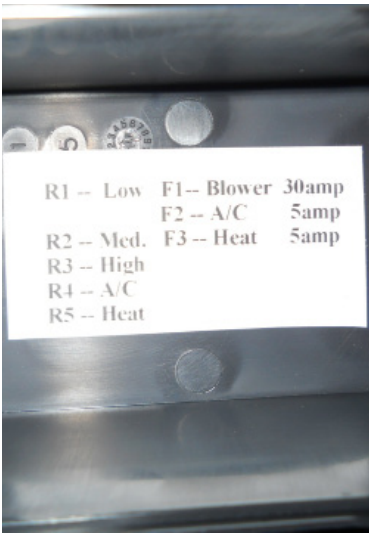


Image 2 - AC/HT Fuse Box Cover



EH Fuse Box & Cover

The engine harness fuse box protects the auxiliary power unit's engine components.

When you replace a fuse, remember to make sure that you have installed the fuse in the proper slot as described in the information label inside the fuse box cover.

Image 1 - AC/HT Fuse Box

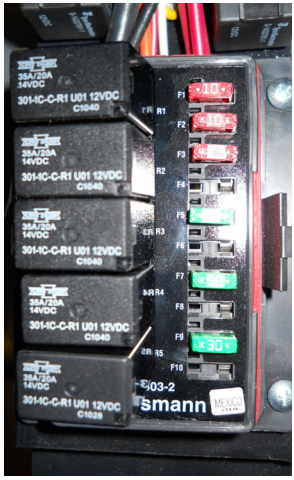
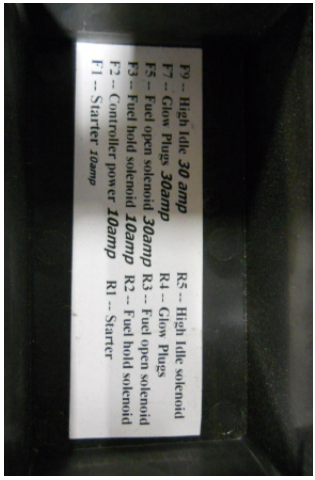
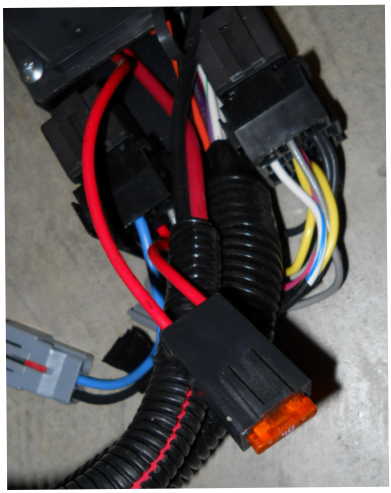


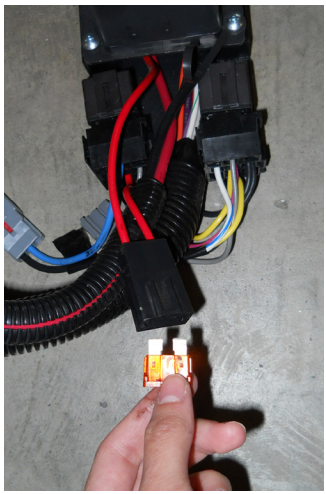
Image 2 - AC/HT Fuse Box Cover



Condenser Fan Fuse

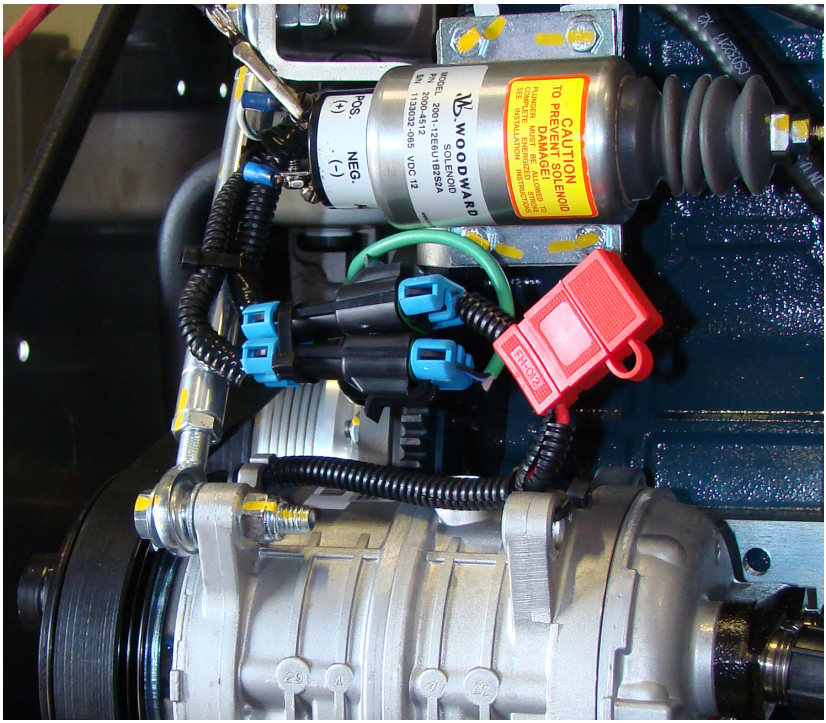
The fuse for the condenser fan is located below the EH fuse box on a single fuse holder. To change, simply pull the fuse out and replace it.





A/C Compressor Fuse

The A/C compressor has a 15 amp fuse located inside the APU chassis.



If you need service assistance, please call Willis Power Systems.

Office hours are Monday - Friday from 8 AM to 5 PM central time.

Willis Power Systems, LLC
2950 N. Martin Springfield, MO 65803
Toll Free: (800) 825-4631
Phone: (417) 831-2520
Fax: (417) 831-0030
service@willisapu.com
sales@willisapu.com
www.willisapu.com

COMMON PARTS & PART NUMBERS

All APU parts are available for replacement. Orders can be submitted on our website, by e-mail, or over the phone with our parts department at Willis Power Systems. Most Kubota parts are available at WPS only. For your convenience, we have included outside options for parts.

Willis Power Systems

2950 N Martin Ave, Springfield, MO 65804

Toll Free: 800-825-4631 | Fax: 417-831-0030

Web: http://www.willisapu.com

parts@willisapu.com | service@willisapu.com | sales@willisapu.com

Part Description	WPS PN	Availability
Relay	01700	Any Auto Store
5 Amp Fuse	02471	Any Auto Store
10 Amp Fuse	02220	Any Auto Store
15 Amp Fuse	01843	Any Auto Store
30 Amp Fuse	01468	Any Auto Store
40 Amp Fuse	02804	Any Auto Store
200 Amp Mega Fuse	00582	Any Auto Store
A/C Compressor Belt	02186	O'Reilly 02186
Alternator Belt	02186	O'Reilly 02186
Water Pump Belt	00171	Kubota/WPS
Silencer Air Filter	00770	Wix 46449
Element Fuel Filter	00234	Wix 33548
Oil Filter	00373	Wix 51064
Valve Fuel Check	00248	Kubota/WPS
Glow Plugs	03370	Kubota/WPS
Exhaust Manifold Gasket	00236	Kubota/WPS
Heat Exchanger Exhaust Gasket	00237	Kubota/WPS
Water Pump	00958-1	Kubota/WPS
Water Pump Gasket	00959	Kubota/WPS
Condenser Fan	02181	WPS Only

SERVICE CENTERS

Location of Sales, Installation, and Service centers for WPS auxiliary power units. Please call your nearest location to confirm your needs as some sites are sales, installation, service, or maintenance specific while other locations offer both installation and service.

General maintenance is available at all **Travel Centers of America** locations nationwide. Visit our service locator on our website to find a location nearest you. www.willisapu.com

For all service, installation, and sales centers see listing below.

Arkansas				
Peterbilt of Fort Smith	6915 Alma Hwy.	Van Buren	72956	866-318-9826
Florida				
German Auto World	2165 W. Atlantic Ave.	Del Ray Beach	33445	561-455-2820
Illinois				
Peterbilt of St. Louis	2350 Sauget Industrial Pkwy	Sauget	62206	866-727-7383
The Larson Group	1945 N. Morton Ave.	Morton	61550	309-263-1126
Clark Power Services	1430-B East of Chain Rocks Rd.	Granite City	62040	618-797-3320
Indiana				
Peterbilt of Louisville	4415 Hamburg Pike	Jeffersonville	47131	800-554-1478
The Larson Group	8401 Baumgart Rd.	Evansville	47725	812-868-6000
The Larson Group	4415 Hamburg Pike	Jeffersonville	47131	800-554-1478
Hoesli Diesel	5716 E. Morgan Ave	Evansville	47715	812-473-5604
Clark Power Services	2610 Independence Dr	Ft. Wayne	46808	800-513-9592
Clark Power Services	1240 W Thompson Rd	Indianapolis	46217	800-513-9594
Clark Power Services	2410 S. 30th St	Lafayette	47909	765-471-7818
Kentucky				
Goins Automotive	1098 N Bardstown Rd	Mt. Washington	40047	502-538-7200
The Larson Group	635 Viox Dr.	Erlanger	41018	859-534-6010
Clark Power Services	4680 Louisville Rd	Bowling Green	42101	270-781-1134
Clark Power Services	401 Triport Rd	Georgetown	40324	502-867-0800
Clark Power Services	751 US Highway 41 S	Henderson	42420	800-513-9593
Clark Power Services	2697 Grassland Dr	Louisville	40299	502-491-2021

Minnisota					
AllState Peterbilt N		21701 John Deere Ln	Rogers	55374	763-428-4333
AllState Sales		558 E. Vilaume Ave	S. St. Paul	55075	800-328-0104
AllState Peterbilt		27053 County Rd 12	Winona	55987	800-533-7384
AllState Peterbilt		2265 Howard Dr. W.	N. Mankato	56003	507-388-9312
Missouri					
Peterbilt Mid America		#1 North Central Dr.	O'Fallon	63366	800-765-7383
Peterbilt of Springfield		3026 N. Mulroy Rd.	Strafford	65757	800-666-7383
Peterbilt		4044 Coyote Dr.	Joplin	64804	800-74- 0472
Peterbilt		443 Western	Sikeston	63801	888-310-7383
Clark Power Services		4200 PCR 800	Perryville	63775	573-547-5506
Clark Power Services		788 N. Interstate Dr	Sikeston	63801	573-472-9717
Clark Power Services		1411 S. Service Drive	Sullivan	63080	573-468-5138
Clark Power Services		2252 E. Pitman Ave.	Wentzville	63385	636-332-3854
Mississippi					
Clark Power Services		645 Highway 45 South	Columbus	39701	662-328-1153
Clark Power Services		7604 US Hwy 49 N	Hattiesburg	39402	601-261-9253
Clark Power Services		620 Highway 49 South	Richland	39218	800-897-8918
Clark Power Services		407 S. Eason Blvd	Tupelo	38804	662-844-2212
North Dakota					
AllState Peterbilt		3739 38th Street SW	Fargo	58107	800-342-4949
Peterbilt of Bismark		3800 E. Century Ave.	Bismark	58501	701-255-7555
New Jersey					
Hunter Truck Sales		524 Monmouth Rd.	Clarksburg	08510	609-259-5950
Hunter Truck Sales		454 N. Broadway	Pennsville	08070	856-299-5010
New York					
Hunter Truck Sales		2970 Walden Ave.	Buffalo	14225	716-684-0010
Ohio					
The Larson Group		2550 Annuity Dr.	Cincinnati	45241	513-554-2200
The Larson Group		222 S. Wheatley St.	Empire	43926	740-537-2141
M Technologies		1818 Hopple Ave SW	Canton	44706	330-477-9009
AllState Peterbilt of Eastern OH		327 Stone Creek Rd.	New Philadelphia	44663	800-362-6680
Cleveland Peterbilt		8650 Brookpark Rd	Brooklyn	44129	216-749-3302
Peterbilt		3680 LeHarps Rd	Youngstown	44509	330-793-4421
Clark Power Services		3133 E. Kemper Rd	Cincinnati	45241	800-513-9591
Clark Power Services		6061 Executive Blvd	Huber Heights	45424	937-684-4402

Pensylvania					
Hunter Truck Sales		9981 Old Route 22	Breinigsville	18031	610-285-2244
Hunter Truck Sales		519 Pittsburgh Rd.	Butler	16002	724-586-7744
Hunter Truck Sales		1503 Airstream Way	Clearfield	16830	814-768-7679
Hunter Truck Sales		101 E. Main St	Eau Claire	16030	724-791-2525
Hunter Truck Sales		6390 Clintonville Road	Emlenton	16373	724 867 5290
Hunter Truck Sales		8125 Wattsburg Rd.	Erie	16509	814-825-3330
Hunter Truck Sales		1463 Mainheim Pike	Lancaster	17601	717-299-6630
Hunter Truck Sales		4637 Campbells Run	Pittsburgh	15205	412-787-0600
Hunter Truck Sales		100 Hunters Way	Smithfield	15478	724-564-4292
South Dakota					
Larson Truck Sales		27115 S. Parklane Dr.	Soux Falls	57106	605-368-5217
Northwest Peterbilt		11720 J.B. Drive	Black Hawk	57718	800-697-3024
Tenessee					
Clark Power Services		2211 Express Dr	Richfield	38305	731-668-7939
Clark Power Services		3070 Sandbrook St	Memphis	38116	800-897-8901
Texas					
Manex		310 N. Rogers Rd	Irving	75061	972-241-6674
Wisconsin					
Advanced Diesel		2666 Mayfield Way	Richfield	53076	262-305-4453
AllState Peterbilt		6500 Texaco Dr.	Eau Claire	54703	877-874-4747
AllState Peterbilt		211 Hammond Ave.	Superior	54880	800-408-5264
AllState Peterbilt		926 Commercial Court	Lacross	54650	800-665-0433
AllState Peterbilt		1620 Winnebago Ave.	Tomah	54660	608-372-0917

WARRANTY

Upon warranty activation, Willis Power Systems, LLC (WPS), warrants to the original buyer that the Willis APU (less Major Components), configured with closed loop cooling, will be free from defects in material and workmanship for two years or 2000 hours of operation, whichever comes first, from the date of original truck installation by a WPS Authorized Service Center or Dealer. Failed components may be required to be returned to WPS for verification of defect and normal use prior to Warranty claim processing.

Kubota Engine

The Kubota engine is warranted separately by Kubota Engine America Corporation for two years or 2000 hours, whichever comes first, from the date of original truck installation by a WPS Authorized Installation Center or Dealer.

Major Components

The following APU major components are covered by the Original Equipment Manufacturer One Year warranty (Alternator, Air Conditioning Compressor, Evaporator, Pneumatic Compressor, Cooling Fan, Radiator, Air Conditioning Remote Condenser Unit, ECU, and Cab Display or APU controller).

WPS will repair or replace any part covered by this warranty that becomes defective, malfunctions or otherwise fails to conform to this warranty under normal use and during the term of this warranty, at no charge for parts or labor. Labor is in accordance with current WPS labor allowance schedule which is the only labor remedy. Repair and replacement of components under this warranty shall not extend the warranty period for the Willis APU, or for any component of the Willis APU, except as may be provided in manufacturers' warranties for individual components at their option.

In order to obtain warranty repairs, you should deliver the product, together with proof of purchase, to a WPS Authorized Installation Center or Dealer at your expense. The names and addresses of WPS Authorized Installation Centers or Dealers are listed at www.willisapu.com or you may write or telephone us to obtain them.

This warranty does not cover:

1. Defects, malfunctions, or failures resulting from accidents, abuse, modifications, alteration, improper servicing, improper installation or failure to perform required service.

2. Normal maintenance services or parts associated with such services,

including but not limited to filters, filter elements, oils, lubricants, coolant, belts and glow plugs.

3. Non-approved parts.

4. Parts that are returned for warranty credit and verified to be in good working order.

5. Used parts.

6. Any damage caused by overheating the Willis APU that is not a direct result of a defect in APU materials or workmanship.

7. Damage caused to the host truck due to improper maintenance or utilization of such truck, whether or not such damage is related in any way to the presence of the Willis APU on the truck.

We neither assume nor authorize anyone to assume for us any other express warranty. The Authorized Installation Center or Dealer has no authority to make any representation or promises on behalf of Willis Power Systems, LLC, or to modify this warranty.

All other expressed or implied warranties arising under law of equity, and including without limitation, the implied warranties of merchantability and fitness for a particular purpose are hereby expressly excluded from the sale and purchase of the Willis APU and related apparatus sold hereunder, regardless of whether a claim arises under contract tort principles. The Buyer's sole remedy hereunder shall be limited to the repair or replacement of any nonconforming equipment or parts, but only if returned to the Company's factory or a WPS Authorized Installation Center or Dealer within the warranty period defined above, or with the express approval of WPS management. Willis Power Systems' liability on any and all claims for damage or loss related to the delivery, installation and use of the Willis APU shall not exceed the original installed price of the Willis APU. IN NO EVENT WILL WPS BE LIABLE FOR LOSS OF USE, LOSS OF PROFITS, LOSS OF, OR DAMAGE TO, SHIPPED GOODS, INCONVENIENCE, COMMERCIAL LOSS, OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Maintenance

Proper use of the Willis APU requires that it be maintained according to the schedule defined in the Willis APU Instruction Manual. As a condition of this warranty, Willis Power Systems may require written substantiation that scheduled service performed on the Willis APU has been carried out.

Warranty Activation

Activation of the WPS APU warranty requires that the following be completed in full and returned within 30 days of install to WPS via website, mail or fax (417) 831-0030. The WPS APU warranty is void and non-valid until the information is returned. A letter of receipt will be sent to the purchaser's address acknowledging the below information has been received and warranty is activated.

1. Warranty registration form (SER 001-001)
2. Installation Checklist (SER 001-013)
3. Operator Training Checklist (SER 001-011)

Transfer of Warranty

This warranty shall be for the benefit of the initial purchaser. If a truck upon which the Willis APU is installed is sold, the new owner may request in writing that WPS transfer the remainder of the original warranty. Such a request shall note the hours accumulated by the Willis APU at the time of ownership transfer, as well as the initial date of installation.

No warranty transfer will be granted for a Willis APU unit that has been removed from one truck and installed on another, unless such installation is done at a WPS Authorized Installation Center or Dealer, and the transfer is requested in writing as described previously.

WPS reserves the right to deny transfer of warranty if these conditions are not met. WPS also reserves the right to deny warranty extension if the transfer and reinstallation of the Willis APU is not done to the satisfaction of a company-authorized inspector.

This warranty is extended under the laws of the State of Missouri. Enforcement of this warranty shall be conducted according to the laws of the State of Missouri. By acceptance of this warranty, the owner of the Willis APU agrees that any litigation and the resolution of any dispute between Willis Power Systems shall be conducted exclusively in courts of the State of Missouri.