TriPac™ EVOLUTION
with
Diesel Particulate Filter (DPF)
TK 56295-19-OP (Rev. 2, 03/16

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The procedures described herein should only be undertaken by suitably qualified personnel. Failure to implement these procedures correctly may cause damage to the Thermo King unit or other property or personal injury.

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Introduction

Taking the time to read this manual will help in understanding how to properly operate, service and maintain your Thermo King Diesel Particulate Filter (DPF) system.

Performing pre-trip checks and enroute inspections on a regular basis will minimize on-the-road operating problems. A regular maintenance program will also help to keep your DPF system in top operating condition. When factory recommended procedures are followed, you will find that you have purchased the most efficient and dependable diesel particulate filter system available. All service requirements, major and minor, should be handled by a Thermo King dealer for four very important reasons:

• They are equipped with the factory recommended tools to perform all service functions
• They have factory trained and certified technicians
• They have genuine Thermo King replacement parts
• The warranty on your new DPF system is valid only when the repair and replacement of component parts is performed by an authorized Thermo King dealer.

When the DPF system and its components are installed onto a Thermo King TriPac APU diesel engine, the emission control level will conform to the California Air Resource Board (CARB) Airborne Toxic Control Measure (ATCM), and is warranted for a period of 3-years or 1600- hours, which ever comes first, as it applies to Auxiliary Power Units (APU). See “Diesel Emission Warranty” on page 59 for complete details.

IMPORTANT: This manual is published for informational purposes only and the information furnished herein should not be considered as all-inclusive or meant to cover all contingencies. If more information is required, consult your Thermo King Service Directory for the location and telephone number of the local dealer.
Safety Precautions

Thermo King recommends that servicing be done only by an authorized Thermo King dealer. However, there are several general safety precautions that you should become familiar regarding the Thermo King Diesel Particulate Filter (DPF).

The warning symbol appears next to a point that is particularly important:

- **DANGER:** Addresses a circumstance that, if encountered, will lead to death or serious injury.

- **WARNING:** Addresses a circumstance that, if encountered, might lead to death or serious injury.

- **CAUTION:** Addresses a circumstance that, if encountered, may cause damage to equipment or minor injury.

### General Practices

- **DANGER:** Always turn the TriPac unit off while refueling the truck. Fuel vapors could ignite if they come in contact with TriPac electrical or heater components.

- **WARNING:** Turn the TriPac unit On/Off switch to the Off position before inspecting any part of the APU or the Diesel Particulate Filter (DPF) components.

- **WARNING:** Disconnect the positive power cable from the truck's battery to the Diesel Particulate Filter (DPF) before servicing any of its components.
Safety Precautions

Burn Hazard

WARNING: The Diesel Particulate Filter (DPF) canister, exhaust system components and exhaust discharge at the tail pipe can get extremely hot and could cause serious burns to the skin.

Fire Hazard

WARNING: The Diesel Particulate Filter (DPF) canister, exhaust system components and exhaust discharge at the tail pipe can get extremely hot and could ignite a fire if placed in close proximity with combustibles such as dry grass, paper or leaves.

Hazardous Material

WARNING: The Diesel Particulate Filter (DPF) accumulates ash that may be considered hazardous material and must be disposed of in accordance with all applicable Federal, State, and local laws.
TriPac Unit Description

The Thermo King TriPac EVOLUTION APU (Auxiliary Power Unit) provides auxiliary heating, cooling temperature management that allows drivers to reduce unnecessary truck engine idling, conserve diesel fuel and save money. TriPac EVOLUTION provides truck engine preheating, battery charging and truck cab sleeper compartment climate control.

By using TriPac, drivers can reduce fuel cost, rest comfortably during stops and comply with local, state and federal anti-idle laws. Reducing unnecessary truck engine idling also reduces engine wear and extends engine maintenance intervals.

TriPac’s own diesel engine uses an automatic start/stop feature for additional fuel efficiency.

TriPac’s two-cylinder diesel engine is EPA Tier 4 approved. An automotive type air conditioning compressor is used for sleeper compartment cooling. A fuel-fired air heater provides sleeper compartment heat in cold conditions. Voltage sensing automatically charges the truck batteries from TriPac’s 12-volt alternator. Noise dampening construction assures quiet operation. Truck engine preheating provides easier cold-climate starts by exchanging coolant between TriPac and the truck engine. An optional inverter provides 120-volt power to operate on-board appliances. An optional Arctic package aids truck engine startups in cold weather by sensing low coolant temperature. The TriPac is started automatically to heat the coolant as required.

For units equipped with a Diesel Particulate Filter (DPF), See “DPF Description” on page 15.
TriPac Unit Description

**Standard Features**
- Human Machine Interface (HMI) Controller
- Truck cab sleeper compartment cooling and heating for driver comfort in all climates
- Truck engine preheating for easy starts in cold climates
- Truck battery charging with automatic low voltage sensing
- 9.0 hp 2 cylinder diesel engine - EPA Tier 4
- Thermo King TK 15 compressor for air conditioning
- Diesel fuel-fired sleeper compartment air heater
- 65 amp alternator standard
- Noise-dampening construction for quiet operation
- Automatic start/stop operation for maximum fuel efficiency

**System Components**
- Auxiliary Power Unit (APU)
- Condenser
- Evaporator
- Heater
- HMI Controller
- Engine On/Off Switch
- Control Box and Fuses

**Auxiliary Power Unit (APU)**

The TriPac EVOLUTION APU is mounted onto the side of the tractor’s frame rails and contains the diesel engine, air conditioning compressor, alternator and engine On/Off switch.
**Condenser**

The TriPac air conditioning condenser is typically mounted on the outside rear wall of the truck cab.

**Evaporator**

The TriPac air conditioning evaporator is typically installed under the bunk in the truck cab sleeper compartment. Air ducts from the evaporator carry conditioned air to the sleeper compartment. The evaporator has a filter that can easily be removed for cleaning.
Heater
The TriPac heater is typically installed in the cargo compartment or under the truck cab sleeper compartment. It draws fuel from the truck’s diesel fuel tank and is powered by the truck’s batteries.

HMI Controller

DANGER: Always turn the TriPac HMI Controller OFF while refueling the truck. Fuel vapors could ignite if they come in contact with TriPac electrical or heater components.

The TriPac HMI controller is installed in the truck cab, typically on a wall in the sleeper compartment. It is easily accessible to the driver and controls the heating, cooling and fan operation of the TriPac. If necessary, system operating parameters can be programmed by your Thermo King dealer.
**Engine On/Off Switch**

The APU Engine On/Off Switch is located inside the TriPac APU housing on the lower right side of the frame. This switch is used to disable the engine when performing service and maintenance on the TriPac system. The switch is normally in the ON position to allow the TriPac system to operate.

**Control Box and Fuses**

The control box is typically located in the bunk area. The control box contains the circuit board and operates on 12 Volt DC supplied by the truck batteries.

The electrical system is protected by a number of fuses. Most of the fuses are located inside the control box. Other fuses are located in fuse holders in wire harnesses. See “TriPac Fuses” on page 47.
Standby Truck Integration with Dash-Mounted Selector Switch (Option)

This optional switch allows the operator to disable the TriPac system without accessing the HMI Control Panel in the sleeper.
DPF Description

The Thermo King Diesel Particulate Filter (DPF) is designed to reduce the particulate matter output from the TriPac APU’s diesel engine. When the TriPac’s APU is operating, the DPF control system monitors the APU’s diesel engine exhaust. The DPF canister captures the particulate matter from the APU’s engine exhaust and the control system alerts the driver when to initiate the regeneration process to clean the particulate matter (soot) from the filter. The driver initiates the regeneration by activating the dash-mounted regeneration switch. After approximately 1 to 2 hours, the regeneration process is complete, the indicator lights go out and the APU is ready to operate again. This process will be repeated after the APU has been operated again for a period of time. The DPF system replaces the standard APU muffler and exhaust system and includes a Solid State Control Module, Valve Box, Exhaust Monitor and a dash-mounted Regeneration Switch.

IMPORTANT: The DPF system operates using electrical voltage supplied by the truck’s alternator system. Due to the large current draw required by the DPF, the regeneration process should only be initiated during daytime hours while the truck is expected to be operating at highway speeds (above 1150 rpm) for a minimum of one hour. Do not operate the DPF while the truck is stopped, idling or moving slowly in traffic. If this condition occurs, the regeneration process may automatically be cancelled.

NOTE: The TriPac APU will be disabled when the DPF is in the regeneration mode or if the DPF regeneration switch is in the OFF position.
DPF Description

DPF System Components

- Stainless Steel DPF canister and exhaust components
- DPF Exhaust Monitor
- DPF Regeneration Switch
- Solid State Control Module Assembly with On-board Diagnostic System.
- Corrosion resistant Valve Box.

DPF Canister

The DPF canister is typically mounted to the rear of the APU in place of the standard exhaust and muffler system. The exhaust particulate matter that is captured and retained in the DPF canister is burned off during the regeneration process.

DPF canister mounted onto the rear of a TriPac APU
DPF Exhaust Monitor

The DPF Exhaust Monitor is typically mounted in the bunk area of the tractor. Two indicator lights are displayed on the monitor to alert the driver when to initiate a regeneration, when a regeneration is in process, or when a fault has been detected by the on-board diagnostic system. These lights not only help the driver determine when to initiate the regeneration, but also identify any problems that may have been detected by the on-board diagnostic system. The red DPF Fault and amber DPF Status indicator lights are displayed on the Exhaust Monitor, while only the amber DPF Status indicator light is displayed on the Regeneration Switch.

When no indicator light is displayed, the DPF system has not detected any need to initiate a regeneration and the TriPac APU can be operated as usual.
**Regeneration Switch**

The DPF Regeneration Switch is typically mounted in the truck’s instrument panel. The switch allows the driver to initiate a regeneration or to cancel the regeneration if necessary. The switch has an amber indicator light which illuminates when a regeneration is required.

*NOTE: The TriPac APU will be disabled when the DPF is in the regeneration mode or if the DPF regeneration switch is in the OFF position.*

![Amber Indicator Light Location on Switch](image1)

**Control Module Assembly**

The Control Module Assembly is typically mounted on top or near the existing TriPac control box and is connected to the TriPac’s control system. The control module monitors the APU’s exhaust and operates the DPF system components. The control module also includes an on-board diagnostic system used for diagnostic and maintenance purposes.

![Control Module Assembly](image2)

| 1. TriPac Control Box | 2. Control Module Assembly |
Valve Box

The Valve Box is mounted on the exterior of the truck and contains an electrical contactor, air solenoid and blower motor. These components are used to operate the DPF system.

![Valve Box shown mounted on exterior of truck](image)

Protection Devices

Battery Voltage Monitoring

The DPF control system monitors the truck’s battery voltage and stops the regeneration process if the voltage raises or drops below a safe operating level.

On-Board Diagnostic System

The DPF controller includes an on-board diagnostic system that monitors the TriPac’s APU diesel engine exhaust and the operation of the DPF regeneration process. If a problem is detected while in the regeneration mode, the on-board diagnostic system will display the WARNING or SHUTDOWN fault code(s) for diagnostic purposes. Additionally, if a SHUTDOWN code is detected, the system will shutdown and disable both the DPF and the TriPac system from operating.
Fuses
Three fuses are used to protect the DPF components:

**Main Fuse:** A 150 amp fuse protects the DPF canister from shorts. The fuse is located on the positive battery cable, near the truck’s battery.

**Ignition Switch Fuse:** A 1 amp fuse protects the ignition wire input from shorts. The fuse is located in-line and typically is connected to the truck’s "SWITCHED POWER" side of the ignition system.

**Control Module Fuse:** A 10 amp fuse protects the control module from shorts. The fuse is located inside the valve box.

Relays
Four relays are used to operate the components of the DPF system. The relays are located on the Control Module Assembly panel inside the truck.
Manual Pretrip Inspection

Complete TriPac pretrip inspections are an important part of a preventative maintenance program designed to minimize operating problems and breakdowns. Perform this pretrip inspection before every trip.

*NOTE: Pretrip inspections are not intended to take the place of regular maintenance inspections.*

**Before Starting the TriPac Unit:**

**TriPac Engine:** Check engine oil and coolant levels.

**TriPac Belts:** Make sure the TriPac APU belts are in good condition and adjusted to the proper tension.

**TriPac and DPF Electrical:** Check the electrical connections to make sure they are securely fastened. Wires and terminals should be free of corrosion, cracks, and moisture.

**TriPac and DPF Structural:** Visually inspect both the unit and DPF for leaks, loose or broken parts, and other damage.

**TriPac Coils:** Make sure the condenser, evaporator and pre-cooler coils are clean and free of debris.

**TriPac Heater:** Check exhaust pipe and intake tube to be sure they are secured properly and the inlet and outlets are not obstructed.

**General:** Listen for unusual noises and vibrations.
TriPac Operating Instructions

The HMI (Human Machine Interface) is typically mounted in the bunk area of the truck cab. The operator can select the desired function of the system. It has three selector knobs and system condition display. The HMI contains the Cab Temperature Sensor. It communicates with the Controller using the Controller Area Network (CAN).

HMI Control Panel Display

The operator can select these functions from the HMI:

- System On/Off
- Mode (Cool, Fan, Heat)
- Cab Temperature (Cooler/Blue-Warmer/Red)
- Fan Speed (Off, Low, Medium, High)

When any change of settings is made there is a two second delay before the controller will recognize the new setting. This prevents momentary or accidental mode changes.

The HMI indicator LEDs will dim after 90 seconds if no selections are made. Bump the On/Off button to activate bright display for an additional 90 seconds.
On/Off Button
The On/Off Button is behind the left knob on the HMI. It provides several functions depending on how long the button is pressed.

Press Button for ON or OFF

Turn system On: If the system is off, press the Mode Selector knob for a minimum of 1 second to turn the system on. The mode icon will flash for 10 seconds while the controller completes a boot process. Once the system has been turned on the system mode, temperature or fan speed may then be selected. If no selection is made the system will be in Monitor Mode. See Monitor Mode later in this section.

NOTE: Pressing the Mode Selector knob for less than 1 second will not turn the TriPac system on.

Turn system Off: If system is on, press the Mode Selector knob for a minimum of 2 seconds to turn the system off.

Display System Status: If system is on but display has dimmed, press the Mode Selector knob for less than 1 second to restore display to full brightness. The display will automatically dim again in about 90 seconds. Pressing the Mode Selector knob for less than 1 second is referred to as a “Bump”.

Mode Selector
Mode selection is accomplished by rotating the left Mode Selector knob. It selects between three operating modes. A mode icon will flash then light indicating the selection. There will be a two second delay before the new mode is activated to prevent momentary or accidental mode changes. When the system is first turned on at the HMI there will be a 10 second delay before the selected mode is activated.

- Cool Mode
- Fan Only Mode
- Heat Mode
**NOTE:** When the system is turned on for the first time after replacing or disconnecting the main controller from power, the mode icon will flash for approximately 60 seconds. This is the initial boot of the micro processor.

**Temperature Selector**

Temperature selection is accomplished by rotating the center temperature selector knob. It adjusts the desired cab temperature cooler (blue) or warmer (red). Adjust to operator comfort. The default represented range is approximately 65 - 80 °F (20 - 27 °C) in Cool Mode and 50 - 80 °F (10 - 27 °C) in Heat Mode.

**Mode Selection**

1. Cool Mode
2. Fan Only Mode
3. Heat Mode

**Center Knob Adjusts Temperature**
**Fan Speed Selector**
Evaporator fan speed selections are Off, Low, Medium and High. Rotating the Fan Speed Selector knob clockwise will increase fan speed, counterclockwise will decrease fan speed. As fan speed increases/decreases, groups of four LEDs will progressively turn on/off. The fan will continue to run at the chosen speed. When Air Conditioning mode is selected and Fan Speed is selected OFF, the fan speed will default to LOW. When Fan Only or Heat mode are selected Fan Speed will default to OFF.

![Fan Speed Selector Diagram](image)

1. FAN Selector  
2. LEDs

Right Knob Adjusts Fan Speed

**System Condition**
Display Several LED indicators are on the left side of the HMI. These provide additional System Condition information.

**Standby Indicator**
STBY is illuminated when the system is in Standby or Monitor mode.

![System Condition Display Icons](image)

1. ENG Icon  
2. Alarm Icon  
3. ALT Icon  
4. STBY Icon  
5. ACS Icon

System Condition Display Icons
TriPac Operating Instructions

Alarm Icon
If the system has an active alarm the Alarm Icon will illuminate. It will be Red for shutdown alarms and Yellow for Check alarms.

Alarm Group Indicator
System shutdown alarms have been organized into three general groups to help diagnosis. When a shutdown alarm is generated the red Alarm Icon and the corresponding Alarm Group name will illuminate.
- [ENG] are APU engine related alarms.
- [ALT] are alternator or charging system alarms.
- [ACS] are air conditioning system related alarms.

Clearing Alarms
Alarm codes can be cleared by turning the controller off and back on again. If the condition that caused the alarm still exists, the alarm will return. Refer to the TriPac EVOLUTION Diagnostic Manual TK 55739 for more information about alarm codes. Contact the nearest Thermo King dealer if alarms continue to appear.

Operating Modes

Cool Mode
When Cool Mode is selected at the Mode Selector knob, the HMI Control Panel uses the Cab Temperature Sensor to measure sleeper compartment temperature. If it is above the temperature selected by the Setpoint Selector knob, the APU engine will begin a start sequence (if not already running). The evaporator fan is defaulted ON and will run in low or the speed selected by the Fan Speed Selector knob. The compressor clutch will engage 60 seconds after a successful engine start. The system will cool the sleeper compartment until it falls to the selected setpoint temperature. The compressor clutch will disengage but the APU engine will continue to run for several minutes based on the Engine Delay Timer setting (default 8 minutes). The evaporator fan will continue to run at the
selected speed. If sleeper compartment temperature rises above setpoint by more than the Dead Band setting (default 3 F) during this time the compressor clutch will re-engage.

During normal air conditioning operation the compressor clutch may cycle on and off with no alarm. The evaporator fan will continue to run. The system is monitoring the Evaporator Coil Temperature sensor to prevent frost buildup on the evaporator coil. If coil temperature falls below 32 F the compressor clutch is de-energized. When coil temperature rises above 45 F the compressor clutch is energized.

The APU engine will shut down when the sleeper compartment temperature remains near setpoint and the truck batteries are charged. The evaporator fan will continue to run. If sleeper compartment temperature rises above setpoint by more than the Dead Band setting (default 3 F) the APU engine will restart and compressor clutch will re-engage. Battery voltage sensing and engine coolant temperature sensing are enabled for the APU. Refer to Monitor Mode.

**Heat Mode**

The air heater is a separate module that heats the sleeper compartment to the setpoint selected with the Temperature Selector knob. Sleeper compartment temperature is sensed inside the air heater, it does not use the Cab Temperature Sensor on the HMI. All heater function is controlled by a separate module inside the heater. The TriPac evaporator fan is defaulted to OFF when Heat Mode is selected. It can be turned on to provide additional air circulation. Battery voltage sensing and engine coolant temperature sensing are enabled for the APU. Refer to Monitor Mode.

**Fan Mode**

The TriPac evaporator fan can be turned on with the Fan Speed Selector knob to provide additional air circulation in the sleeper compartment and truck cab. Three fan speeds can be selected (Low, Medium, High). LEDs around the Fan Speed Selector will indicate the selected speed. Battery voltage sensing and engine coolant temperature sensing are enabled for the APU. Refer to Monitor Mode.
Standby Mode (Option)
The optional TriPac Standby Mode allows the system to be controlled by an external switch input. This is typically the truck ignition using the optional Standby Truck Integration. The feature is used to disable the TriPac APU when the truck engine is running. When the truck ignition switch is in the run position, a voltage signal is sent to the controller. The TriPac system will enter Standby Mode. The following occurs when the TriPac system is in Standby Mode:

- The STBY indicator on the HMI will illuminate.
- Air conditioning, fan or heat operation will terminate.
- The APU engine will stop.
- The TriPac controller remains on but will not respond to any operation requests, such as low battery voltage or low coolant temperature.

Standby Truck Integration (Option)
An optional wire harness connects the truck ignition switch to an input connection on the TriPac interface board. The board monitors voltage on this circuit.

- Truck ignition switch is in the Off or Acc position. If the TriPac system is turned on the unit operates normally.
- Truck ignition switch is in the Start or On position. The TriPac unit is forced to Standby mode. The HMI Controller STBY indicator will illuminate.
Standby Truck Integration - with Dash-Mounted Selector Switch (Option)

An optional wire harness connects the truck ignition switch and dash mounted selector switch to an input connection on the TriPac interface board. The board monitors voltage on this circuit.

Dash-mounted selector switch is in the NORMAL position:
- If the TriPac system is turned on the unit operates normally. The system will respond to the truck ignition as with the Standby Truck Integration option.

Dash-mounted selector switch is in the STANDBY position:
- The TriPac system will enter Standby Mode. This allows the operator to disable the TriPac system without accessing the HMI Control Panel in the sleeper.

Monitor Mode

Activate
By default Monitor Mode is active when the TriPac system is turned on at the HMI Control Panel but a mode has not been selected by the operator. Monitor Mode is also activated when the truck ignition has been turned on (Standby) then turned off. The STBY indicator on the HMI will illuminate.

Deactivate
Monitor Mode will be deactivated and system will begin HVAC operation if the operator presses the On/Off button at the HMI, moves the Mode selector or moves the Fan Speed selector. The selected HVAC mode will activate. The STBY indicator on the HMI will turn off. System will continue to monitor battery voltage and engine coolant temperature.

Operation
While Monitor Mode is active the APU will continue to start and stop as necessary to maintain battery voltage and engine coolant temperature (if the Arctic Option is installed). While in Monitor Mode the system will not react to changes in cab temperature. TriPac Cool, Heat and Fan modes will remain off.
Battery voltage sensing is enabled. When battery voltage falls to the level set by Battery Voltage Restart Value (default 12.2 Vdc) the APU engine will start so it can charge batteries. It will continue to run until the Charge Current Shutoff Value setting has been reached (default 12 amps).

If the Arctic Option is installed and enabled, truck engine coolant temperature sensing will occur. If engine coolant temperature at WT2 falls below 35 F the APU engine will start to warm the truck engine. It will continue to run until returning coolant temperature rises to 55 F.

Monitor Mode may be disabled. If disabled the system will return to the mode it was in when the truck ignition was turned on.

*NOTE: This is not the recommended setting. Refer to the TriPac EVOLUTION Diagnostic Manual TK 55739 Section 3, Software Settings, Switch to Monitor for more information.*

### Engine Load Management

To maintain Tier 4 engine emission levels, engine load may be reduced under some conditions.

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### Engine On/Off Switch

**WARNING:** The unit may start automatically without warning if the Engine On/Off Switch is in the On position.

**WARNING:** Immediately stand clear when the preheat buzzer sounds. This indicates that the engine is preheating and will start shortly. If the engine is hot, preheat time will only be a few seconds.

The Engine On/Off Switch is located inside the TriPac APU housing on the lower right side of the frame. This switch must be in the On position for the TriPac engine to operate.
The APU Engine On/Off Switch functions as a service switch. It allows maintenance personnel to disable the APU engine. This assures the engine will not crank even if the HMI On/Off button is pressed on.

When the Engine On/Off switch is placed in the Off position:

- If the TriPac system is OFF and the TriPac HMI On/Off button is pressed, no alarm will generate. The engine will not start.
- If the TriPac system is ON but the APU engine is not running, no alarm will generate. The engine will not start.
- If the TriPac engine is running, the engine will stop and a shutdown alarm (code 35) will generate in the [ENG] group. The engine will not restart.

### DPF Regeneration Switch

The DPF Regeneration Switch has three positions:

- 1 (top position) - **DPF Regeneration ON**
- 2 (center position) - **TriPac and DPF ON**
- 3 (bottom position) - **DPF OFF**

To operate the TriPac, place the Regeneration Switch in the center (ON) position.

*NOTE: The TriPac APU will be disabled when the DPF is in the regeneration mode or if the DPF regeneration switch is in the OFF position.*
Alarm Codes

Alarm Notification
The TriPac control system continually monitors operation and can generate several alarm codes. If the unit has an alarm condition the operator will be notified by an illuminated Alarm Icon on the HMI Control Panel. The icon can be Yellow or Red.

1. ENG Icon
2. Alarm Icon
3. ALT Icon
4. ACS Icon

System Condition Display Alarm Icons
**Yellow = Check Alarm:** This indicates one or more of the system Check Alarms are active. This level of alarm serves as notice to take corrective action at the earliest convenience before a problem becomes severe. The system will continue to operate but some features and functions may be inhibited or disabled.

**Red = Shutdown Alarm:** This indicates one of the system Shutdown Alarms is active. This level of alarm serves as notice that a potentially severe system problem exists. Immediate corrective action should be taken. The system will not be operating. Along with the Red Alarm Icon, one of the shutdown alarm group names (ENG, ALT, ACS) will illuminate. This indicates the alarm falls into one of the three categories, helping to focus diagnosis and repair.

**ENG:** Alarms in this group are engine related.

**ALT:** Alarms in this group are alternator, battery or system voltage related.

**ACS:** Alarms in this group are air conditioning system related.

**To Clear Alarm Codes**

If the alarm icon is Red, first note the alarm group that is illuminated on the HMI display (ENG, ALT, ACS). Use the HMI Control Panel System On/Off button to turn the TriPac unit off. Resolve the condition that caused the alarm. Use the HMI Control Panel System On/Off button to turn the TriPac unit on. Any active alarms will be cleared.

**NOTE:** If the alarm condition still exists the alarm will return.

Active alarms and those recently cleared by the operator can be read and cleared by a Thermo King service technician.
DPF Operating Instructions

Introduction
The Thermo King diesel particulate filter (DPF) is designed to capture diesel particulate matter or soot emitted from the exhaust of the TriPac’s APU diesel engine. The particulate matter retained in the DPF is then cleaned by the regeneration process.

The DPF system features include:
- On-board Diagnostic System that interfaces with the TriPac controls to operate and monitor the DPF system to assure peak operating efficiency.
- Exhaust Monitor to alert the driver of the operating status or if a fault has been detected with the DPF system.
- DPF Regeneration Switch to allow the driver to manually initiate the regeneration cleaning process of the DPF system while driving.

When to Regenerate
The DPF control system determines when a regeneration is needed by displaying steady amber indicator lights on the Exhaust Monitor and the Regeneration Switch. These amber lights will illuminate a steady glow to alert the driver when it is time to initiate a regeneration.

The amber light must be illuminated to initiate a regeneration. Pressing the regeneration switch when no amber light is illuminated has no effect and will not start a regeneration.

When the amber DPF Status light is illuminated, the APU can still be operated for approximately 10-15 hours, however a regeneration should be initiated at the drivers earliest convenience.

After approximately 10-15 hours of operating the APU with the steady amber lights illuminated, the APU will shut down, set a fault code and will not operate again until a regeneration is performed.
Initiating a DPF Regeneration

The DPF system operates using electrical voltage supplied by the truck’s alternator system. Due to the large current draw required by the DPF, the regeneration process should only be initiated during daytime hours while the truck is expected to be operating at highway speeds (above 1150 rpm) for a minimum of one hour. Do not operate the DPF while the truck is stopped, idling or moving slowly in traffic. If this occurs, the regeneration process may automatically be canceled. The TriPac APU will be disabled when the DPF is in the regeneration mode or if the DPF regeneration switch is in the OFF position.

NOTE: The dash mounted DPF Regeneration Switch switch must be in the ON (center position) for the TriPac and the DPF systems to operate.

Regeneration Switch

The Regeneration Switch has three positions:

- 1 (top position) - DPF Regeneration ON
- 2 (center position) - TriPac and DPF ON
- 3 (bottom position) - DPF OFF

1. Turn the TriPac system on at HMI control panel.
2. Select an operating mode (Cool, Fan, Heat) and verify STBY indicator is not on. The APU engine may start.
3. Start the truck (the APU engine will stop) and drive to the highway.
4. Push and hold the top (REGEN) of the DPF Regeneration rocker switch for 5 seconds.

5. The solid amber light will begin flashing on the Regeneration Switch and the Exhaust Monitor indicating the system is in the regeneration mode.

6. After approximately 1 to 2 hours, the flashing amber lights will go out indicating the regeneration process is complete.

**To cancel a regeneration**

To cancel the regeneration process:
- Press the bottom (OFF) of the Regeneration switch.
- The flashing amber DPF STATUS light will go out, the regeneration process will stop and the HMI will display [Eng] code.
- The regeneration process should be initiated again at the drivers earliest convenience.

*NOTE: The TriPac APU will be disabled when the DPF is in the regeneration mode or if the DPF regeneration switch is in the OFF position.*
Indicator Light System

DPF Fault (RED) and DPF Status (AMBER) indicator lights are used to display the status of the DPF system. These lights not only help the driver determine when to initiate the regeneration, but also identify any problems that may have been detected by the on-board diagnostic system. The DPF Fault and DPF Status lights are both displayed on the Exhaust Monitor, while only a single amber light is displayed on the Regeneration Switch.

- **Steady DPF Status** - indicates a DPF regeneration is needed.
- **Flashing DPF Status** - indicates a regeneration is in process
- **Flashing DPF Fault** - indicates that a system fault has been detected by the on-board diagnostic system. Additionally, the fault code will be retained for diagnostic and maintenance purposes. *See “DPF Fault Codes” on page 41.*
Steady Amber Indicator Light
A steady DPF Status (amber) indicator light illuminated on the Exhaust Monitor and the Regeneration Switch indicates the regeneration needs to be initiated by the driver. When a regeneration is initiated, the process will take one to two hours and then the amber lights will shut off.

The DPF control system determines when a regeneration is needed by displaying a steady amber DPF Status indicator light. The amber light must be illuminated to initiate a regeneration. Pressing the regeneration switch when no amber light is illuminated has no effect and will not start a regeneration.

Flashing Amber Indicator Light
A flashing DPF Status (amber) indicator light illuminated on the Exhaust Monitor and the Regeneration Switch indicates a regeneration is in progress.

No Indicator Light
When no indicator light is displayed, the DPF system has not detected any need to initiate a regeneration and the Tripac APU can be operated as usual.
Flashing Red Indicator Light

A flashing red DPF Fault indicator light illuminated on the exhaust monitor indicates an abnormal condition has been detected and a fault code, either WARNING or SHUTDOWN, has been detected by the on-board diagnostic system. This red indicator light is only found on the Exhaust Monitor.

- If a WARNING code is detected, the TriPac system will continue to operate.
- If a SHUTDOWN code is detected, the entire TriPac system will be disabled and the System Fault Indicator light on the HMI will glow red.

The fault code can easily be checked to determine what actions need to be taken. See “DPF Fault Codes” on page 41.

In some cases, clearing the fault code and restarting the TriPac APU is all that’s needed. See “Clearing DPF Fault Codes” on page 44.
## DPF Indicator Light Quick Reference Chart

<table>
<thead>
<tr>
<th>INDICATOR LIGHT STATUS</th>
<th>STATUS and ACTION REQUIRED</th>
</tr>
</thead>
</table>
| **NO LIGHT**           | Status - TriPac is ready to operate. DPF regeneration is not required.  
Action - None          |
| **STEADY DPF STATUS (AMBER)** | Status - Regeneration Required  
Action - Initiate Regeneration - Push and hold the top of the TriPac DPF REGEN switch for 5 seconds (until the amber light starts flashing).  
A regeneration should only be initiated when the truck is operating during the daytime hours at highway speeds (above 1150 rpm) for one to two hours depending on requirement. See “Initiating a DPF Regeneration” on page 35. |
| **FLASHING DPF STATUS (AMBER)** | Status - Regeneration In Process  
Action - Continue driving at highway speed until light goes out. |
| **FLASHING DPF FAULT (RED)** | Status - Indicates a system fault has been detected by the on-board diagnostic system  
Action - See “DPF Fault Code Chart” on page 42. |
DPF Fault Codes

A fault code is generated when the DPF on-board diagnostic system detects an abnormal condition. These codes direct an operator or service technician to the source of a problem.

The on-board diagnostic system also uses the red DPF FAULT indicator light to produce the fault code/codes by a utilizing a series of flashes for diagnostic and maintenance purposes.

For example: one flash, short pause, followed by three flashes, long pause in rapid succession would be fault Code 13.

Two types of fault codes are used: Warning and Shutdown. Refer to the Fault Code Chart on the next page for more details.

**IMPORTANT:** Multiple fault codes may exist. Always count the flashes several times to verify all fault codes present.

**WARNING CODE** - When the diagnostic system detects an abnormal operating condition resulting in a warning code, it will allow the TriPac to continue to operate. However, the TriPac unit should be checked by a service technician as soon as possible.

**SHUTDOWN CODE** - Additionally, the System Fault Indicator light on the HMI controller will illuminate and [Eng] will be displayed. When the diagnostic system detects an abnormal operating condition resulting in a shutdown code, it will immediately shut off and disable the complete TriPac system. When a shutdown code appears, the TriPac unit should be checked by a service technician immediately.
## DPF Fault Code Chart

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Code Type</th>
<th>Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Shutdown</td>
<td>Air Control Relay Input</td>
</tr>
<tr>
<td>12</td>
<td>Shutdown</td>
<td>Air Control Relay Closed</td>
</tr>
<tr>
<td>13</td>
<td>Warning</td>
<td>Air Control Relay Open</td>
</tr>
<tr>
<td>21</td>
<td>Warning</td>
<td>Heater Contactor Input</td>
</tr>
<tr>
<td>22</td>
<td>Shutdown</td>
<td>Heater Contactor Closed</td>
</tr>
<tr>
<td>23</td>
<td>Warning</td>
<td>Heater Contactor Open</td>
</tr>
<tr>
<td>31</td>
<td>Warning</td>
<td>Excessive High Ambient Air Temperature</td>
</tr>
<tr>
<td>32</td>
<td>Warning</td>
<td>Excessive Low Ambient Air Temperature</td>
</tr>
<tr>
<td>33</td>
<td>Warning</td>
<td>High Ambient Air Temperature Range</td>
</tr>
<tr>
<td>34</td>
<td>Warning</td>
<td>Low Ambient Air Temperature Range</td>
</tr>
<tr>
<td>41</td>
<td>Warning</td>
<td>Excessive High Back Pressure</td>
</tr>
<tr>
<td>42</td>
<td>Warning</td>
<td>Excessive Low Back Pressure</td>
</tr>
<tr>
<td>43</td>
<td>Shutdown</td>
<td>High Back Pressure</td>
</tr>
<tr>
<td>44</td>
<td>Warning</td>
<td>Excessive Low Back Pressure</td>
</tr>
</tbody>
</table>
## DPF Fault Code Chart (Continued)

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Code Type</th>
<th>Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>Warning</td>
<td>Out of Range Low Back Pressure</td>
</tr>
<tr>
<td>46</td>
<td>Warning</td>
<td>Low Zero Back Pressure</td>
</tr>
<tr>
<td>47</td>
<td>Warning</td>
<td>Low Back Pressure</td>
</tr>
<tr>
<td>51</td>
<td>Warning</td>
<td>Consecutive Rapid Filter Loading</td>
</tr>
<tr>
<td>52</td>
<td>Shutdown</td>
<td>Maximum Time Reached Since Last Regeneration</td>
</tr>
<tr>
<td>53</td>
<td>Warning</td>
<td>Maximum Low Voltage Aborted Regeneration</td>
</tr>
<tr>
<td>54</td>
<td>Warning</td>
<td>Maximum Regenerations Reached with Pressure Fault</td>
</tr>
<tr>
<td>61</td>
<td>Warning</td>
<td>7A7X/SBY Relay Input</td>
</tr>
<tr>
<td>62</td>
<td>Warning</td>
<td>8 Circuit Input</td>
</tr>
<tr>
<td>71</td>
<td>Warning</td>
<td>High 5V Supply Voltage</td>
</tr>
<tr>
<td>72</td>
<td>Warning</td>
<td>Low 5V Supply Voltage</td>
</tr>
<tr>
<td>73</td>
<td>Warning</td>
<td>High System Voltage</td>
</tr>
<tr>
<td>74</td>
<td>Warning</td>
<td>Low System Voltage</td>
</tr>
</tbody>
</table>
DPF Fault Codes

Clearing DPF Fault Codes

To clear fault codes:

1. Record the Fault Code(s).
2. Turn the truck’s ignition off.
3. Push and hold the top (REGEN) of the DPF Regeneration rocker switch for only 2 seconds.
4. If APU shuts down due to [Eng] code, turn off the HMI main power to clear the code.
5. Turn the HMI back on and restart the APU.
6. If the APU fails to start, or the alarm code returns, contact the nearest Thermo King Dealer for assistance.
## Specifications

### Engine

<table>
<thead>
<tr>
<th>Engine Model</th>
<th>TK 270F (Tier 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuel Type</strong></td>
<td>No. 2 Diesel fuel under normal conditions</td>
</tr>
<tr>
<td>Caution: Use fuel suitable for the climate you operate in (see your truck engine manufacturer’s recommendations). Blending used engine oil with diesel fuel is not permitted in the TriPac system. It will plug the filters and will not allow the air heater to run properly. Thermo King reserves the right to void all warranty on the unit.</td>
<td>No. 1 Diesel fuel is acceptable cold weather fuel</td>
</tr>
<tr>
<td><strong>Oil Capacity: Crankcase &amp; Oil Filter</strong></td>
<td>6.5 quarts (6.2 liters) maximum.</td>
</tr>
</tbody>
</table>
**Specifications**

**Engine (Continued)**

| Oil Type | API Type CJ-4 or better multi-grade oil  
|          | API Synthetic Type CJ-4 or better multi-grade oil is required for units equipped with the optional DPF (Diesel Particulate Filter)  |
|          | IMPORTANT: The port on top of the engine should not be used to add engine oil. Always add oil through the lower port on the timing gear cover to prevent engine lock-up and/or serious internal damage. Approximately 1.5 quarts (1.4 liters) is required to move the oil level from the lower line (5.1 quarts [4.8 liters]) to the upper line (6.5 quarts [6.2 liters]) on the dipstick. |
| Oil Viscosity | 5 to 104 F (-15 to 40 C): SAE 15W-40  
|          | -4 to 86 F (-20 to 30 C): SAE 10W-30  |
| Coolant System Capacity (TriPac engine only) | 0.6 quarts (0.6 liters)  
|          | 2.75 quarts (2.6 liters) with Closed Loop Cooling  |
| Engine Thermostat | 160 F (71 C)  |

**TriPac Electrical Control System**

| TriPac Control System Voltage | 12 Vdc (powered from tractor’s batteries)  |
| Fuses | See “TriPac Fuses” on page 47.  |
| Power Inverter 1100 to 1800 Watts (Option) | 12 Vdc to 120 Vac (1100 to 1800 Watts depending on model)  |
### TriPac Fuses

<table>
<thead>
<tr>
<th>Fuse</th>
<th>Amp Rating</th>
<th>Component Protected</th>
<th>Fuse</th>
<th>Amp Rating</th>
<th>Component Protected</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>30</td>
<td>Starter</td>
<td>F14</td>
<td>5</td>
<td>Heater On</td>
</tr>
<tr>
<td>F2</td>
<td>2</td>
<td>HMI Controller</td>
<td>F15</td>
<td>2</td>
<td>Real Time Clock</td>
</tr>
<tr>
<td>F3</td>
<td>30</td>
<td>Glowplugs</td>
<td>F16</td>
<td>50</td>
<td>System Power</td>
</tr>
<tr>
<td>F4</td>
<td>2</td>
<td>HMI Controller</td>
<td>F17</td>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>F5</td>
<td>5</td>
<td>Standby Switch (Option)</td>
<td>F18</td>
<td>3</td>
<td>Voltage Sense</td>
</tr>
<tr>
<td>F6</td>
<td>5</td>
<td>Logic Power (main controller)</td>
<td>F19</td>
<td>1</td>
<td>Truck Ignition Input</td>
</tr>
<tr>
<td>F7</td>
<td>40</td>
<td>Fuel Solenoid</td>
<td>F24</td>
<td>150</td>
<td>Main DPF Power (option)</td>
</tr>
<tr>
<td>F8</td>
<td>7.5</td>
<td>Engine Switch</td>
<td>F25</td>
<td>10</td>
<td>SECM Power</td>
</tr>
<tr>
<td>F9</td>
<td>5</td>
<td>Engine Start Signal</td>
<td>F26</td>
<td>1</td>
<td>Truck Ignition Input to SECM</td>
</tr>
<tr>
<td>F10</td>
<td>15</td>
<td>Pre-cooler Fan</td>
<td>F28</td>
<td>5</td>
<td>Heater Power Sense</td>
</tr>
<tr>
<td>F11</td>
<td>20</td>
<td>Condenser Fan</td>
<td>F29</td>
<td>200</td>
<td>Main Power Cable</td>
</tr>
<tr>
<td>F12</td>
<td>20</td>
<td>Evaporator Fan</td>
<td>F30</td>
<td>3</td>
<td>Alternator Sense</td>
</tr>
<tr>
<td>F13</td>
<td>7.5</td>
<td>Compressor Clutch</td>
<td>F90</td>
<td>20</td>
<td>Cab Heater</td>
</tr>
</tbody>
</table>
## Specifications

### DPF Electrical Control System

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPF System Voltage</td>
<td>12.5 Vdc</td>
</tr>
<tr>
<td>Alternator (Vehicle)</td>
<td>160 Amp minimum required fuse</td>
</tr>
</tbody>
</table>
| Fuses            | 150 Amp Main Fuse  
|                 | 1 Amp Ignition Switch Fuse  
|                 | 10 Amp Control Module              |
| Relays           | Four 12 Vdc relays are located on the DPF Controller Assembly. |
| Blower Motor     | 12 Vdc                               |
| Air Solenoid     | 12 Vdc                               |
| Contactor        | 12 Vdc                               |
| Control Module   | 400 ma                               |
Air Conditioning System
The TriPac air conditioning system must be serviced by an authorized Thermo King Dealer.

Truck Sleeper Compartment Heater
The TriPac heater system must be serviced by an authorized Thermo King Dealer.
Thermo King recommends all maintenance and service procedures be performed by an authorized Thermo King dealer. 

Thermo King reserves the right to deny warranty coverage on claims due to lack of maintenance or neglect. Claims in question must be supported by maintenance records.

Engine Operation

The TriPac APU’s engine equipped with the diesel particulate filter (DPF) must be maintained according to the engine manufacturer’s recommendations for air cleaner change interval, oil change interval, and other service related items. See “Engine Maintenance Schedule” on page 52 and “Engine Oil Change Intervals” on page 54.

Diesel Fuel

- Use Ultra Low Sulfur Diesel (ULSD) fuel which has 15 ppm sulfur content or lower.
- No additional fuel additives are required for proper operation of this filter.
- Do not mix lube oil with the fuel in any concentration. The lube oil in the fuel will result in premature clogging of the DPF.

Engine Oil

- Engine oil consumption rate should be less than 1.1 quarts (1.0 liters) per 200 hours, or 1/4 quart (1/4 liters) per 50 hours. If the engine oil consumption rate is higher, service the engine as needed to reduce the oil consumption rate. A high oil consumption rate can cause premature clogging of the DPF.
- Use only CJ-4 or better oil.
Injectors
Injectors must be serviced at time of the DPF installation if they have not been serviced within the past 3000 engine hours. In addition, injectors must be serviced at 3000 engine hour maintenance intervals to maintain proper combustion and proper operation of the DPF. See “Engine Maintenance Schedule” on page 52.

DPF Canister
If the DPF canister is ever suspected to be in need of cleaning, contact the nearest authorized Thermo King dealer.

Air Conditioning System
The TriPac air conditioning system must be serviced by a authorized Thermo King Dealer.

Truck Sleeper Compartment Heater
The TriPac heater system must be serviced by a authorized Thermo King Dealer.
## Engine Maintenance Schedule

<table>
<thead>
<tr>
<th>Pre-Trip</th>
<th>500 Hrs</th>
<th>Annual 2,000 Hrs</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Check engine oil level.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Check engine coolant level on units with optional closed loop cooling system.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Inspect belts for condition and proper tension.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Listen for unusual noises, vibrations, etc.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Check air cleaner hose for damage.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Inspect air cleaner. Change as needed or annually.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Inspect fuel pre-filter screen. Clean as required or annually.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Change fuel filter. Thermo King brand filter is required.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Drain water from fuel tank and check vent.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Check and adjust engine speed.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Check condition of engine mounts.</td>
</tr>
<tr>
<td>•</td>
<td></td>
<td>•</td>
<td>Maintain year-round anti-freeze protection at –30° F (-34° C). Change coolant every two years, or with truck coolant. For units equipped with optional closed loop cooling system and ELC (red) engine coolant, change ELC coolant every 5 years or 12,000 hours.</td>
</tr>
</tbody>
</table>
## Engine Maintenance Schedule (Continued)

<table>
<thead>
<tr>
<th>Pre-Trip</th>
<th>500 Hrs</th>
<th>Annual 2,000 Hrs</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adjust engine valves every 1000 hours.*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Test fuel injection nozzles at least every 3,000 hours.*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Replace fuel return lines between fuel injection nozzles every 10,000 hours or sooner, as required.</td>
</tr>
</tbody>
</table>

* Based on EPA 40 CFR Part 89.
## Engine Oil Change Intervals
(Change oil and filters hot)

<table>
<thead>
<tr>
<th>Pre-Trip</th>
<th>500 Hrs</th>
<th>Annual 2,000 Hrs</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>2,000 Hour Interval - Oil change interval is every 2,000 hours of operation only when using a Thermo King brand oil filter and CJ-4 or better oil. Units with optional DPF require CJ-4 or better oil.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>500 Hour Interval - Oil change interval is every 500 hours of operation when using any other brand oil filter and CI-4 or better oil. Units with optional DPF require CJ-4 or better oil.</td>
</tr>
</tbody>
</table>

**IMPORTANT:** The port on top of the engine should not be used to add engine oil. Always add oil through the lower port on the timing gear cover to prevent engine lock-up and/or serious internal damage. Approximately 1.5 quarts (1.4 liters) is required to move the oil level from the lower line (5.1 quarts [4.8 liters]) to the upper line (6.5 quarts [6.2 liters]) on the dipstick.
### TriPac Electrical

<table>
<thead>
<tr>
<th>Pre-Trip</th>
<th>500 Hrs</th>
<th>Annual 2,000 Hrs</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>• Check operation of protection shutdown devices.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>• Check alternator voltage.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>• Check alternator bearings. See Note 1.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>• Inspect electrical connections at battery posts to assure they are clean and tight.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>• Inspect electrical connections at 150 amp fuse to assure they are clean and tight.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>• Inspect electrical connections to contactor to assure they are clean and tight.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>• Inspect all wire harnesses for rubbing or damage.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>• Inspect Temperature Sensor mounting clamp and position of sensor.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>• Check electric condenser, evaporator and pre-cooler fan operation.</td>
</tr>
</tbody>
</table>

*Note 1 - With belt removed spin alternator by hand. Listen for noise and ensure that bearings roll freely.*
# TriPac Structural

<table>
<thead>
<tr>
<th>Pre-Trip</th>
<th>500 Hrs</th>
<th>Annual 2,000 Hrs</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Visually inspect unit for fluid leaks (coolant, oil, refrigerant).</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Visually inspect unit for damaged, loose or broken parts.</td>
</tr>
<tr>
<td>•</td>
<td></td>
<td></td>
<td>Check APU mounting bolts and brackets for cracks, damage and poor alignment. Verify tightness and torque to 100 ft/lbs (135.6 N•m) for the claw mount, or 200 ft/lbs (271.2 N•m) for the direct frame mount.</td>
</tr>
</tbody>
</table>

# DPF Structural

<table>
<thead>
<tr>
<th>Pre-Trip</th>
<th>500 Hrs</th>
<th>Annual 2,000 Hrs</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Visually inspect DPF canister and exhaust system components for leaks, damaged, loose or broken parts.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td></td>
<td>Torque DPF mounting straps to 110 in-lb (12 N•m)</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td></td>
<td>Drain air inlet hose condensation trap.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td></td>
<td>Inspect air inlet and air outlet hoses for kinks or damage.</td>
</tr>
</tbody>
</table>
## DPF Structural (Continued)

<table>
<thead>
<tr>
<th>Pre-Trip</th>
<th>500 Hrs</th>
<th>Annual 2,000 Hrs</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>•</td>
<td>•</td>
<td>Check valve box cover is tightly secured.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>•</td>
<td>Check valve box for cracks, air leaks, damage or loose mounting bolts.</td>
</tr>
</tbody>
</table>

## Air Conditioning System

<table>
<thead>
<tr>
<th>Pre-Trip</th>
<th>500 Hrs</th>
<th>Annual 2,000 Hrs</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>•</td>
<td>•</td>
<td>Check refrigerant level.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>•</td>
<td>Check refrigerant lines for rubbing or damage.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>•</td>
<td>Inspect, clean and (if necessary) replace evaporator air filter. It may be necessary to check or replace it more often if conditions require.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>•</td>
<td>Inspect evaporator drain valves (kazoos) to ensure that they are in place, in good condition and are sealing.</td>
</tr>
<tr>
<td></td>
<td>•</td>
<td></td>
<td>Steam clean condenser and APU pre-cooler coil. Do not bend coil fins.</td>
</tr>
</tbody>
</table>
## Air Conditioning System (Continued)

<table>
<thead>
<tr>
<th></th>
<th>Pre-Trip</th>
<th>500 Hrs</th>
<th>Annual 2,000 Hrs</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Blow out evaporator coil and evaporator water drains with air. Do not bend coil fins.</td>
</tr>
</tbody>
</table>

## Heater

<table>
<thead>
<tr>
<th>Monthly</th>
<th>Annually</th>
<th>Check condition of or service the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>•</td>
<td>•</td>
<td>Start and run for at least 20 minutes each month.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>Inspect combustion air intake tube and exhaust pipe for restrictions or blockage.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>Inspect ducting, air intake screen, and air outlet for restrictions or blockage.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>Remove glow pin and inspect for carbon build up. Clean.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>Remove glow pin screen and inspect for carbon build up. Replace.</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>Change fuel pump screen.</td>
</tr>
</tbody>
</table>
Diesel Emission Warranty

Your (Customer) Warranty Rights and Obligations:
Thermo King warrants the diesel emission control system, in the application for which it is sold or leased, to be free from defects in materials, workmanship and operation of the diesel emission control system, which defects cause the diesel emission control system to fail to conform to the emission control performance level for which it was verified, or to the requirements of California Code of Regulations, Title 13, Sections 2700-2706, and 2710, for a period of 3-years or 1,600-hours from date of installation, provided said diesel emission control system, unit engine or APU has not been subjected to abuse, neglect, or improper maintenance as specified in the owner’s manuals. Where a warrantable condition exists, this warranty also covers the engine from damage caused by the diesel emission control system, subject to the same exclusions for abuse, neglect, or improper maintenance. Consult the owner’s manual for other warranty information. The diesel emission control system may include a core part (particulate filter) as well as hoses, connectors, a back pressure monitor, and other emissions related assemblies.

Where a warrantable condition exists, Thermo King will repair or replace the diesel emission control system at no cost to owner, including the cost of diagnosis, parts, and labor.

Warranty Coverage:
For the TK270VFM engine used in a Thermo King APU application, the warranty period for damage caused by the after treatment system will be 3-years or 1,600-hours, whichever comes first. If any emission-related part of the diesel emission control system is defective in materials, workmanship, or operation of the diesel emission control system thus causing the diesel emission control system to fail to conform to the emission control performance level to which it was verified or to the requirements in the California Code of Regulations, Title 13, Sections 2700-2706, and 2710, within the warranty period, as defined above, Thermo King will repair or replace the diesel emission control system, including parts and labor.
In addition, Thermo King will replace or repair the engine components to the condition prior to the failure, including parts and labor, for damage to the engine proximately caused by the verified diesel emission control strategy. This also includes those relevant diagnostic expenses in the case in which a warranty claim is valid. Thermo King may, at its option, instead pay the market value of the engine prior to the time the failure occurs.

**Additional Warranty Coverage**

In addition to the coverage as stated above, Thermo King will provide a minimum of 6 months full coverage for installations conducted by non-certified installers or 12 months of full coverage when an installation is completed by a certified installer. This applies both to DPF’s installed on existing TriPac units and for DPF’s ordered with new TriPac units.

**Owner’s Warranty Responsibility:**

Each APU owner is responsible for performing the required maintenance described in the owner’s manuals. Thermo King recommends that owner retain all maintenance records and receipts for maintenance expenses for the APU and diesel emission control system. If such receipts are not kept or if owner fails to perform all scheduled maintenance, Thermo King may have grounds to deny warranty coverage. Owner is responsible for presenting the APU and diesel emission control system to a Thermo King dealership as soon as a problem is detected. The warranty repair or replacement should be completed in a reasonable amount of time, not to exceed 30-days. If a replacement is needed, this may be extended to 90 days should a replacement not be available, but must be performed as soon as a replacement becomes available.

For questions regarding warranty rights and responsibilities, contact Thermo King Cold Line by phone at 888-887-2202 or on the web at [http://www.thermoking.com](http://www.thermoking.com) or the California Air Resources Board at 9528 Telstar Avenue, El Monte, California 91731, or 800-363-7664 or electronic mail: helpline@arb.ca.gov.
The following is to be furnished to the owner:

Your Warranty Rights and Obligations

(Enter Installer’s Name Here) must warrant that the installation of a diesel emission control system is free from defects in workmanship or materials which cause the diesel emission control system to fail to conform to the emission control performance level it was verified to or to the requirements in the California Code of Regulations, Title 13, Sections 2700 to 2706. The warranty period and the extent of the warranty coverage provided by (Enter Installer’s Name Here) must be the same as the warranty provided by the product manufacturer, and the same exclusions must apply.

Owner’s Warranty Responsibility

As the APU owner, you are responsible for presenting your APU to (Enter Installer’s Name Here) as soon as a problem with the installation is detected. If you have questions regarding your warranty rights and responsibilities, you should contact (Enter Installer’s Name and Phone Number Here) or the California Air Resources Board at 9528 Telstar Avenue, El Monte, California 91731, or 800-363-7664 or electronic mail: helpline@arb.ca.gov.
Serial Number Locations

**APU:** Unit nameplate is located on the front right edge of APU frame near the Engine On/Off Switch. Open the service access door to view nameplate.

**Engine:** Nameplate is located on the top of the engine inside the APU.

**Compressor:** Nameplate is located on the compressor body. The compressor is located inside the APU.

**Heater:** Nameplate is located on the side of the heater. The heater is typically installed in the cargo compartment or under the truck cab sleeper compartment.

**DPF Canister:** Serial plate is located on the DPF canister.
Emergency Cold Line

If you can’t get your rig rolling, and you have tried the Thermo King North American Service Directory (available from any Thermo King dealer) to reach a dealer without success, then call the Toll Free Emergency Cold Line Number (888) 887-2202.

The answering service at the factory will assist you in reaching a dealer to get the help you need. The Cold Line is answered 24 hours a day by personnel who will do their best to get you quick service at an authorized Thermo King Dealer.
Recover Refrigerant

At Thermo King, we recognize the need to preserve the environment and limit the potential harm to the ozone layer that can result from allowing refrigerant to escape into the atmosphere.

We strictly adhere to a policy that promotes the recovery and limits the loss of refrigerant into the atmosphere.

In addition, service personnel must be aware of Federal regulations concerning the use of refrigerants and the certification of technicians. For additional information on regulations and technician certification programs, contact your local THERMO KING dealer.
CALIFORNIA
Proposition 65 Warning

Diesel exhaust is a chemical known to the State of California to cause cancer.
Ingersoll Rand’s Climate Solutions sector delivers energy-efficient HVACR solutions for customers globally. Its world class brands include Thermo King, the leader in transport temperature control and Trane, a provider of energy efficient heating, ventilating and air conditioning systems, building and contracting services, parts support and advanced controls for commercial buildings and homes.

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