Installation Manual

Model T4-6

This Installation Manual was written for T4-6 model RigMaster units built in 2008

Last Updated March 4, 2008

Safety

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1. Zero Energy State

ATTENTION: ZERO ENERGY STATE

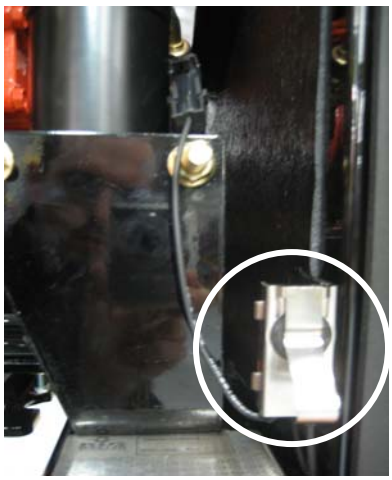
To perform service, maintenance and repairs you ***must*** disconnect the RigMaster from its battery source. In the recommended installation configuration the RigMaster shares the battery bank with the vehicles main engine. After disconnecting the battery cables, check the battery posts inside the RigMaster engine cabinet to confirm there is no voltage to the auxiliary power unit (APU).

2. Safety Cover Switch

ATTENTION: SAFETY COVER SWITCH

It is critical that this safety cover switch is never deactivated or bypassed; failure to comply may result in serious injury.

Fig. S-1



The safety cover switch (fig. S-1) is designed to prevent the RigMaster Power APU from starting when the engine cover is loose or has been removed. When the switch is in the closed position the cover is down. When the switch is open position the cover has been removed or is loose. The switch is located at the front of the engines enclosure in the lower right hand corner.

3. AutoStart Automatic Start/Stop Feature

ATTENTION: AUTOSTART FEATURE

Remember that a properly functioning RigMaster is capable of starting independently of its operator. If the AutoStart feature is enabled, battery voltage, temperature, and time of day can all cause the RigMaster's engine to start. Please see the cabin controllers operating instructions for further information on the AutoStart feature.

You must deactivate this feature prior to refueling.

4. Engine Hoist Points

ATTENTION: ENGINE HOIST POINTS

The Perkins and Caterpillar engines have hoist points that are useful for removal and reinstallation of the engine. ***Under no circumstances*** should the entire RigMaster APU assembly be lifted by the engine hoist points as they are not intended to hold the increased weight of the engine with fluids, frame and other on-board equipment.

5. Starting Aids

WARNING
Do not use any type of starting aids such as ether. Such use could result in an explosion and personal injury, and will render the APU warranty null and void.

6. Starting with the Cover Off

ATTENTION
Some installation or repair/diagnostic procedures require that the APU is started with the engine cover off. ***Do not deactivate or bypass the safety cover switch.*** Instead, have another individual assist by manually holding the safety cover switch down in the closed position for the duration of the procedure.

7. Inspection of the Safety Systems

The safety systems on the RigMaster APU should be examined and tested prior to performing any service work and at 50 hour intervals to ensure that they are in good condition and proper working order.

8. Safe Working Practices

Safe working practices are your responsibility. The use of protective safety equipment is mandatory when performing inspections, service, diagnostics and repairs on the RigMaster APU. Follow your local regulations and guidelines regarding occupational health and safety.

9. Contact Us

If you do not fully understand this safety information, contact RigMaster's Technical Support Department toll free at (888) 208 – 3101 before proceeding with the operation or service of this APU.

Introduction to Installation

Control Panel
Mounts neatly inside the cab for easy finger tip control

HVAC
Mounts inside the bunk with two "house current" 120V receptacles

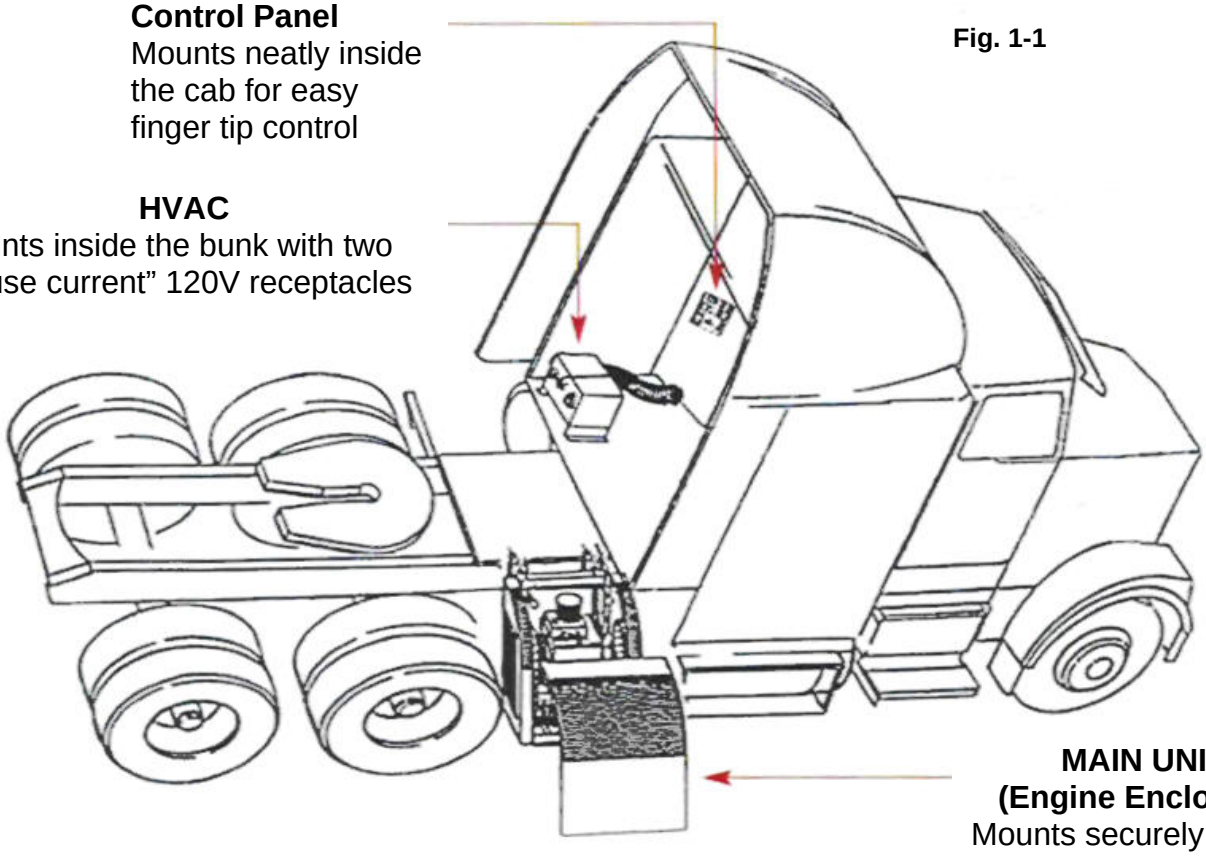


Fig. 1-1

MAIN UNIT (Engine Enclosure)
Mounts securely to the frame rail

1:1:0 Introduction to Installation

The following information is supplied as a reference to support qualified technicians during the installation of the RigMaster APU. Given the diversity of vehicles, these installation procedures are general guidelines and will apply to Class 8 over the road vehicles, unless technical modifications of the vehicle influence the serviceability. Depending on the version and vehicle equipment, changes in procedure may be required that are outside the scope of this manual. In any event, the directives in the installation manual must be followed and accepted engineering principles observed when installing the RigMaster APU. Please review the entire manual before beginning the installation.

1:1:1 Definitions

NOTE

A **NOTE** describes important information necessary to properly complete a procedure, or information which will make the procedure easier to understand.

CAUTION

A **CAUTION** describes a special procedure or special steps which **must** be taken while completing a task. Disregarding a **CAUTION** may result in **damage** to the assembly.

WARNING

A **WARNING** describes a special process or steps, which **must** be taken while completing the procedure. Disregarding a **WARNING** may result in **serious injury**.

This manual will refer to the RigMaster as an auxiliary power unit, which is abbreviated APU.

1:1:2 Necessary Tools

It is expected that the installing technician(s) have a comprehensive set of tools suitable for automotive service work. Please see Section 14 for a detailed list of tools and materials required to complete an installation.

1:1:3 Technical Assistance

Technical Support is available by calling

(888) 208 - 3101 or (416) 201 - 0040

Mon - Fri, 8:30 am to 5:00 pm EST

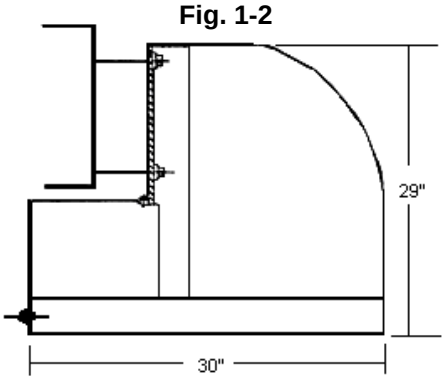
1:2:0 Placement of the RigMaster Components

Deciding on the placement of the RigMaster APU components is the first and most important step. Poor placement of the APU will have a negative impact on the performance and accessibility of the unit. Remember that the best location is one that considers practicality, serviceability and aesthetics.

The main unit (engine enclosure) and HVAC can be mounted on either the driver or passenger side of the vehicle. The optimal location is on the curb side for safety, practicality and ease of installation. The RigMaster is also suitable for installation on cab-over vehicles. Please contact RigMaster's Technical Support Department for more detailed information on cab-over installations.

The RigMaster requires approximately 28 inches of clear frame rail for installation. It has a projection from the frame of 21 inches (24 inches with the adapter S brackets), which allows the unit to be mounted behind a fairing. It may be necessary to relocate or modify preexisting vehicle components to accommodate the RigMaster. There must be additional space on either side of the APU for proper air circulation (refer to 2:3:0).

Fig. 1-2



Installation factors to consider include the location of the battery box; air tanks, air dryers, fuel tanks, tool boxes, pumps, main engine exhaust pipe etc. The location and accessibility of these components will influence the overall installation time.

Remember when choosing a location that the harder it is to access the unit, the more difficult it will be to service. Owners are also less likely to perform frequent maintenance inspections of oil and coolant levels if the unit is severely restricted.

The RigMaster may be mounted using several different methods. Commonly the unit is clamped, with or without the adapter S brackets, to the frame rail of the vehicle using the hardware provided with the kit. The adapter S brackets should be used when there are protrusions (bolts threads/heads/collars etc.) which prevent the back of the Main Unit from fully contacting the surface of the frame rail. See Section 2 for detailed frame rail mounting information.

If the configuration of the truck allows, the unit may be bolted directly to frame using suitable Grade 8 mounting hardware and following the vehicle manufacturer’s guidelines for drilling or modifying the frame rails. Ensure that the unit is mounted straight and level on the frame rail.

CAUTION

- When installing the unit, regardless of the method used, it is critical that it be mounted straight and level on the frame rail. Units that are not level with the frame rail may experience high vibration and subsequent component failures that are not covered in any way by warranty.
- In the event that you do not fully understand how to safely and properly mount the APU, contact RigMaster's Technical Support Department before proceeding with the installation. For part numbers of installation components please see the packing lists enclosed within each box in the RigMaster APU kit.

Preparation and Frame Rail Mounting

NOTE

Please note that the T4-6 model RigMaster unit is designed so a Diesel Particulate Filter (DPF) may be installed after it has been mounted on a vehicle. Please allow 6 inches on the radiator/condenser side of the RigMaster assembly to accommodate the DPF if it is to be installed at a later date.

2:1:0 Preparing the RigMaster

The RigMaster kit is shipped on a wooden skid and should be uncrated near the installation area with sufficient space to prepare the unit while on the skid.

It is much easier to prepare the RigMaster prior to mounting it by installing the battery cables, brass fittings, air conditioning, fuel and coolant hoses. The use of corrugated split loom to protect all cables and hoses is highly recommended. Slit loom also makes your work look more professional, but will add some cost to the installation and as before it is much easier to add loom during the preparation phase.

Disconnect the safety cover switch from the wiring harness, then remove the protective caps and four 7/16” hex head screws that secure the right hand enclosure panel (fan shroud) to the frame (Fig. 2-1).

Install the fuel fittings to the bulkhead using thread sealant. Be sure to tighten the return fitting fully before attempting to install the supply fitting. See section 7:3:0 for further information on fuel fitting installation.

Install the straight brass coolant fittings to the bulkhead using thread sealant. To avoid contaminating the cooling system, do not to apply sealant to the two leading threads of the fitting.

Remove the generator cover, 7/16” hardware, and the junction box lid, 5/16” hardware (Fig.2-2).

Fig 2-1

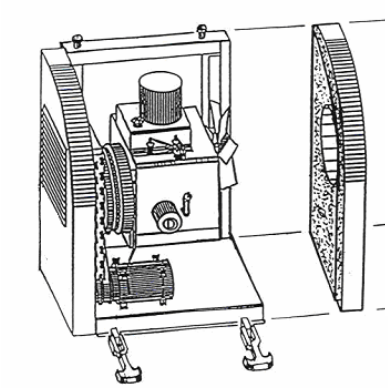
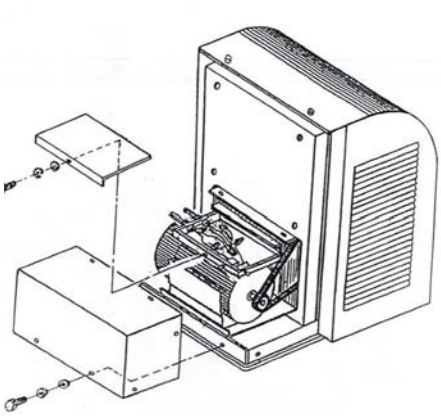


Fig 2-2

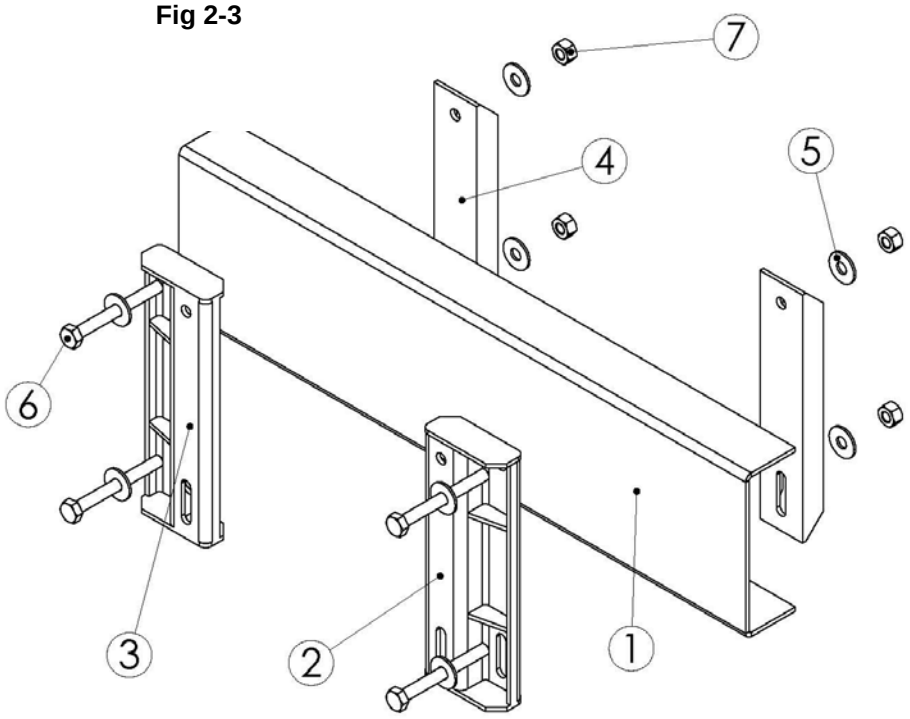


2:2:0 Frame Rail Mounting

Once the frame rail location has been chosen, and prior to installation, it is important that you consult with the owner/operator to ensure they are satisfied with the proposed placement of the APU.

Below are some sample frame rail installations…

Fig 2-3

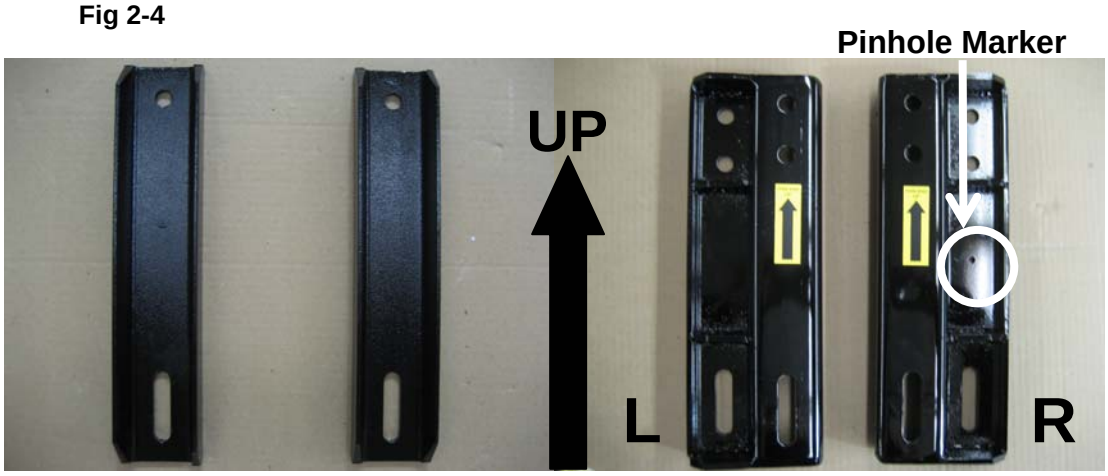


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Vehicle Frame Rail		
2	RP10-001-57HD	Adapter S Bracket Left	1
3	RP10-001-56HD	Adapter S Bracket Right (pin hole)	1
4	RP10-001-08	Frame Clamping C Channel Bracket	2
5	RP12-107	5/8” Flat Washer (Hardened)	16
6	RP12-105	5/8” x 6” Mounting Bolts	4
7	RP12-106	5/8” Nylon Lock Nuts	8
Not Shown	RP12-105	5/8” x 1 1/2” Mounting Bolts	4

WARNING

The mounting brackets and hardware may not be modified in any way without the prior written consent of RigMaster Power Corp. Bolts, nuts and washers may be replaced with identical grade and dimension hardware if necessary.

Fig 2-4



C Channel Brackets **Adapter S Brackets**

CAUTION

Make sure that the slotted holes on the adapter S brackets are towards the bottom of the APU and the bolts connecting the brackets to the APU are inserted from inside the engine enclosure.

Prior to mounting, if required, bolt the adapter S brackets to the back of the Main Unit using the 5/8” x 1 1/2” bolts, washers and nylon lock nuts. Once attached, the adapter S brackets will not accept the 5/8” x 6” mounting bolts and washers; install them beforehand (Fig. 2-5).

NOTE

The adaptor S brackets can be mounted with the flanges either both to the inside or both to the outside. Occasionally it is necessary to use two left or two right hand brackets to achieve the optimal mounting configuration.

Fig. 2-6

Bottom of 5/8” Hardened Washer

MARKING

See that the marking is not visible after the washer is installed.

Top of 5/8” Hardened Washer

NO MARKINGS

1. Using a pallet jack (or similar lifting device), position the Main Unit against the frame rail and slowly lower it until the upper long bolts sit approximately 1/8” above the top of the rail.

CAUTION

Do not let the mounting bolts carry the weight of the APU until fully tightened.

2. Install the two frame clamping C channel brackets

3. Install the 4 flat hardened washers and thread the nylon lock nuts on the four mounting bolts. If the nylon nuts have been tightened and removed they must be replaced. Do not lubricate the threads in any way.

4. Hand-tighten the four nuts evenly so that the mounting brackets are flat against the frame rail and the hardware is straight. Then proceed to use a torque wrench to fully tighten the assembly. Do not use air tools or impact guns during this process; hand tightening with the correct tools will yield much better results. Uneven or over tightening the mounting hardware can cause damage, so exercise caution when performing this step.

CAUTION

When installing unit, slotted holes in all mounting brackets **must be on the bottom** and all bolts must be **properly torqued to 75 foot pounds** using a torque wrench.

5. Double check that all mounting bolts are secure and remove the lifting device.

2:2:1 Optional Frame Clamp Mounting Hardware

The following figure 2-7 illustrates the correct way to install the frame clamps and mounting hardware. See that the bolts and clamps are straight with the trucks frame.

Fig. 2-7

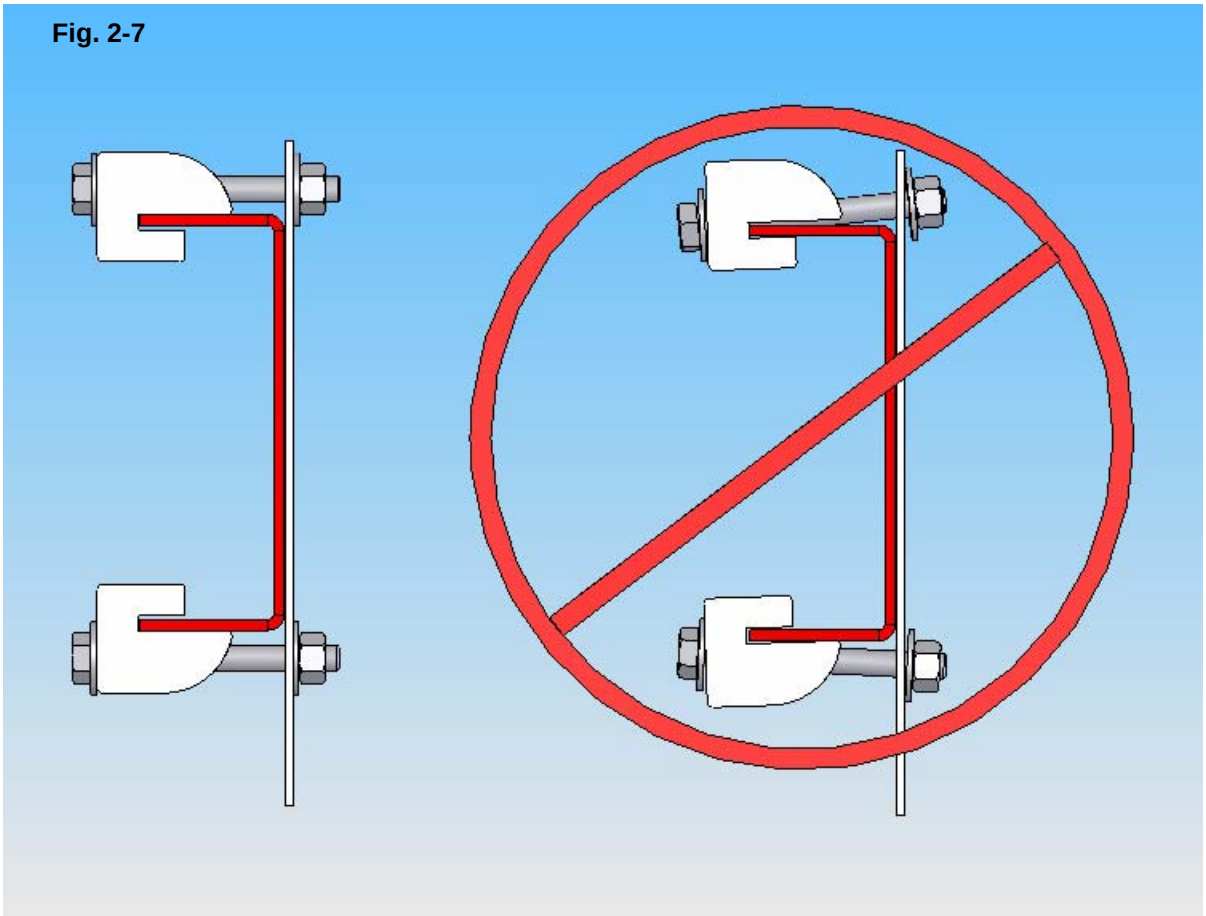
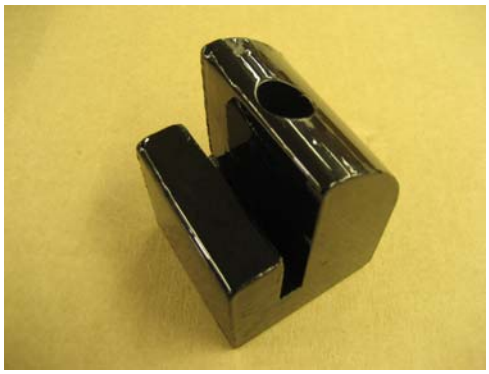


Fig. 2-8

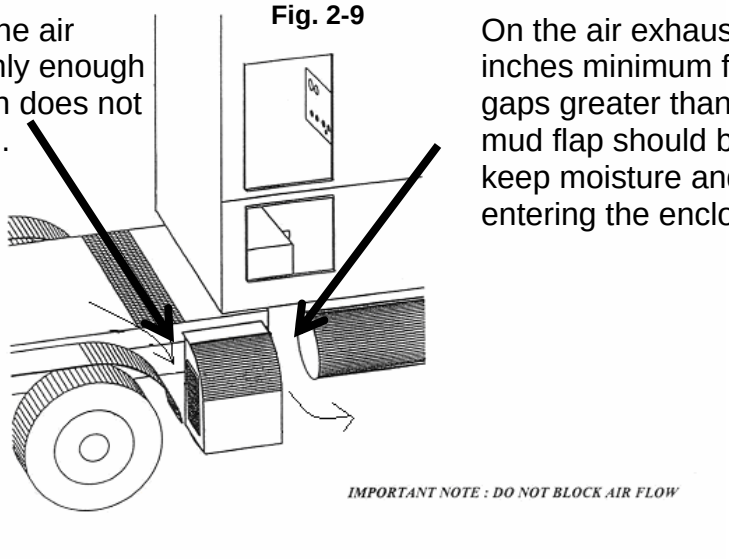


The optional frame clamp mounting brackets are not included with the RigMaster Kit. Order four frame clamps (RP10-001-28) to make a complete set. The standard bolts supplied with the RigMaster should be used, however, if using the adapter S brackets longer mounting bolts may be needed. Measure the installation configuration to determine the necessary bolt length given the frame rail dimensions.

2:3:0 Installing a Mud Flap

The electric fan on the air intake side needs only enough space so that the fan does not rub against anything.

Fig. 2-9



On the air exhaust side allow 2 ½ inches minimum for air flow. For gaps greater than 12 inches a mud flap should be installed to keep moisture and debris from entering the enclosure.

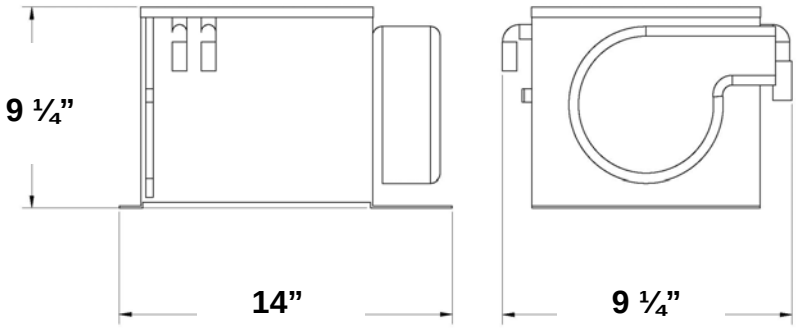
A mud flap should be installed where there is greater than 12 inches of clearance in front of the unit. Mud flaps are typically hung from the frame rail, but may also be hung from the bottom of the sleeper. It is important that the mud flap hangs closer to the ground than the RigMaster's frame to properly deflect debris.

Fig. 2-10

Fig. 2-11

Installing the Bunk HVAC Unit

Fig. 3-1 **HVAC Dimensions**



3:1:0 Preparation to Install the HVAC Unit

Before installing the HVAC unit it is important that you perform the following steps:

1. Consult with the owner to ensure they are satisfied with the mounting location of the HVAC unit.

2. Use the template to ensure the HVAC unit will fit in the space chosen. The template is printed on the kit box that contains the HVAC unit. Remember to allow space to remove the air filter and service the unit. It is also important to decide on a ducting configuration before drilling any holes.

3. Ensure that there are no obstructions under the vehicle (A/C lines, conduit, cross members, exhaust etc.). Do not drill through structural members within or under the trucks floor. Choose a location that requires only the flooring material be drilled.

4. The RigMaster kit contains an information package in an envelope. This package has an Owners Manual and other material that is useful to the operator of the RigMaster APU. Place the information package on the dashboard of the vehicle so the operator of the vehicle receives it. This envelope is in the kit box that contains the HVAC unit. It is suggested that the RigMaster serial number and engine serial number be recorded in the Owners Manual for the driver’s future reference.

3:1:1 Mounting the HVAC Unit

The HVAC unit has a flush mount filter secured by two thumb nuts. Before installation, see that there is enough room to remove the filter. Leave sufficient clearance on all sides for proper air flow.

1. Using the template, drill the six holes for the air conditioning hoses, coolant hoses, condensation drain tube and wiring. It is recommended that the holes be piloted with a 3/16" drill bit prior to drilling the 1 ¼" holes with the hole-saw. After drilling use a file to remove any sheet metal burrs that remain.

2. Attach the condensation drain tube to the bottom of the HVAC box using the supplied hose clamp, usually found inside the owner's envelope.

3. Place the HVAC box into the cab of the truck and ensure that the drain hose is in the center hole of the template.

4. Do not secure the HVAC unit to the floor of the vehicle until you are sure that all connections are correct and fully secured.

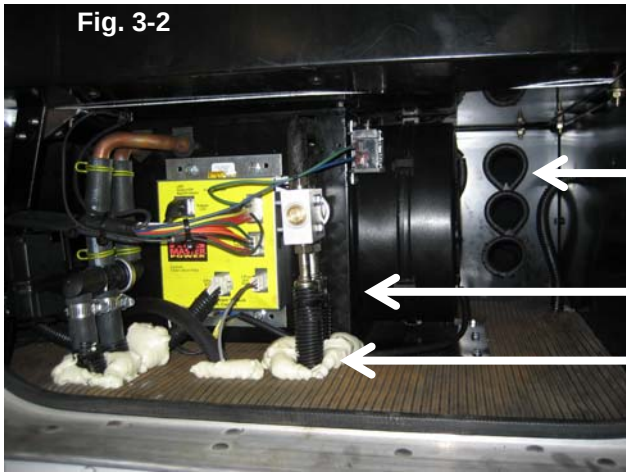
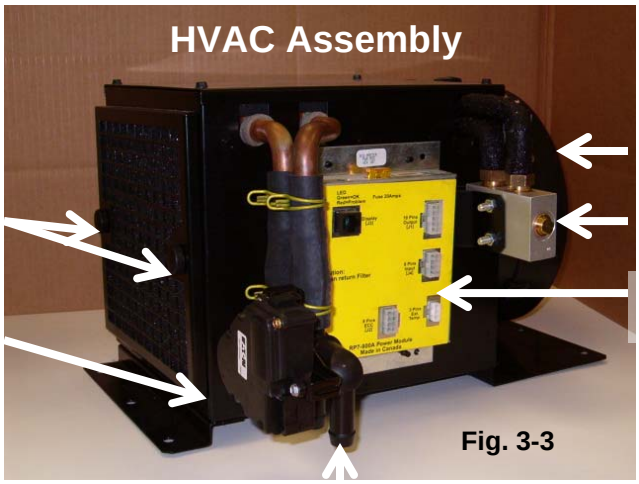


Fig. 3-2

Return Air Vents

HVAC Unit

Insulating Foam Sealant (apply sealant after Section 12 is complete)



Blower Motor

Thumb Nuts

Expansion Valve

Power Module [RP50-202]

Water Valve Return

Fig. 3-3

Water Valve Supply

3:2:0 Ducting the Ventilation System

Independent and Integrated Ducting are the two methods of providing air from the HVAC box to the bunk area. A great deal of thought and consideration should be used before deciding how to perform the vent installation.

3:2:1 Independent Ducting

The first method uses separate ductwork included in the RigMaster kit. We recommend this independent ducting method because it provides the least restriction to airflow from the HVAC.

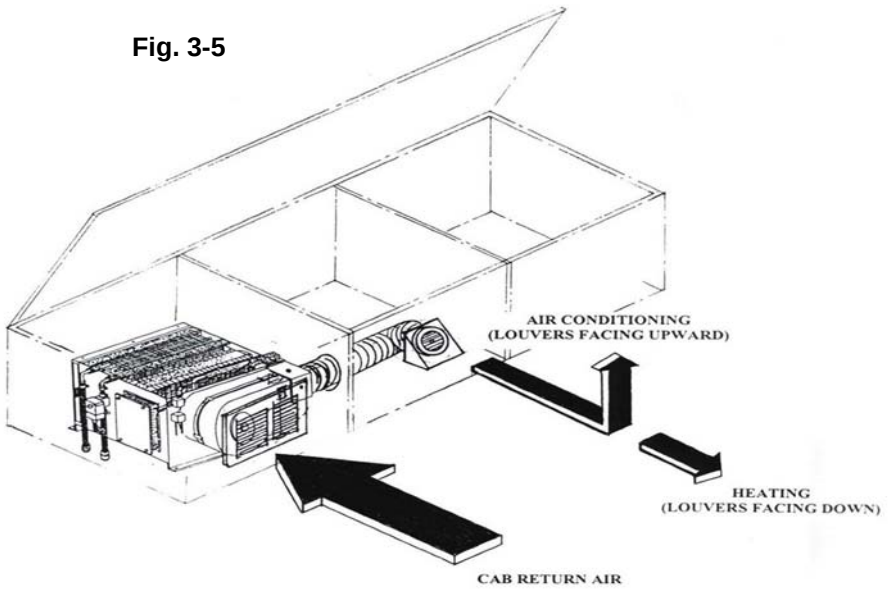
Fig. 3-4

4" Flexible Ducting

Install the flexible ducting by sliding it over the adapter on the blower motor at one end and over the louvered vent at the other. Excess ducting material must be removed to ensure optimal air flow.

Method 1 Independent Ducting

Fig. 3-5



AIR FLOW - NEW VENT

3:2:2 Vent Installation

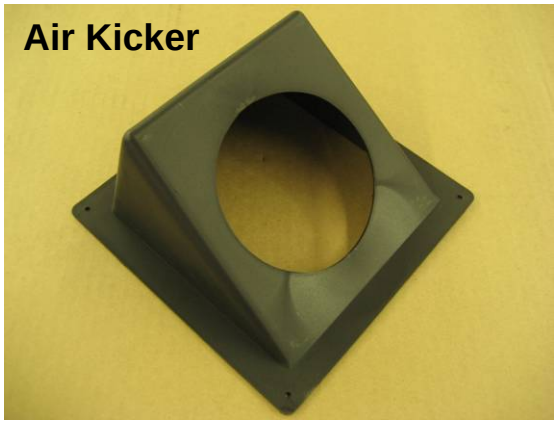


Fig. 3-6

Fig. 3-7

The vent kicker is an important component when fitting the independent ducting system; it promotes the circulation of vented air from floor to ceiling within the sleeper. It can be installed one of two ways:

1. Recess Mounting (fig. 3-8) the air kicker requires that a square hole be cut in the face of the bunk.

2. Surface Mounting (fig. 3-9) the air kicker requires that a 4 ¼ inch hole is drilled in the face of the bunk.

It is important that the vent is mounted so that it discharges directly into the sleeper and is unobstructed. Do not allow vents to discharge under the bunk.

Fig. 3-8

Fig. 3-9

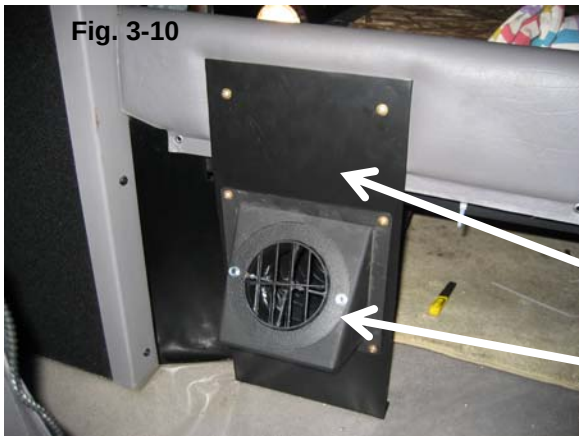


Fig. 3-10

In situations where there is no space to mount the air kicker and vent, a partial fascia may be fabricated and added to the bunk. Be sure to fold the edges if using sheet metal so not to leave sharp surfaces inside the cab.

Painted Aluminum Sheet Metal

Air Kicker and Vent Assembly

3:2:3 Installation of Return Air Vents

The RigMaster HVAC unit is capable of delivering approximately 278 cubic feet per minute of heated or cooled air. In order to supply the blower motor, a return air vent must be installed if not already present. A 4 inch hole, or the equivalent in smaller holes, is sufficient to supply the HVAC with return air from the sleeper. It is common to port return air vents between the cabinets and the face of the bunk as this leaves them less visible.

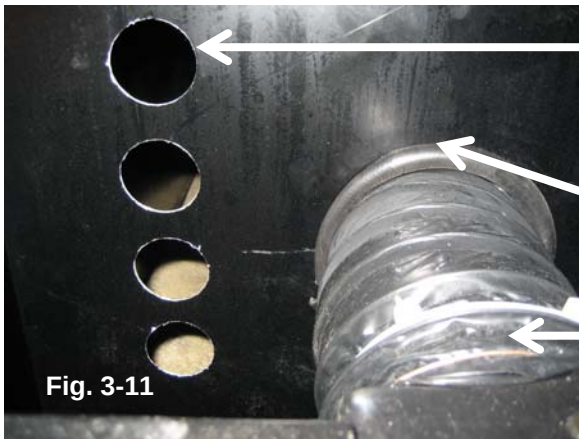


Fig. 3-11

1 ¼" Return Air Vents.

Split rubber hose to protect the flexible ducting from sheet metal burrs

Flexible 4" Air Ducting

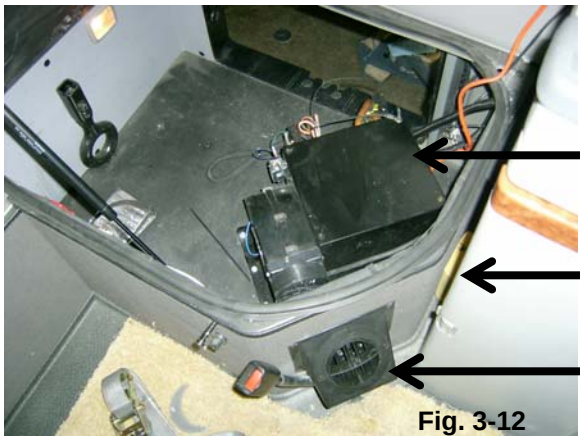


Fig. 3-12

HVAC Unit

Hidden Return Air Vents

Vent Assembly

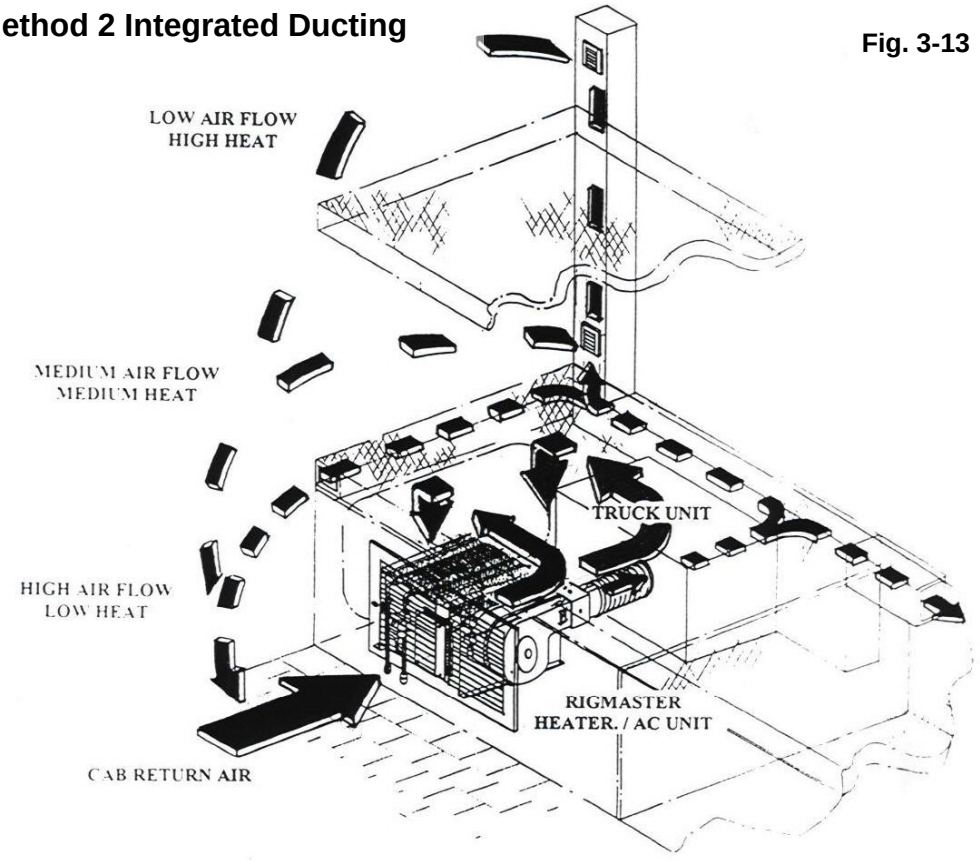
3:3:0 Integrated Ducting

Integrated ducting interconnects the vehicles OEM ductwork to the RigMaster HVAC box. RigMaster Power does not supply any fittings to perform this type of installation. Custom ductwork is the installers responsibility. For further information on this type of installation contact RigMaster's Technical Support Center.

Using a Damper Valve

A T-fitting with a flap to direct the air flow can be used to ensure proper air flow. This is commonly referred to as a damper valve. Using a T fitting without a flap will allow some air to escape through the OEM HVAC unit. A Y fitting may also be used to direct the air into the vehicles vent system, which will reduce the amount of air that escapes through the OEM HVAC unit if installed correctly.

Method 2 Integrated Ducting **Fig. 3-13**



AIR FLOWS - USING BUNK DUCTING

Mounting the Control Panel

Mounting the Control Panel	4:1:0

4:1:0 Mounting the Control Panel

The ideal mounting location for the control panel is at the head of the bed and about half way between the floor and the ceiling. Make sure that the chosen location is close enough to the HVAC unit that the communication cable will reach the power module when completely routed. Ensure that vented air does not discharge directly on the controller as this will cause it to register a false temperature reading. Once a location has been chosen it is necessary to either route the cables behind a cabinet or wall, or surface run the cable securing it to prevent damage. When routing the cables, avoid sharp edges and protect the cable from damage with grommets and/or wire loom. See that the bunk and cabinetry will not make contact with the control panel when folding.

Use some self-tapping screws to secure the mounting bracket to the wall. Take your time to make sure it is level; the operator will look at their control panel closely for many years. If the screws protrude through to the inside of a cabinet, use a piece of fuel line or shrink tube to cover the tip (short bolts and cap nuts are preferable in this situation). This will protect the operator's hands from damage when reaching into the cabinet.

Cabin Controller Mounting Bracket

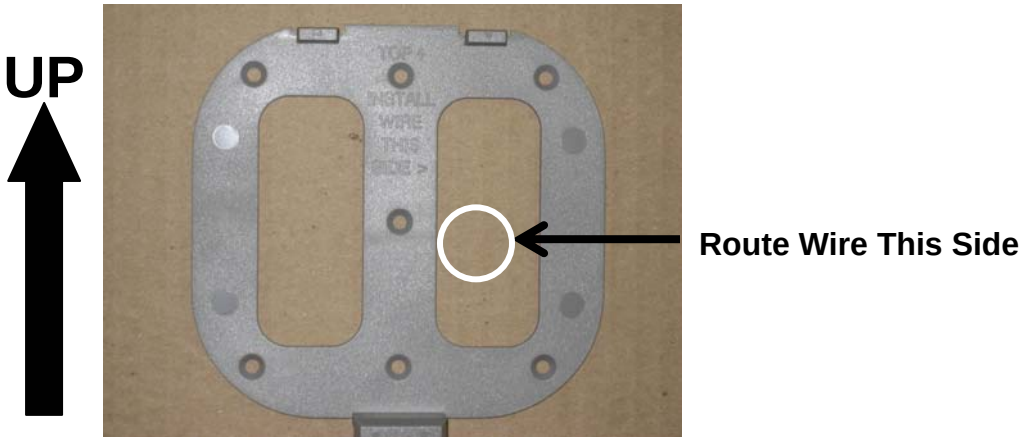


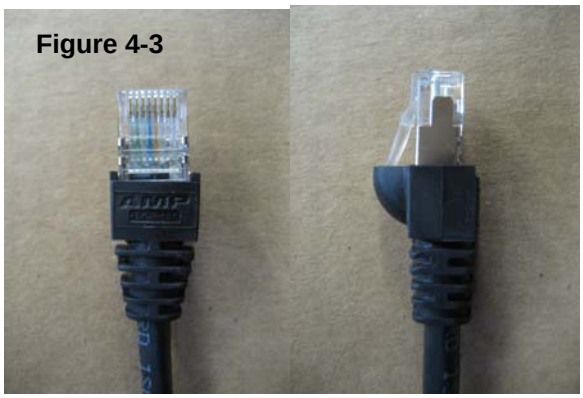
Figure 4-1

Figure 4-2

Communication Cable Connection Terminal

For surface run cables use this channel in the back of the controller

Figure 4-3



The communication cable is a Category 5e (shielded) cable with two RJ-45 connectors at each end. The cable should be attached to the control panel and routed to the power module. Coil up the excess cable and secure it with wire ties. Connect the cable to the power module. Connecting the electronic control system to live wires may cause damage. Longer Category 5e communication cables may be purchased at local computer equipment supplier if the supplied cable will not reach the desired location.

Figure 4-4

The Communication Cable is hidden, giving the control panel installation a professional look.

Installing the Coolant Hoses

5:1:0 Installation of the Coolant Fittings

Apply thread sealant to the straight brass fittings. Install the fittings taking care not to allow any of the sealant to enter the cooling system. If the distance in front of the Main Unit is heavily restricted it is acceptable to use a 45° male to female brass fitting to accommodate a sharper turn without kinking the coolant hose.

5:2:0 Installation of the coolant hoses

RigMaster is a “stand alone” auxiliary power unit which does not share coolant with the vehicles engine. The coolant hoses from the Main Unit are routed directly to the HVAC unit. The coolant must flow in the correct direction for the heating system to function normally. The kit includes the following components:

DESCRIPTION	QTY
12 ft. (3.5 m) heater hoses	2
3/8” NPT to 5/8” hose fittings	2
Hose clamps #10	4

NOTE

Mark the coolant supply line at both ends to prevent the two coolant hoses from being accidentally reversed when connecting them to the water valve.

The connections from the HVAC unit to the engine enclosure are as illustrated in Figure 5-1 and Figure 5-2. Care must be taken not to kink or restrict coolant flow through the coolant lines. Be sure to protect the coolant lines from damage using wire loom and grommets, and do not over tighten the wire ties that secure the hose to the vehicle.

Step 1 Connect the coolant supply and return line to the RigMaster bulkhead (Figure 5-1). The return line is the top coolant fitting and the supply line is the lower coolant fitting. Remember Fuel Supply and Coolant Supply ports on the bulkhead are next to one another.

Step 2 Route the coolant lines along the inside of the vehicles frame rail and secure them with wire ties taking care not to pinch the hose.

Step 3 Connect the coolant supply and return line to the HVAC box. (Figure 5-2)

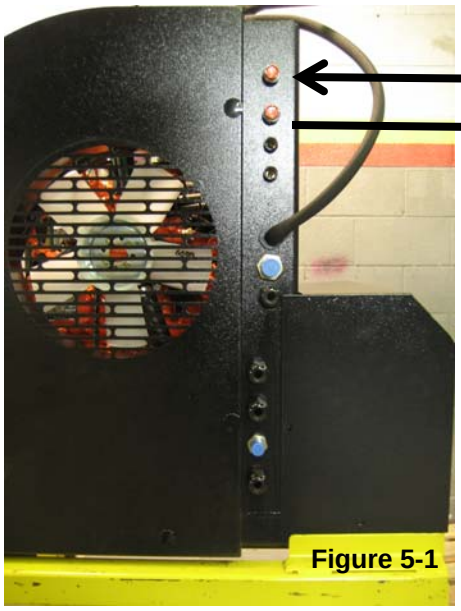


Figure 5-1

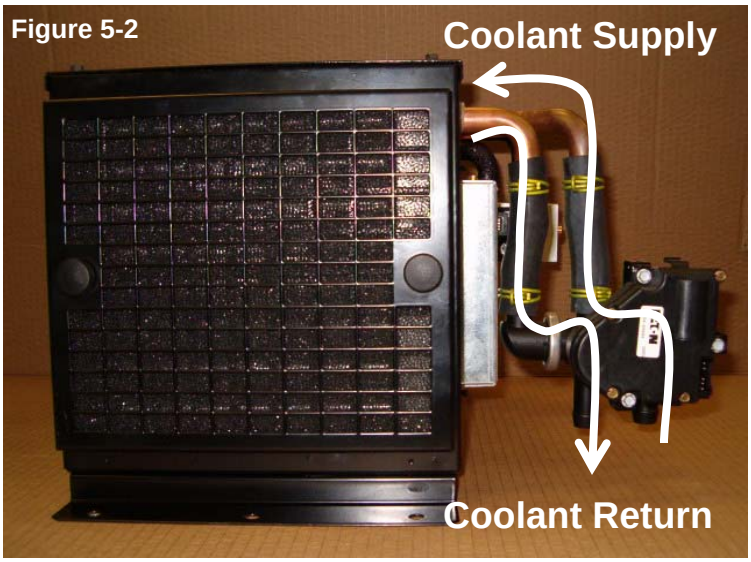


Figure 5-2

Installing the A/C Hoses

WARNING

Exercise caution when removing protective caps from the #10 and #8 ports as the compressor may be under pressure. Wear safety glasses and cover the ports with a shop rag prior to removal of the protective caps.

The RigMaster is shipped with the air conditioning system capped to reduce the possibility of contamination which may result from extended storage of the unit. The air conditioning system uses an aluminum condenser for optimum heat exchange properties. Care should be taken when connecting and removing the air conditioning lines because of the brittle nature of aluminum.

6:1:0 Installation of the A/C Refrigerant Hoses

WARNING

Cross contamination with other refrigerants will cause damage to this air conditioning system. Avoid breathing air conditioning refrigerants and lubricant vapor mist. Exposure may irritate eyes, nose and throat. To charge or recover R134a from the system, use equipment certified to meet the requirements of SAE j2210. If accidental system discharge occurs, ventilate the area before resuming service.

NOTE

- Ester Oil will be required if using non-Teflon coated o-rings. It is recommended that ester oil be used to lubricate the Teflon o-rings to reduce the likelihood of tearing upon installation.
- WD-40 should be used to prevent corrosion between the aluminum and steel fittings.

The installation of the A/C refrigerant hoses will require #6, #8, #10 o-rings (Teflon coated o-rings supplied with the RigMaster kit)

TOOLS REQUIRED	
5/8” Wrench	**1” Wrench**
11/16” Wrench	**Freon Recovery Unit**
3/4” Wrench	**Hoses (supplied)**
7/8” Wrench	**Ester Oil**

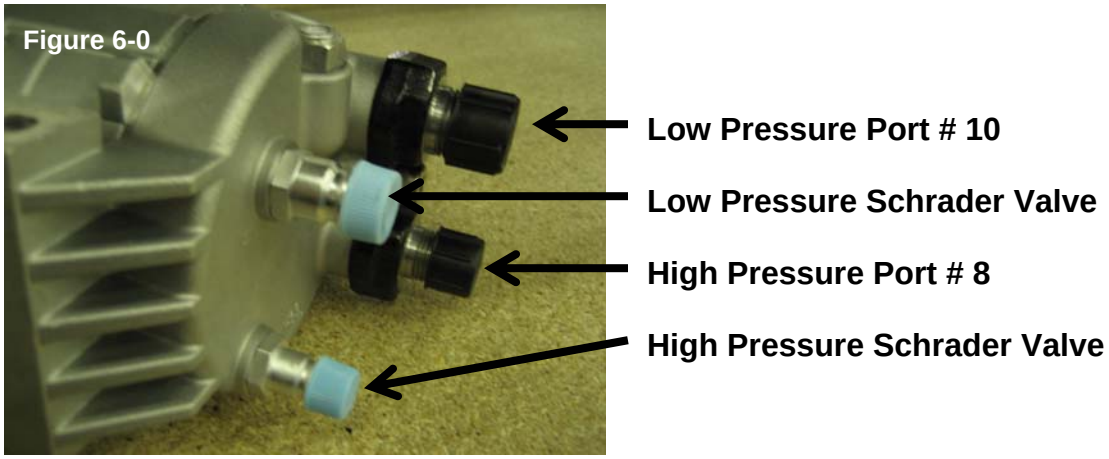
6:1:1 Installing the A/C hoses in the Engine Compartment

NOTE

Make sure you leave room between the compressor hoses in the engine enclosure, so that they do not rub together.

- Install the two #8 o-rings on the #8 refrigerant hose [RP9-400] and connect it to the compressor fitting that is the closest to the engine block (21-27 ft-lb). See that there is a ½ inch gap between the hose and engine block. This will allow room to adjust the compressor belt without the hose hitting the engine block.

Figure 6-0



- Install the straight hose fitting to the top fitting on the condenser (15-20 ft-lb). Use two wrenches so excess stress is not placed on the condenser fitting (Figure 6-3).
- Install the # 10 o-ring on the #10 refrigerant hose [RP9-401] and connect it to the compressor (21-27 ft-lb).

6:1:2 Installing the A/C hoses from the RigMaster to the HVAC unit

Remember to use a wrench to hold the fitting on the inside of the bulkhead when tightening the fitting on the outside of the bulkhead; this will prevent the fitting on the inside from rotating out of alignment.

- Install the two #6 o-rings on the #6 refrigerant hose [RP9-404] and connect it to the bulkhead first. Hand-tighten the fitting and torque to between 21 and 27 ft-lb. Route the hose and connect it to the expansion valve (21-27 ft-lb).
- Install the two #10 o-rings on the #10 refrigerant hose [RP9-405] and connect it to the bulkhead first. Hand-tighten the fitting and torque to between 21 and 27 ft-lb. Route the hose and connect it to the expansion valve (21-27 ft-lb).

Excess hose must be secured and allow for movement of the cab. Install the hoses with the cab air suspension inflated. After installation, deflate the air suspension and inspect hose clearances for potential problems. A/C hoses should not be under twisting or flexing stresses after installation as this may cause fittings to leak and/or break.

Figure 6-1

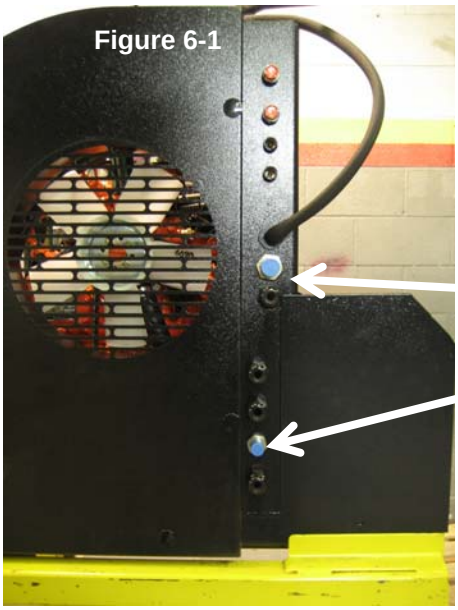
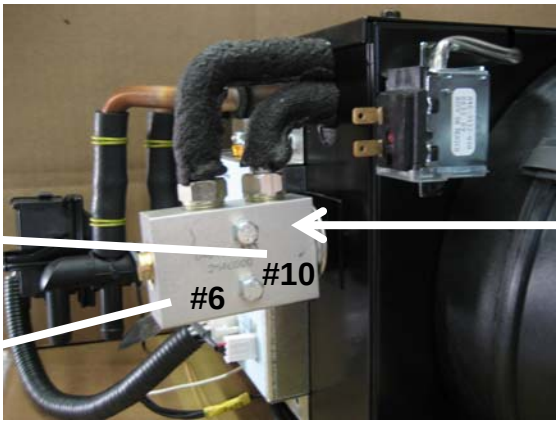


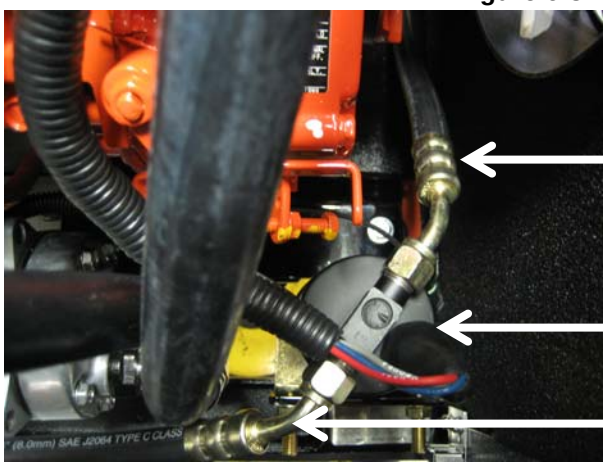
Figure 6-2



Expansion Valve

The preinstalled hose that connects the receiver-dryer to the condenser is part number RP9-402. To install this hose hand-tighten the fittings at the receiver-dryer and the condenser. Raise the receiver-dryer about 5/8" from the frame ensuring no stress is applied to the attached air conditioning lines and tighten the dryers clamp. With the condenser fitting in the 6 o'clock position tighten it with two wrenches to avoid stressing the condenser fitting. Tighten the remaining receiver-dryer hoses (11-13 ft-lb) ensuring that the fittings are at the appropriate angles. The hose fittings on the receiver dryer should point to the 2 and 7 o'clock positions.

Figure 6-3



[RP9-403] Dryer to Bulkhead

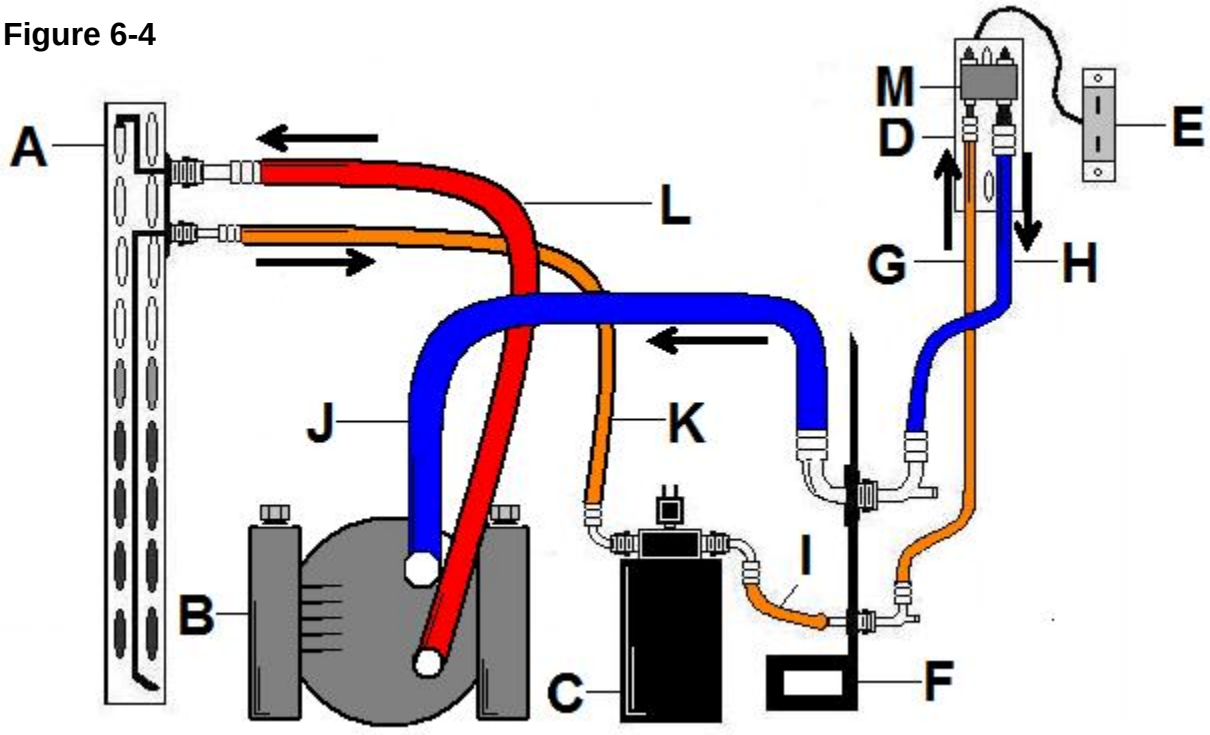
[RP9-027] Receiver-Dryer

[RP9-402] Condenser to Dryer

6:1:3 Air Conditioning Specifications

AIR CONDITIONING	SPECIFICATIONS
Refrigerant Type	R134a
Volume of Refrigerant	1.9 lbs; 30.5 oz; 0.86 Kg
Compressor Oil Type	SP-46 PAG Compressor Oil
Compressor Oil Volume (pre-filled new)	6.0 fl oz; 177 cc; 177 mL

Figure 6-4

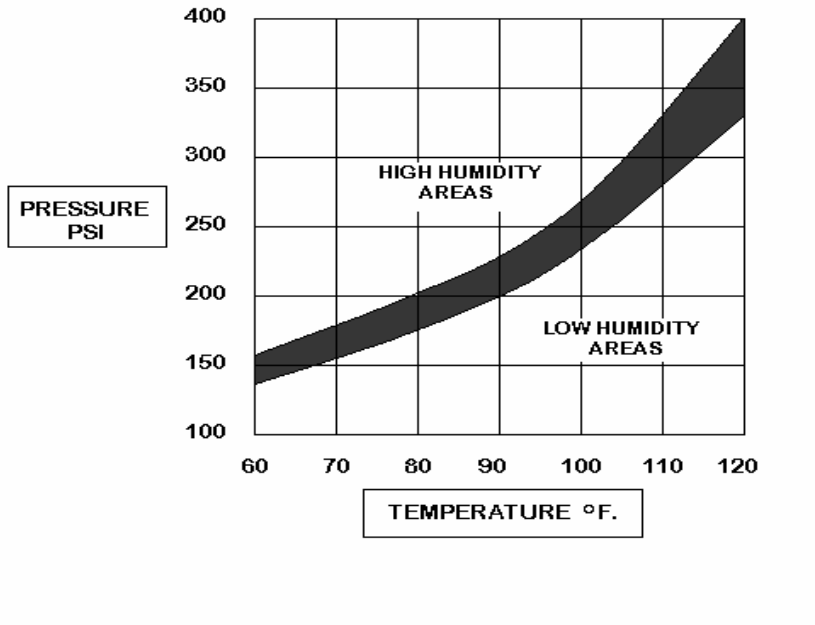


	LEGEND	PRESSURE	Part Number
A	Condenser	High	RP9-011
B	Compressor	High/Low	RP9-129
C	Receiver Dryer	High	RP9-027
D	Evaporator	High	RP9-201
E	Evaporator Core Temperature Probe	High/Low	RP9-113
F	Bulkhead Section of Frame	N/A	RP10-001-1A
G	Evaporator to Bulkhead	High	RP9-404
H	Evaporator to Bulkhead	Low	RP9-405
I	Receiver Dryer to Bulkhead	High	RP9-403
J	Compressor to Bulkhead	Low	RP9-401
K	Condenser to Receiver Dryer	High	RP9-402
L	Compressor to Condenser	High	RP9-400
M	Expansion Valve	High/Low	RP9-112

High Pressure vs. Temperature Readings

High temperatures and pressures are approximate. Readings within 10-15% of the chart in Figure 6-4, will deliver acceptable performance.

Figure 6-4



Suction Pressures – Low Side

Common low side pressure will be 15-40 PSI depending on the ambient temperature and humidity.

Installing the Fuel System

7:1:0 Installation of the Fuel System

The RigMaster uses fuel from the vehicles tanks. There are two basic methods of installing the fuel system. The first method is to tee into either the connection at the fuel tank or the crossover that links both tanks. When using this method, a check valve must be installed on the RigMaster supply hose as close to the source as possible to prevent the vehicles engine from draining the APU fuel supply.

The standard installation package includes:

DESCRIPTION	QTY
¼" check valve	1
¼" male NPT to hose fittings	2
12ft. (3.5m) fuel hoses	2
Fuel line hose clamps	4
¼" female NPT to hose fitting	1

The following illustration shows a typical fuel system hook up. The same principle can also be applied at the crossover junction.

NOTE

The check valve has an arrow indicating the correct direction of fuel flow. Try to keep the arrow on the valve in view; this will help when troubleshooting.

7:2:0 Installation of the Fuel Fittings at the Fuel Tanks

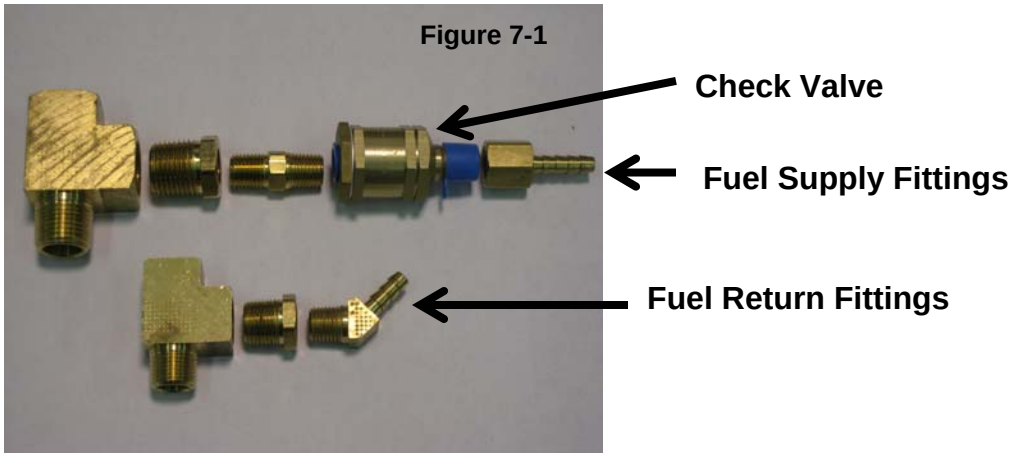
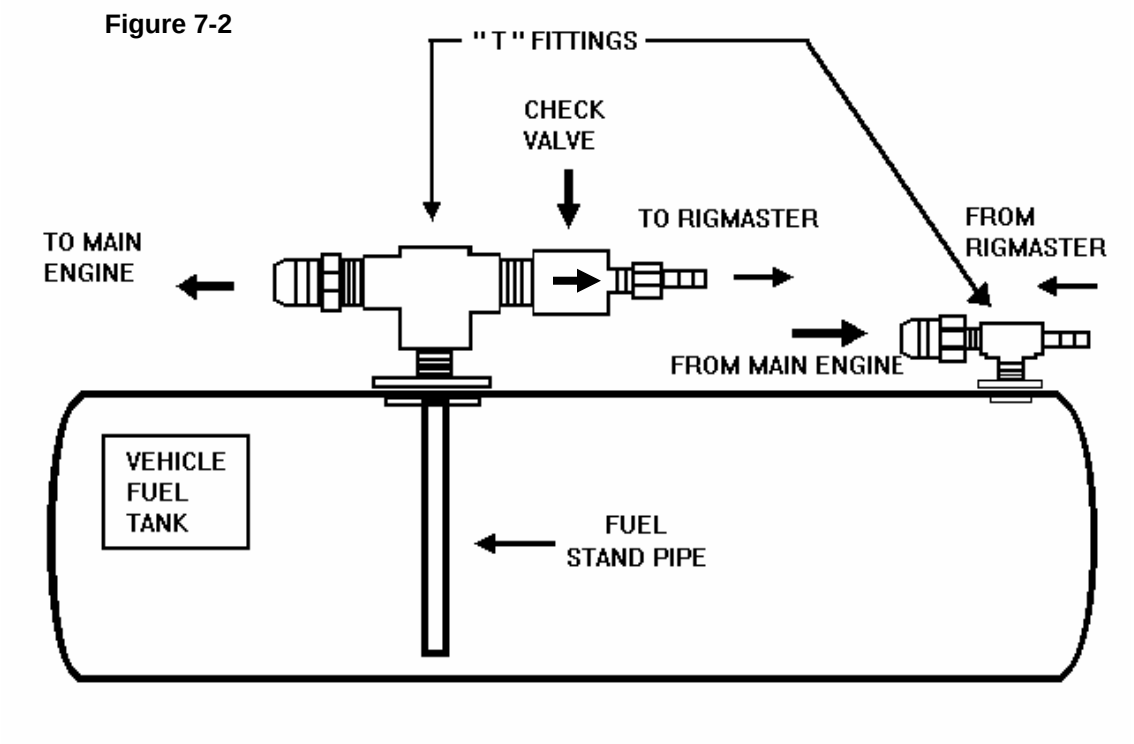


Figure 7-2



NOTE

Mark the fuel supply line at both ends to prevent the two fuel hoses from being accidentally reversed when connecting them to the fuel fittings.

Figure 7-3

Figure 7-4

7:2:1 Optional Fuel Pick-Up Tube

The second method is to install a separate fuel pickup. This method requires a fuel pickup tube [RP2-006] and the consent of the owner to modify their fuel tank if no auxiliary fuel port is available (please follow the fuel tank manufacturer's guidelines for all modifications). A check valve is not necessary when using a separate fuel pickup.

Fuel Stand Pipe – RP2-006

Fuel Stand Pipe is supplied with the seal and hardware

7:3:0 Installation of the Fuel Fittings at the RigMaster APU

Fuel Supply from Vehicle Fuel Tank to APU

Fuel Return to Vehicle Fuel Tank from APU

Figure 7-5

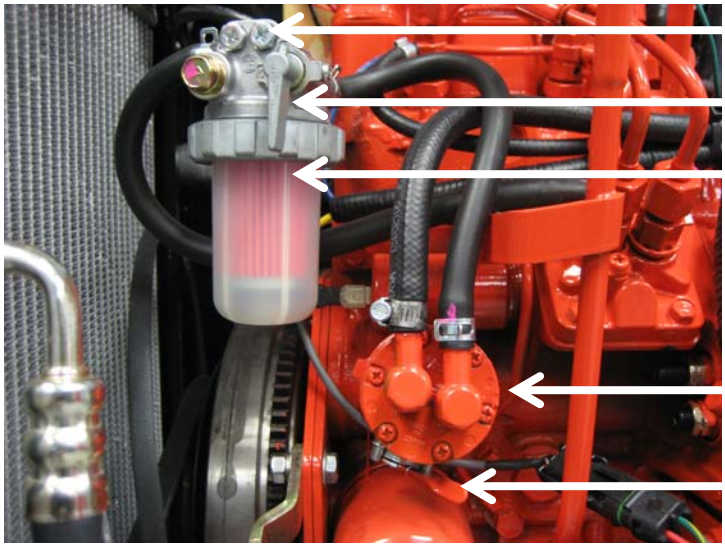
7:4:0 Prime the fuel system

1. Ensure that all fuel fittings and hose clamps are tight.

2. If teeing into the trucks fuel fittings, start and run the vehicle for 30 seconds prior to bleeding the RigMaster's fuel system. This will reduce the volume of any residual air in the vehicles lines that may reach the RigMaster's fuel system.

3. Ensure that the valve on the fuel filter assembly is in the open position and loosen the right hand Phillips head bleed screw.

Figure 7-6



4. Place a rag on the underside of the fuel bowl to collect any diesel that spills.

5. Manually prime the fuel bowl using the spring loaded priming lever located on the underside of the priming pump.

6. Allow all of the air to escape the fuel bowl at the bleed screw.

7. Observe a clean stream of diesel leaving the fuel bowl and retighten the bleed screw.

The engine is mechanically fuel injected; as a consequence the cam behind the fuel pump must be in the open position to allow fuel to flow through freely. It may be necessary to turn the engine over approximately 180° to operate the priming pump.

Exhaust System

8:1:0 Integrated Straight Muffler with Reversible End Caps


Figure 8-1

The integrated straight muffler [RP6-009] has flexible exhausting options as the end caps are interchangeable to redirect the engine exhaust out of the front or rear of the assembly.

To reverse the end caps:
1. Remove the four hex head crews from each end cap
2. Remove the end caps (Figure 1-36 and 1-47) and switch their positions
3. Reinstall the hex head screws


Figure 8-2 RP6-009


Figure 8-3


Figure 8-4 Removable Open-End Cap


Figure 8-5 Removable Closed-End Cap

NOTE

Extension pipe/elbow (solid pipe, not flex pipe) can be added to the exhaust system to direct the exhaust away from the sleeper. A maximum of 10 feet including the muffler can be added to the exhaust system without creating a harmful back pressure. See that any extension pipe is securely fastened.

The 45° exhaust tip is not a required component in this exhaust system, and may be removed in the event that extension tail pipe must be added (see NOTE above).

8:2:0 Diesel Particulate Filter Installation Instructions

The Diesel Particulate Filter (DPF) kit is sold under the part number RP50-200K and is not included with the T4-6 model RigMaster APU kit. The installation instructions for this exhaust component are supplied with each new RP50-200K DPF kit. These instructions may also be downloaded by authorized customers from the RigMaster Power website under “Manuals and Support Material” or can be obtained by contacting RigMaster Power’s Technical Support Department at (888) 208 – 3101.

Installing 120 Volt Power Cords

9:1:0 Introduction to Installing the 120 Volt Power Cables

The installation kit includes two 120 Volt power outlets, one for the interior of the vehicle and one for the vehicles block heater outlet. Please note that if you are to install a diesel particulate filter kit during this phase of the installation, the junction box wiring information shall be taken from the Diesel Particulate Filter Kit Installation Instructions.

NOTE

If the vehicle does not have a AC 120V block heater, it is recommended that one be installed. The block heater places a necessary load on the engine and improves heating efficiency during winter operation.

The bunk's Ground Fault Interrupter (GFI) circuit incorporates a twin outlet receptacle, which supports household 120V appliances. The block heater cable has a single grounded outlet that connects to the vehicles block heater receptacle (typically located under the driver's door).

With the generator cover removed, feed the cables through the wire retainers in the frame and into the junction box on top of the generator. Strip approximately 5 inches of the cables sheathing to expose the three wires (black, white, and green). Fully tighten the wire retainers.

CAUTION

Use caution when stripping the cables sheathing that you do not to cut into the inner insulation as generator damage may occur.

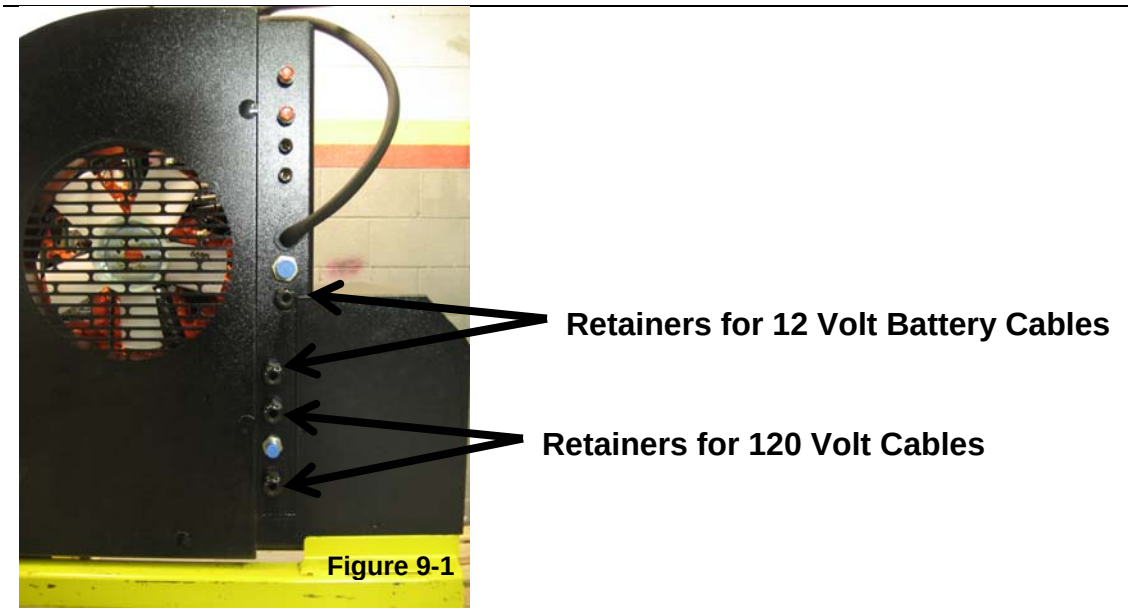
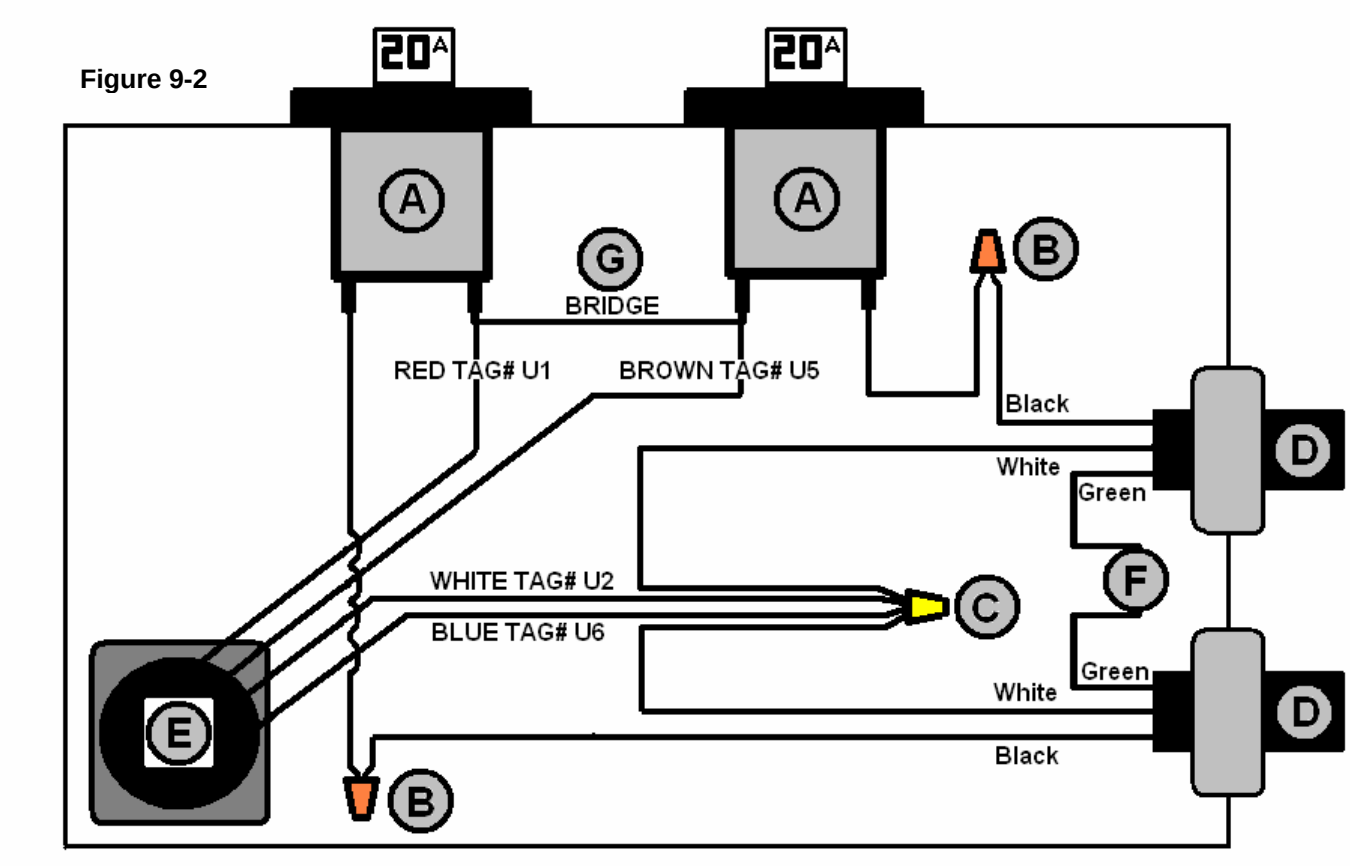


Figure 9-1

9:2:0 Wiring the 120V Generator Junction Box (without DPF Kit Installed)

Figure 9-2



LEGEND	
A	20 Amp Breakers
B	Small Wire Nut – Twist On
C	Large Wire Nut – Twist On
D	12/2, 120 Volt Electrical Cables
E	Wiring from Generator
F	Green Wires Grounded Using Existing Junction Box Mounting Bolt
G	Breaker Interconnect Wire (Bridge)

Sleeper and Block Heater Electrical Cords:

- Connect the two **green wires** to ground using a single 10 gauge eyelet terminal or two 12 gauge eyelet terminals. Secure the terminal(s) to the junction box mounting hardware **(F)**. The eye of the terminal must be ¼" in diameter.
- Connect the two **black wires**, one to each breaker (**B**) - black wires from the sleeper or block heater cables can be connected to either breaker.
- Two **white wires** to the White Tag# U2 and Blue Tag# U6 (**C**)

CAUTION

Vibrations can cause wire nuts to become loose or fall off. When wiring the generator it is important to use electrical tape to fully secure the wire nuts.

9:3:0 Installing the 120 Volt Block Heater Supply Cable

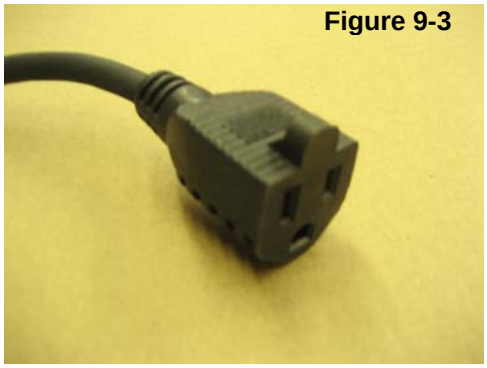


Figure 9-3

Connect the receptacle to the 120V generator and route it along the frame rail securing it frequently. This cable should terminate next to the block heater receptacle and the excess cable coiled up and secured with wire ties. See that the block heater extension cable will reach the receptacle when secured.

9:4:0 Installing the 120 Volt GFCI Outlet in the Sleeper

When mounting the 120 Volt GFCI outlet, pay close attention to where the 120 Volt appliances are in the vehicle (or where they are likely to be located) and position the receptacle close to that area. Secure the 120 Volt outlet mounting bracket (hardware not included). Drill a hole under the bracket and route the GFCI outlet cable to the 120 Volt generator and connect it. Cut the excess cable after all the wire retainers are secured and you are sure of the outlets placement. Secure the receptacle to the bracket and ensure that it is firmly mounted.

Bunk 120V Outlet Bracket

Figure 9-4

Bunk 120V Outlet

Figure 9-5

Electrical Connections

10:1:0 Introduction to RigMaster Electrical Connections

CAUTION

Before making, or removing any electrical connections (including the power module and the cabin controller), ensure that the battery source is not connected to the RigMaster. Failure to do so may cause damage to the electronic controls.

The following electrical connections are made between the engine wiring harness and the power module at the HVAC unit. The J terminals are individually labeled on the power module. Ensure that the J connectors are clean and free of debris that may have entered while routing the cable outside the vehicle.

10:2:0 Connecting the Engine Harness to the Power Module

J1connection

- Connect the 10 pin harness J connector to J1 on power module.
- Connect the green wire with the female spade terminal to the thermostatic switch (top position).
- Connect the black wire with an eye terminal to ground (HVAC box mounting hardware is a good ground source)
- White wire with a female bullet connector is an optional wire that does not need to be connected at this time (block heater wire)

J2 Connection

- Water valve to power module 8-pin harness (already connected from factory)

J4 Connection

- Connect the 8 pin harness J connector to J4 on the power module.
- Red wire with a bullet connector is a optional wire (when power is detected the RigMaster will shut down)

3 Pin Exterior Temperature Sensor (Ext. Sensor).

Figure 10-1

Connect the 3 pin temperature sensors J connector to the power module. The exterior temperature sensor can be routed to the exterior through the same hole as the 120V cable and engine wiring harness. If this is not ideal a 3/16” – 1/4” diameter hole may be drilled independently for the sensor. This should be drilled after the HVAC unit is mounted to determine the best location. Thread the sensor through the floor so that 3”-4” minimum is exposed under the cab/sleeper. Ensure that this sensor is located away from the exhaust system or other sources of heat that might cause it to give a false reading. See that the sensor is sealed where it enters and exits the vehicle.

Two Harness Wires

- Connect the blue wire with the female spade terminal to the evaporator thermostat (bottom position).

- Connect the black wire with an eye terminal to ground (HVAC box mounting hardware is a good ground source)

10:3:0 Evaporator Temperature Switch Wiring Connections

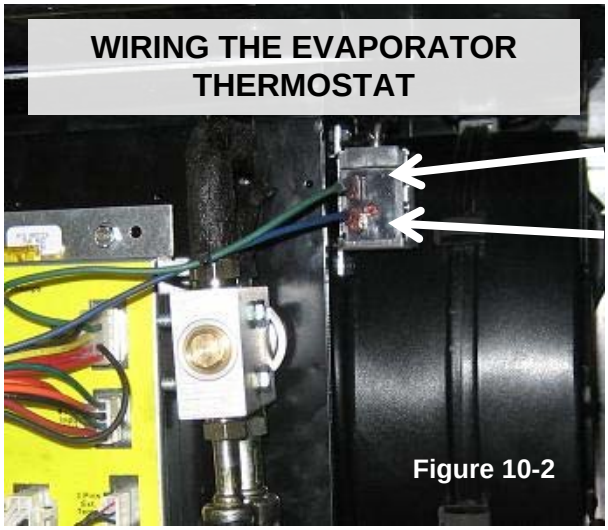


Figure 10-2

Green Wire – 12V from Power Module

Blue Wire – 12V to Binary Pressure Switch

10:5:0 Connecting the Cabin Controller

J3 Connection

- Connect the communication cable to the cabin controller first (see section 4) and then route it to the power module. Coil any excess cable and secure it with wire ties. Connect the 8 pin communication cable to the J3 terminal.

10:6:0 DPF Backpressure Monitor Wire

The T4-6 model RigMaster is designed to accommodate a Diesel Particulate Filter as an optional upgrade. An exhaust backpressure monitor will be supplied with the kit. The back pressure monitor integrates with the silver power module bearing the part number RP50-202. The wiring harness has a blue wire with a white stripe that is to be connected to the module only when the DPF kit has been installed. Do not connect this wire unless there is a DPF kit present of the APU. Instead tie the wire off to prevent damage and cover the tip with electrical tape. For further information on how to connect this feedback wire refer to the Diesel Particulate Filter Installation Instructions RP50-200K supplied with the DPF kit.

Installing the Battery Cables

WARNING

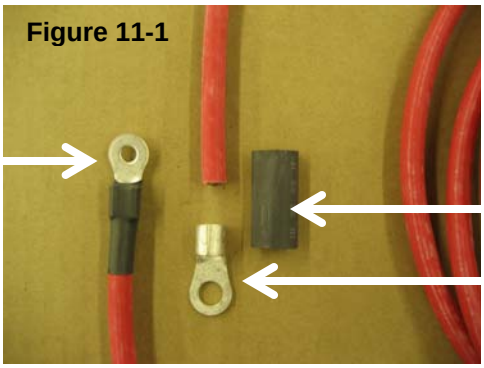
The following procedures present hazards which can result in injury or death. Only persons qualified to carry out electrical and mechanical servicing should undertake this work.

Do not connect the batteries until the installation is completely finished and you are ready to perform the pre-start inspection in Section 12.

11:1:0 Introduction to Installing the Battery Cables

Both battery cables are supplied with eye terminals and shrink tube. The smaller eye terminal connects to the battery posts inside the RigMaster's engine enclosure, and the larger terminal to the vehicle's battery bank.

Figure 11-1



11:2:0 Installing the Battery Cables to the RigMaster Battery Posts

Route the battery cables through the upper two cable supports in the RigMaster's bulkhead and connect the terminals to the battery posts.

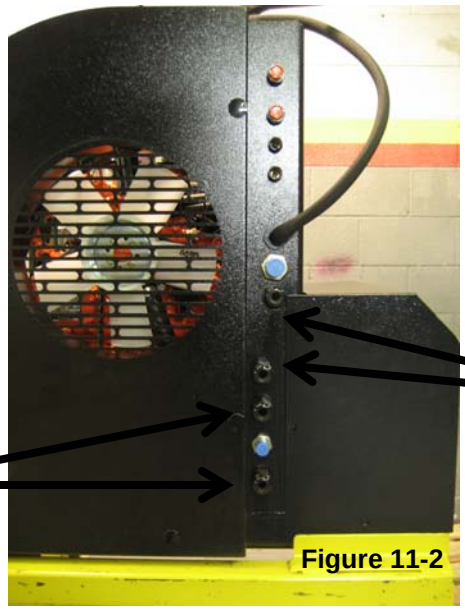


Figure 11-2

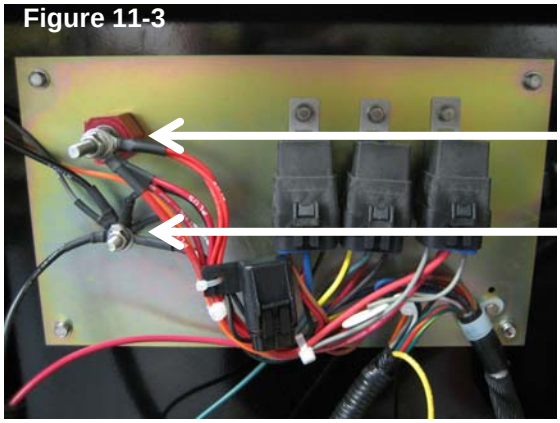


Figure 11-3

Connection 1: Positive cable to the RigMaster (Figure 11-3)

Remove the nut and washer from the positive stud on the engine harness back plate and connect the red cable (1/4” terminal)

Connection 2: Negative cable to the RigMaster (Figure 11-3)

Remove the nut and washer from the positive stud on the engine harness back plate and connect the black cable (1/4” terminal)

11:3:0 Installing the 100 Amp Battery Fuse

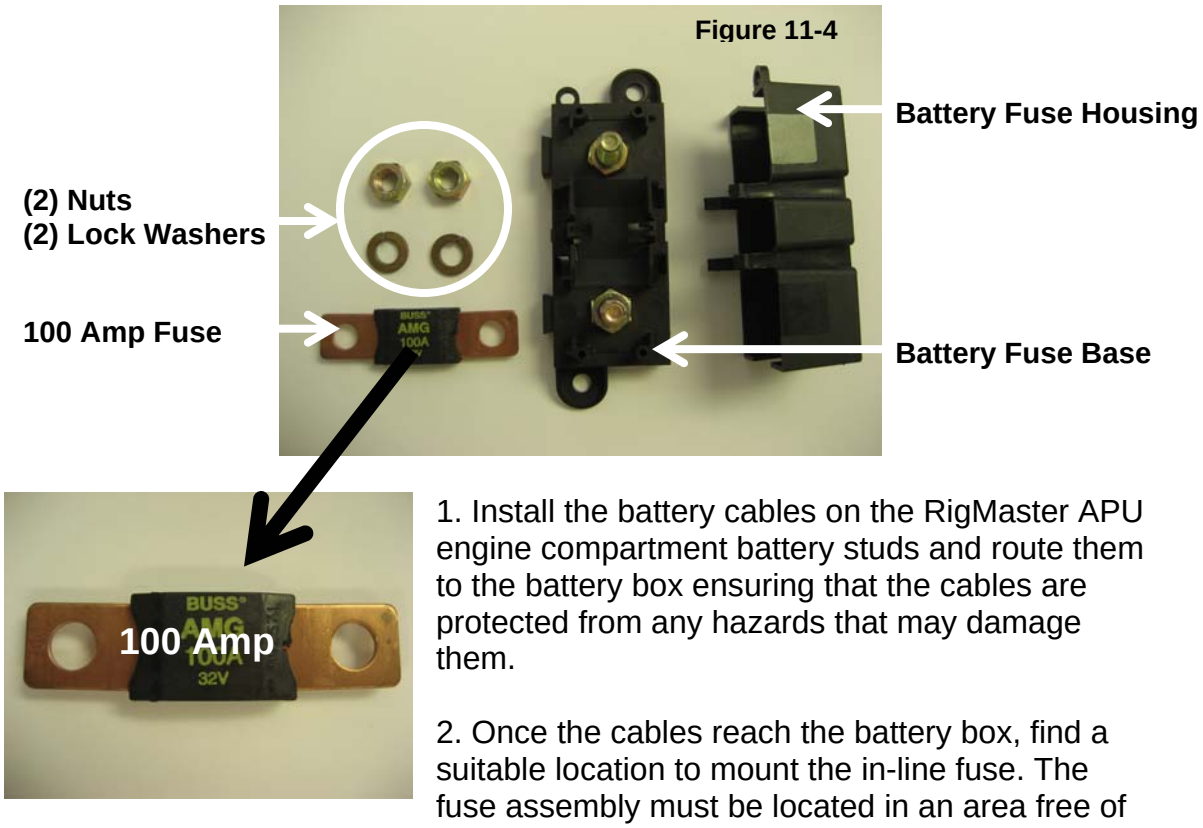
A 100 Amp in-line DC fuse must be installed on the RigMaster's positive (+) battery cable. The fuse assembly kit will be supplied under the following part numbers:

Description	Part Number
Fuse Kit Fuse Holder, 18" Cable, Fuse	RP7-085
Fuse Holder with Fuse	RP7-071
100 Amp Fuse	RP7-073
18" positive battery cable	RP7-042
17' positive battery cable with 5/16" eye terminal	RP7-045

NOTE

The RigMaster positive battery cable should be located on a separate battery than the negative cable. The RigMaster positive battery cable should be on an independent post (i.e. there should be no other line or load terminals connected to the same stud as the RigMaster's positive battery cable).

Figure 11-4



1. Install the battery cables on the RigMaster APU engine compartment battery studs and route them to the battery box ensuring that the cables are protected from any hazards that may damage them.

2. Once the cables reach the battery box, find a suitable location to mount the in-line fuse. The fuse assembly must be located in an area free of hazards and firmly secured (mounting hardware not included).

NOTE

Prior to mounting the fuse assembly ensure that the 18 inch battery cable will reach the positive battery terminal and the fuse assembly.

3. Cut back any excess cable that connects the RigMaster APU to the fuse assembly and secure the 5/16” eye terminal. The use of shrink tube and dielectric grease on all points of connection is highly recommended.

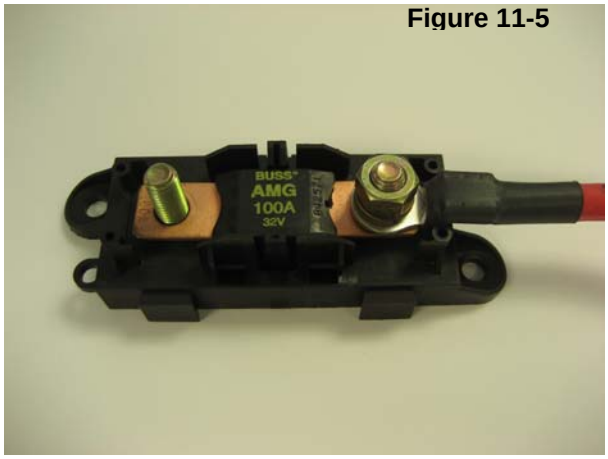


Figure 11-5

4. Connect the fuse assembly to the positive battery terminal with the 18 inch positive battery cable prior to connecting the RigMaster’s negative terminal.

11:4:0 Installing the Battery Cables to the Vehicles Battery Bank

NOTE

Before connecting the battery cables to the vehicles batteries make sure all connections are made at the power module and cabin controller first.

Route the battery cables to the battery compartment and cut the excess cable. Fit the shrink tube to the cables and connect the 3/8 terminals.

Connection 1: Positive cable to the vehicles batteries (Figure 11-4)

Ensure that the positive battery terminal is clean and connect the red battery cable.

Connection 2: Negative cable to the truck batteries (Figure 11-4)

Ensure that the negative battery terminal is clean and connect the black battery cable.

NOTE

The use of dielectric grease is recommended on all battery connections

Start-Up Procedure

12:1:0 Introduction

It is important that you ensure all steps are complete before performing the start up procedure. If you require assistance in completing any of the following steps see Section 1:1:3 for manufacturers Technical Support information.

12:2:0 Operation of the Electronic Control

Before beginning the start-up procedure it is necessary to know how to operate the cabin controller.

Figure 12-1

Controls

The Cabin Controller consists of two sections:

1. LCD (Liquid Crystal Display) with basic control buttons.
2. Advanced control buttons

The LCD and basic control buttons are always visible to the user. The advanced control buttons are concealed behind semi-circular cover.

The controller also contains a LED indicator. When the LED is green, the system is active, if it glows red then the system is detecting a problem and an error message will scroll across the bottom of the LCD screen. The LED is turned off in low power mode.

1. Basic Controls and Functions

Basic controls contain the following buttons:

1. Start system
2. Stop system
3. Up arrow (Red triangular button)
4. Down arrow (Blue triangular button)

If the unit is in advanced mode, pressing any of the basic control buttons will return the unit to basic mode. Alternately, the control panel will return to basic mode after two minutes of inactivity.

If the unit shows the current temperature, pressing either the up or down button will show the set point temperature without changing it. Once the set point is indicated, pressing up or down buttons will adjust the set point. The new set point takes effect only when display is returned to show internal temperature.

2. Advanced Controls and Functions

The advanced controls are as follows:

1. **Power** button controls whether the module is active. In inactive mode all system functions including engine start, climate control and AutoStart are disabled. You can still see the temperature reading, current time and use the alarm clock function.
2. **Fan** button is used to change fan setting. Pressing the button cycles between auto, high, med, low and off settings.
3. **Clear** button will take you back to the main screen without saving any information.
4. **Clock** button is used to set the time/date/day menu features.
5. **Alarm** button is used to set the alarm menu features.
6. **AutoStart** button is used to access and set AutoStart menu features.
7. **Mode** button is used to activate the different operational modes. Pressing the mode button will back you out of a menu mode, but does not save the information just entered.
8. **Ext. Temp** button will display the external temperature on the LCD when

pressed.

9. **Oprtg. Hours** button will display the total hours of use.
10. **Select** button enters the data and advances the program to the next menu step. Pressing the select button will save the information when entering operational data.
11. Left scroll button (with ◄ symbol)
12. Right scroll button (with ► symbol)

The left and right arrow buttons are used to locate the desired data and/or adjust those values.

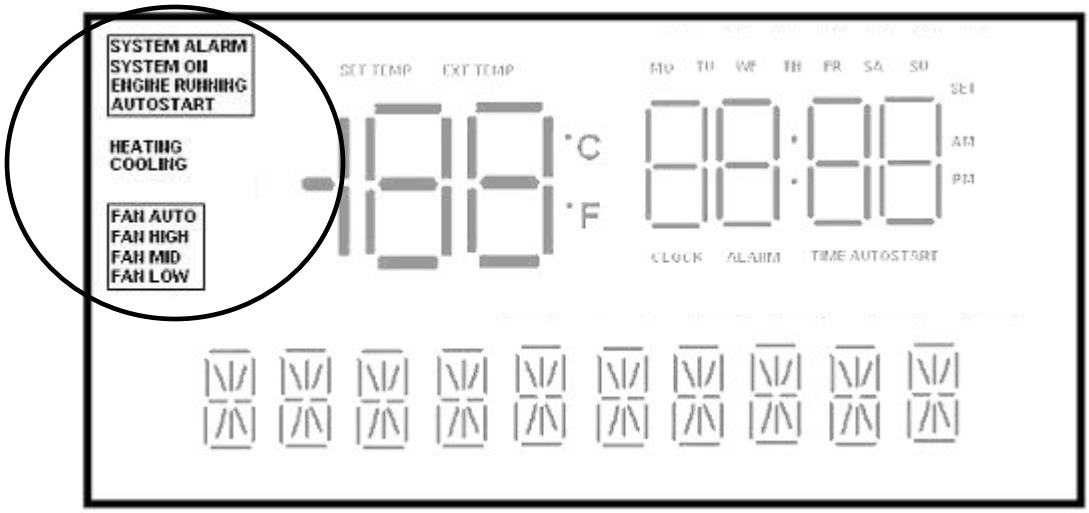
12:2:1 Cabin Controller LCD Display

The Cabin Controller LCD has a white backlight that turns on each time a user presses a button and will remain on for 2 minutes after the last button that has been pushed. The backlight will turn red when there is an alarm condition. A fault code will be displayed if the unit shuts down or fails to start.

The LCD displays 4 groups of information:

1. System information
2. Temperature information
3. Clock, day and alarm information
4. Alphanumeric display for additional information

1. System Information:

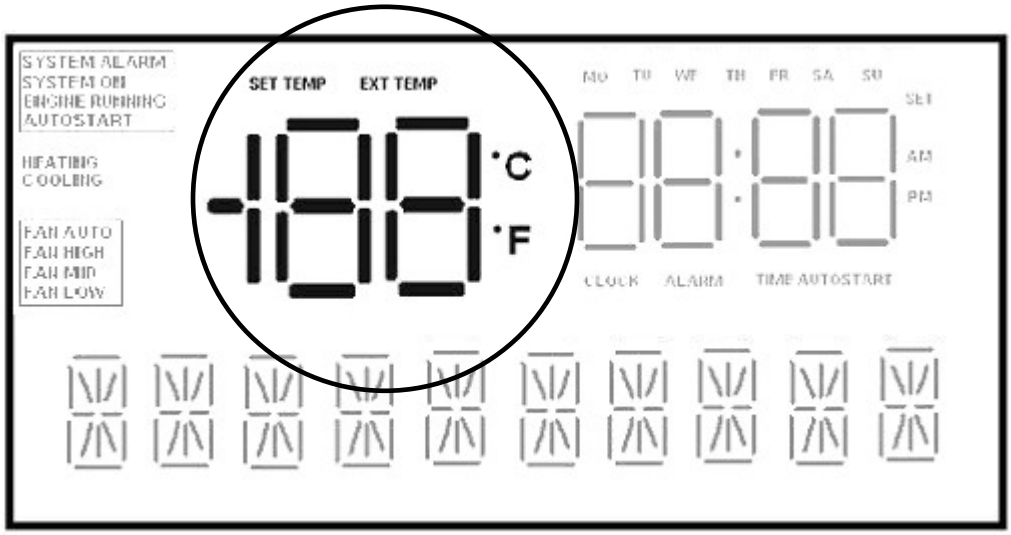


SYSTEM ALARM symbol will flash if an alarm condition has occurred. The alphanumeric display along the bottom of the display screen will show more information about the alarm. Red status LED will be on.
SYSTEM ON symbol will display if the unit is in ON mode. (Green status LED will be on.)

ENGINE RUNNING symbol will display when the engine is running.

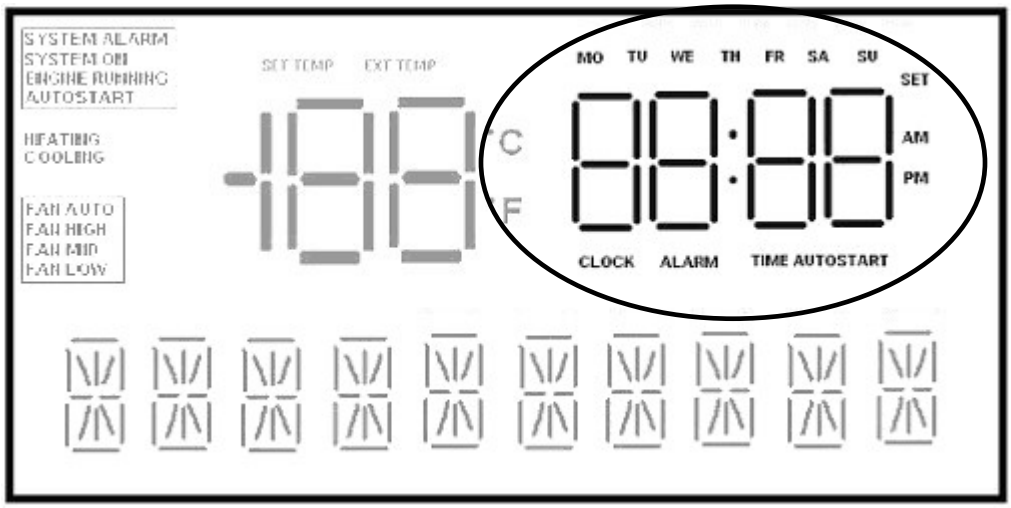
AUTOSTART symbol will display and flash if temperature AutoStart is enabled (when engine is off). If the engine has been started through AutoStart, this symbol is constantly on while the engine is running.
HEATING symbol will display when the system is in heating mode.
COOLING symbol will display when the system is in cooling mode.
FAN AUTO, FAN HIGH, FAN MED, or FAN LOW symbol will display depending on which setting has been selected. Nothing will display in this area if the fan is set to off.

2. Temperature Information:



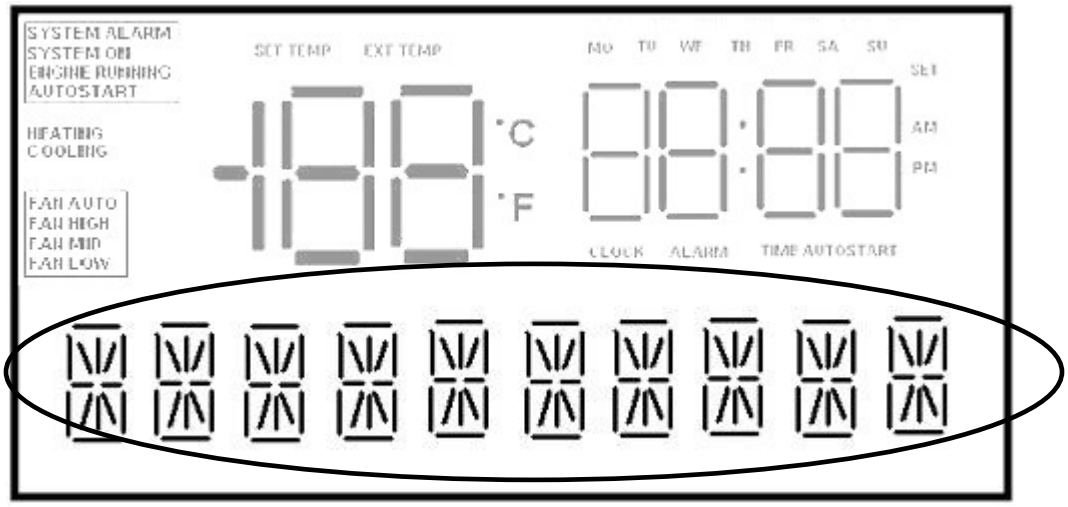
This area indicates the internal (or external) temperature and can be programmed to display in either “Celsius” or “Fahrenheit”
Internal temperature is shown if **EXT TEMP** and **SET TEMP** symbols are not illuminated. Pressing the **Ext. Temp** button will momentarily display the outside temperature. After 5 seconds, the display will default back to showing the internal temperature.
EXT TEMP symbol will flash when showing external temperature. After a few seconds the display returns to show internal temperature.
SET TEMP symbol appears (and the numeric temperature value will flash) whenever adjusting temperature set point. A few seconds after adjusting the temperature, the display returns to show internal temperature.

3. Clock and Alarm:



This is a 12:00 hour clock system with **AM/PM** symbols and 7 symbols indicating day of the week: **MO, TU, WE, TH, FR, SA, SU**.
CLOCK symbol appears when the current time is showing.
ALARM symbol appears to indicate that the alarm setting is showing. Pressing the alarm button allows you to set the alarm. The alarm symbol flashes when the alarm has been set.
TIME AUTOSTART symbol appears if the display shows time AutoStart setting. It flashes if time AutoStart is set.

4. Additional Information/Message Area:



This line is used to show extra information in the basic mode, error messages to provide interface when going through menus in advanced mode. Longer text lines are scrolled to the left on the display.

12:2:2 Operation of the Cabin Controller (Functions)

To Turn Power On
Press the **POWER** button to activate the system. When the power switch is activated the LCD display will light and **SYSTEM ON** symbol will turn on (active mode). Press **POWER** button again for 2 seconds to switch the unit back to low power mode.

Engine Start
Press **START** button.
The control panel will display the status of the operation as it occurs: *Glow Plug* and a countdown will display on the screen. Once the countdown is complete the display will read *Cranking* as the RigMaster starts up and the **ENGINE RUNNING** symbol will blink. Once started the control will display *Engine Running* for 5 seconds (and **ENGINE RUNNING** symbol will turn on).

Engine Stop
Press **STOP** button.
The screen will initially display *Stopping* and then change to *Stopped* once the operation is complete. The **Engine Running** symbol will turn off.

Temperature Control
Press UP or DOWN (red/blue) buttons to adjust temperature set point on the display. When editing the set point, the LCD display will show the set point instead of internal cabin temperature. The set point is stored without a need to press any other buttons.

NOTE

The manual temperature control ranges from 59ºF-90ºF (15ºC to 32ºC).
The system will remember the last set temperature when the RigMaster is turned on. If the system is already running, the change will take effect a few seconds after the last UP or DOWN key is pressed and the display will switch back from set point to internal cabin temperature.

Clock & Date Set Up
It is necessary to enter the time and date programming mode if the module has never been programmed or a different time zone is required. (**SET** symbol is flashing and **CLOCK** symbol is turned on during clock setup)
Press **CLOCK** button:
The display will read *Set Clock.* Press **SELECT** button to continue, **MODE** to exit.
Clock hour will start flashing.
Press LEFT or RIGHT scroll button to adjust *Clock hour*.
Press **SELECT** button: *Clock hour* will stop flashing and *Clock minutes* will start flashing.
Press LEFT or RIGHT scroll button to adjust *Clock minutes*.

Press **SELECT** button: *Clock minutes* will stop flashing and *am/pm* will start flashing.
Press LEFT or RIGHT scroll button to change.
Press **SELECT** button: *am/pm* will stop flashing and *day of week* will start flashing.
Press LEFT or RIGHT scroll button to change.
Press **SELECT** button: *day of week* stop flashing and *Month* will start flashing.
Press LEFT or RIGHT scroll button to change.
Press **SELECT** button: *Month* stop flashing and *Date* will start flashing.

Set Alarm Clock
Press **ALARM** button:
The display will read *Set Alarm*. Press **SELECT** button to continue, **MODE** to exit.
Alarm Clock hour will start flashing.
Press LEFT or RIGHT scroll button to adjust *Alarm Clock hour*.
Press **SELECT** button: *Alarm Clock hour* will stop flashing and *Alarm Clock minutes* will start flashing.
Press LEFT or RIGHT scroll button to adjust *Alarm Clock minutes*.
Press **SELECT** button: *Alarm Clock minutes* will stop flashing and *am/pm* will start flashing.
Press LEFT or RIGHT scroll button to change.
Press **SELECT** button
Press LEFT or RIGHT scroll button to turn Alarm clock on/off.
Press **SELECT** button to save settings and return to menu or press **MODE** to return to menu without saving.

When enabled, **ALARM** symbol is flashing.

Fan Speed Control
Press **FAN** button to adjust fan speed:
Press the **FAN** button to cycle through fan settings: *AUTO OFF, AUTO ON, FAN LOW, FAN MEDIUM, FAN HIGH, FAN OFF*. There is no need to press any other buttons to confirm. AUTO OFF is for heating efficiency during winter operation. AUTO ON is for air conditioning efficiency during summer operation.

NOTE

The air conditioning/heating system will only operate when the fan speed is in a setting other than *OFF*. To stop the operation of the air conditioning/heating system, the fan speed must be set to *OFF*. If the system was stopped by another method, the air conditioning/heating will start immediately when the system is restarted.

12:2:3 AutoStart Features and Operation

- **AutoStart Time/Day Programming** –allows you to program a day and time for the RigMaster for the start automatically up to 7 days in advance. This feature will run for three hours and shut down. At the end of the AutoStart program the cabin controller will display the error code #10, “Run Timeout”; this is normal.

Set AutoStart Timer
The user can adjust the time and day for the next timed AutoStart event. (**SET** symbol is flashing and **TIME AUTOSTART** symbol is turned on during alarm setup)
Press **AUTOSTART** button:
Time AutoStart will scroll across the screen.
Press **SELECT** button to continue, **MODE** to exit.
Press LEFT or RIGHT scroll button to adjust *AutoStart hour* as required.
Press **SELECT** button
Continue to set the *AutoStart Minutes* and *am/pm* as you would set the clock.
Press **SELECT** button after each entry.
Press LEFT or RIGHT scroll button to adjust *AutoStart Day* as required.
Press **SELECT** button
Press LEFT or RIGHT scroll button to locate *On/Off*.
Press **SELECT** button to save settings or press **MODE** button to return to menu without saving.
NOTE: When enabled, **Time AutoStart** symbol will be flashing.

- **Automatic Temperature Control Start Up/Shut Down**-will start and stop the RigMaster to regulate the temperature giving you further fuel savings on extended absences from the cab.

Set AutoStart Temperature Start-Up
Press **AUTOSTART** button twice: *Temp AutoStart* will scroll across the screen.
Press **SELECT** button to continue, **MODE** to exit.
Press LEFT or RIGHT scroll button to select mode of temperature control. Mode options include *OFF, AUTO, HEAT or COOL only*.
Press **SELECT** button to continue, **MODE** to exit.
Press LEFT or RIGHT scroll button to select AutoStart temperature setpoint if *HEAT* or *COOL* have been selected.

NOTE

The AutoStart temperature range is between 32°F and 95°F.

Press **SELECT** button to save settings or press **MODE** to return to menu without saving.

When enabled, the **AutoStart** symbol will flash. AutoStart temperature start-up will engage when the inside temperature is more than 5°F lower or more than 5°F higher than the temperature control setting (in auto mode). It also engages at least 1 minute after enabling AutoStart temperature.

- **Low Battery Start Up**-automatically starts up the RigMaster to charge the truck battery if it gets low. This option is always enabled in active mode. The voltage sensitivity of the low battery AutoStart feature can be adjusted, however, this is a dealer programmable feature and must be performed at a RigMaster licensed facility.

Set AutoStart Low Battery Start-Up

Low Battery AutoStart does not require that it be set by the user in the same way as the time/date and temperature based AutoStart. All that is necessary to ensure that low battery AutoStart functions is to leave the RigMaster engine OFF and the cabin controller powered on (active mode).

Version Display
Press **MODE** button.
Current version of the Power Module software will appear on the screen
Press **MODE** or **SELECT** to return.

Electronic Control Operation and Fault Codes

The RigMaster's electronic control will display fault codes on the LCD display if the unit fails to start or shuts down. The following table contains fault codes and information on the cause and/or remedy. These fault codes will display one time only; if the code is cleared (by pressing select) the failure will have to reoccur for the code to be displayed again.

CODE	REMEDY/CAUSE	REMEDY/COMMENT
Error Code 1 Safety Cover Open	Engine cover of RigMaster unit is open. APU will not start or run until the cover is closed	• Cover not seated • Damaged wiring • Failed cover switch • Switch out of adjustment
Error Code 2 Low Oil Pressure	Low oil pressure	• Low oil level • Wiring damaged • Faulty switch • Dirty Oil Filter

CODE	REMEDY/CAUSE	REMEDY/COMMENT
Error Code 3 Battery Low Voltage	Low battery voltage Start system immediately	• Damaged or broken battery cables • Excessive load on batteries • Bad battery • Faulty charging system
Error Code 4 Engine Run Failure	Engine started but did not run properly. Manual start attempts can occur.	• Speed sensor adjustment • Damaged speed sensor wiring • Failed speed sensor
Error Code 5 Low Coolant/ Engine Overheated	• Engine will not run until temperature becomes normal • Engine will not run until coolant level is full	• Low coolant • High Engine Temperature • Failed Temperature or Coolant Level Switch • Damaged Wiring
Error Code 6 Module Failure	Power Module is not responding	• Failed Power Module
Error Code 7 Engine Start Failure	Engine did not start. Automatic start is disabled until operator presses select button	• Bad glow plug relay • Bad starter relay • Failed glow plug • Lack of fuel
Error Code 8 No Communication Error	Communication between control panel and power module is lost. Engine will not run until communication is re-established	• Communication Cable Damaged • Poor Connectivity at the terminals
Error Code 9 Main Engine Running	Truck engine is running. RigMaster will not run if the main engine is already running	• Optional engine wire is connected to DC voltage supply at the power module

CODE	REMEDY/CAUSE	REMEDY/COMMENT
Error Code 10 Run Timeout	The RigMaster has shut down as the maximum run time has been exceeded in the AutoStart Time/Day Setting	• Engine will only run 3 hours max when set on AutoStart Time/Day
Error Code 11 Check Power Module Fuse	Very low battery voltage detected at the power module	• Check 20 Amp fuse at the power module (Located under the bunk on the HVAC unit)
Error Code 12 Battery Charging Failure	Battery voltage still low two minutes after cranking. Auto and manual starts can occur	• Faulty charging system • Bad batteries • Engine harness ground wires disconnected at the HVAC
Error Code 13 Battery Discharge	Alarm, system will enter low power mode. Auto and manual starts can not occur	• Bad batteries
Error Code 14 Check External Temperature Sensor	External temperature sensor disconnected from the power module	• External Temperature Sensor Disconnected • Connection loose or damaged
Error Code 15 External Temp Disable Limit	Engine shut down since the external temperature is outside the programmed range. Set default to OFF from factory.	The RigMaster has been programmed not to start when the external temperature is outside a preprogrammed range.
Error Code 16 Module Reset – Set Clock	Power to the cabin controller has been lost.	• Reset clock
Error Code 17 Service Exhaust Filter (for units equipped with Diesel Particulate Filters)	Level 1 Service - Filter has a higher than normal backpressure and requires maintenance.	Proceed to a licensed RigMaster Dealer to have the DPF filter cleaned.
Error Code 18 Replace Exhaust Filter (for units equipped with Diesel Particulate Filters)	Level 2 Service - Filter has a higher than normal backpressure and requires that it be replaced.	Proceed to a licensed RigMaster Dealer to have the DPF filter replaced.

12:3:0 Pre-Start Inspection

WARNING

Safety goggles must be worn while purging air from the coolant system as engine coolant is under pressure and can be extremely hot.

CAUTION

Inspect the engine oil volume prior to starting the APU and adjust as necessary **Do not over-fill with oil as damage to the crankshaft seals will result**.

The RigMaster's engine requires 3 US qt. (3 Liters) of motor oil (SAE 5W-40 Premium Synthetic API CJ-4 Diesel Oil is supplied from factory). See the RigMaster RMP-T4-6 Service Manual for more detailed information on the oil specification.

Ensure that all mounting hardware, hose clamps and fittings are tight.

Ensure that the engine air filter is in place and secured.

See that the belts are in place and tensioned.

12:4:0 Purge the Heater Core and Test the Heating System

Top up the radiator reservoir with premixed 50/50 water and glycol engine coolant suitable for aluminum radiators (approximately 5 liters or 5 US quarts if the system is totally dry).

Figure 12-2

After installation, the RigMaster's coolant lines and heater core contain air that must be removed. Purge with the following method.

1. Set the cabin controller in the sleeper to a temperature higher than that in the vehicle. This will ensure that the electronic coolant control (water valve) opens and allows coolant to enter the heater core and air to escape.

NOTE

The cabin controller is where the bunk temperature is monitored. It may be necessary to artificially lower the temperature of the controllers thermostat.

2. Remove the radiator cap.

3. Gently insert a screw driver or pick between the brass fitting and the coolant hose on the return side of the heater core. Use a pail to contain any coolant that spills.

4. Start the engine and allow the coolant to heat up until the water valve opens (approximately one minute).

5. As soon as coolant enters the heater core it will force the air out and aerated coolant should be seen passing by the screwdriver or pick. As soon as a steady stream of air-free coolant is observed the pick can be removed and the hose clamp secured.

6. After purging air at the heater core coolant lines, both copper supply and return pipes will become hot to the touch if all the air has been removed.

If no heat is present at the copper line on the return side of the heater core, shut the engine off and allow it to cool completely before repeating the above steps.

During this process have someone hold the safety cover switch down so the unit will run with the cover off (ensure the air conditioning system is off). As air is being removed from the system, coolant can be added to the radiator via the radiators pressure cap (not through the reservoir).

After running the RigMaster for several minutes, the volume of the expansion tank should be examined and coolant added as necessary. The cooling system has the appropriate amount of coolant when the surge tank reads FULL. During testing, check the coolant level periodically to ensure that all air removed from the system is replaced by coolant.

The RigMaster APU is supplied with premixed 50/50, standard life coolant and should be topped up with a compatible coolant type suitable for aluminum radiators. Approximately ½ - ¾ gallon of additional coolant is required to fill the heater core, coolant hoses and radiator on a new install.

12:5:0 Test the Air Conditioning System.

CAUTION

Do not operate the unit in the air conditioning mode with any cover removed. High pressures and temperatures will result from reduced air flow across the condenser and radiator.

Set the controller for a temperature lower than that in the cab to activate the air conditioning. Start the engine and allow the system to operate for a few minutes. Inspect the vent temperature and confirm that cold air is being produced.

NOTE

The cabin controller is where the bunk temperature is monitored. It may be necessary to artificially raise the temperature of the controllers thermostat.

12:6:0 Test the 120 Volt Generator

Using a multi-meter set to Volts AC, test the two outlets and see that they are both producing approximately 120 Volts. While under 1500 Watts of load the AC generators frequency should test between 61.5 and 62 Hz.

12:7:0 Test the Alternator

Test to see that the alternator is producing between 13.5 and 14.5 Volts DC (14.8V DC maximum).

12:8:0 Mark the Serial Number Placard

Permanently mark the in-service date on the serial number placard with a punch. The placard is located in the lower right hand corner of the engine enclosure to the front of the receiver dryer. The in-service date is the date the customer will take possession of their newly installed RigMaster APU. The in-service date may be different from the inspection date. See the 14-6 Owners Manual for a more detailed explanation of the warranty policy.

12:8:1 Complete the Installation Checklist and Warranty Registration

Upon installation or re-installation of the RigMaster, a licensed facility must complete a thorough inspection and file a warranty registration electronically. The Installation Checklist is only to be completed at the time of inspection by authorized technicians at licensed facilities. The contents of this check list will be submitted via the RigMaster Power website and activate or reactivate whatever portion of warranty remains on the unit. On a new RigMaster APU the Installation Checklist is inside a plastic envelope attached to the engine cover.

12:8:1 RigMaster Installation Check List

Date Inspected	**RigMaster Model No.**	**RigMaster Serial No.**
Vehicle Make/Model/Year	**RigMaster Engine Model No.**	**RigMaster Engine Serial No.**
Installing/Certifying Dealers Name	**Inspecting Technician**	**Invoice No**
In-Service Date	**APU Hours Reading**	**Owners Name**
Owners Phone Number	**Owners Address**	**Owners Signature**

RigMaster Unit	**Comments**
Make sure the RigMaster is straight with the truck's frame. ☐	
Keep 2 ½ inches on the right side of the RigMaster for air flow. **Note:** You will need room to attach the a/c quick connect to the two charge port fittings. ☐	
Cables/Hoses	
Make sure all hoses are secure using tie cables. ☐	
Make sure that the coolant/fuel hoses are not pinched when using the tie cables. ☐	
Make sure there is loom around the cables/hoses that might have a chance to rub on the truck's frame or brackets. ☐	
Muffler Assembly	
If the muffler tail pipe is located under the bunk then additional piping must be added to avoid exhaust entering the cab. ☐	
HVAC Box/Control Panel	
Make sure all ground wires are secured to the HVAC box. ☐	
Make sure a grommet or loom is used to protect the cables/hoses where they pass through the vehicles floor. ☐	
Make sure the holes drilled through the floor are sealed. **Note:** Add sealant to the out side of the bunk & inside the cab. This will keep moisture from entering the cab. ☐	
Make sure that the control panel is not placed in a location that the vent is blowing air directly at the controller. **Note:** If the vent is blowing air directly towards the controller a false temperature reading will displayed. ☐	
Start-Up Procedures	
Start the RigMaster. **Note:** Check oil & coolant level first ☐	
Check for heat and air conditioning in the bunk. ☐	
Check for 120 volt power at the block heater outlet. ☐	
Check for 120 volt power at the bunks outlet. ☐	
See that the alternator is charging the batteries. ☐	
Check for any leaks as in coolant and engine oil. ☐	

Register this RigMaster Installation Check List at www.rigmasterpower.com/login

12:8:2 Diesel Particulate Filter Registration

If a Diesel Particulate Filter has been installed it must be independently registered. For further information of DPF registration please refer to the Diesel Particulate Filter Kit RP50-200K Installation Instructions supplied with the DPF Kit.

Installation Equipment List

14:1:0 Installation Materials List

Wire Loom ½ inch
Wire Loom 1 inch
Hole Saw 1 ½ inch
Hole Saw 4 ½ inch
Hole Saw Arbor with 3/16" Pilot
Polyurethane Insulating Foam (Small Can)
Black Plastic Wire Ties - 8 inch
Black Plastic Wire Ties - 12 inch
Thread Sealant
Standard Life Engine Coolant [Premixed 50/50 suitable for Aluminum Radiators]
Fuel Stand Pipes for 3/8 ID Fuel Lines [RP2-006 (Optional)]
Frame Grabber Mounting Clamps [RP10-001-28 (Optional) See Section 2:2:1]
Assorted Self Tapping Screws
Electrical Tape

14:2:0 Installation Tools List

Wrenches
5/16"
3/8"
7/16"
9/16"
5/8"
11/16"
3/4"
7/8"
1"
1 1/16 "
1 1/8"
10 mm
17mm
8"Adjustable

Ratchets
Air Ratchet
Impact Gun
1/4 " Drive Hand Ratchet
3/8 " Drive Hand Ratchet
1/2 " Drive Hand Ratchet
Torque Wrench [½" drive]

Sockets ¼" Drive
1/4"
5/16"
3/8"
8mm
10mm

Sockets ⅜" Drive
7/16"
1/2"
9/16"
17mm

Sockets ½" Drive
1 1/16
1 1/8"

Extensions
6" Extension [1/4" drive]
12" Extension [3/8" drive]
24" Extension [1/2" drive]

Screwdrivers
Flat Head (small-thin)
Flat Head (small)
Flat Head (medium)
Flat Head (large)
Philips Head (medium)

Hole Saws
1 ½ " diameter
4 ½ " diameter
Arbor with 3/16 pilot

Other Tools
Safety Glasses
Tape Measure (26' / 8m.)
Flashlight
Air Blow Gun
Test Light (LED Type)
5/8"-1 ½" Reamer
8" Needle Nose Pliers
8" Square Nose Pliers
Channel Lock Pliers
6" Side Cutter
Wire Stripper/Crimper

14:3:0 Shop Equipment List

Pallet truck, fork lift, transmission jack or equivalent lifting device with a minimum weight capacity of 650 lbs (approx. 300kg)

2 or 4” 4”x 24” Spacer Blocks (if Pallet Truck used).
R134 Refrigerant Charge and Recovery System
Radiator Pressure Tester
Air Impact Gun
Pressurized Air Line Supply
Portable Extension Light
Battery Operated Drill
Electric Drill
Extension cord
Electrical Test Meter

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