NITE® PLUS

A Division of Bergstrom Inc.

Installation Manual

WESTERN STAR TRUCKS®

2390 Blackhawk Road • Rockford, IL 61072 • 815-874-7821 • www.bergstrominc.com

Table of Contents

Introduction

Congratulations. You have chosen the premier no-idle climate control system on the market today—the ***NITE Plus*** from Bergstrom.

The ***NITE Plus*** is a powerful 12V rechargeable DC system that keeps sleeper compartment cool in hot weather and warm in cold weather (with optional heater) without having to idle the truck's engine—and without a genset. It not only dramatically reduces fuel burned, it's also very environmentally friendly.

Your ***NITE Plus*** is a self contained, hermetically sealed, compact A/C system that produces approximately 4,600 BTUh and has been quality engineered for years of reliable service. The system operates independently from your truck's engine using its own deep cycle batteries that are completely separated from the truck's starting batteries.

The ***NITE Plus's*** deep cycle batteries are the most advanced ever—and will efficiently power the system for 8 to 10 hours. The batteries are then fully recharged after just 4 to 6 hours of driving.

Add it all up, and you have a revolutionary no-idle system that will save you money and fuel year after year—the ***NITE Plus*** from Bergstrom.

NOTE:

*The **NITE Plus** A/C system is designed to maintain a comfortable temperature inside the sleeper without running the engine.*

For optimal comfort, the curtain between the cab and the sleeper must be closed when using the unit. To enhance cooling efficiency during the day, solar reflectors or curtains should be placed over windshield and all windows to block sunlight from entering the cab and sleeper.

*The **NITE Plus** A/C unit will not pull down a hot sleeper that has been sitting in the sun without the factory A/C running. To assist the **NITE Plus** unit in cooling down the sleeper, start the engine and run the factory A/C until desired temperature is reached. The **NITE Plus** unit will then maintain a comfortable temperature depending on solar load & ambient temperature.*

Before You Start

A typical installation of the ***NITE Plus*** generally takes between 8 to 10 hours, although your particular situation may vary. This manual contains step-by- step installation instructions. It is divided into three categories:

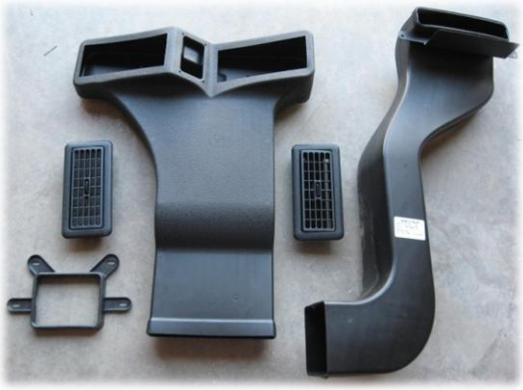
- General installation
- Electrical installation
- Heater installation (optional)

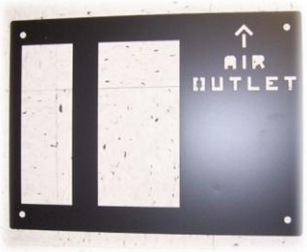
There is also a section on how to check your ***NITE Plus*** to make sure the installation was successful, and a section on how to operate your ***NITE Plus***.

If relocation or reinstallation of any pre-installed equipment is necessary for installation of the NITE Plus equipment - please refer to the components manufacturer's instructions or safety guidelines for proper installation.

Before you start, we highly recommend doing the following to help make your installation as easy as possible.

1. Lay out all parts and check to make sure you have all parts listed on the parts list. **Depending on truck, some hardware may not be used.** If you are missing any parts, please call 1-866-204-8570.
2. To prevent damage to compressor, keep the ***NITE Plus*** unit in an upright position at all times. If unit is tipped, place back in upright position for a minimum of 6 hours prior to running.
3. Check the list of tools needed for installation and make sure you have all of them. Keep all tools within easy reach.
4. Look through the whole installation manual to get an understanding of the order in which components are installed.
5. Make sure you have good lighting and enough space to work in.
6. You may want to get an assistant to help you to reduce the number of times you have to climb in and out of the cab.
7. Make sure you wear all appropriate safety equipment.





Photos above are representative of kit 1000113991 only.

Parts List – Kit 1000018320

Bergstrom Part #	Part Description	Quantity
	1000113877 NITE STANDARD KIT A/C ONLY	
1000078163	ASSEMBLY, NITE UPGRADE UNIT	1
1000014440	KIT, NITE POWER	1
1000007552	POLICY, NITE WARRANTY	1
585421	MANUAL, NITE OPERATION	1
585511	CARD, NITE, WARRANTY SURVEY	1
	1000119244 NITE STANDARD KIT A/C & HEAT	
1000078163	ASSEMBLY, NITE UPGRADE UNIT	1
530713	KIT, ESPAR HEATER	1
1000014440	KIT, NITE POWER	1
1000007552	POLICY, NITE WARRANTY	1
585421	MANUAL, NITE OPERATION	1
585511	CARD, NITE, WARRANTY SURVEY	1
	1000113991 INSTALL KIT	
454634	BRACKET, MOUNTING	2
454635	PANEL, CLOSEOUT	1
500105	LOUVER,CARY 633 WITH 631 BEZEL	2
500198	GRILLE, AIR RETURN	1
870059	ASSEMBLY-DUCT OUT	1
870093	ASSEMBLY-INSERT FRAME	1
1000007614	DUCT, UPPER	1
1000011467	CONTROL DUCT ASSY	1
1000113415	WIRE-HARNESS NO-IDLE CONTROL	1
1000113995	KIT, NITE STD HARDWARE	1
1000115617	CD ROM, NITE INSTALL MANUAL	1
B360692	GROMET-NO6 AND NO10 HOSE ADPTR	2

Parts List – Kit 1000018320

Bergstrom Part #	Part Description	Quantity
	1000014440** NITE Plus **POWER KIT	
660706	ASSY, WIRE BATTERY CABLE 5300MM BLACK	2
660707	ASSY, WIRE BATTERY CABLE 5000MM RED	3
660694	ASSY, WIRE BATTERY CABLE 225MM	2
660678	HARNESS, WIRE NO-IDLE POWER	1
660827	WIRE, 16 GAUGE BLACK	1
651383	SEPARATOR 200 AMPS	1
651225	FUSE, MAXI 50 AMP	1
B230083	RING TERMINAL, 5/16	2
B300642	WIRE LOOM, .413 I.D. X BULK – BLACK SPLIT PLASTIC	70 ft.
B300652	WIRE LOOM, .625 I.D. X BULK – BLACK SPLIT PLASTIC	15 ft.
B360113	STRAP, CABLE TIE	50
709860	BLADE TERMINAL	1
708000	RING TERMINAL, 5/16 16 GAUGE	1
651462	HEAT SHRINK TUBING	10
670136	5/16 RING TERMINAL, 4 GAUGE	8
670137	3/8 RING TERMINAL, 4 GAUGE	2
660706	ASSY, WIRE BATTERY CABLE 5300MM BLACK	2
660707	ASSY, WIRE BATTERY CABLE 5000MM RED	3
660694	ASSY, WIRE BATTERY CABLE 225MM	2

Tools Required

1) Drill Bit Set
2) Hole saws (1″, 1-5/8″, 2″, 2-1/2″ and 4-3/4″)
3) Electric/Air Drill
4) Screwdrivers/Assorted Bits (Flat Head & Phillips Head)
5) Impact Gun
6) Air saw/Jigsaw (Cutting Sheet metal)
7) Torx Head (T30) Bit
8) Metric Wrenches
9) SAE Wrenches
10) 1/4″, 3/8″ Drive Ratchets
11) SAE Socket Set
12) Metric Socket Set
13) Wire Cutters
14) Terminal Crimpers
15) Wire Strippers
16) Razor Knife
17) Electrical Tape
18) Cable Cutters
19) #4 Professional Grade Cable Crimpers
20) Cable Strippers
21) Work Light
22) Torque Wrench up to 50 in/lbs
23) U-barrel Crimper
24) Pop Rivet Gun

NITE AIR CONDITIONING AND HEATING SYSTEM

OPERATION NOTES

- For optimal comfort Bergstrom recommends to close the curtain between the cab and the sleeper when using the NITE A/C and heating system.

- The NITE A/C system is designed to maintain a comfortable temperature inside the cab without the engine running.

- The A/C unit will not pull down a hot cab that has been sitting in the sun without the factory A/C running. To assist the NITE system in cooling down the cab, start the engine and run the factory A/C system for a few minutes. This will help cool the cab to a respectable temperature. Once the cab is pulled down, the NITE system will maintain a comfortable temperature.

- The system must be turned off every time the system is not in use or the batteries May not charge properly. After use of the system be sure to turn the control knob to the off position, even if the unit is not running.

BATTERIES & FUSES

- The system must be turned off every time the system is not in use or the batteries may not charge properly.
  After using the system turn the control back off, even if the unit is not running.

- The NITE A/C and heating system uses its own batteries. A battery isolator or separator keeps the starting batteries from being drawn down.

- The NITE A/C and heating system switches off automatically when batteries charge level is low.

- The A/C fuses (2) are located next to the NITE A/C unit, under the bunk.

- The parking heater fuse (1) is located inside the battery box.

SERVICE

- The NITE A/C unit is not serviceable. If problems are encountered please contact the NITE line at 1-866-204-8570.

INSTALLATION INSTRUCTIONS

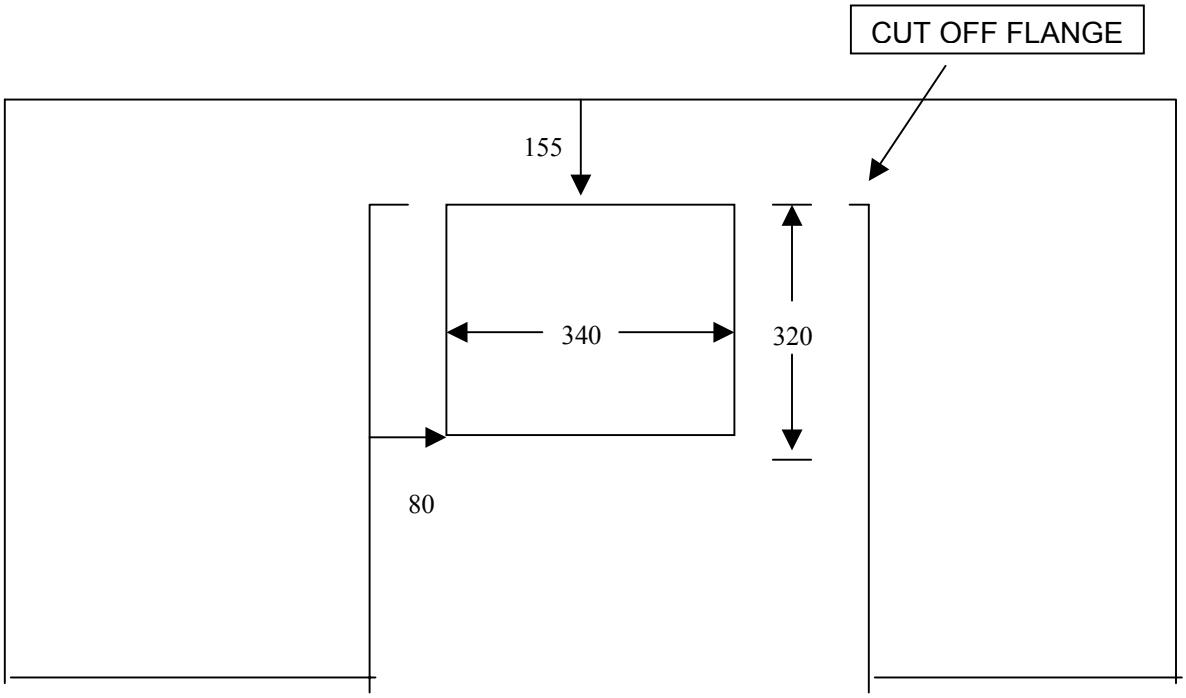
1) DISCONNECT GROUND WIRE FROM BATTERY.

2) REMOVE MATTRESS FROM THE SLEEPER.

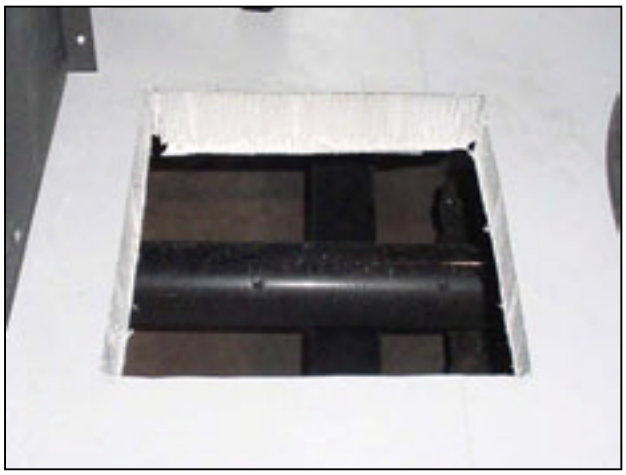
3) REMOVE THE INSULATION OFF THE FLOOR THAT LIES IN THE CENTER COMPARTMENT UNDERNEATH THE BED.

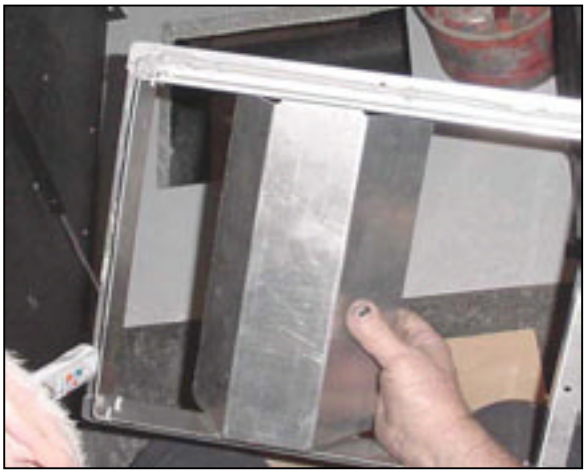
4) REMOVE THE BACK WALL OF THE CENTER COMPARTMENT BY DRILLING OUT THE 6 RIVETS, (3) ON EACH SIDE.

5) NOW A CUT-OUT NEEDS TO BE MADE IN THE FLOOR FOR THE NO-IDLE UNITS CONDENSER AIR. USE THE DIAGRAM SHOWN BELOW FOR MARKING THE CUT-OUT. USE AN AIR SAW TO CUT-OUT THE OPENING AND CUT-OFF THE FLANGE ON THE RIGHT WALL AS SHOWN.

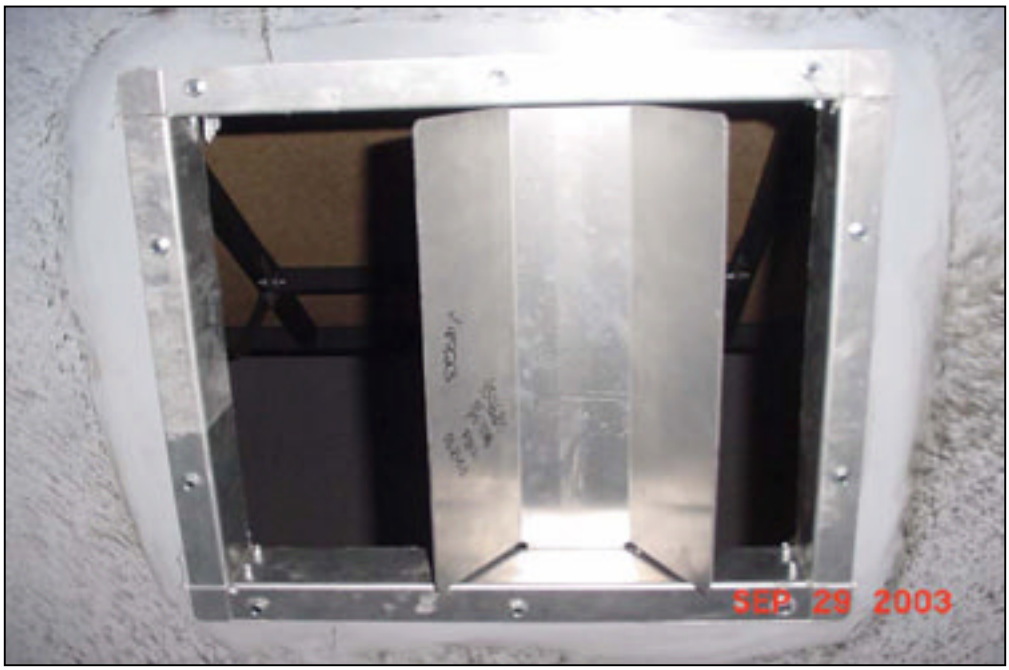


6) NOW INSTALL THE ALUMINUM DIVERTER BOX FROM UNDERNEATH THE TRUCK. PLACE A BEAD OF SILICONE OR SEALANT AROUND THE FLANGE. AND INSERT THE DIVERTER BOX FROM UNDERNEATH THE TRUCK IN ORDER TO SEAL THE OPENING.
<u>NOTICE:</u> BE SURE THE SMALLER OPENING OF THE DIVERTER IS LOCATED ON THE PASSENGER SIDE OF THE TRUCK.

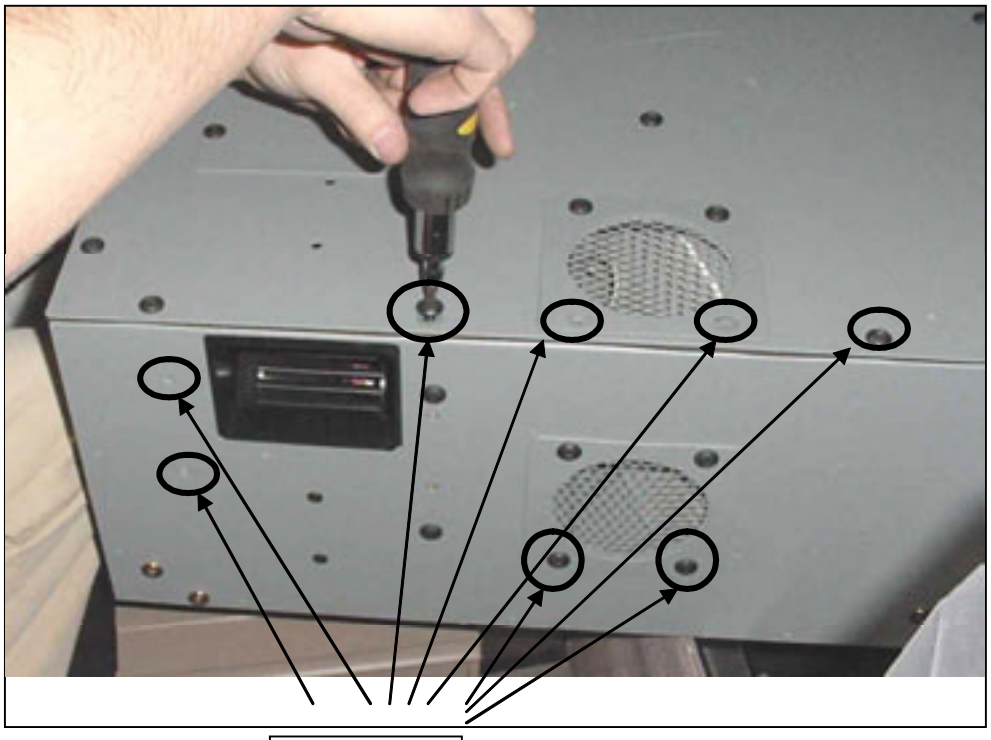




7) USE THE PROVIDED SELF-DRILLING SCREWS TO MOUNT THE DIVERTER UNDERNEATH THE FLOOR.

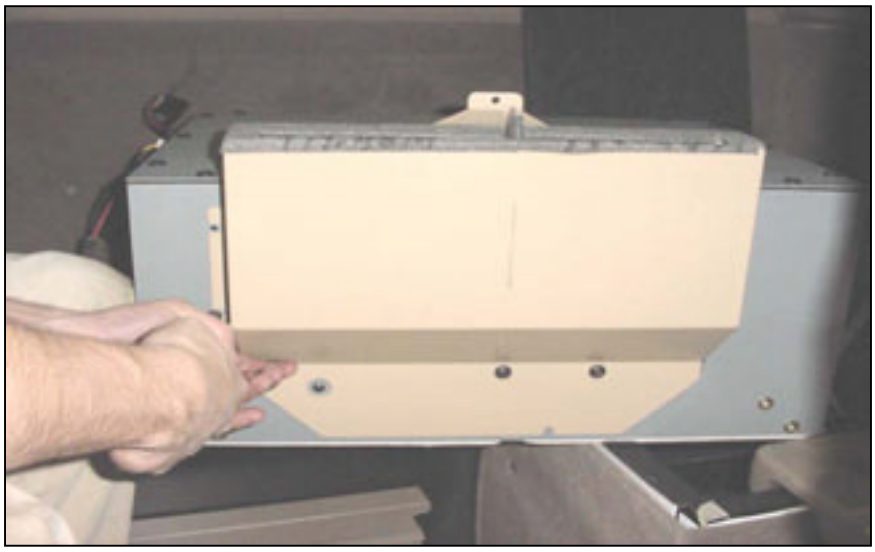


8) NOW THE UNIT CAN BE PREPARED FOR INSTALL. MOUNT THE PROVIDED AIRBOX ON TO THE AIR OUTLET OF THE UNIT. REMOVE THE 8 NOTED SCREWS BELOW IN ORDER TO MOUNT THE AIRBOX TO THE UNIT. ALSO REMOVE THE TOP RECIRC GRILL. SLIDE THE MOUNTING TAB OF AIR BOX UNDERNEATH THE RECIRC GRILL.

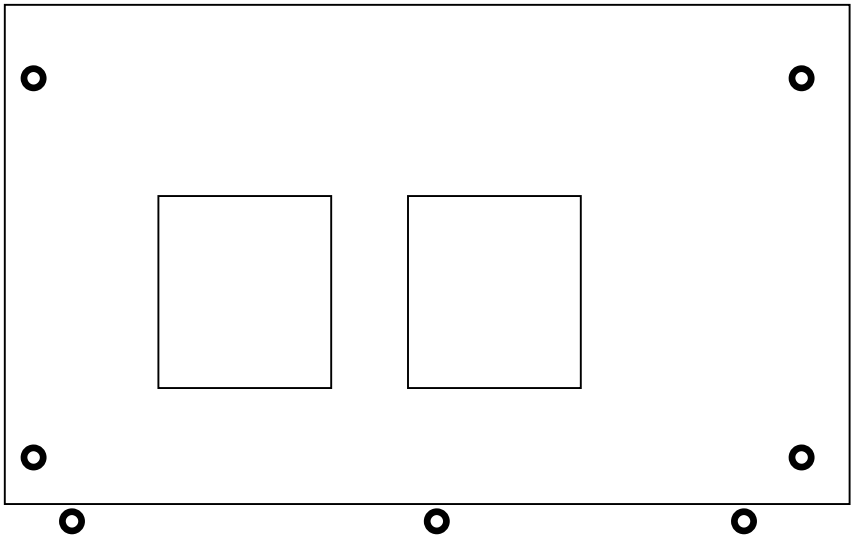


REMOVE

9) NOW USING THE 8 SCREWS YOU REMOVED, MOUNT THE AIRBOX TO THE UNIT AS SHOWN.
<u>NOTE:</u> BE SURE TO MOUNT THE TOP SCREWS FIRST AND THEN PUSH THE AIRBOX AGAINST THE SIDE OF THE UNIT. THEN INSTALL THE SIDE AND BOTTOM SCREWS AND FASTEN SECURELY.



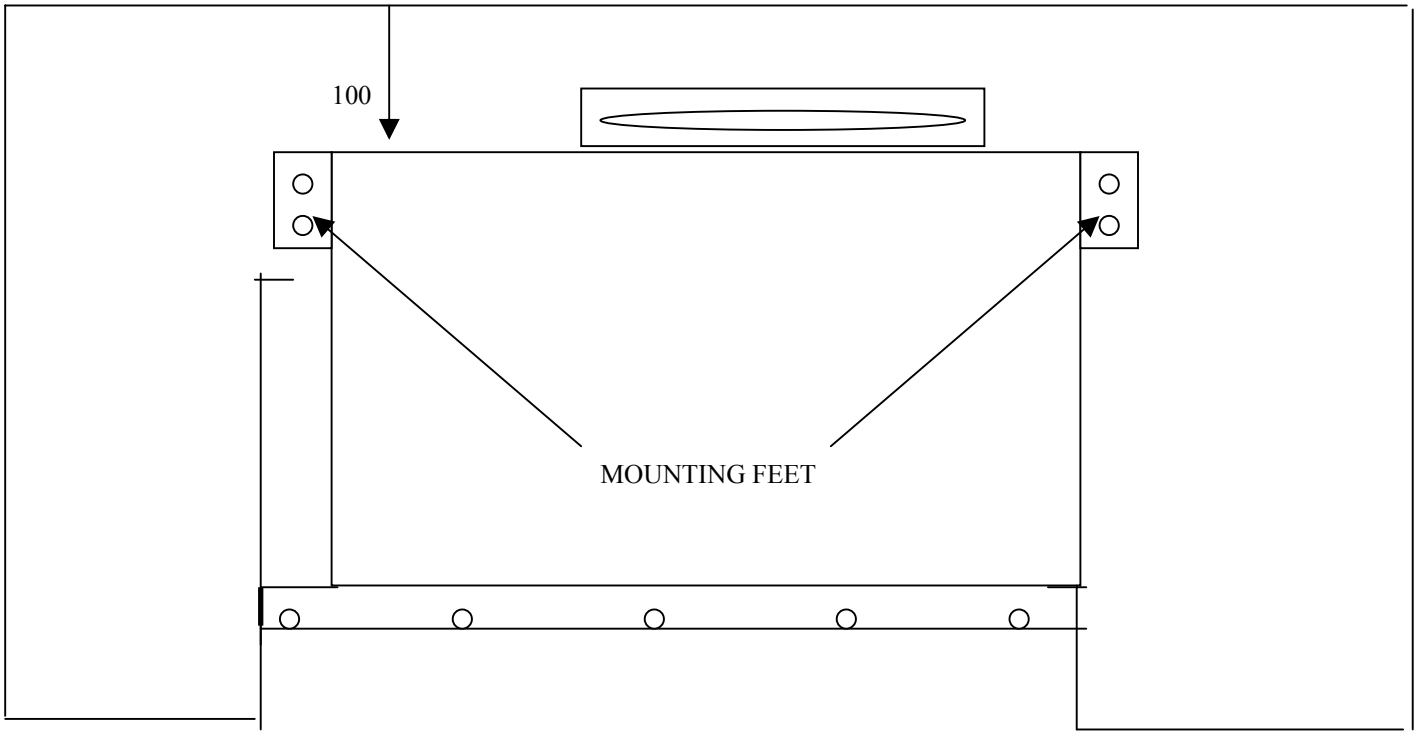
10) NOW MOUNT THE NEW PROVIDED FRONT WALL ON THE FRONT SIDE OF THE NO-IDLE A/C UNIT. REMOVE THE 7 OUTSIDE BOLTS AS SHOWN. MOUNT THE WALL TO THE UNIT USING THE 7 BOLTS YOU REMOVED.



11) INSERT THE RUBBER DRAIN TUBE ON THE BOTTOM OF THE UNIT, INTO THE 1" HOLE. NOW LIFT AND PLACE THE A/C UNIT INTO POSITION. THE AIRBOX SHALL BE IN THE BACK AND THE WALL FACING THE FRONT.
***<u>CAUTION:</u>* BE SURE THE DRAIN TUBE DROPS INTO THE OPENING OF THE FLOOR, THROUGH THE DIVERTER BOX.**

12) USE THE DIAGRAM BELOW TO MAKE SURE THE UNIT IS LOCATED IN POSITION BEFORE MOUNTING TO THE FLOOR. PLACE MOUNTING FEET IN POSITION AS SHOWN AND MOUNT THEM TO SIDE OF UNIT WITH PROVIDED M10 BOLTS AND WASHERS. MAKE SURE THE 6 HOLES ON THE TWO SIDES OF THE FRONT WALL LINE UP WITH THE RIVET HOLES IN THE SIDE WALLS. DRILL (4) 1/8" PILOT HOLES AND THEN BOLT THE FEET TO THE FLOOR USING THE ¼" x 1.25" BLACK SCREWS.

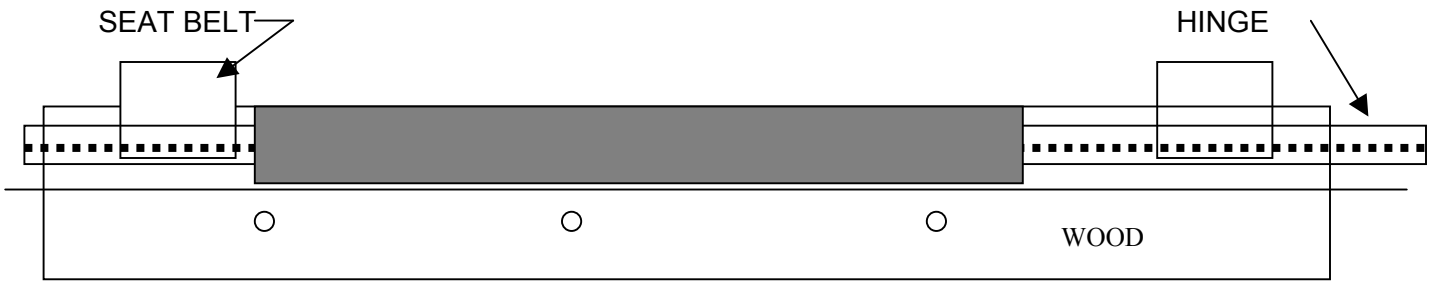
BACK WALL



13) NOW DRILL 5 MORE 1/8" PILOT HOLES AND MOUNT THE FRONT WALL OF THE UNIT DOWN TO THE FLOOR USING THE ¼" x 1.25" BLACK SCREWS. ONCE THE UNIT IS MOUNTED, RIVET THE FRONT WALL TO THE SIDE WALLS USING THE (6) RIVETS PROVIDED.

14) THE HOLE NOW NEEDS TO BE CUT IN THE BED'S HINGE TO ALLOW CLEARANCE FOR THE NITE DUCT. USE THE DIAGRAM BELOW FOR CUTTING THE OPENING FOR THE DUCT. THE SHADED AREA IS WHAT NEEDS TO BE CUT OUT. THE CUT NEEDS TO BE 13.5" LONG BY 2" WIDE.

<u>NOTICE:</u> THE CUT NEEDS TO START DIRECTLY NEXT TO THE PASSENGER SIDE SEAT BELT BUCKLE. DRILL (2) ½" HOLES ON EACH END OF THE MARKED OPENING TO ALLOW CLEARANCE FOR AN AIR SAW.



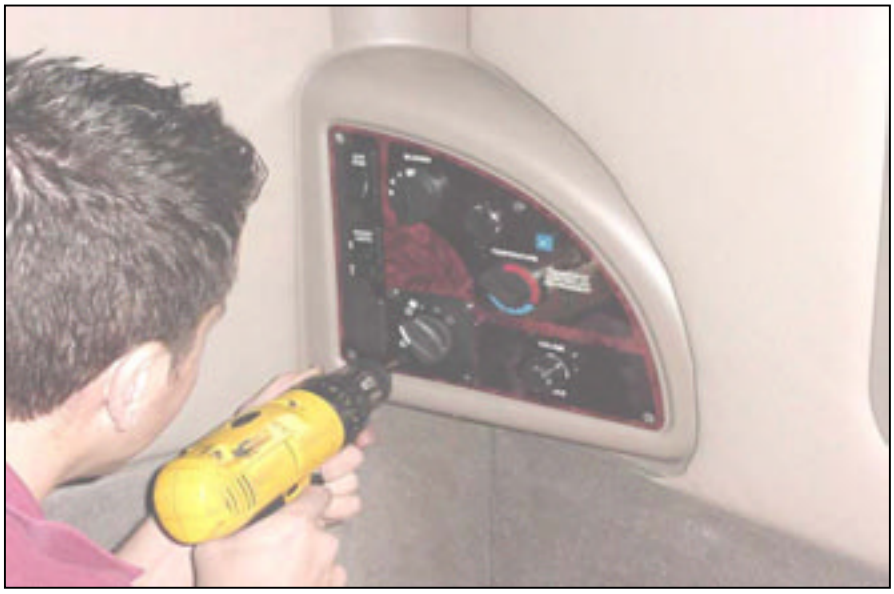
15) SLIDE THE DUCT INSIDE THE OPENING AND FLUSH INTO THE AIRBOX. SCREW THE DUCT TO THE TAB OF THE AIRBOX USING ONE OF THE PROVIDED SHEET METAL SCREWS.

16) NOW SECURE THE TOP OF THE DUCT TO THE BACKWALL. REMOVE THE 4 LOUVERS AND SHOOT A ¼" x 1.5" SELF-DRILLING SCREW WITH A WASHER INTO EACH OF THE FOUR OPENINGS. REINSTALL THE LOUVERS.

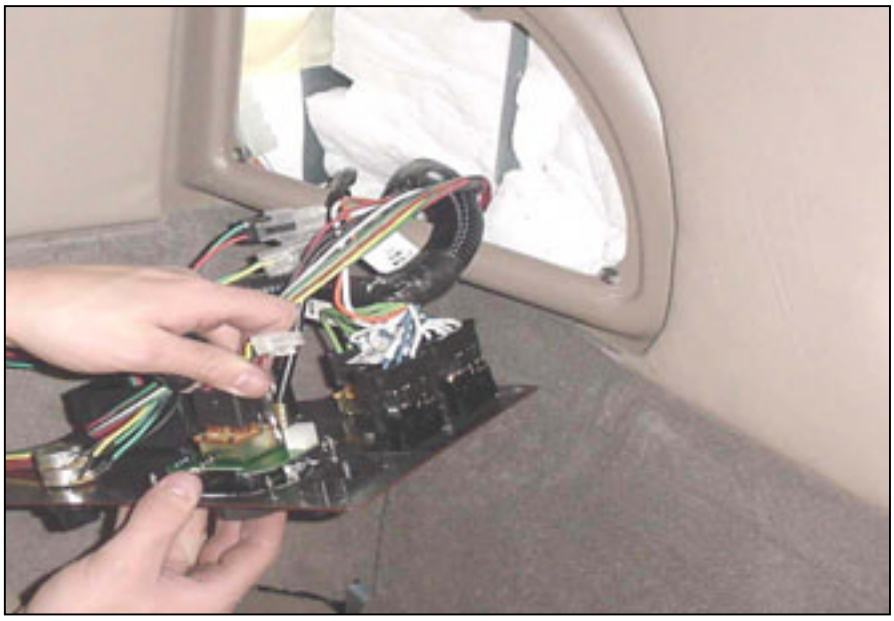
17) CHECK THE LENGTH OF THE CONTROL HARNESS TO SEE IF THERE IS ENOUGH WIRE TO ROUTE FROM THE NITE UNIT TO THE EXISTING CONTROL PANEL. IF NOT MOUNT THE CONTROL ON ONE OF THE INTERIOR TRIM PIECES CLOSER TO THE LOCATION OF THE UNIT.

18) USING A HOLESAW, DRILL A 2.5" HOLE INTO THE EXISTING CONTROL PANEL IN ORDER TO MOUNT THE NITE CONTROL.
CAUTION: BE CAREFUL NOT TO CUT ANY EXISTING WIRES WHEN CUTTING THROUGH THE PANEL.

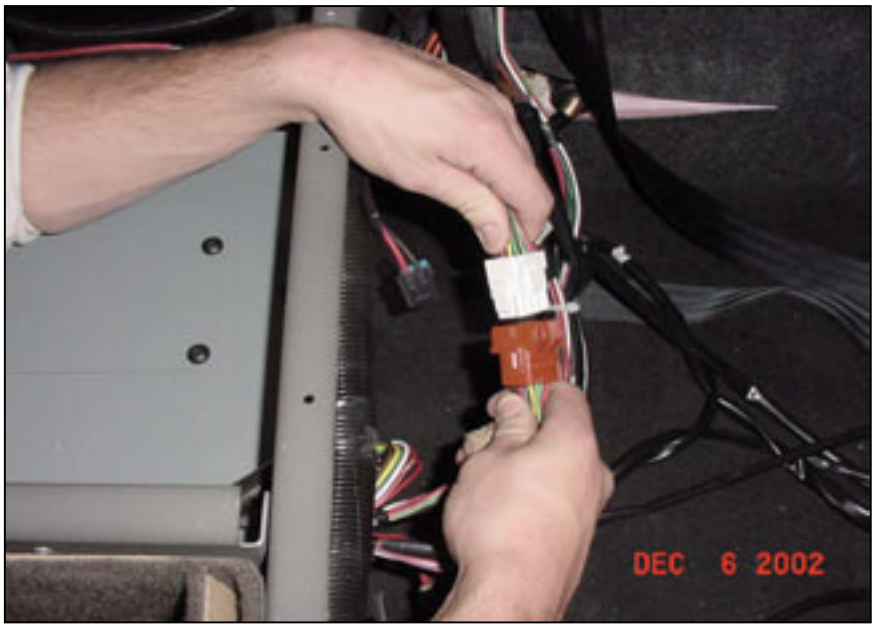
19) PLACE THE CONTROL INTO THE 2.5” HOLE AND MARK THE 4 MOUNTING HOLES. USE 1/8” DRILL BIT TO DRILL THE 4 PILOT HOLES. THEN SECURELY FASTEN THE CONTROL TO THE PANEL USING THE 4 PROVIDED SHEET METAL SCREWS.



20) NOW REMOVE THE ENTIRE CONTROL PANEL IN ORDER TO PLUG IN AND ROUTE THE NO-IDLE CONTROL HARNESS. CONNECT BOTH PLUGS INTO THE CONTROL SWITCHES AND ROUTE THE HARNESS DOWN THE INTERIOR WALL AND OUT OF THE STORAGE COMPARTMENT. NOW REINSTALL THE CONTROL PANEL.



21) PLUG THE OTHER END OF THE CONTROL HARNESS INTO THE NO-IDLE UNITS HARNESS AS SHOWN.



22) BEFORE BEGINNING THE INSTALLATION OF THE ELECTRICAL SYSTEM, CONNECT THE PROVIDED RING TERMINALS TO THE POWER AND GROUND WIRES OF THE A/C AND HEATER HARNESS.

23) NOW DRILL (2) 1" HOLES IN THE FLOOR EITHER BEHIND THE UNIT OR IN ONE OF THE SIDE STORAGE COMPARTMENTS. THESE TWO HOLES WILL BE USED FOR ROUTING THE POWER WIRES OUT TO THE BATTERY SUPPLY.

24) NOW MAKE THE A/C POWER HARNESS CONNECTION INSIDE THE CAB. PLUG THE NO-IDLE POWER HARNESS INTO THE BLACK PLUG OF THE A/C UNIT. ROUTE THE OTHER END OF THIS HARNESS THROUGH ONE OF THE 1" HOLES IN THE FLOOR.

INSTALLATION NOTE:

IF YOU HAVE THE HEATER OPTION, NOW IS A GOOD TIME TO REVIEW THE HEATER INSTRUCTIONS AND BEGIN THE HEATER INSTALL. THIS WILL SAVE YOU SOME TIME BEFORE STARTING TO INSTALL THE POWER SYTEM OUTSIDE OF THE CAB.

NITE® Plus

SECTION 2
ELECTRICAL INSTALLATION

NOTE: ***Bergstrom does not condone putting batteries under the sleeper bunk. The floor is not designed to carry that amount of weight and even deep cycle AGM batteries can emit gas under certain circumstances. Bergstrom can only support batteries being placed in battery boxes or tool boxes designed to support the weight of the batteries outside the cab of the truck.***

1

Available Battery Boxes Options

Refer to www.nitesystem.com for styles and part numbers. Aluminum clamp-on boxes include between rail and vertical box styles. Steel battery boxes require frame drilling and must be attached to frame rail with bolts (see instructions in the following steps 2 and 3).

Steel Battery Box
(2 required)

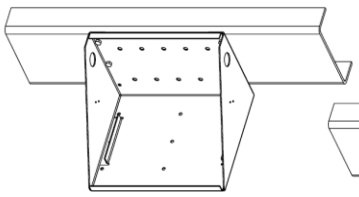
Vertical
Clamp-On Box

Between Rail
Clamp-On Box

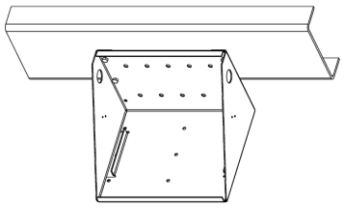
2

Steel Battery Box Installation

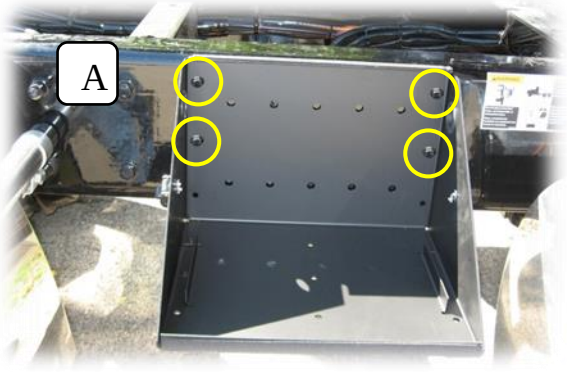
Locate the battery box on the frame as close as possible to the sleeper NITE Phoenix unit. When positioning the box, always keep the top of the box as close to the top of the frame rail as possible – Some manufacturers recommend no drilling within 2″ of top or bottom of frame rail. Check truck manufacturer guidelines prior to drilling. Using box as template, mark and drill a minimum of 4 holes. Always use the holes in the rear outer corner area where you have double walled steel. Of the 3 holes available on each side of the outer most edge of box, choose the top and center holes on each side (see photo A). Drill frame rail using ½″ HS bit. Install box with ½″ grade 8 bolts and hardware provided. Tighten securely.



Correct



Incorrect



3 Attaching Hold-down Brackets

Set two batteries side-by-side in the battery box and place a hold-down bracket on top, with the u-channel facing up. Take two 5/16″ bolts, place a 5/16″ flat washer on each, and then put the bolts through the outer holes. Tighten each bolt securely from underneath using the supplied nuts and washers. Repeat the procedure for the other two batteries.

4 Mounting the Separator

Mount separator in battery compartment or in supplied 6 x 6 x 4 enclosure.

Mount enclosure first. Mark and drill two 3/8″ holes in the back of the box, to use for mounting. Secure with 3/8″ bolts/ washers/ lock nuts. DO NOT USE THE OUTSIDE TABS FOR MOUNTING THE BOX!!

Mount separator inside enclosure. Mark and drill two ¼″ holes in bottom side to mount the separator, attach with ¼″ bolts / washers / lock nuts. You must also drill two ½″ holes directly under the posts of the separator where the cables will connect.

***NOTE*: The separator ties into the truck's starting batteries and gives priority to the starting batteries. It then charges the NITE aux batteries. The aux batteries begin charging after the starting batteries reach 13.2V.**

5 Preparing Cables

The batteries are wired series/parallel for 6V or parallel only for 12V. See diagrams on pages 2-3 to 2-6.

***NOTE*: Before proceeding – Make sure the *NITE PLUS* control switch is turned off. Disconnect the truck batteries.**

6a Directions for Wiring a 6-Volt Series/Parallel, 4 Battery *NITE Plus*

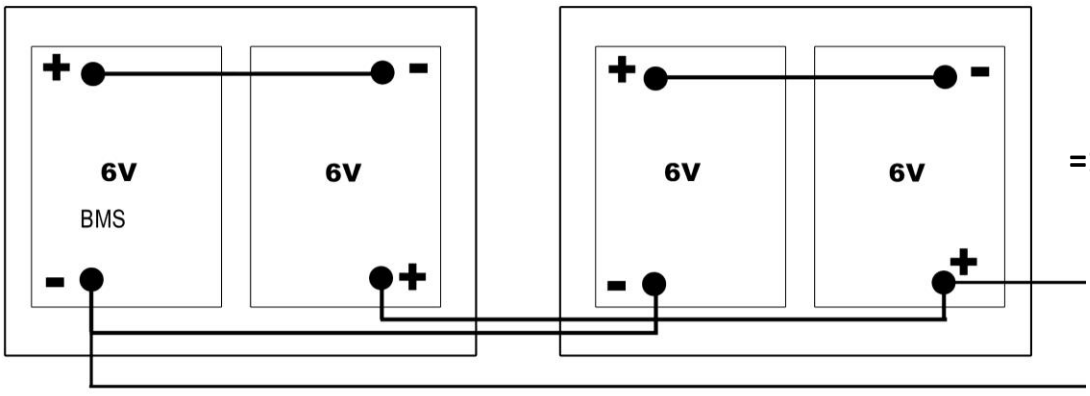
Step 1: Install the two short battery cables provided in the kit. These cables connect the positive (+) of one battery to the negative (-) of the other to create a set or bank. We refer to this as a series connection. **DO NOT connect any other cables or wires to these terminals.**

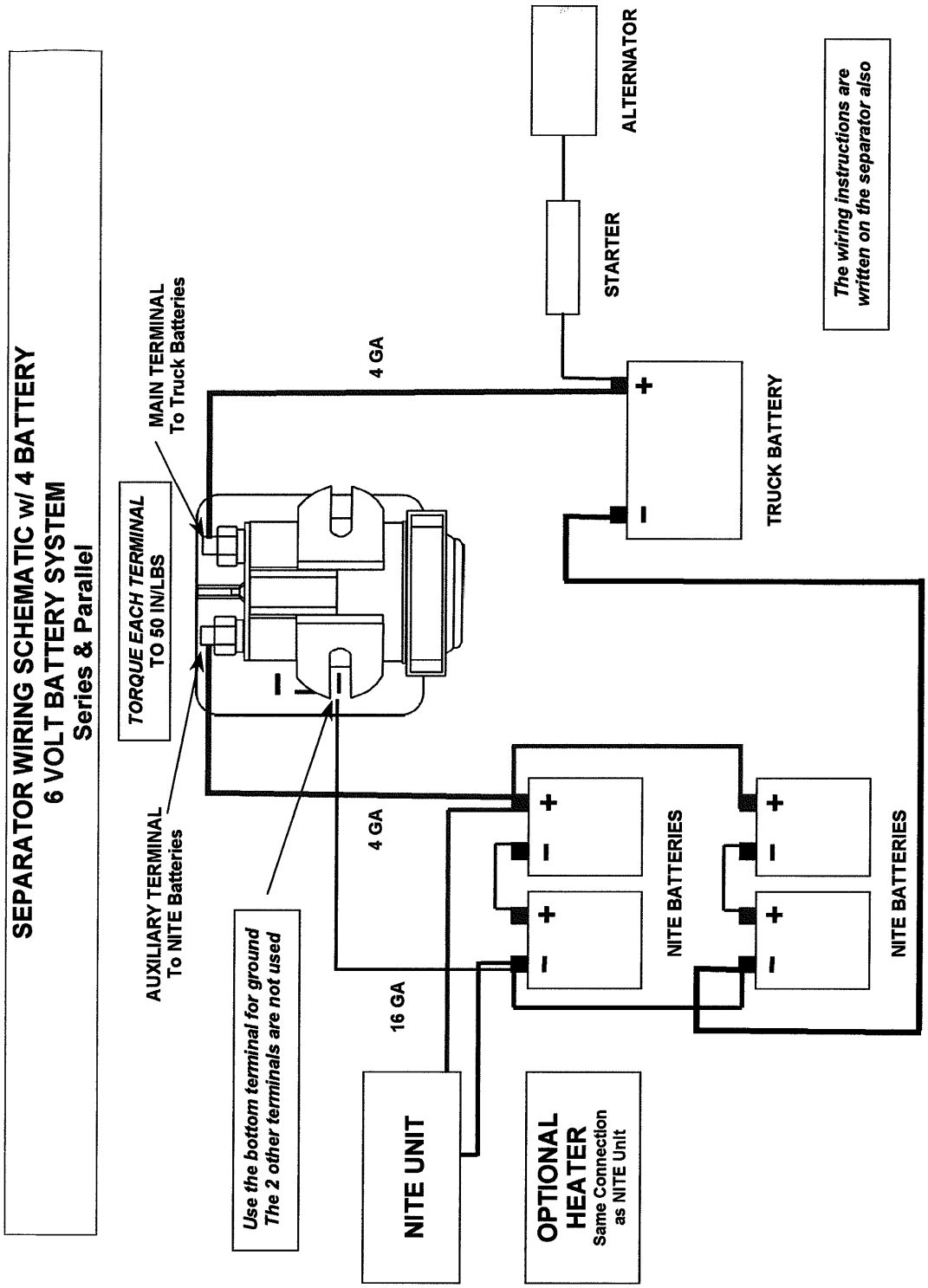
Step2: For the positive to positive parallel connections, measure and cut a piece of red cable to the proper length. Attach a ring terminal to each end using a professional grade crimper. Place heat shrink around each terminal and heat. Then loom it. Use this cable to connect the positive (+) of one bank of batteries to the positive (+) of the other bank of batteries.

Step3: Repeat procedure for the negative to negative connection using a black cable. Then loom it. Use this black cable to connect the negative (-) of one bank of batteries to the negative of the other bank of batteries.

Now proceed to step 7.

Do NOT use truck frame as a ground




SEPARATOR WIRING SCHEMATIC w/ 4 BATTERY
6 VOLT BATTERY SYSTEM
Series & Parallel
ALTERNATOR
STARTER
The wiring instructions are written on the separator also
MAIN TERMINAL
To Truck Batteries
4 GA
TORQUE EACH TERMINAL
TO 50 IN/LBS
TRUCK BATTERY
AUXILIARY TERMINAL
To NITE Batteries
4 GA
NITE BATTERIES
NITE BATTERIES
Use the bottom terminal for ground
The 2 other terminals are not used
16 GA
NITE UNIT
OPTIONAL
HEATER
Same Connection
as NITE Unit

6b Directions for Wiring A 12-Volt Parallel, 4 Battery *NITE Plus*

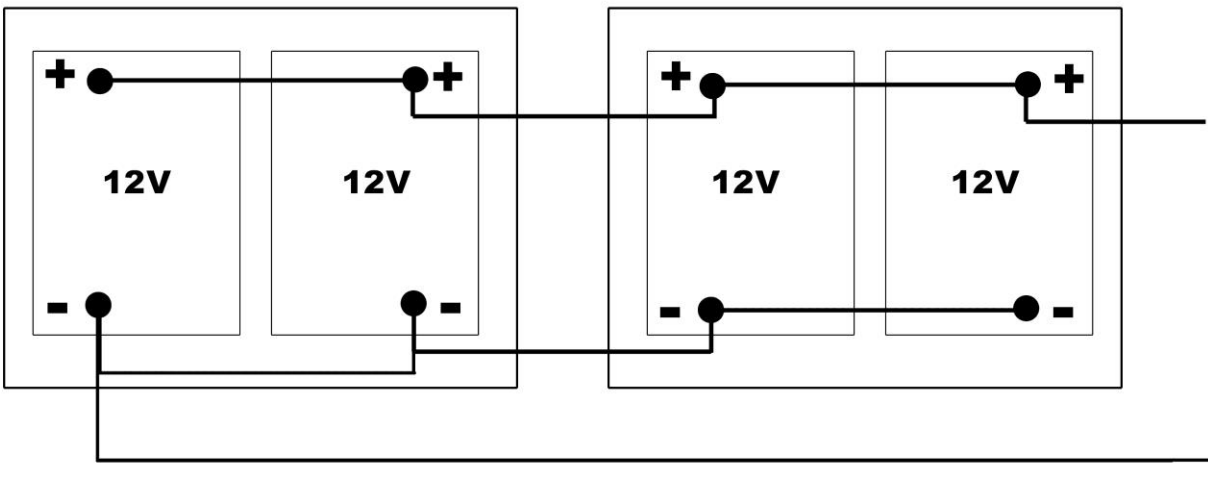
Parallel is all positives connected together and all negatives connected together.

Step 1: For the positive (+) to positive (+) parallel connections measure and cut pieces of red cable to length. Attach a ring terminal to each end using a professional grade crimper. Place heat shrink around each terminal and heat. Then loom it. Use these cables to connect all positive (+) terminals on all 4 ***NITE Plus*** batteries.

Step2: For the negative to negative connections repeat procedure using black cables. Then loom it. Connect all negative (-) terminals of the 4 ***NITE Plus*** batteries together.

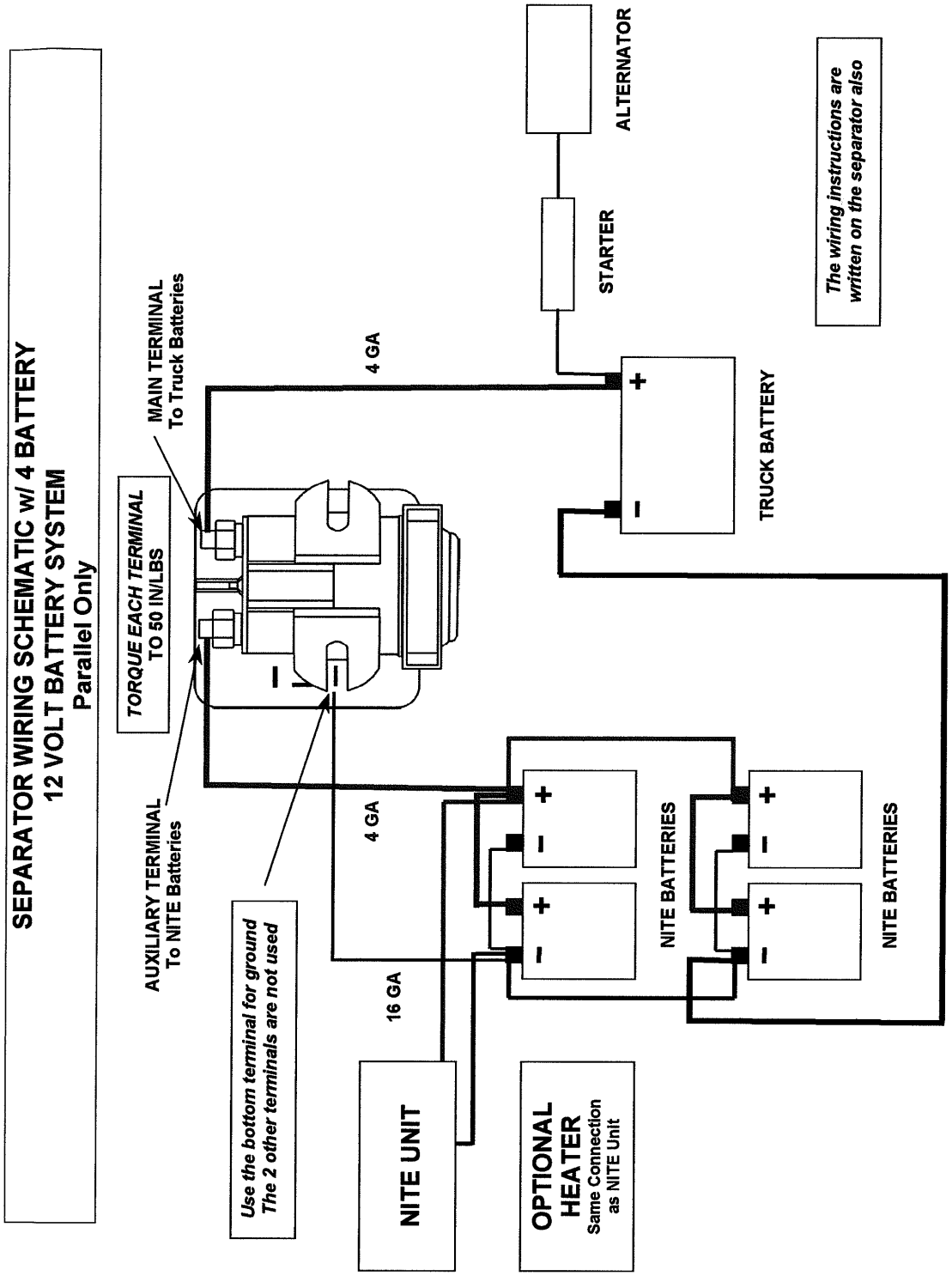
Now proceed to step 7.

Do NOT use truck frame as a ground



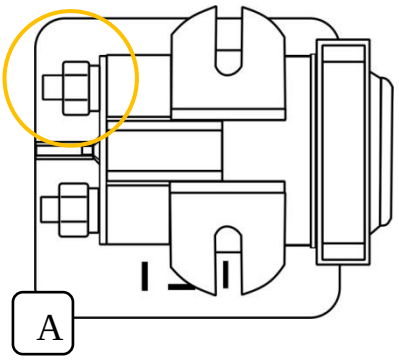
Connect positives here: AC Unit, Heater, and Separator

Connect negatives here: AC Unit, Heater, and Truck Battery negative


SEPARATOR WIRING SCHEMATIC w/ 4 BATTERY
12 VOLT BATTERY SYSTEM
Parallel Only
ALTERNATOR
STARTER
The wiring instructions are written on the separator also
MAIN TERMINAL To Truck Batteries
4 GA
TORQUE EACH TERMINAL TO 50 IN/LBS
TRUCK BATTERY
AUXILIARY TERMINAL To NITE Batteries
4 GA
NITE BATTERIES
NITE BATTERIES
Use the bottom terminal for ground The 2 other terminals are not used
16 GA
NITE UNIT
OPTIONAL HEATER
Same Connection as NITE Unit

7 Connect Separator to the Truck Batteries

Add ring terminals and protective looms to ONE END of the negative and positive cables, leaving about an inch of the cables exposed for proper identification. DO NOT CUT cables at this time…you will do that in a later step.



8 Run Cables to Truck Batteries

Attach the positive cable to the main battery terminal of the battery separator (photo A above). Attach the negative cable to the negative terminal on the ***NITE Plus*** batteries (see diagrams on pages 26 or 28). Zip tie the cables together every 1 ½ feet. Run the cables along the frame rail and over the transmission to the other side to the truck batteries.

9 Attach Cables to Truck Batteries

Cut the cables to the proper length and crimp ring terminals. Attach negative side to truck battery. Zip tie all wires to secure them in place.

DO NOT CONNECT POSITIVE TRUCK BATTERY CABLE YET. WE WILL CONNECT THIS CABLE LATER.

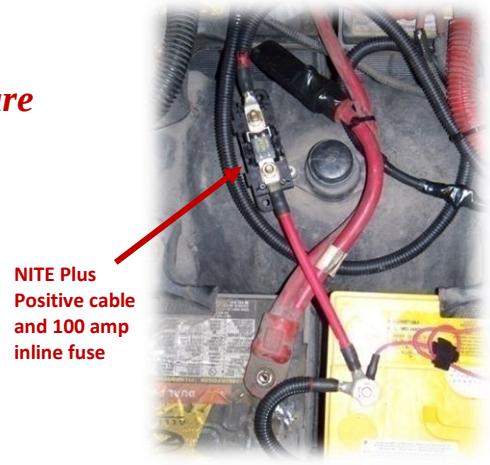
See Diagrams on Pages 2-3 to 2-6

10 Connect NITE Plus positive power cable to auxiliary battery location.

Before connecting positive cable make sure blower control switch is in OFF position.

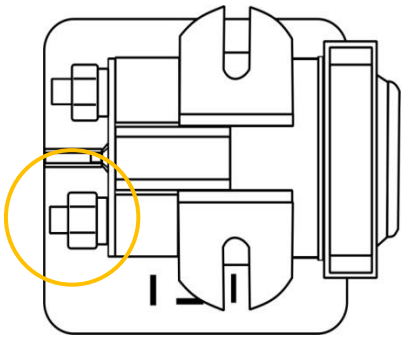
Install 100 amp fuse between power cable and AGM positive battery post as shown.

Do not tighten posts at this time.



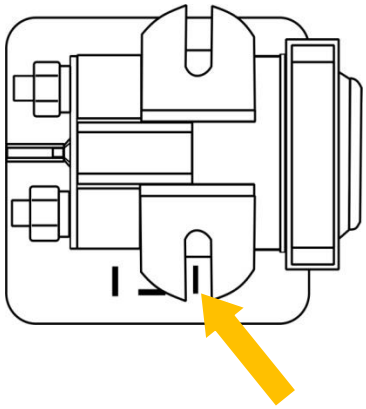
11 Connecting *NITE Plus* Batteries to Battery Separator

Using red battery cable, measure and cut to proper length. Crimp ring terminals and heat shrink. Connect one end to the most appropriate positive (+) terminal of the ***NITE Plus*** batteries. Connect the other end to the auxiliary terminal of the battery separator.



12 Grounding the Separator

Connect one 16 gauge black wire from the male spade terminal marked “ground” to the negative battery terminal of either the truck or ***NITE Plus*** batteries. Without proper grounding the system will not recharge batteries correctly.



13 Complete Electrical Wiring

Recheck and tighten all battery and separator connections. Zip tie cables where necessary. Your wiring should look like the diagram on page 4 or 6.

This completes the electrical section of the installation. If you are installing the optional ESPAR heater proceed to heater section. If not, your installation is complete and you may reconnect the truck batteries and connect positive cable from battery separator described on page 26. Then proceed to the Checklist section.

NITE® Plus

SECTION 3
ESPAR HEATER
INSTALLATION

Espar Heater Installation

1 Unpack Heater Parts

Take out the parts to the heating unit.

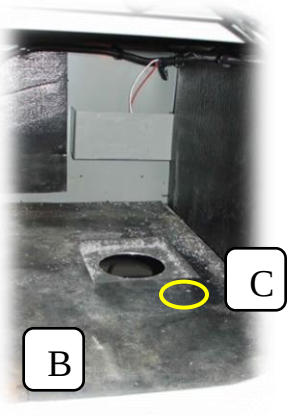
NOTE: Do NOT use NITE duct or OE ductwork for heater venting.

2 Prepare Heater Mounting Location

Choose the most appropriate location to install the heater—in this case we have chosen a side box floor location. **Check underneath truck for any obstructions or supports.** Use the mounting plate as a template to cut an opening in the rubber mat. Cut around the mounting plate, then remove the piece of rubber to expose truck floor.

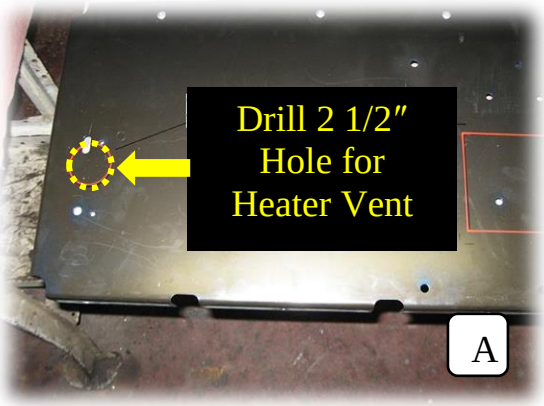
3 Drilling Outlet Hole for Heat Unit

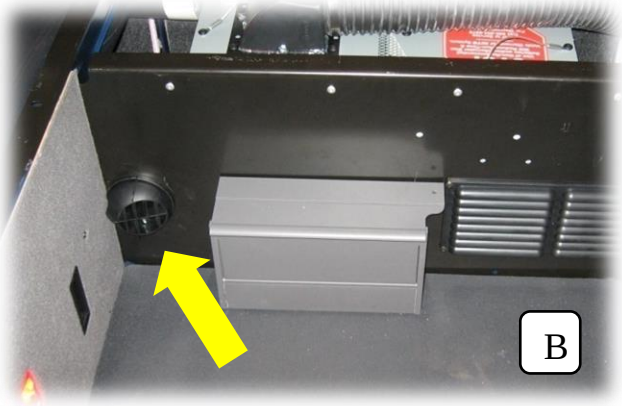
Mark the floor of the truck using the 5 small holes of the mounting plate. Remove mounting plate, place a 4 ¼″ hole saw over the middle of the floor marks (A), and drill the outlet hole for the heater, intake, exhaust and pickup tube (B). Also drill a 1/2″ hole approximately 1 to 2″ from mounting plate corner (C).



4 Install Sleeper Heat Vent

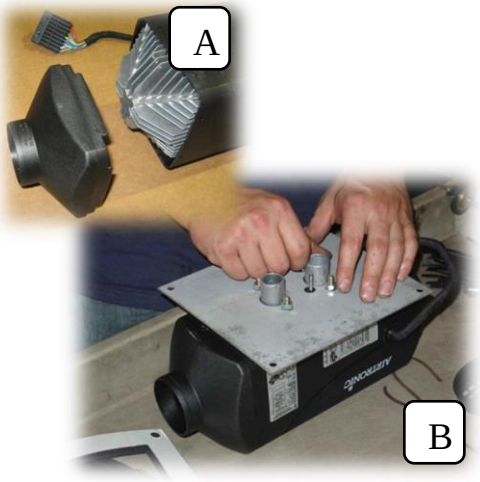
Select location for the vent in the lower left side of the center support wall closest to heater. Drill a 2 ½″ hole (A) to allow distribution of heat into the sleeper. After hole is drilled, use 5/16″ x 1″ self-tapping screws to attach heat port then snap louver into place (B).





5 Heater Unit Assembly – Attaching Mounting Plate

Snap end cap on heater unit (A). Place mounting plate over heater unit (B). Attach with flat lock washers and 10mm lock nuts—tighten down securely.



6 Heater Unit Assembly – Attach Gasket and Fuel Line Connection

Peel off backing from gasket and place gasket over mounting plate edges, sticky-side down. Place small black rubber fuel line connector over the fuel intake tube and push down. Place a small clamp over connector, push to bottom and tighten.

7 Heater Unit Assembly – Attach Fuel Line

Now take the clear pick up tube, place a small clamp over it, and push the tube all the way to the bottom of the fuel intake tube. Place clamp flush with top of black connector and tighten securely.

8

Heater Unit Assembly – Identify Intake and Exhaust Ports

Look closely at the two small metal tubes. One has an arrow pointing out away from the unit—this is the exhaust. One has an arrow pointing in towards the unit—this is the intake.

9

Heater Unit Assembly – Attach Exhaust Hose

Take the heavy duty silver metal hose and place a large, heavy duty clamp over the end of it. Place the hose and clamp over the exhaust tube, push all the way down, and tighten securely.

10

Heater Unit Assembly – Attach Intake Hose

Take the black flex hose and place a small clamp over the end of it. Place the hose and clamp over the intake tube, push all the way down, and tighten securely.

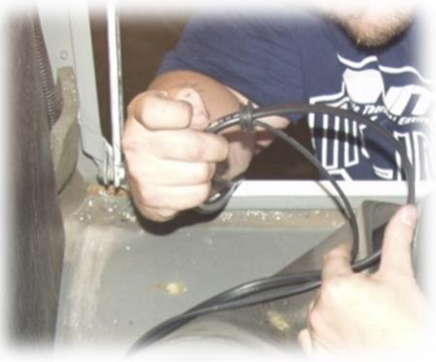
Heater is now ready to install in the truck.

11 Prepare to Mount Unit

Check to make sure truck batteries are still disconnected. Carry unit into truck. It will be mounted over the 4 ½″ hole that was drilled earlier. Make sure hoses and tubes don't get tangled or caught on anything.

12 Run Power and Fuel Pump Wires Through Floor

Run the power wire and fuel pump power wire through the rubber mat. Next, slip on the grommet, then run the wires out the hole in the truck floor and down under the truck. Seat grommet into hole, and push rubber mat back down.



13 Run Lines Through Cab Floor

Feed exhaust hose, intake hose, and fuel line through the 4 1/2″ hole, making sure they are not bent, crimped or rubbing on the side of the hole.

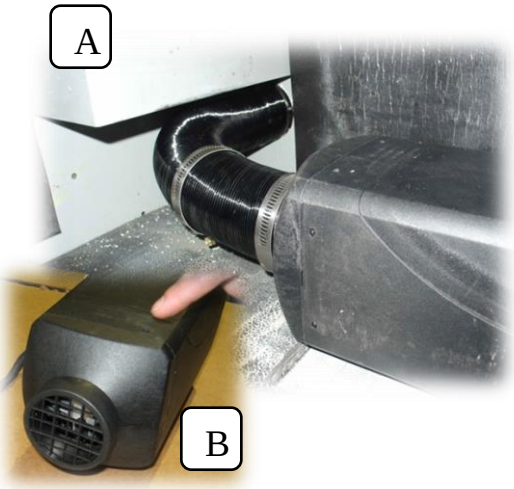
14 Mount Heater Unit to Cab Floor

Make sure that the heater unit is set with the fan (intake) end opposite the 2 ½″ hole for the vent/louver drilled earlier. Set unit flush to floor and attach with a self-tapping screw at each corner of the mounting plate.

15

Attach Heat Line to Sleeper Vent

Take the black metallic flex tube, measure and cut length to run from heater unit to louver/vent opening (A). Place two clamps over ends of tube, and clamp tube to heating unit and louver. Tighten clamps securely but do not over tighten. Snap Intake Grill onto intake end of heater (B). Keep this area clear of debris.



16

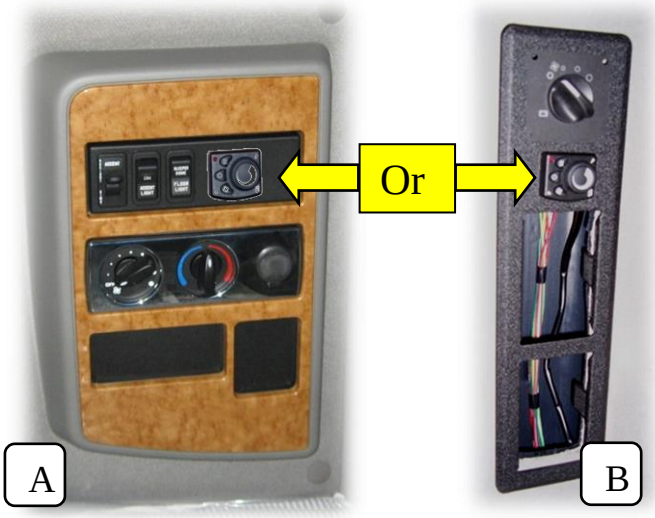
Attach Wiring Harness

Attach plug end of wiring harness into wiring plug at bottom of heating unit. Be sure the lock-in pin seats securely.

17

Install Heater Control into *NITE Plus* Control Panel or OEM control panel

You can install the heater control in either the OEM control panel (A) or the ***NITE Plus*** control panel (B). Remove the faceplate from the location you select and follow steps 18 – 20 for installation instructions.

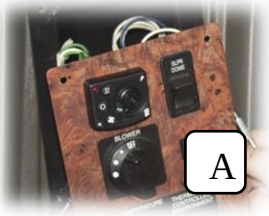


18 Attach Template to Faceplate – Drill

Take the sticker template that came with the Espar controller and place it on the panel. Drill holes through panel for wiring and for attaching screw as indicated on sticker. Pull sticker off after holes have been drilled.

19 Mount Heat Controller and Knob

Now feed controller wiring harness wires through large hole to backside of panel.
Remove controller knob.
Screw controller to panel with small screw (A).
Replace controller knob (B).

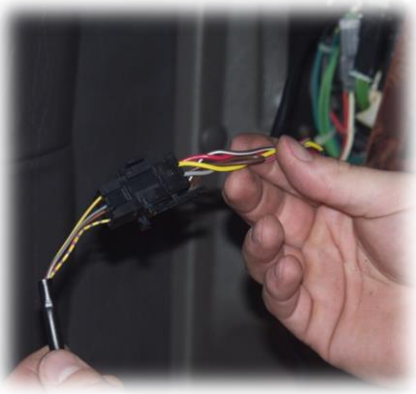


20 Re-attach Faceplate

Carefully tuck all wires behind the corner faceplate, and re-attach faceplate with screws that were removed earlier. Run control harness wires from the corner control panel, along bed and in parallel with other wiring down toward the heater.

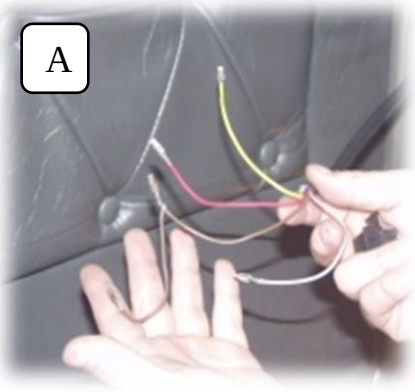
21 Install Connector on Mini Controller Harness

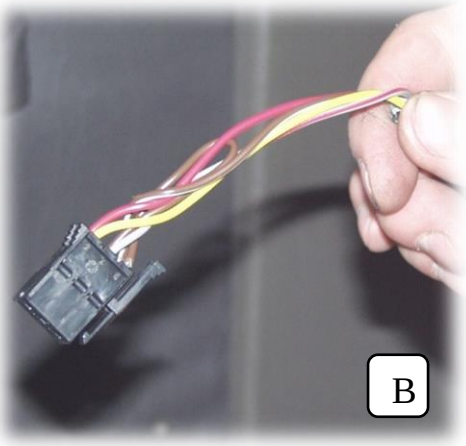
Connect ends of wire harness to plastic connector in this way: 1 = red, 2 = yellow, 3 = brown, 4 = solid grey, 5 = yellow with violet stripe.



22 Attach Wire Connector from Heater Control Harness

Route the control cable along the bed towards the heater control panel. Use zip ties as needed. Strip off 6″ of black outer jacket from cable coming from heater. Fold all wires back and cut off the outer jacket, the blue, solid gray and solid brown wires. Save the brown wire and make a jumper wire. Strip down ends of solid brown wire. Connect one end of solid brown jumper to brown/white wire. Add clips to ends of wires and crimp on with crimper. On connector, the numbers 1, 3, and 5 are on one side, 2, 4, and 6 are on the other. Insert wires into plug as follows:
1 = red, 2 = yellow, 3 = brown jumper,
4 = gray with red stripe, 5 = other end of jumper including brown/white wire. Now connect the heater control harness to the controller harness.





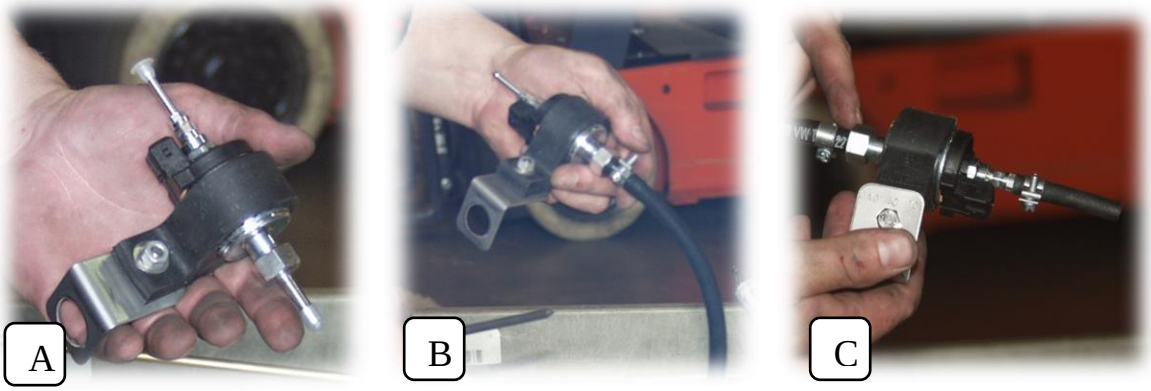
23 Finishing Intake and Exhaust Hose Installation

First, attach intake air tube to truck structure with zip ties. Put cap on bottom of intake tube. Next, run exhaust hose toward back of cab (A), attach with clamps to the structure of the truck. Cut off excess exhaust hose, and place End Sleeve on the end of the hose (B).

***NOTE*: HOT – Keep exhaust hose away from wiring or flammable material.**

24 Assemble the Fuel Pump Mount and Hoses

Take rubber mount bushing and L bracket and put them together to make mounting bracket for fuel pump. Slide fuel pump into rubber bushing (A). Take plastic caps off both ends of fuel pump. Attach large fuel hose to larger diameter end (B), figure out length needed to go out center hole of L bracket, and cut off excess. Secure with clamp. Attach small precut hose to smaller diameter end of the fuel pump and secure with clamp (C).



25 Drill Hole in Fuel Tank, Insert Pickup Tube and Mount Fuel Assembly

Use a 1″ hole saw to scribe initial location for two outer holes. Drill the two outer 1/4″ holes centered on scribe. Then complete drilling the 1″ hole. See diagram A. **Option:** When possible drill holes in the fuel sender block off plate. Slide pickup tube into fuel tank through hole, install with bottom washer then put on rubber seal and place metal washer on top of pickup tube followed by pump mounting bracket and nut. Tighten slightly. Put clamp over end of large fuel line from fuel pump, attach to pick up tube and clamp down. Finish snugging up large nut, but do not over tighten. Cut off excess from small feeder tube fuel line and attach to fuel pump. Secure with

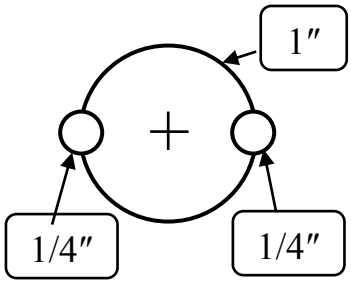


Diagram A

26 Prepare Power Harness and Attach to Fuel Pump

Measure and cut power harness wires to appropriate length. Strip wires, put on rubber boots, then attach ends and crimp (A). Attach wires to plug: 1 = green, 2 = brown. Make sure rubber boots are seated to keep out moisture (B). Connect the power harness spring loaded plug to the fuel pump (C). Secure all wires and hoses with zip ties.

27

Run Heater Unit Power Cable to *NITE Plus* Batteries

Take the heater unit power cable, run it under the truck (attach with zip ties where necessary) over to the ***NITE Plus*** batteries. Strip back outer cover to expose two inner wires.

28

Attach Connectors

Strip end off brown wire. Before stripping red wire, put the housing for the fuse bracket on, and pull the red wire through. Now strip the end of the red wire, attach fuse bracket and crimp down. Pull red wire back into fuse bracket housing. Push rubber seal into place. Attach ring terminal to ground wire and crimp.

29

Attach Wires to *NITE Plus* Batteries

Connect heating unit ground wire to ground terminal of ***NITE Plus*** batteries. Connect heating unit positive wire to positive terminal of ***NITE Plus*** batteries. Insert 20 amp fuse into fuse bracket. Tighten all connections. **YOU CAN NOW RECONNECT THE TRUCK'S BATTERIES TO TEST THE SYSTEM.**

NITE®Plus

SECTION 3
WEBASTO HEATER INSTALLATION

Webasto Heater Installation

DO NOT USE NITE DUCT FOR HEAT VENT.

ATTN: Refer to Webasto manual for all heater installation instructions.

http://techwebasto.com/redirect/heater_main/5001118B.pdf

NITE® Plus

SECTION 5
CHECKLIST

Now that you've completed installation, it's time to check the systems to make sure everything is working properly. To help you do that, we've prepared a brief description of how the ***NITE Plus*** operates, and several checklists to help you make sure everything is in working order.

1. System and controls overview

The ***NITE Plus*** has a 3-position control: Low, Medium, and High. For each of these positions, the compressor speed and evaporator blower settings are different. This table shows how the compressor and blower are set for each control position:

Control Position	Capacity Setting	Blower Speed	Compressor speed
1 (LOW)	Low	Low	Low
2 (MEDIUM)	Medium	High	Low
3 (HIGH)	High	High	High

NOTE 1: *Airflow does not change when switching the control from MEDIUM to HIGH. Only the compressor speed changes.*

NOTE 2: *In addition to the evaporator blower and the compressor, the* ***NITE Plus*** *also uses a condenser fan. It is located (along with the compressor and evaporator blower) inside the* ***NITE Plus*** *unit. It draws air from below the sleeper floor to cool the condenser coil, and then expels the heated air to the outside. The condenser fan speed remains the same for all control positions.*

NOTE 3: *Low voltage cutout – unit will turnoff once* ***NITE Plus*** *batteries are below 11.3 volts. Also will not start if voltage is too low*

2. System components checklist

Follow this table to check that the individual components of the ***NITE Plus*** run properly when the unit is ON.

Component	Function	How to check it
Blower (evaporator)	Blows cold air to the sleeper area through the ducting. This is a 100% recirculating system with two air intakes located on the top and side of the ***NITE Plus*** unit.	Switch the ***NITE Plus*** control to LOW (Position 1). You should feel air coming from the louvers. Next, switch the ***NITE Plus*** control to MEDIUM (Position 2). You should feel an increase in airflow coming out of the louvers. ***NOTE****: Make sure nothing is blocking the recirculation air intake opening on the* ***NITE Plus*** *unit.*
Fan (condenser)	Pulls outside air from under the sleeper floor to cool the condenser coil, and then expels the heated air outside.	Go under the sleeper underneath the truck and check to make sure that air is coming OUT the rectangular condenser air outlet when the ***NITE Plus*** unit is running. Then check the triangular inlet to make sure air is going IN.
Compressor	Compresses and pushes the refrigerant through the ***NITE Plus*** unit refrigerant loop.	The best way to check that the compressor is running is to feel the compressor speed changes when the control is switched from MEDIUM to HIGH. Set the control to MEDIUM, and lift up the bed so you can hear the sound changes. Wait 1 minute. Then set the control to HIGH—you should notice a change in the vibration and sound of the ***NITE Plus*** unit.

3. Electrical and temperature checklists

Use the following checklist to check that your ***NITE Plus*** is operating within the correct electrical and temperature ranges.

Electrical power

3.1 Check the ***NITE Plus*** unit's voltage. On the power supply cables (red and black cables) located close to the unit, there is a black connector from which the voltage can be read. When the ***NITE Plus auxiliary (aux)*** batteries are fully charged you should read between 12 and 12.5 volts.

3.2 Check the ***NITE Plus*** unit's current. Set the ***NITE Plus*** control to HIGH, use a clamp-on inductive ammeter to measure the current on the unit power supply RED cable. You should read between 27 and 35 amps depending on ambient temperature. On a hot day you should read higher amps, on a cool day, lower amps.

Temperature

3.3 Air temperature at louvers

First, precondition your sleeper compartment. Turn the ***NITE Plus*** unit control on and set to high. After the unit has operated for a minimum of 20 minutes, check your ***NITE Plus*** louver temperatures. With the sleeper curtain closed you should see a temperature difference of 13-25 degrees from the outside temperature. Please keep in mind High solar loads and high humidity will vary the performance of the unit.

3.4 Condenser outlet temperature

The ***NITE Plus*** unit pulls air from outside under the sleeper floor to cool down the condenser coil. The air is then expelled to the outside, also under the sleeper floor. With the ***NITE Plus*** running in HIGH, locate the condenser air outlet under sleeper—it is a rectangular opening with a screen. Measure the temperature of the air coming from this outlet. It should be 10° F higher than the outside temperature.

4. Separator checklist

4.1 Check to make sure all electrical connections are tight and secure.

4.2 Check to ensure all electrical components/connections have been installed according to instructions and diagrams.

4.3 Check voltage with engine OFF

First, check that the voltage on the TRUCK batteries is the same as the voltage on the separator (use the ground terminal to check separator voltage). Both voltages should be approximately 12V.

Next, check that the voltage on the aux batteries is the same as the voltage on the separator (use the ground terminal to check separator voltage). Both voltages should be approximately 12V.

4.4 Check voltage with engine ON

With the engine ON, check the voltage at the truck batteries. It should be higher than when the engine is OFF (>13V).

Next, wait for the truck batteries voltage to reach at least 13.2V. You may need to increase the engine RPM to raise voltage. At 13.2V, the separator should close and start charging the aux batteries—you should hear the separator make an audible "click".

Now check the voltage of the aux batteries. It should be higher than the voltage when the engine is OFF, and should be approximately the same voltage as the truck batteries.

You can double check that the separator is allowing the aux batteries to charge by measuring the amps going to the aux batteries using a clamp-on inductive ammeter. Place it on the 4 gauge cable that connects the separator to the aux batteries positive terminal. It should read >0 amps.

NOTE:

Older starting batteries will change time needed to charge aux batteries and may cause decrease in runtime.

Old batteries do not hold charge long enough requiring alternator to continuously charge starting batteries.

Separator looks for 13.2 volts on start batteries prior to charging aux batteries.