



Idle Free Flex Systems® Supplemental Installation
Manual

Freightliner 108SD or 114SD Edition

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Flex System Installation Overview

Installing the Flex System requires installation of components on the interior and exterior of the truck.

The exterior modules include the following:

- Coolant Heater
- Engine Start Module (ESM)

The interior modules include the following:

- Touchscreen Control System

Coolant Heater



Touchscreen
Control System



Engine Start
Module



The following tools are required for installation:

- 3/8 drive ratchet/socket set
- Standard and cross point screwdrivers
- Wire strippers
- Wire crimpers
- Torx wrenches
- Coolant hose clamps
- Coolant hose cutter

Safety

Follow the safety guidelines listed below:

- Wear safety glasses during all procedures.
- Ensure the work area is clear of trip, slip or fall hazards prior to starting work.
- Wear non-conductive shoes prior to working with electrical components.
- Do not lift heavy objects by yourself; use a lift cart or 2-person procedures.

Coolant Heater Installation

For Coolant Heater Installation instructions, visit this link.

<http://techwebasto.com/documentation/heater/cargoapp/thermo-top-c.html>. You will see a link to download the operation manual which also includes the installation instructions on page 401.

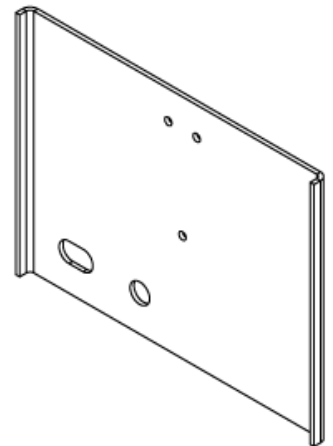
Heater Installation

Installation of the coolant heater involves physically mounting the heater and bracket to the truck frame, installing new coolant hoses, installing the fuel supply line, and installing the heater harness. Start by installing the heater first.

Install Coolant Bracket and Heater

The coolant heater comes with a mounting bracket and hardware.

- 1) Mount the heater to heater bracket with supplied machine screws (3).



- 2) Attach bracket (with heater) to truck crossmember underneath rear of cab. Bracket will fit over existing bolts in crossmember. After installing bracket with heater, torque to manufacturer specification.

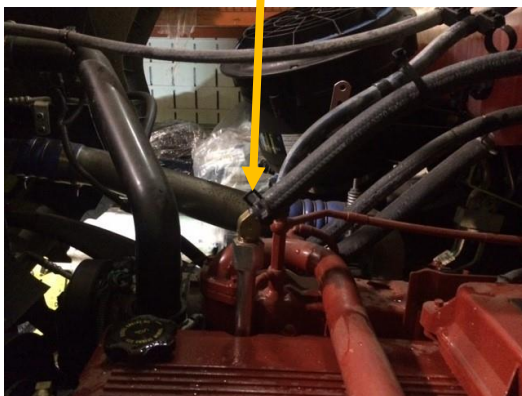


Install Coolant Hoses

Note: Installation of coolant hoses requires work on the truck's coolant system. Coolant will need to be removed from the system to avoid coolant loss.

1. Installation of the coolant hoses from the coolant heater to the truck's engine requires the removal of the OEM hose routed from the top of the engine to the firewall on the passenger side. *Discard this hose.*

Engine end of hose



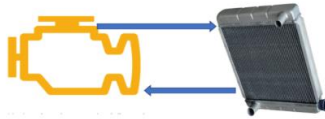
Firewall end of hose



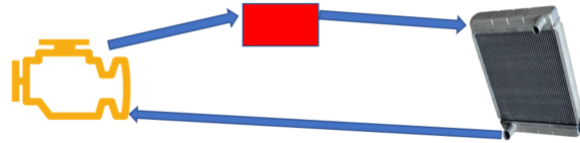
2. The hose removed in the previous step is replaced with two new hoses.

These two images show how the coolant heater is plumbed into coolant circuit.

**OEM coolant plumbing from
Engine to cab heat exchanger**



**Coolant plumbing with
Webasto coolant heater**



* The hose connection on top of the engine is connected to the input of the coolant heater (inlet on circulating pump).

* The hose connection going into the firewall is connected to the output of the coolant heater (see arrow on heater).

Attention: Ensure the coolant lines are installed properly. Improper installation will result in inadequate heating inside the truck cabin.

Note: If your truck engine is different than above contact technical support for assistance.

Install Fuel Supply to Coolant Heater

View installation instructions on page 401 in the Webasto Operation manual.

<http://techwebasto.com/documentation/heater/cargoapp/thermo-top-c.html>

Heater Harness Installation

The heater harness is routed from the heater to three locations.

Attention: Do not run the harnesses near any heat producing devices, and do not attach to fuel lines.

- 1) Route the 3-wire harness to the relay package installed under or behind the passenger seat (see photo). Only the yellow wire in this harness is used. Terminate the yellow wire to an output on the relay board.
- 2) Route the 2-wire power harness to the battery box. This two-wire harness has a black conductor and a red conductor that connect to 12 VDC battery power in the battery box.
- 3) Route the 2-wire fuel pump harness to where the fuel pump is located. This two-wire harness has a black conductor and a white conductor. Using the Webasto manual previously downloaded, terminate the conductors with the supplied terminals and connector.



Engine Start Module (ESM) Installation

For Engine Start Module (ESM) Installation instructions, visit

http://www.maxwell.com/images/documents/1017462_5_installation_guide_and_user_manual_12v_esm.pdf

On the Freightliner 114-SD there are 3 conductors on the positive engine starter stud. Per the Maxwell ESM directions, the only conductor that can remain on the starter stud is the large conductor going to the batteries. The other two conductors must be removed from the back of the starter and re-routed to battery (+) at the battery bank. Both conductors are long enough to reach the battery bank.

Attention: When finished the only conductor remaining on the positive stud of the truck's engine starter is the largest cable. This cable is routed to the output terminal of the Engine Start Module (ESM), output terminal.

Touchscreen System Installation

For touchscreen system installation instructions, visit

http://www.4x4spod.com/v/vspfiles/assets/PDF_Files/SE_UNIVERSAL_Touchscreen.pdf

Install Touchscreen

Do not install the touchscreen on top of dash (direct sunlight). Install in a location where the driver can easily see and access from driver's seat.

Using supplied screws, install the RAM ball mount in the desired location of the touchscreen.



Ball Mount

Attach touchscreen to ball mount using supplied adjustable RAM arm.



Adjustable Arm

Install Relay Assembly Under Passenger Seat

1. Use two self-tapping screws and attach relay assembly to passenger seat frame as shown at right.
2. Determine which circuits will be powered when the truck's ignition is turned "OFF". Examples below
 - Coolant heater
 - Two-way radio
 - HVAC controls on dash
 - Body strobes
 - Other...



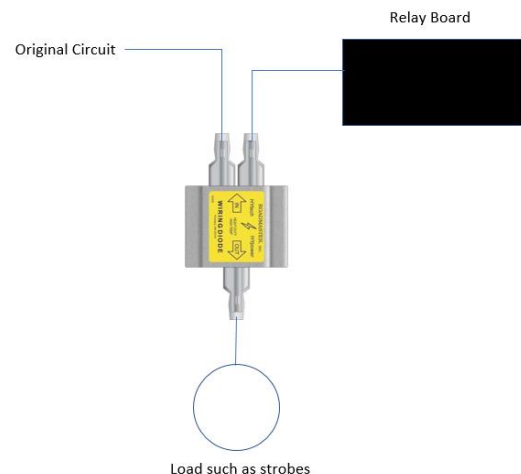
These pieces of equipment must be wired into the control module outputs using supplied wiring harnesses.

Note: At the tie-in point for all circuits, a diode MUST be installed to prevent feedback (see photo below). Cut the circuit conductor you are tying into.

INPUT: Hot side of circuit you are tying into

INPUT: Conductor from control module output

OUTPUT: Conductor going to load being powered



Diode Installation

Circuit 1 – This circuit will be used to power the Webasto coolant heater and OEM HVAC control module located in truck dash. Route the Webasto heater switch leg to output 1 in the control module (Positive output terminal). **Note: Webasto switch leg does not require diode.**

Remove HVAC control head from truck dash and locate conductor 98. Cut the conductor and install diode. Using supplied harness (4-conductor), tie into circuit and rout back to circuit 1 output at control module.

Note: Circuit 1 will power both the coolant heater and HVAC controls



Circuit 2 – Locate control circuit for two-way radio. Install diode and tie into output 2 at relay module.

Circuit 3 – Locate body strobe circuit outputs and tie into as many outputs as required to power lights required for safety. More than one output may be required.

Install Ignition Sense Relay (inside dash)

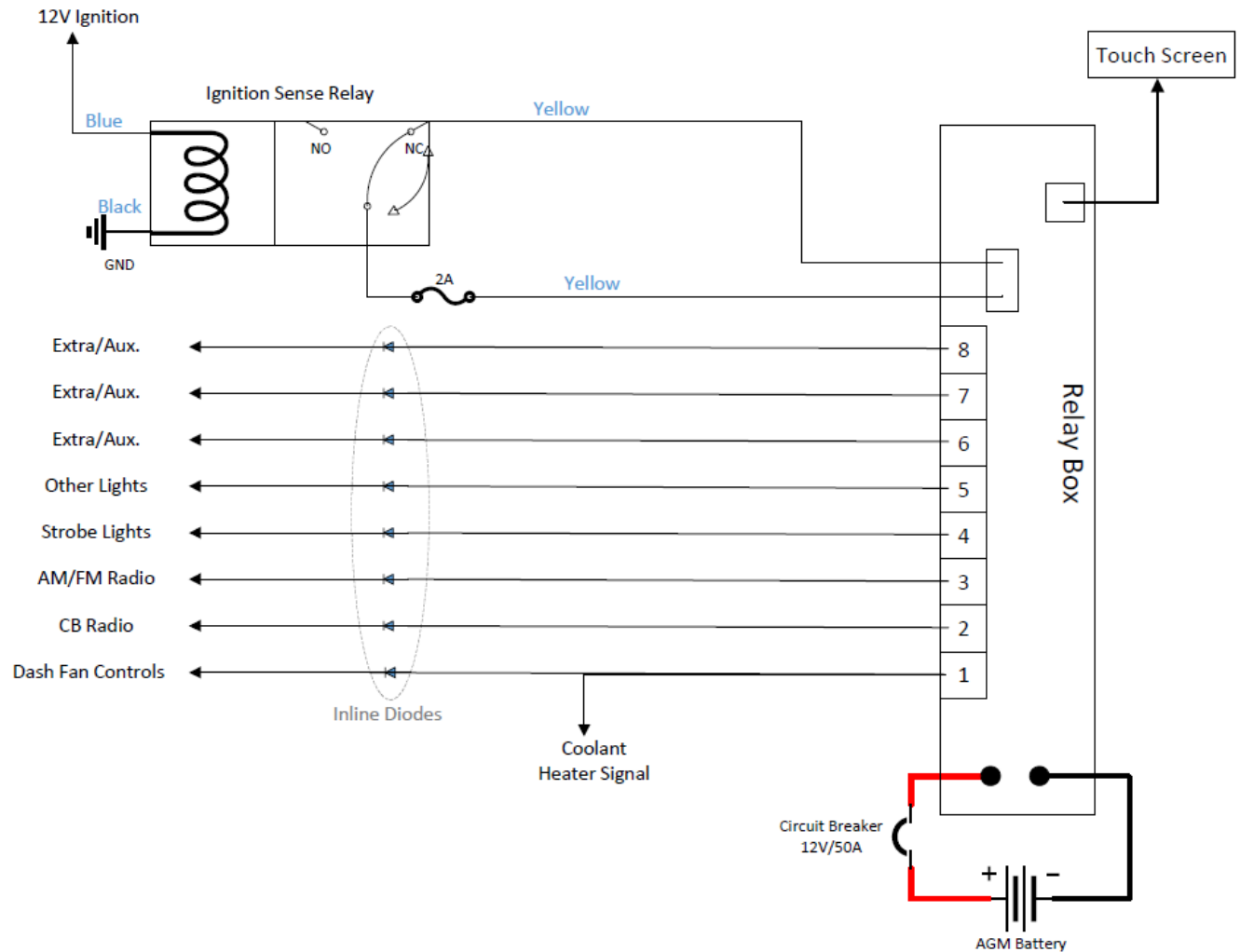
The ignition sense relay senses what state the truck's ignition switch is in. This circuit controls when the touchscreen is powered "on" and "off". The touchscreen should only power up when the ignition is "off" and the battery voltage is => 12.9 VDC.

1. Secure relay under passenger side of dash
2. Locate 12 VDC "ACCESSORY POWER" source and wire the BLUE wire to this source. Tie the BLACK wire into battery negative (-).
3. Route the yellow wires to the relay box under the passenger seat. Remove the 2-amp fuse on the circuit board and insert the spade terminals on the black and blue wires into the fuse slots.

See schematic on the next page for detailed information.

Relay package wiring schematic

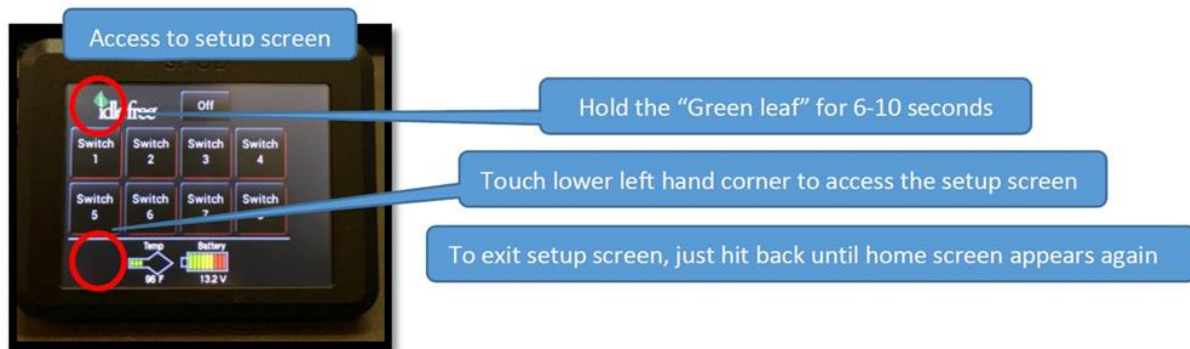
Note: The 12 VDC ignition input to the relay MUST actually be an "ignition accessory" signal.



Programming the Touchscreen

Note: Use a stylus or pencil eraser when programming the system.

1. Access the programming area using the directions below (see below)



2. Select the switch you are programming and enter the name of the switch. For example, enter "Strobe Lights" for the body strobes on the truck. Notice there are multiple lines for programming and separating words makes it easier to read on the screen.
3. It is recommended to remove default programming on switched not being used, or enter the word "Spare" or "Not Used".
4. Save every screen before leaving or you will lose your work.

Completing the Installation and Warranty Registration

Place provided stickers in driver compartment so they are visible to the operator. In this photo the stickers are attached to the center console for plow controls.



Attach the serial number sticker on the driver-side door jamb. Locate it near the other stickers displaying truck information such as truck VIN.



Finally make sure to register the system for warranty. Your installation trainer will show you how to do this to ensure warranty coverage.