NEW

PETERBILT ESSENTIALS

MODULE 11

- Heating
- Air Conditioning
- Ventilation

Peterbilt

CLASS PAYS

PETERBILT NEW ESSENTIALS – MODULE 11

Introduction

The Peterbilt heating, ventilation and air conditioning system is engineered to be efficient and environmentally friendly. In addition, the Peterbilt HVAC system saves weight by using a lightweight case and an evaporator and heater core made of aluminum.

How To Use New Peterbilt Essentials

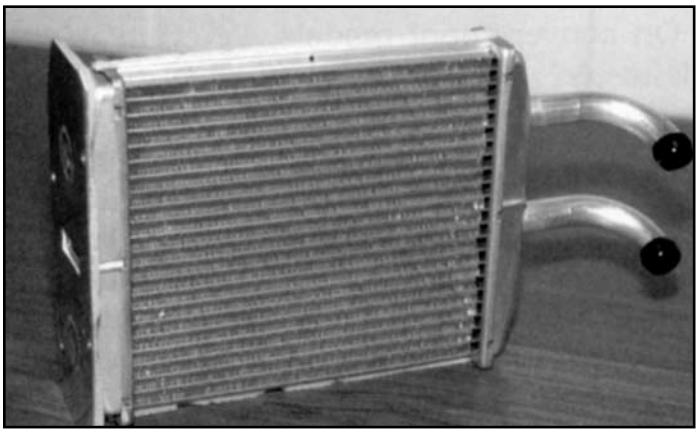
1. Print the module and study the information. To print, click the printer icon on your browser. Highlight material that is new to you, or complex.
2. When you are ready to take the online test, click the "Begin" button in the "Test" column for the desired module. When the test is completed, it will automatically be scored and the results will be entered in the Peterbilt training records database.
3. Upon successful completion of all modules, you will receive a personalized certificate.

It is recommended that you complete these training modules in sequence since each succeeding module builds on the previous module.

Heating

On conventional models, Peterbilt uses a "blend-air" system for temperature control inside the vehicle. This type of design has been used successfully for years in the automobile industry. Peterbilt was one of the first OEM's to employ this advanced technology in the Class 8 industry. Blend-air units work by controlling the airflow through the heater core and A/C evaporator through the use of an electrically adjusted internal deflector door. This deflector door directs all of the air, any part of the air or no air through the hot heater core.

This system eliminates the need for a water valve that regulates coolant flow through the heater core. With blend-air, more consistent interior temperatures can be maintained because of the capability for more precise temperature adjustments. Increased air conditioning outlet airflow is also achieved with the blend-air system, because the air passes only through the evaporator core – not the heater core as well – when the maximum cooling setting is selected.



Heater Core

Heating is simply the act of adding heat to the air. This is accomplished when the air is brought into contact with a hot surface, which in the case of a Peterbilt vehicle is an aluminum alloy heater core located in the heater-A/C unit. Engine coolant, which is hot from having been used to cool the engine, is routed through the heater hoses and the heater core by the water pump. The coolant returns through another hose back to the engine block to absorb heat from the engine, and excess coolant is carried to the radiator to be cooled.

Cold air from both outside and inside the truck is drawn through the heater core by the blowers and then distributed through ducting to the cab. The amount of air entering the cab is regulated via the electrically operated deflector doors and blower fans, which are operator-controlled.

Sleeper heater operation is the same as that of the cab. The sleeper has its own unit and can be controlled separately from inside the bunk area.

Air Conditioning

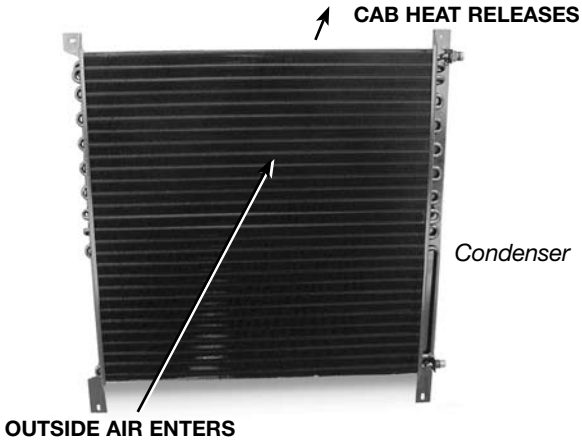
Compressor

The compressor is the heart of any A/C system. It draws in R134a refrigerant as a gas from the suction side and compresses it into a hot, high-pressure gas, which it then discharges toward the condenser. Peterbilt has selected a compressor that is specifically designed for R134a, which has proven to be the most environmentally friendly yet effective refrigerant. The R134a compressor has seven cylinders for high output and reduced chance of failure.

Condenser

The condenser acts as a heat exchanger in which heat from the hot R134a is transferred to the cooler air flowing over the tubes and fins. As the R134a cools, it condenses into a warm, high-pressure liquid. Peterbilt installs a condenser with a frontal area that is 28 inches x 28 inches (784 square inches.). A condenser of this size offers a number of advantages:

- Proper cooling is ensured even when the vehicle is parked and idling.
- System operating pressures are reduced, which reduces stress on the compressor.
- Since refrigerant is cooled over a large area, the engine fan runs less.



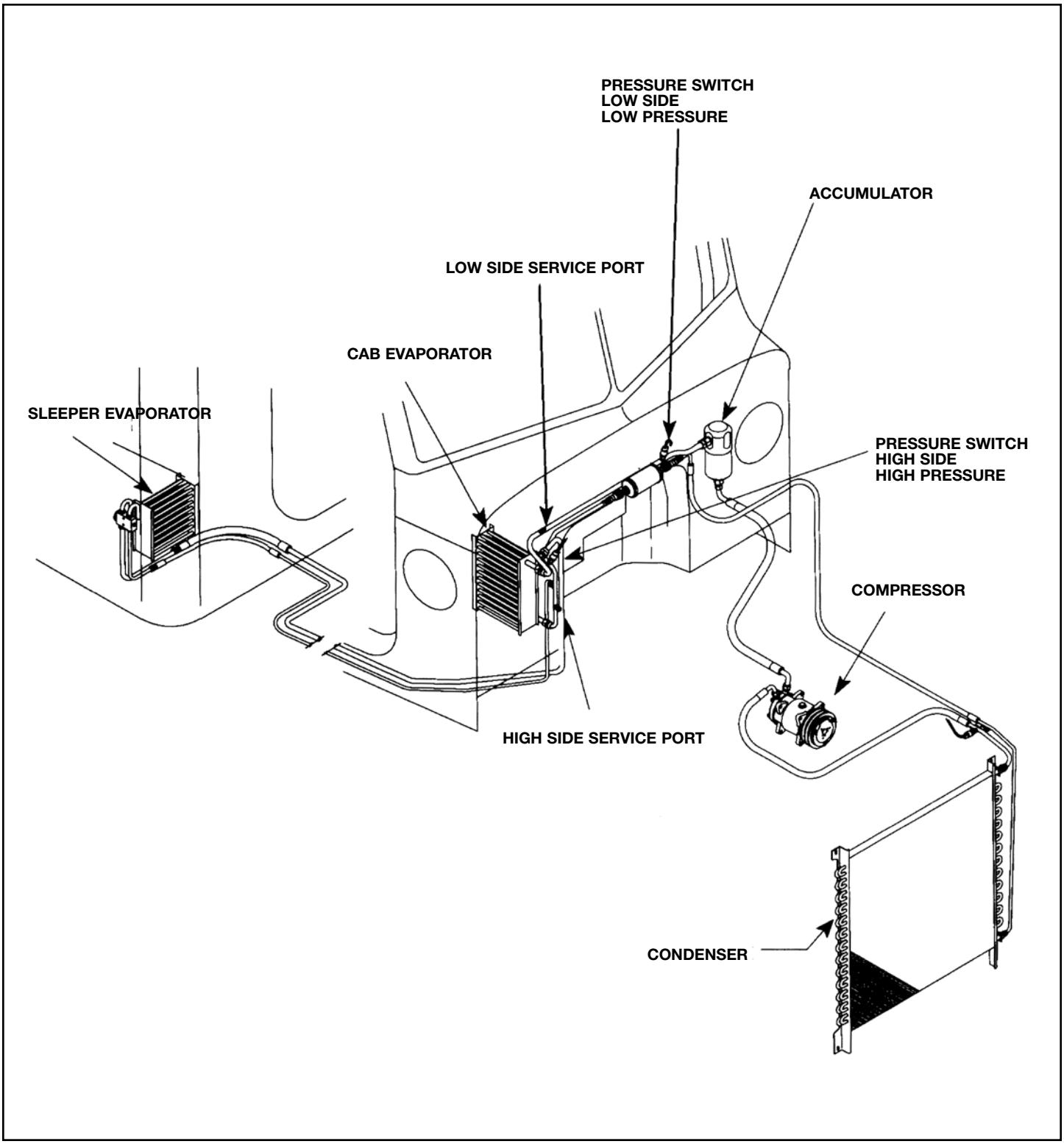
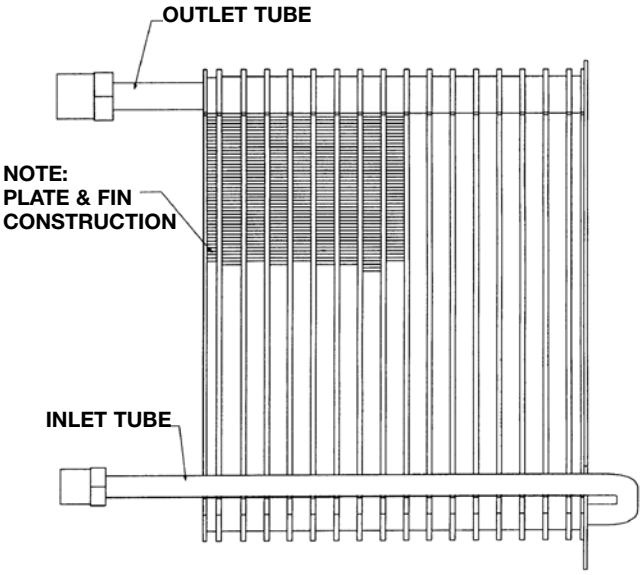


Diagram of Traditional Conventional HVAC System. Note the configuration of HVAC components discussed in this module.

Evaporator

After leaving the condenser, the warm liquid moves toward the evaporator. For improved performance, aluminum evaporators are used on the Peterbilt system.

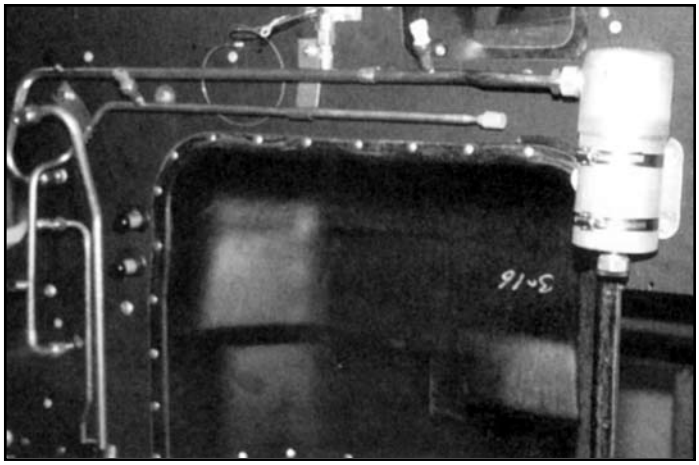
Located in the evaporator inlet is an orifice tube, a refrigerant expansion device that restricts the pressurized liquid as it flows into the evaporator. The orifice tube has no moving parts, so it is virtually maintenance-free and very dependable. As the liquid passes through the tube, the pressure drops and the R134a becomes cold. As the air that will cool the cab is sent over the evaporator coils, the R134a evaporates and carries the heat transferred from the air to the accumulator.



Accumulator

The accumulator has three functions:

1. It absorbs water in the system, by way of a dessicant.
2. It acts as a reservoir for liquid R134a.
3. It regulates the flow of R134a, making sure none of the liquid refrigerant reaches the compressor.



Accumulator. Note the hard refrigerant lines (Left, and running to the accumulator).

In the Peterbilt system, every refrigerant line that does not need to accommodate relative motion between components is a hardline instead of a rubber hose. For instance, the lines on the firewall and the lines to and from the sleeper are all hardlines. Hardlines reduce the potential of refrigerant leaks caused by a puncture. In addition, hardlines also reduce the chance of refrigerant seeping out and moisture working in, which could happen with rubber hoses. The result is a more dependable system that requires less time in the shop for evacuating and charging the air conditioning system.

Ventilation

There are seven air registers in the cab; this more-than-adequate ventilation system prevents any cold spots from occurring. A total of six registers in the sleeper – four in the bunk and two for the bunk floor – ensure even temperatures throughout the sleeper as well.

Air Outlets in Cab

Heating and A/C Control Panels

Two control panels are located in the truck: one in the cab and the other in the sleeper. A six-control main panel is in the cab. It permits cab control of the system, and also contains a switch to provide electrical power to the sleeper unit for sleeper temperature control from the bunk. The labeled drawing below illustrates the cab control panel.

A. A rotary knob that controls the blower speed with four settings

B. A rotary knob that controls the movement of air within the cab. This control is continuously variable through five settings. The settings for the knobs (clockwise) and switches (left to right) are:

- Panel
- Panel/Floor
- Floor
- Defrost/Floor
- Defrost

C. A rotary knob that controls the air temperature

D. A push button switch used to engage the air conditioner compressor

E. A push button switch to select fresh or recirculated air

A separate and independent rocker switch on the dash is used to energize control of the sleeper A/C on vehicles so equipped.

Cab Control Panel

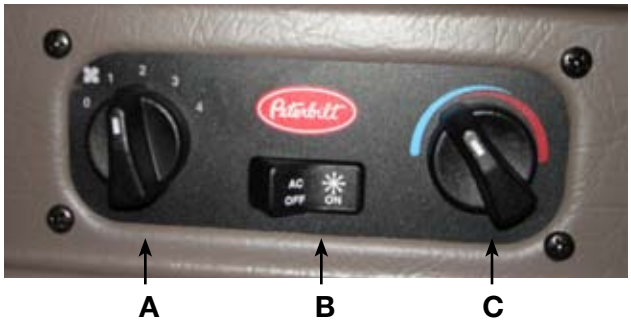
A separate control panel is located in the sleeper to control sleeper temperature. The functions are shown in the illustration on the right.

Any air temperature coming from any combination of outlets is possible with a Peterbilt heating, ventilation and air conditioning system because the electric actuators allow for variable mode control. That is, if the selector is between settings – for example, face and floor modes – the amount of air flowing from one duct or the other (face or floor) can be controlled.

The Peterbilt heating-A/C system also offers humidity control by way of a separate A/C actuation switch that allows air conditioning in any mode. The operator is also afforded the ability to select whether fresh air or recirculated air is flowing into the cab; this ability enhances the efficiency of the system.

Peterbilt provides an air filter for both fresh air and recirculated air. A panel on the passenger side provides quick, easy access to the filter for periodic cleaning to keep the cab air free from dust and other particles.

Heating and Air Conditioning Air Filter



A. A rotary knob that controls the blower speed

B. Sleeper A/C switch

C. A rotary knob that controls the air temperature

Sleeper Control Panel