Pre Start -Up

Antifreeze:

There are a number of products that are used for antifreeze, ethylene glycol(typical automotive, green antifreeze), propylene glycol(Some RV, and Sierra), windshield washer fluid. We recommend ethylene glycol for the testability, function, and cost. Any chemical product should not be discharged on the ground, and care should be taken to prevent spills. Ethylene glycol or green antifreeze can generally be purchased at 100% strength, labeling will vary so make sure to read the fine print on the concentrate.

Some things to remember about ethylene glycol, antifreeze:

1. 100% or straight antifreeze will Freeze at 10°F, so it is important to dilute it properly
2. 70% antifreeze will give you the best protection at -60°F
3. As you use it it will become more diluted and more will be needed
4. Testers are available at most stores, purchase one and make use of it.

Procedure for start up with a cold steamer, full of anti-freeze.

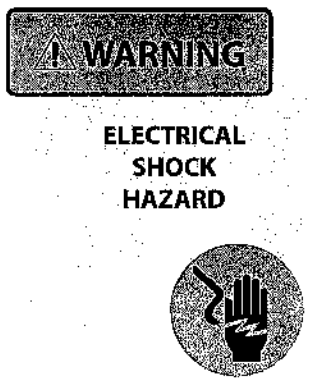
As the temperature gets colder these procedures become more important. The below procedure demonstrates what you might expect to use as a best practice when temperatures are about 5-10°F

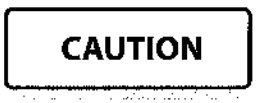
Find your water source in the house, preferably a utility room or laundry tub, using an outside hookup is just asking for extra problems and will often not work properly in the winter. Connect your garden hose to cold water only (NEVER SUPPLY HOT WATER TO MACHINE).

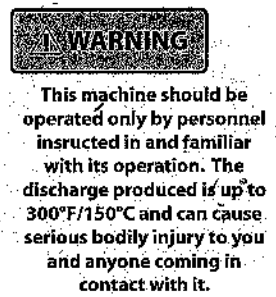
-Tip- Use a ball valve on the garden hose so you can turn the water on/off from outside - Tip-

Turn on water and have your ball valve open slightly so a trickle of water comes through the garden hose and prevents it from freezing. Put this in a snow bank and leave the water flow. This will keep your garden hose from freezing.

Find an electrical outlet that you can hook your steamer to, it will draw about 10 amps. The utility room is a great place to find an outlet; avoid circuits with many lights and appliances. Instruct your customer not to unplug your steamer or use a vacuum on the same circuit.







Warm up the machine before hooking up water.

The metal and antifreeze in the steamer will be the same temperature as the air. If you put water to the machine before warming it up it can flash freeze and cause many problems. To warm up the machine, put the wand in the float tank, turn on the pump. Once you observe the flow of antifreeze in this closed loop system, turn on the burner for 5 seconds, and then off for 15 seconds. Keep using 5 seconds of burner each 20 seconds of recirculating. After you do this for a few minutes you should notice the fluid is getting warm. When you notice the connections are warm to the touch it is time to introduce water. You do not want to preheat the machine to temperatures over 120°F.

Hookup water to your machine

Your steamer is currently circulating antifreeze. Get your garden hose from the snow bank and if you have not had it on, make sure you turn it on for a minute to ensure it is not full of ice chunks and frozen material. Once you are sure you have liquid water flowing through your garden hose, hook it up to the Arctic Steamer. Direct the flow of antifreeze from the nozzle to a 5 gallon pail or other container, and turn on the water. In the course of about a minute and a half the water will push the antifreeze through the system, once the discharge turns from green to clear/white, direct it away from the antifreeze container so you do not needlessly dilute it.

– Tip – After you are pumping water, push down on the float valve to make sure the water supply can overflow the tank, if it can't it is only a mater of time before you run low on water, recirculate the water or winterize the machine and address the water supply problem. **– Tip –**

Operating

Electrical: Connect the machine to an electrically grounded circuit that is fuse or circuit breaker protected. Do not use any type of adapter. If the correct type of receptacle is not available, the have on installed by a qualified electrician.

Oil Level: Check the oil level in the water pump.

Belt: Make sure belt tension and condition is as specified in MACHINE MAINTENANCE.

Stack Cover: Remove the stack cover (if so equipped).

Fuel Filter: Inspect fuel filter for evidence of water contaminants.

Fuel: Make sure the fuel lines are open (CAUTION: Closed valves will DAMAGE the fuel pump and void warranty). Use #1 or #2 diesel. Make sure the fuel supply is sufficient to complete the job. See the GENERAL section of MODEL SPECIFICATIONS for the fuel tank capacity.

Water Supply: This machine must have a water supply meeting or exceeding the maximum discharge volume specified in the PREFORMANCE section, and a minimum water inlet pressure of 40 PSI/ 0.68 BAR.

Lime: Water containing large amounts of lime, calcium or other similar materials can produce a coating on the inside of the spray tip, impact nozzle and coil pipe.

Float Tank: Check the float tank to assure it is full and the float valve shuts off securely.

CAUTION

A good flow of water must be flowing from the end of a gun for 30 seconds before proceeding. Lack of water can cause damage to the water pump and like components.

CAUTION

Do not run the machine with the burner switch in the on position when the fuel tank is empty or with tank valve closed. This will cause damage to the fuel pump and void warranty.

Operation Start -Up

Using your Arctic Steamer:

1. With the gun assembly in hand and with a good flow of water turn the switch to the 'pump' position.
2. Turn the switch to the "burner" position.

In the course of about 3 minutes you will go form cold water to a constant output of 280-290°F steam.

At about 240-250°F you will see the discharge change in sound and appearance. It will go from sounding coarse to sounding smooth. In addition a steady drip of condensation will appear at the bottom of the steam spray. This drip will stay around until about 310°-325°F

CAUTION - If you had accidentally hooked to a hot water heater or the homeowner decided hot water would speed you up, you will visibly be able to see the spray is too hot from the change in the spray. Generally increasing over 290°F will not increase productivity and may damage hoses.

Use the steam to remove pieces of ice, first by melting channels, and then between the roof and the ice. Let the steam do the work, do not force a piece of ice loose as a shingle may be damaged. Be mindful of the size of the pieces and what is below your work area. The closer you keep the nozzle to the ice the faster you will work.

Operation Shut Down

1. Turn the switch to the 'pump' position.
2. After cool, clear water is coming from the end of the wand, turn switch to the 'off' position.
3. Turn off the water supply.
4. Fill a 1-gallon container with Ethylene Glycol type antifreeze. Minimum should be a mixture of ½ antifreeze and ½ water strength before each use, as the antifreeze will dilute with use.
5. Pour the anti-freeze solution into the float tank.
6. Turn on the switch to the "PUMP" position.
7. When it begins to come out green at the nozzle, direct the nozzle back into the float tank, allow the mixture to circulate for a few minutes.
8. Turn on the switch to the "OFF" position.
9. Use your antifreeze tester to make sure the mixture in your tank gives you proper protection.
10. Disconnect electrical supply.
11. Fill the fuel tank with kerosene or #1 or #2 diesel.
12. It is recommended to install a coil cover to keep coil free of debris.
13. Place machine in a dry place protected from weather condition.
14. Store your garden hose in the warm cab of your truck as it contains water.

Overview

Overview:

Warm the machine
Remove antifreeze
Verify Flow, Turn on Burner, and Work.
Cool Down
Winterize
Turn Off

WARNING: **NEVER TURN OFF THE MACHINE WITH WATER IN IT.**

Machine Maintenance

Machine Maintenance

Belt Tension

Deflection for each inch of span between pulley centers with a 6-pound force applied in the middle of the span.

Example: A 6-pound force applied at the middle of an 8-inch span should produce a deflection of 8/64 inch or 1/8 inch.

Belts can be tightened or loosened by loosening the nuts holding the pump assembly to the motor mount. Then tighten or loosen the j-bolt on the motor mount. Retighten the pump assembly after the desired tension is reached.