



Engine Cooling Pulsator[®]

ENGINE COOLING SYSTEM FLUSHER

U.S. Patent No. 5615695

**Perfect for Blasting Clean... Heater Cores,
Radiators, Heads, Intakes, & Blocks.**

	WARNING Risk of eye injury. Wear eye protection.		WARNING Read and understand operator's manual and all other safety instructions before using this equipment.
	WARNING Wear safety gloves.		WARNING This equipment should be used in locations with mechanical ventilation that provides at least four air changes per hour.

WARNING: THIS IS A VERY POWERFUL BLASTING DEVICE

Follow all proper safety practices. This item must be kept out of the reach of children. Safe use is your responsibility; and you must read, understand, and follow all safety warnings. Because conditions of use are out of our control, Hecat, Inc. cannot be responsible for the potential misuse and the inherent hazards of using this tool. The Operator must completely understand and accept the responsibility and liability of the possible hazards, damage, and injury that could occur.

BACKFLOW PREVENTER MUST BE INSTALLED at the spigot end of your water supply hose. Failure to use this safety device can cause damage to your water supply system. It is the user's responsibility to install this safety device, and the manufacturer will not be responsible for secondary water supply system damage.

SAFETY WARNINGS:

- **Keep away from children.**
- **Never point the discharge gun at any person.**
- **Operator must be familiar with the dangers** of and take all necessary precautions when working with pressurized air systems and components.
- **A spit back hazard exists,** if flusher tip is not sealed correctly or is deadheaded against a blocked component; always wear protective equipment, including safety goggles, face shield, and gloves when working with pressurized liquids and compressed air. Pressurized liquids and compressed air can and will cause severe injuries.
- **The manufacturer cannot be responsible for any damage done** to a component being cleaned or secondary damage occurring with the use of this system.
- **Operator must comply with any and all Federal, State, and local laws** governing the use of this equipment as well as the proper handling and disposal of waste antifreeze products, the equipment, and any of its components. The Pulsating Coolant Flusher is **ONLY** to be used after methods have been employed to properly remove and dispose of the Antifreeze in accordance with local, state, and federal guidelines.
- **It is illegal to dispose of antifreeze in the trash or down storm drains.** Antifreeze is a hazardous material and must be managed properly to protect public health and the environment. Because antifreeze contains ethylene glycol and other trace metals, care must be taken in disposal of used antifreeze as well as storage of new antifreeze.
- **Ethylene glycol is a clear and colorless liquid.** Its sweet taste makes it attractive to children, pets, and wildlife. Because ethylene glycol is toxic, it could have serious adverse health effects if taken internally, including respiratory and cardiac failure. **If antifreeze is carelessly disposed of,** such as poured into a storm drain, ditch, or river, or on the ground, or if it is placed with regular trash, it can threaten the health of animals or people and can harm the environment.
- **Do not remove your vehicle's radiator cap when engine is hot.** Because the fluid is heated, serious burns can occur and dangerous amounts of ethylene glycol vapors can be quickly inhaled.
- **Handle antifreeze in an area that is well ventilated,** and clean up any spills with absorbent materials (kitty litter, shredded newspaper, vermiculite, etc.) Bag waste-absorbent material and discard it in the trash.
- **Collect and store used antifreeze in a sealed, labeled container,** away from heat, children, pets, and wildlife.
- **A container is considered empty if no antifreeze pours out when it is held upside down.** Keep in mind that although empty antifreeze containers can be thrown in the trash, your local solid waste or collection programs may be collecting them for recycling.
- **Call Manufacturer's Tech Line (1-800-380-9501)** before attempting any repair or if you have any questions about the safe and proper use of this flusher. Repairs are to only be performed by trained and approved service technicians.

COMPONENT DESCRIPTIONS:

- Impact Resistant Storage Case.
- Patented "Pulsating" **Flushing Gun Assembly.**
- **Large Rubber Tip** for flushing radiators and blocks.
- **Small Rubber Tip** for direct port flushing of heater cores.
- **5/8 & 3/4 Hose Barbs** to connect to heater hose to flush heater cores.
- 1/2 Hose Barb can be removed from the Large Rubber Tip (if needed).
- **Whip Hose** for those places where the tip on the gun will not fit.
- **Backflow Preventer** for the spigot end of your water supply hose.

CHEMICAL CLEANERS:

A chemical flush can be added and allowed to circulate through the coolant system before the system is opened and properly drained. However, the effectiveness of this pulsating tool does not require the use of a chemical flush.

VEHICLE PREPARATION FOR FLUSHING:

Make sure you properly drain and capture the antifreeze first.

Radiator

- Remove lower radiator hose, radiator cap, upper hose, and if possible, completely remove the drain valve to allow for debris outflow from the lowest point of both radiator end tanks.
- Here you will use the Large Rubber Tip to flush through fill neck, upper hose port, and back flush (see Flooding) through lower hose port; this is done back and forth as much as needed until radiator outflow is clear.

Engine Block

- Remove upper and lower radiator hoses and thermostat.
 - Although this flusher has proven powerful enough to push open the thermostat; it is highly recommended that the thermostat be removed to achieve the best flushing results.
- Using Large Rubber Tip, flush through upper hose or thermostat housing until outflow is clear.
- Back flush (see Flooding) block through lower radiator hose as much as needed until outflow is clear.
- You can also flush intake and head pathways by using the Small Rubber Tip or the appropriate Hose Barb to connect and flush through the heater hoses, as needed.

Heater Core

- The Small Rubber Tip can be used for direct access to the heater core tube stub.
- If the heater core tube stub is difficult to access, one of the 3 sized Hose Barb fittings should allow for you to use the existing heater hose to flush through the heater core.
- Use the feather trigger feature to first confirm no hard blockage. Then use the trigger lock for hands free flushing as long as needed. Flush heater core back and forth as much as needed until outflow is clear

Flooding

Back flushing (bottom up) has shown to produce the best results in the larger chambers of the Radiator and Engine Block, and this issue does not apply to Heater Core flushing. Liquid flooding of these larger cavities, allows for the kinetic shock waves of the pulsating action to travel through the liquid into all the passageways to clear debris. This is how the pulse energy can defeat “path of least resistance” and clear the restricted or blocked passages.

A tip to quickly accomplish flooding; is to install the flushing gun to the flushing entry point, disconnect the air line, and pull the trigger to flood the component (block or radiator) with just water. When flooded, release the trigger; reconnect the air line, and pull the trigger again to begin “pulse” flushing. To complete the job, always flush in the opposite direction (top down) to be sure to flush out the debris loosened by the “pulse” process.

WASTE OUTFLOW:

The Pulsating Coolant System Flusher uses clean water and shop air to produce the scale, rust, and contaminant removing scrubbing action. It is up to the operator to determine if this waste must be captured or can be allowed to flow into sanitary drains or even storm drains in accordance with local, state, and federal guidelines.

USING THE PULSATING COOLANT SYSTEM FLUSHER:

- Select and install the accessory tip best suited for the flush job.
- Install the Backflow Preventer to the spigot end of your water supply hose.
- Connect your water supply hose to the flush gun assembly and turn on the water, wide open.
- ONLY when ready to begin flushing, connect your shop air supply (min 75 PSI, max 200 PSI), test for strong pulse (see below), and begin flushing; flush any of the pathways as long as you wish.
- When flushing is complete, immediately disconnect the shop air supply.

NOTE: Failure to connect air supply ONLY when ready to begin flushing, and to disconnect air supply immediately when flushing is complete; will cause air pressure to back into water line and Backflow Preventer to discharge water pressure.

TEST FOR STRONG PULSE:

The air pressure regulator is preset at 75 PSI to balance with common 60-65 PSI regulated water pressure, to produce a strong pulse. In some rare cases, water lines such as commercial buildings, irrigation, and other outside water lines may be set at higher or even lower working pressures (such as some residential applications).

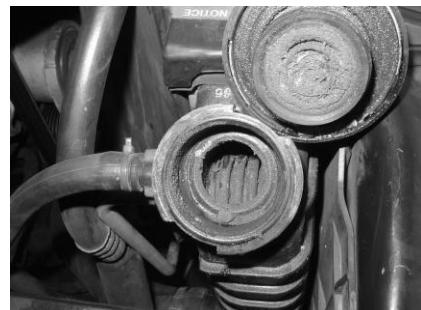
Connect the flusher to a water supply line and turn it on, then connect your air line to the flusher; point it in a safe direction and pull the trigger to see the pulse. If there is any question or doubt of what this should look like, there is a product video of this tool in action on our web site, or you can search “Hecat Coolant Pulsator” on YouTube.

Water flow with a weak or nonexistent pulse will indicate a pressure imbalance, probably caused by high water pressure; in this case the current air pressure setting will need to be increased, to find the balance. Excessive discharge from the back flow preventer and/or excessive air blowing when trying to flush indicates lower water pressure and the current air pressure setting will need to be reduced to find the balance.

To adjust the regulator, connect the water line and turn on the water, then connect the air line; point gun in a safe direction and pull the trigger to see the performance of the pulse. Adjust the regulator by turning the pressure up and/or down; you will quickly see how this changes the performance of the pulse. After you have found the point of peak performance, use the trigger to stop and start a few times to be sure it is set correctly. Small adjustments may even be necessary when changing from the high flow large tip to the use of the restrictive whip hose and small tip.

DON'T FORGET THE OVERFLOW LINE:

An often overlooked item is the line that is usually running from the radiator cap neck (under the cap) to the overflow bottle. When this line clogs, the overflow bottle will appear to always show the system full, as the actual level in the radiator may begin to drop creating the dreaded “steam room” environment and the buildup of “mud” deposits. Bad radiator caps have been identified to be a probable cause; just don't forget to check and if necessary clear or replace this line.



Any Questions? Call (800) 380-9501

WARRANTY STATEMENT

This warranty covers the **Hecat “Pulsating” Coolant System Flusher.**

Please do not call the distributor you purchased this item from.

Warranties are 100% the responsibility of, and handled directly by, the manufacturer.

You should call Hecat's toll free number, which is **1-800-380-9501**.

You must contact Hecat and obtain a return authorization number before returning any unit to the manufacturer.

HECAT, INC. offers to the user of the HECAT “Pulsating” Coolant System Flusher a one-year limited warranty. This warranty covers all manufacturing defects in materials and workmanship for one year from the date of purchase and is offered only to the original purchaser.

This warranty shall not apply to any flusher that has failed due to the failure to follow printed instructions, misuse, neglect, or accident.

This warranty shall not apply to any unit repaired by an unauthorized person(s).

If returning to the factory is necessary, HECAT, INC. will evaluate warranty claim and then, if approved, repair or replace at its option any unit returned. Units for warranty evaluation must be shipped freight pre-paid to the manufacturer's designated address. A letter referencing the return authorization number, outlining the malfunction, proof of purchase with date purchased, and owner's name, address, and contact information must accompany any flusher returned.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the following statement may not apply in your state. Incidental or consequential damages occurring as a result of usage of this flusher are not covered by this manufacturer's warranty.

There are no other warranties implied or stated.