

Coolant “Pulsator” Simple, Economic and Effective Coolant System Pulse Flushing

By Karl Matis

There have been many very well written and in depth technical articles about the theories and facts behind “long life” antifreeze products and the problems associated with improper service, use, and mixing of incompatible products. With this article, we are not going to engage in any of the controversy regarding the root causes or where the ultimate responsibility lies with this issue. Instead we are going to focus on the need; a simple and effective cleaning solution.

Consumers and Technicians are seeing and have been complaining for some time, that a corrosive sludge-like substance is clogging “long life” antifreeze equipped vehicle’s cooling system leading to internal and external coolant leaks, cooling system part failure, overheating, intake manifold gasket failure, as well as clogged or contaminated radiators, heater cores, water pumps, hoses, caps, thermostats, cylinder heads, and engine blocks.

For example, as one of many OEM’s seeing these issues, General Motors (GM) has issued multiple technical service bulletins that relate to the sludge issue and intake manifold gasket problems. GM admits in its technical bulletins, that vehicles equipped with DEX-COOL may be susceptible to the formation of a rust-like material in the cooling system. In addition to part replacements, the recommended flushing procedure takes many hours and requires the use of caustic and corrosive chemicals followed by a neutralizing chemical to hopefully prevent

No matter what type of coolant is used in a vehicle’s cooling system, eventually some type of corrosion will occur. Let that corrosion accumulate long enough and it becomes a detriment to the engine, heater, hoses, water pump, etc. The only true way to handle a contaminated system is to flush it out. An adequate flusher is required.

component damage. While this is an effective process if done correctly, there is a need for a quicker and less potentially corrosive option capable of cleaning any make and model vehicle with this problem.

HECAT, Inc., with 25 years experience developing processes for cleaning heat exchanger internals; was asked to research and develop a simple and effective cleaning process, primarily focused on the issue of clogging heater cores. Various cooling system flushing gun’s, flushing tee’s and other methods both professional and home made, using air and water, have been around for a long time; by adding HECAT’s patented “Pulsating” scrubbing action, it takes this



Photo 1

method to the next level of cleaning effectiveness. As development progressed, it was determined that HECAT could offer a Complete Cooling System Flusher by adding accessories needed to flush not only the heater core, but to target the radiator and engine block also.

After inspecting the cooling system, adding a chemical cleaner of choice if necessary, and only after the antifreeze has been recovered in the proper manner, can the HECAT Coolant “Pulsator” be employed. Using only shop air pressure (regulator is included) and a garden hose water supply; the Coolant “Pulsator” will scrub the internals of the cooling system with its high flow and

hard hitting “water hammer” like action, removing scale, sludge, casting sand, and other deposits.

To flush the radiator, we first remove the upper and lower radiator hose and direct the outflow to the appropriate capture container or sanitary drain. Flushing the radiator (or the engine block) is done using the large rubber tip. This can be done through the upper hose neck as pictured (Photos 1 & 2), or directly to the fill neck. Removal of the drain valve is recommended to allow for all available paths for larger debris to flow out. Reverse flushing through the lower hose or hose neck can also be done in this same manner. It should be noted that with back flushing, complete flood-

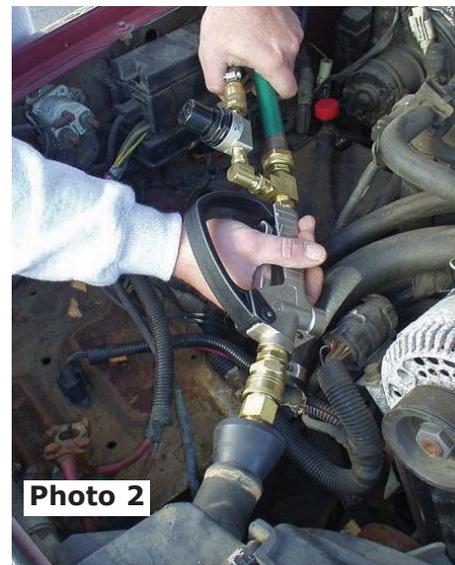


Photo 2

ing and a little back pressure will intensify the “Pulsating” action.

The engine block can be flushed through the upper hose as pictured (Photo 3), the thermostat housing, or directly to the intake with the thermostat and housing removed. The Coolant “Pulsator” has the power to push open the thermostat but the benefits of the pulsating action will be limited and thermostat removal is recommended. Flushing the block in the opposite direction using the lower hose can be done in this same manner and again; back flushing and flooding will only intensify the “Pulse.”

Flushing the heater core can be done

Thorough Cooling System Flushes

with two different methods. You can use the whip hose with small rubber tip to flush directly to the hose nipple of the heater core (Photo 4). Because some heater core nipples are difficult to access, hose adapters have also been included (Photo 5). This eliminates the need to hold the rubber tip firmly to maintain a seal, by using a direct connect to the heater hoses. This also allows for the trigger lock to be employed and hands free flushing can be done as long as necessary (Photo 6). This method can also be used to as a block flushing alternative, by using the heater hoses and reversing the flushing direction to flush through the intake, heads, and block.

To give you a visual impression of the pulsating action and flow rates being used, a 60 second video of this tool in action can be seen on our home page at www.hecatinc.com.

Flushing is a term that has been applied to fluid exchangers. Just like a Transmission Flusher, today's Coolant Flushers are just fluid exchangers, and they do a great job at completely evacuating all the old fluid to replace it with new and do provide some cleaning. But when facing a hard blockage this equip-



Photo 5

ment cannot get the job done, and this is where this tool comes in.

After completing our in house testing and flushing everything in the employee parking lot, we set out to find professional approval and feedback. We decided that this tool should be evaluated by professional radiator repair shops before we offered this tool to general repair; and this is what they had to say: “

Danny Spitznagel (Ft. Walton Radiator & Auto Air in Ft. Walton Beach, FL) says “You definitely have produced a very effective tool for cleaning the heater cores with all their problems today. The radiator and block flushing works best when back flushing, by allowing all the

cavities to flood, the pulsating action seems to be stronger and more effective. We have not tried it on all the models we



Photo 3

want to, and it may not be the right fit for all models, but we do feel it is a good tool for most repair shops needing a quick and effective tool for flushing.”

R.C. Schirmer & Wayne Passow (Glen-ray Radiators, Inc. in Wausau, WI.) says “It works beautifully, it works great.



Photo 6

This tool amazed us with its ability to clean some extremely blocked heater cores. Screening the outflow on one heater core we flushed, we collected a 3 to 4 inch diameter pile of debris. It has been working great on cleaning clogging issues on DEX-COOL Blazers. We have been very surprised to see how well the pulsating action does on back flushing blocks and radiators, it does a nice job.”

David McKinney (Gainesville Radiator & Air Conditioning Co., Inc. in Gainesville, GA) says “This tool works great! The whip hose with rubber tip requires 2 hands so I have preferred to use the included heater hose adapters which allow me to clamp the adapter to

the heater hose and turn on and lock the trigger of the flushing gun. This tool is removing a lot of stubborn junk from the



Photo 4

heater cores we have flushed. This is doing our customers a great service and saving them a lot of money. We have been able to clean the heater cores and return the heater functions on many GM S-10 series vehicles eliminating the need for the high labor charges to replace a heater core in one of these vehicles.”

Before using this tool, proper waste water disposal according to local, state, and federal guidelines must be determined for your location. As it is often said, If it legal to use in California it will most likely be legal for use everywhere else. A Water Pollution Control Administrator in Hayward, California offered the following quote regarding coolant system flushing and proper waste water disposal: “The city allows automotive service facilities to discharge the flushing of automotive cooling systems into the sanitary sewer system provided that all coolant which can practically be drained from the system is first captured for recycling and/or off-site disposal. The City recognizes that cooling system service operations are a necessary service that the public needs and requires.”

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