

# Model FAC-400

A/C Component Flusher

## OPERATING INSTRUCTIONS

# HECAT, INC.



**THE ORIGINAL**



**PULSATING  
FLUSHER**

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[www.hecatinc.com](http://www.hecatinc.com)

# HECAT, INC.

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# HECAT, INC.

## A/C COMPONENT FLUSHER - SAFETY WARNINGS

- **Please read and understand entire manual and all the instructions before beginning use of the flusher.**
- **A compressed air filter must be used in line before the flusher. Moisture should not be introduced into the flusher or the A/C component. Drain filter before each use. Evidence (rust) of the use of non-filtered air will VOID warranty.**
- **Wear protective equipment, including safety goggles and gloves, when working with refrigerants and solvents. Refrigerants and solvents can cause injuries.**
- **Equipment must be operated by qualified, certified A/C service professionals. Operator must be familiar with air conditioning and refrigeration systems, solvents, and the dangers of working with pressurized systems and components.**
- **Operator is responsible for complying with any and all applicable laws and regulations governing the use of this equipment, as well as the disposal of used solvents, waste oils, the equipment, and any of its components.**
- **Call Manufacturer's Tech Line (1-800-380-9501) before attempting any repair. Repairs are to be performed by trained and approved service technicians ONLY.**
- **This equipment should only be used in locations with mechanical ventilation.**
- **Avoid Breathing A/C refrigerant, lubricant, and flush vapor or mist. Exposure may irritate eyes, nose, and throat.**
- **To remove the refrigerant from the A/C system, use service equipment certified to meet the requirements of the current SAE standards. Additional health and safety information may be obtained from the refrigerant, lubricant, and flush manufacturers.**
- **Caution – Do not pressure test or leak test refrigerant service equipment and or vehicle air conditioning systems with compressed air. Some mixtures of air and refrigerant have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information can be obtained from refrigerant manufacturers.**

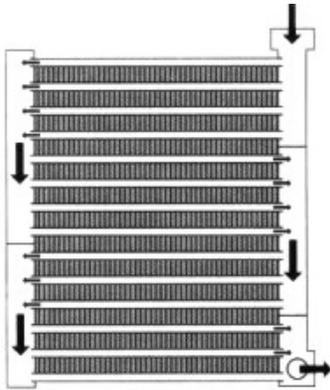


# TIPS FOR A/C COMPONENT FLUSHING

## CONDENSERS

Complete or partially assembled systems cannot be flushed. You cannot flush through service ports. You must always isolate the heat exchanger and flush through the hoses or the most direct and unrestricted path to obtain the most satisfactory flushing results. Do not attempt to flush through compressors, orifice tubes, accumulators, or filter/dryers; these items must be replaced or serviced by other means.

For years, flushing Condensers has been very successful and there have been no major issues with flushing the simple pathways of the "Tube & Fin" or "Serpentine" designed Condensers. The most common Condenser flushing problems are associated with the "Parallel Flow" Condensers (PFC). The following information is provided as a basic guide to flushing a condenser and cannot cover all the possible scenarios a technician may encounter.



◀ The arrows in this picture to the left are indicating the normal refrigerant flow path. In some PFC designs, a serviceable filter/dryer will be found as an integrated component. The filter/dryer desiccant bag and screen must be removed and the housing resealed before attempting to flush.

Condensers will have the inlet usually located at or near the top, and the outlet will usually be located at or near the bottom of the unit. As with most heat exchanger flushing, this unit should be back flushed first (bottom to top), in the opposite direction of normal refrigerant flow. This is done to back out possible debris that cannot be driven through the small passageways. Back flushing (bottom to top) followed by the air purge "in car" may leave some solvent residue. It is recommended to swap the lines to perform (a second flush if necessary) the air purge in the opposite direction (top to bottom) to be sure all the solvent is removed, which leaves a clean and dry component.

In cases of extreme high debris loads such as a catastrophic compressor failure, it may be necessary to even remove the PFC from its mountings and position the component to allow for gravity to assist in removing the larger metal pieces during the flushing process. A good understanding of the internal flow paths and design of the component being flushed is necessary to select the correct position. Contact the manufacturer's tech line if necessary.

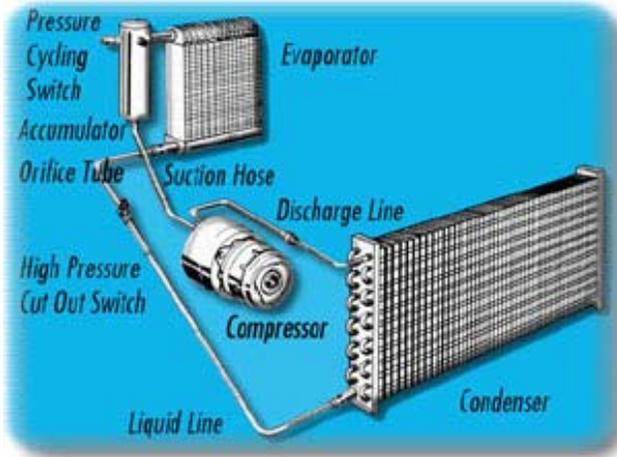
If flushing is for oil removal only and backing out debris is of no concern, then it would be acceptable to perform one flush in the normal refrigerant flow direction (top to bottom).

You can flush back and forth as much as you wish. Always make the last flush in the normal flow direction (top to bottom) to allow for the complete removal of the flushing solvent during the final purging process.

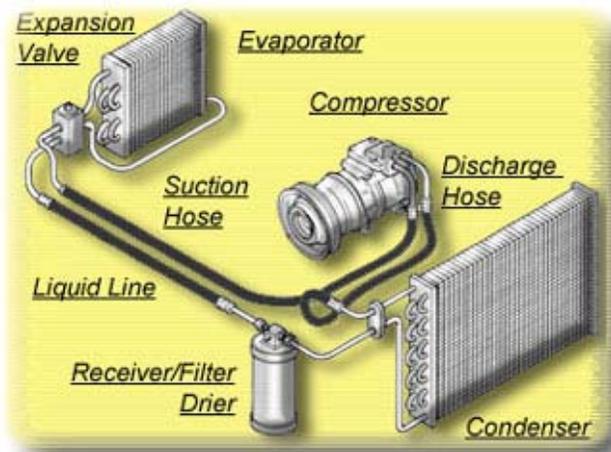
# EVAPORATORS

Complete or partially assembled systems cannot be flushed. You cannot flush through service ports. You must always isolate the heat exchanger and flush through the hoses or the most direct and unrestricted path to obtain the most satisfactory flushing results. Do not attempt to flush through compressors, orifice tubes, accumulators, or filter/dryers; these items must be replaced or serviced by other means.

Successful flushing of A/C evaporators has proven to save technicians the time and frustration related to the difficulty of in dash replacement, eliminates the guessing about how much waste oils are remaining and the concern of unknown debris, and reduces the overall repair cost, which will turn quotes into jobs. The following information is provided as a basic guide and does not cover all possible scenarios.



Common Orifice Tube (OT) systems will usually have an Accumulator located between the Evaporator and Compressor and the debris load is limited to what can pass through the OT and its screen. The Evaporators inlet is the lower or smaller of the two ports. Usually only one flush in the back flush direction by flushing in through the larger or upper port is required.



Common Thermal Expansion Valve (TXV) systems will usually have a filter/dryer located between the Condenser and the TXV and the debris is usually very limited from entering the Evaporator through the filter and TXV. However, in the case of a catastrophic Compressor failure, with nothing between the Evaporator outlet and the Compressor inlet, large debris does back up into the Evaporator when the system pressures equalize. This large debris cannot be flush through the component and must be backed out the direction it came in. The TXV should be removed and the component should be flushed through the smaller of the two ports (normal

refrigerant flow direction).

## REAR AIR

For vehicles with rear air, the recommended procedure is to access the rear Evaporator and bypass the expansion device and flush the rear Evaporator. While disconnected from the front and rear, the long hoses can be connected together at one end and flushed like another component.

## THROUGH A TXV

TXV's on the passenger side of the fire wall and in rear air situations, make flushing through a TXV desirable. As with regulated refrigerant flushes of the past (R-11, R-113), the HECAT H1000 Refrigerant flusher is the only HECAT model that has shown success due to the use of a highly evaporative "refrigerant" solvent (Genesolv SF) and a vacuum recovery process. For all other HECAT models, and any other flushing method, removal of the TXV will be required.

# FAC-400 A/C COMPONENT FLUSHER/RECYCLER

## Machine Operation

### Preparation

- Make sure the DRAIN valve on the back of unit and the three control valves (AIR, FLUSH, RECYCLE) on the control panel are all in the OFF position.
- Before each use always check, drain, and/or service as necessary (1) the inlet air filter/separator and (2) the exhaust mist separator This will keep the inlet air clean and limit the solvent mist and fumes from the exhausting air.
- The return line T-strainer should be checked cleaned after every use.
- If the unit is empty of flush, remove filler cap at back of machine and install 2 gallons of an approved flush. Fluid level will be visible in the sight tube on the back of the flush tank. **Do Not Overfill.** (Use of Hecat Safe-Flush will provide for a Lifetime Warranty, see Warranty Statement)
- Using A/C flushing adapters (The Hecat FAD-100 Universal A/C Adapter Kit is recommended), connect the flusher hoses to the A/C component in a back flush direction as outlined in the previous “Tips for Component Flushing”.
- With all the control valves in the OFF position, connect your shop air supply. The Flushers internal regulator is set at 80 PSI and should never be adjusted.
- If you feel the need to see or inspect what is in the component, we have supplied a quick coupler that will allow for you to remove the return line from the back panel of the flusher and place it into a suitable capture container. This will allow you to purge the component of the majority of contamination with a quick 5+ second blast. Turning the AIR valve to the FLUSH AIR position and then the FLUSH valve on and then fairly quickly turning them back off will do this. Warning: The escaping solvent and air is a very high volume blast and this could prove to be a very messy step. It will splash out of an open bucket, use a closed bucket and hold the line firmly in the pour spout being sure to allow for the escaping air. This method may also be employed to increase the usable life of the flushing solvent by limiting its waste oil contamination allowing for more internal recycling before a complete fluid and filter change is necessary.

### Flushing

- With the flusher lines firmly connected to the Flusher and the A/C component, turn the AIR valve to FLUSH AIR first and then the FLUSH valve to the ON position to begin the pulsating flush process:
  - For Condensers: Following the “Tips for Component Flushing”, back flush the component using the full 2 gallons of solvent, turn the FLUSH and AIR valves off. Recycle the solvent according the Recycling instructions found later in these instructions. Reverse the hoses at the condenser and repeat the flushing operation in top down flow direction using as much solvent as you feel necessary.
  - For Evaporators: Following the “Tips for Component Flushing”, flush the component using the full 2 gallons of solvent.
- Turn the AIR and FLUSH valves off and this completes the flushing process.
- Flushing, recycling, and repeating is at the discretion of the technician.

### Purging

- Turn the AIR valve to the PURGE AIR position to allow for high a volume air purge. Purge as long as possible, you cannot purge too much.
- Air purge for 20 to 30 minutes minimum. Some flush manufacturers may recommend a longer period of air purging depending on how readily their fluid will evaporate out of the component being cleaned. Always follow the flush manufacturer's recommendations.
- Turn the AIR valve OFF this completes the purging operation.
- Flushing must be followed by a thorough job of evacuating the system with a strong vacuum pump to assure removal of any possible remaining residual flush.

### Recycling

- Hoses must be attached to the storage fittings on the back of the flusher or left attached to the component if additional flushing is required. It is not required that you disconnect the hoses from the component to recycle the flush.
- With the AIR & FLUSH valves OFF, turn ON the RECYCLE valve to return the filtered cleaning fluid back to the flush tank for reuse. The fluid will be seen in the sight gauge as it returns to the flush tank and the air volume will be heard to increase when all fluid is recycled. At this time you should turn RECYCLE valve OFF. Always RECYCLE before storing to prevent overfilling at next use.

### Changing Fluid

- Technicians should use good judgment as to how frequently to drain the flusher, install a new particle filters, and new flush.
- Recycling removes the contaminant particles but does not remove the waste oils. Accumulation of waste oils in the flush will decrease its cleaning effectiveness.
- Flushing of several extremely dirty A/C systems in succession will obviously contaminate the flush much more rapidly and decrease the number of recycles before changing the fluid becomes necessary.
- The various approved flushes have different characteristics in their recycling ability and it is recommended not to recycle any flush more than 10 times without changing the fluid.
- When draining or changing the flush is necessary, please observe the following procedure.
- With shop air supply connected to the flusher and both flush hoses connected to the storage fittings on back of the machine, be sure to perform the RECYCLE operation as instructed above.
- Remove the drain hose from its stored location and place open end of hose into suitable capacity drain container(s). Turn the AIR valve to the FLUSH AIR position and open the DRAIN valve SLOWLY to avoid fluid being blown from the hose too rapidly. Allow fluid to flow from drain hose until only air comes from the hose. Leaving the DRAIN open, turn off the AIR valve and allow for the air pressure to bleed off the flush tank then close the DRAIN valve.
- Most used flushes can now be discarded with other waste oil products (see and follow the flush manufacturers disposal instructions)
- You can now carefully remove the fill cap and refill with no more than 2 gallons of fresh fluid.

### Filter Service

- Always clean the return line T-strainer screen after every flush.
- A slow RECYCLING process will indicate restricted spin-on filter.
- Spin on filter: Use Fram #PH2951 or equivalent. Can be sourced locally.
- Every time the flush is changed the particle filter should be serviced also.

If you have any questions we would be happy to assist, our Technical Line is: 800-380-9501

## HOW TO TEST A COMPONENT TO BE CLEAN

Because so many variables exist that can affect the flushing results such as component size, component design, type of failure, and debris load; it is recommended that the technician employ the following suggested method to confirm satisfaction in component cleanliness and complete solvent recovery. It is known as the air “Pop” and considered by some to be “Old School”, but we prefer to consider it what “Experienced” technicians do.

Using a high flow rubber tipped blow gun with nitrogen or very dry and filtered shop air, holding a clean lint cloth (or the return line with T-strainer) at the opposite port, blast the component hard with a generous volume. Because of the known effectiveness for the solvents to remove all the contaminant holding waste oils and sludge, any possible remaining debris particles will now be loose and dry and should readily blow out. Blow it in both directions and if nothing or a few very small specs are found in the lint cloth, this confirms the component is clean.

If a concerning amount of debris, waste oils, or solvents are blown out with this test; it is highly recommended that the technician should blast more or repeat the flushing & purging process until they have confirmed their complete satisfaction in a clean and dry component.

## TAKING CARE OF YOUR A/C FLUSHER

As with most any air tool, the proper care is imperative to its performance and useful life. In the case of this A/C flusher, proper care is not only important and required for the life of the tool; but the improper care of this tool, can and will most probably be reflected in reducing the quality of the A/C repair work you are performing. **KEEP IT CLEAN!**

The use of **FILTERED, CLEAN, & DRY AIR** is necessary to prevent the rust and corrosion that would occur over time inside of the flusher tanks. It is just as important and also necessary that we are not contaminating the A/C system we are trying to clean with oily, dirty, and moisture laden air.

The use of a clean and effective flushing chemical such as **HECAT SAFE-FLUSH** is also very important. Although it is possible to filter or recycle the cleaner a few times for reuse, it is important to limit such activity and to change it out and use clean and fresh fluid as often as possible. There will be little or no benefit found in trying to clean an A/C system with a dirty flushing fluid and a dirty and contaminated flusher.

Finally, drying out/removal of the cleaner from the component is most important and requires a considerable volume of air that must be clean. Always test to confirm the complete removal of the oils, particulates, and solvent; never assume.

If you would like to read and understand more about the specific nuances of A/C flushing, what works, what does not, and why; please visit our web site for more information ([www.hecatinc.com](http://www.hecatinc.com)), and read the “Flushing Technical Paper” that will be found on the “article” page.

# HECAT Safe-Flush A/C

## Air Conditioning Component Flush

Flushing A/C Evaporators and Condensers is a necessary step to complete a professional A/C system repair. Compressor manufacturers require flushing or their warranty is void. After extensive testing with many solvents and cleaners, we have developed Hecat Safe-Flush A/C, a synthetic hydrocarbon blend that includes a drying agent to aid in evaporation. Although it can be used with traditional flush guns and as a pour in flush, best results can be found when used with Hecat's Pulsating Flushing Equipment, which will safely and effectively remove the oil sludge and contaminants from the A/C component being cleaned. This product is CARB compliant and tested with our "Pulsating" Flushers through the activated carbon vent filter, does not exceed California VOC emission standards.



- Available by the case (4-1gal.).
  - Case includes (2) replacement filters (for the FAC-300 & FAC-400 models).
  - Ships via UPS (31 lbs).
  - DOT classification - not regulated.
  - Breaks down deposits.
  - Environmentally & User friendly.
  - No noxious fumes or odors.
  - No need for special ventilation.
  - Miscible with PAG, POE, & Mineral Oils.
  - Compatible with system seals & hoses.
  - Low boiling point ensures that residual is removed during air purge process.
  - Easily disposed of with waste oils.
  - Safe for use in Waste Oil Heater.
- Can also be used as a drop in low VOC parts washer solvent.

Air Purging – Connecting only filtered and dry shop air to the highest component port. Air purge the component for approximately 20-30 minutes. When system has been reassembled it is recommended to pull a deep vacuum for at least 1 hour to flash off any residues remaining from the air purge process. MSDS is available at [www.hecatinc.com](http://www.hecatinc.com).



# HECAT FAD-100

## Universal A/C Adapter Kit

PATENT PENDING

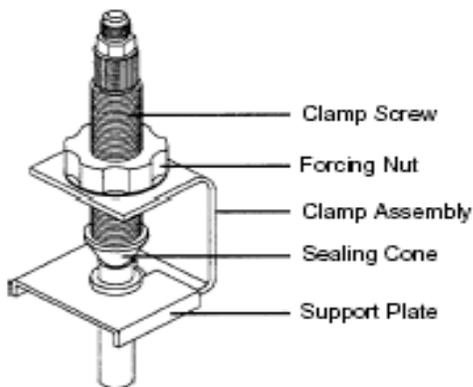
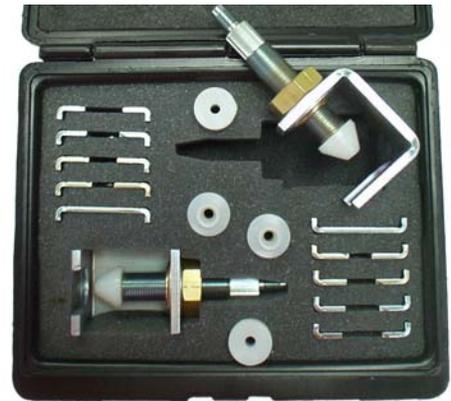
Perfect for Flushing & Vacuum Testing A/C Components

- For use with many types of flush equipment and methods.
- Can be installed on most foreign and domestic A/C hose or component tube stub ends.

- **NEW:** Now includes 90 durometer Buna-N Rubber sealing cones for a ► more positive seal to vacuum & Pressure test components.



- Seating of the sealing cone into the fittings or tube ends does not require any tools.
- Slotted support plates allow for different size tubes or line nuts to be supported.
- Chamfered areas on the support plates will allow the flared end of the tubes to sit level.
- The clamp screw terminates with a 1/4" male refrigerant flare to allow for universal use.
- The internal flow path of all components is 0.250" minimum to allow for high flow flushing.



### Included in this Kit:

- (1) #300031 - Storage Case (w/ foam insert)
- (2) #300012 - Zinc Plated U-Clamp
- (2) #300013 - Zinc Plated Clamp Screw
- (2) #300014 - Solid Brass Forcing Nut
- (2) #300024 - Support Plate (1/2" tube)
- (2) #300023 - Support Plate (5/8" tube)
- (2) #300022 - Support Plate (3/4" tube)
- (2) #300021 - Support Plate (7/8" tube)
- (2) #300020 - Support Plate (blank for manifolds)
- (2) #300017 - 3/8" Tube Seal (UHMW)
- (2) #300018 - Cone Shaped Seal (UHMW)
- (2) #300018B - Cone Shaped Seal (Buna N)
- (2) #300019 - Concave Seal (UHMW)

If used properly, this tool will not damage A/C lines or connections. The technician is responsible to ensure of this tools proper use and Hecat is not responsible for any damage done due to the misuse of this tool. Because of ongoing product improvements, we reserve the right to change design, specifications, and materials without notice.

# HECAT, INC.

## WARRANTY STATEMENT

This warranty covers all models of the patented HECAT Air Operated Pulsating Flushers.  
(Models: MARK II and IV; and the FAC-200 and 400)

HECAT, INC. offers to the user of the HECAT 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.

HECAT, INC. also offers a **LIFETIME EXTENDED WARRANTY**. By simply exclusively using the HECAT SAFE-FLUSH and keeping good proof of purchase records. The one year limited warranty will be extended to the original purchaser only, for the lifetime of the unit.

**This one year or lifetime warranty shall NOT apply to any flusher...**

- That has failed due to misuse, neglect, or accident.
- That shows evidence of rust, corrosion, or material failure from the use of corrosive or incompatible liquids.
  - Do not use Gasoline, Brake Fluid, Water, Acids, Corrosive liquids, foaming products, and known Ozone depleters.
- That has been tampered with or repaired by an unauthorized person
- That shows any evidence (rust) from the failure to filter and supply **DRY** air.

If you have a problem with this flusher, **please call HECAT at 1-800-380-9501** or you can contact us through our web site at **www.hecatinc.com**.

Warranties issues are handled directly by the manufacturer. In many cases HECAT may be able to quickly deliver a replacement part that will correct the problem and reduce the down time and shipping costs associated with returning a unit.

If a return is necessary, you must contact HECAT and obtain a return authorization number before returning any unit to the manufacturer. HECAT will evaluate warranty claim and then, if approved, repair or replace at its option any unit returned.

Units for warranty evaluation must be properly packaged and shipped freight pre-paid to the manufacturer's specified location. Any flusher returned must be accompanied by a letter referencing the return authorization number, description of the malfunction, proof of purchase with date purchased, owner's name, address, and contact information. Proof of consistent and repeat SAFE-FLUSH purchases/use will be required if claiming extended warranty coverage.

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.