CANOIL TECHNICAL NOTE

GE EHC 400 and 800 Gallon Hydraulic Packages - Setting Flowrate for Bypass Purification System

Significance: EHC fluid degradation issues are generally either because of overstressing the fluid with excessive heating or because of inadequate purification. The latter can be because the media cartridges were not changed enough, stale, were not stored right, installed improperly, and/or the flowrate was not correct. This Tech Note is about the latter.

Background: The GE EHC hydraulic systems for the 400 and 800 gallon reservoirs have a bypass purification system. Originally called a TAFEFU (transfer and fuller's earth filtration unit), it takes either 2 or 4 of the 718 sized purification media cartridges. These can now contain fuller's earth, Selexsorb, or IX (ion exchange) media. Cartridges can also vary in ID or OD but are nominally 18" long. There are two housings and in the 4 cartridge systems they are stacked two high. There is a fine filter element downstream of the media and it is either 10" or 20" long. In the case of the longer one, there are two stacked 10" filter elements. The system also contains a transfer pump that can be used to add fluid, drain fluid and/or to run the purification and filtration system independently of the main pumps.

Short housings showing flat housing cap mod, and a 20" filter housing.

Showing long housings extending up thru the deck. Takes 4 '718' cartridges.

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Note that there have been a number of TIL's related to issues found with the original configurations and often stations have made other changes. These include but are not limited to the following; centering device in the upper filter cap to prevent element misalignment and bypassing, modified media housing caps to reduce distortion, adding an automatic housing air vent, adding a vent line to recirculation tank to prevent over pressurization, elimination of recirculation tank, eliminating need to cake media, upgrading post media filter, using a 20" post media filter element, and/or adding a flow gauge.

During normal operation, the fluid supply to this bypass system is taken off the main fluid supply. It is downstream of the main pump discharge filters. So, the main pumps must be running unless on recirculation mode using the transfer pump.

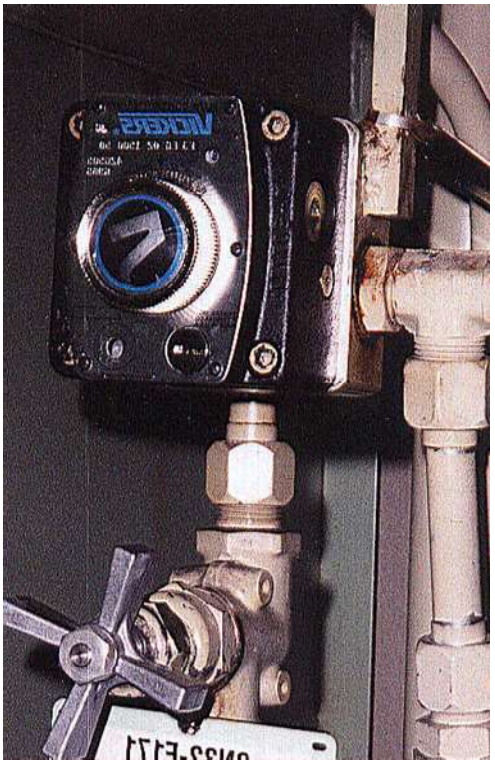
Note also that the typical fluid sample valve is on the LP (low pressure) manifold so that the fluid is filtered. For this reason, the particle counts might be representative of the fluid supplied to the valves, but they are not as valuable for assessing reservoir contamination, pump generated or ingested particulates. GE allow for dip sampling from the reservoir or to run the bypass system on recirculation to take reservoir samples. This take the fluid supply from the reservoir and is then not filtered upstream of the sample valve.

Flow Rate: The recommended flow rate from the purification media suppliers is typically ½ gpm (2 lpm) per 718 cartridge. So, if two, then 1 gpm (4 lpm) and if four, 2 gpm (8 lpm). Both too high and too low can be problematic. The flow rate can affect media performance and if too high, then the pressure drops can be excessive. The bypass system has a reported maximum pressure of 75 psi as controlled by pressure relief valves. Note that the recommended flow can vary depending on the media and the supplier so verify with them.

During normal operation with the fluid supply off the main line, the pressure and flow rate is controlled by a Vickers Flow Control valve. This is adjusted by turning a knob on the front. It is also locked so a key is required.

If all is right, the GE setting is 2½ turns open. See Water-Cooled Hydraulic Power Unit GEK 46355F or latest. In particular, Section 7. Setting Flow Control Valve, FV-45. This also has a step to check the PRV. Note that the flow control valve can require periodic maintenance and/or replacement. Also, if the key has been lost it might have been left in a wrong setting.

See the GEK but in summary, set the valving to isolate the flow from the main pumps and set the valving up to run the transfer pump. This is to take the fluid supply from the reservoir, through the bypass purification and filtration back to the reservoir. Regardless of the size of the reservoir the transfer pump flowrate should be that required for normal flow. Just record the pressure readings at the inlets to the housings.



Showing Vickers Flow Control Valve.
Key slot is to lower right.

Then restore the system to normal operation and adjust the flow control valve to give the same pressure readings.

One advantage of this procedure is that it is independent of fluid temperature and condition of the media and filter.

Even better would be a real flow control valve.

Suggestions: Having the design flow is essential to keep the fluid within specification and to help prevent operational issues. Verification of the flow is strongly suggested to correct the root causes of fluid degradation and as a preventative measure step to check the flow control valve and pressure relief valves.

Canoil are suppliers of the GE approved Reolube Turbofluid 46B. Turbofluid 46XC is also available.

This is provided for information and provided in good faith. Any actions or nonactions the responsibility of the end user. Verify as required with the turbine OEM, and component suppliers. Contact Canoil for clarification and/or suggested changes or additions.

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