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Tech Note General Electric: TAFEFU Flow Control Valve

BACKGROUND: GE electrohydraulic control systems use phosphate ester control fluids, and these require continuous purification and filtration. This is done using a built-in purification system (TAFEFU - transfer and fuller's earth filtration unit) that takes a bit of fluid off the system supply and treats it in a bypass mode. The fluid goes back to the reservoir. If the purification is not being effective, one of the causes can be the Vickers flow control valve (FV-45). This is if the flow is not set correctly and/or valve defective.

Maintenance: GE recommend that the setting be checked monthly. They also refer to GEY-447. The concern is that too high a flow rate and even too low a flow rate can lead to major problems later. These can include rising acid numbers, high particle counts as media fines are being pushed downstream, falling fluid resistivity, plugged pump discharge filter and/or plugged servo-valve screens. The correct TAFEFU flow rate depends on how many purification media cartridges are in each housing and the type of media.

Configuration	Flowrate (FE)
Two housings with one '718' cartridge each (two in total)	1.0 gpm
Two housing with two '718' cartridges each (four in total)	2.0 gpm.

This is based on the Hillard recommendation for their fuller's earth cartridges which are about 7" dia. x 18" long. The Hilliard media housings are about 30" high if there is one cartridge in each and about 48" high if there are two cartridges. With the higher housings the tops usually project through the deck plate around the reservoir and are covered by a sheet metal box.

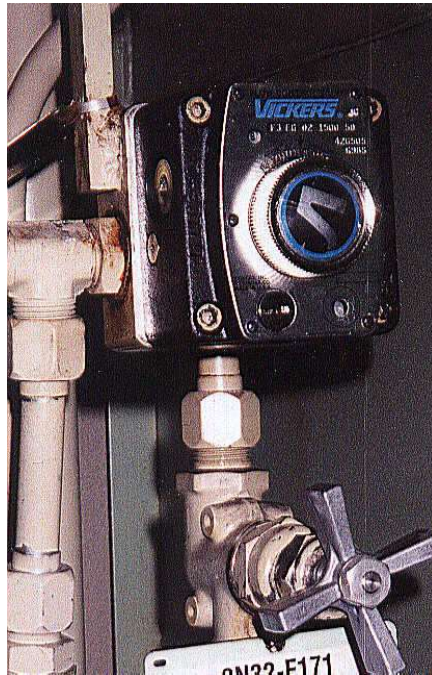
Trouble Shooting: It is adjustable and for 2 gpm is about 2 1/3 turns open clockwise. Did they turn it the right way? If still no flow this is not a surprise because they seem to require periodic replacement or rebuilding. When was it last changed?

If it can't be fixed soon, consider using the transfer pump which will give you about the same flow. It is a fixed flow type and should not be throttled on the discharge. Doing so can pass fluid back to the transfer pump suction via the 75-psi pressure relief valve and can lead to fluid overheating.

Verify the flow by noting the pressure gauge readings and/or by timing the flow into a bucket with the Flow Selector valve to drain.

The pressure drops for new FE cartridges and filter elements with 100F fluid and 2 gpm through 4 fuller's earth cartridges and two stacked 10" trap filters are estimated to be 7 and 4 psi respectively. The pressure drops can be much higher with cold fluid such as when adding fluid from cold drums. Transfer pump is limited to 75 psi.

With 4 media cartridges the transfer pump flow will be about 2.6 gpm. This is a bit higher than what Hillard recommend for their fuller's earth cartridges (4 x 0.5 = 2 gpm) but should not be a problem.



VICKERS FLOW CONTROL VALVE
F3-FG-02-1500-50

Note: Clockwise increases flow.

SPARES: The valve is supplied by Vickers, Inc. which is now part of Eaton Hydraulics in Rochester Park, MI. They can be reached at 888 258-0222. Press 4, then 2 and wait. Spares are reportedly available and the valves can be rebuilt by distributors. The valve is likely F3-FG-02-1500-50 and a distributor list is on the Eaton Hydraulics website. Delivery for a new one is reportedly 4 months.

ACTION: Verify the setting of the flow control valve and then check it. To measure the flow set the Flow Selector to drain and using a length of hose and a bucket, time the flow for a given quantity. Even better install a proper flow gauge on the supply to the media housings. A suggested procedure and a list of flow gauge suppliers is available upon request.

SUGGESTED PREVENTATIVE MEASURES

- Install a flow gauge. About \$300 for the gauge and make sure it is for phosphate esters.
- Make sure the operators know that low pressure gauge readings or readings that are not changing can be an issue. Plus, that they know to notify the system responsible engineer.
- That the operators know the correct valves when valving back in new media cartridges and trap filter elements.
- If you see a rising acid number take action at 0.1 mgKOH/g to give you time is there are flow issues.

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