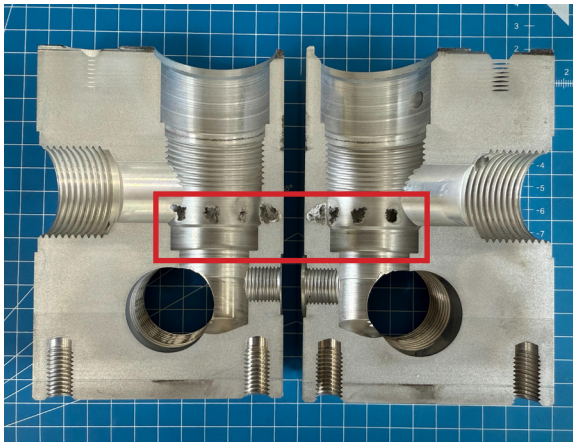
About Manifold Cavity-Erosion and Solutions

Formations

When the hydraulic fluid experiences a high-pressure drop (ΔP), especially over 210 bar (3000 psi) across the valve metering edge or orifice, low pressure causes cavitation (Bernoulli's theorem) and manifold erosion due to the cavitation (as small bubbles collapse in the fluid due to low pressure and vacuum).



Improvements

(a) To switch the manifold form aluminum to steel or ductile iron will reduce the rate of erosion.

(b) The balance piston valves are more likely to cause the erosion problem, such as pilotoperated
relief valve. To use Winner’s balanced poppet valve (X=2G or 3G) or add downstream pressure, taking the pressure drop in two or more stages; that can prevent the problems e.g.: switching from RV17A30AL to RV173GAL.

(c) Winner direct-acting design sequence or relief valves (such as SC, SD and RD series) create the backpressure inside the valve. That can prevent cavity erosion.

(d) The FR family priority flow control valves because spool piston design. The solution for cavity erosion is to add “backpressure”.

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