

The Impact of Dents on Spin-on Filters

Filter manufacturers occasionally receive used filters involved in warranty investigations due to a crack in a spin-on filter. In many cases the crack is located within or near a dent in the can. This evidence predominantly indicates that the dent is the root cause of the crack and that the failure was not within the control of the filter manufacturer. Once the steel can is dented, a concentration of stress in the material is created, making the can more susceptible to fatigue.

Filters are designed with low carbon steel to resist fatigue and are formed so the pulses in the system are equalized over the surface area of the can. A dent provides an area of stress concentration from pressure pulses and can greatly shorten the fatigue life of the can.

The fatigue to the material results from the fluid pulsing within the system. For example, the pressure in an oil lubrication system is regulated by an integral pressure regulating valve. This valve is spring operated and intermittently opens and closes to regulate the pressure. Once the pressure exceeds the setting of the spring in the regulating valve, the valve will open and relieve pressure until the spring can expand and close the valve. This function is repeated continuously during the operation of the system, creating a pulsing effect. The can of the filter is subjected to the same pulsation. Likewise, fluid pumps incorporate some type of gear, rotor, or other device to circulate the fluid. As these pumps operate, they produce high speed cyclical fluid pulsations. The can of the filter is continuously subjected to these normal system pulsations. As a result of the continual flexing of the filter can in the dented area, the steel is susceptible to fatigue and eventual fracture.

Filters that are dented prior to or during installation should not be used. Filters dented after installation should be replaced immediately. The cost of replacing a dented filter is much less than the cost of the damages that could result from a dented filter that fails during service. If you receive filters that were dented prior to your receipt, you should contact your filter supplier for corrective action.

FOR ADDITIONAL INFORMATION, CONTACT:

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