www.healthyhydraulics.com LAUNCHED

A new web site is set to help improve the health, safety, performance, and economy of a wide range of industrial, construction and agricultural equipment.

www.healthyhydraulics.com is the brainchild of Richard Price, the founder and Managing Director of sister companies Hydrotechnik(UK) and Filtertechnik. The new site, which went live in July, aims to offer practical advice to owners and operators of machines that rely on hydraulic fluid power to operate properly.

Filtertechnik, a manufacturer and supplier of filtration solutions for oils, diesel, biofuels and process fluids, recently commissioned a thorough analysis of the type and quantity of hydraulic oil contamination in construction equipment. The results are alarming and could account for some of the poor reliability seen in the industry and for unseen performance and economy losses.

ALcontrol Laboratories, an independent laboratory based in Conway, was asked to summarise the particulate ISO cleanliness codes and water content of hydraulic oil from 10,000 samples taken from mobile construction equipment. The samples were taken from a variety of equipment working in the UK, both large and small, from leading brands including,Bobcat, Kubota, JCB, Manitou, Bomag, Volvo, Doosan, Hyundai, Komatsu, Hitachi, Caterpillar and Liebherr.

The results clearly show that the majority of equipment is being operated with contaminated hydraulic oil that is inevitably doing harm to the major hydraulic components in the machine, causing premature wear and a loss of performance.

ANALYSIS OF 10,000 HYDRAULIC OIL SAMPLES FROM UK CONSTRUCTION EQUIPMENT				
ISO CLEANLINESS CODES 4/6/14 µ			**WATER CONTENT PPM**	
15/12/9	99.7%	CLEAN/LOW	<200 PPM	28.4%
16/14/11	92.1%		>200 PPM	71.6%
18/16/13	64.9%		>400 PPM	34.4%
19/17/14	46.5%		>500 PPM	12.7%
20/18/15	30.8%	DIRTY/HIGH	>600 PPM	2.2%
			>1000 PPM	1.0%
Source Al Control Laboratories and Filtertechnik Ltd. Analysis June 2014.				

Over 30% of equipment has hydraulic oil that does not meet the bare minimum cleanliness requirement (ISO 4406 20/18/15).Over 46% of equipment has oil at ISO 19/17/14 the cleanliness level required for a simple vane pump. Over 64% of equipment has hydraulic oil (ISO 4406 18/16/13) that is not suitable for use with piston pumps or electro-hydraulic valves, the type most commonly used on modern equipment. Hydraulic oil with a cleanliness rating of 18/16/13 can have up to 250,000 particles per 100 ml of hydraulic oil. In a large excavator with a 220 litre hydraulic system that's over 550 million particles, any one of which can cause harm to internal components. Over 92% of equipment has oil (ISO 16/14/11) so contaminated that it's not suitable for use with servo valves and yet most machines now use servo valves to control the machine's hydraulic functions. And over 99% of equipment has oil dirtier than ISO 15/12/9 the standard for advanced servo controlled hydraulics.

Water in hydraulic oil is essentially bad news as it depletes some additives and reacts with others to form corrosive by-products, it reduces lubricant film-strength, which leaves critical surfaces vulnerable to wear and corrosion, it can clog filters and it increases the likelihood of cavitation occurring. New hydraulic oil from a reputable brand should have less than 200 parts per million (ppm) of water in it. 400 ppm is regarded as being close to 'danger level' and over 500 ppm as being positively harmful to the machine's system. The results, again from the 10,000 samples, show that 71.6% of machines have water in hydraulic oil at over 200 ppm, over 34% at over 400 ppm and over 12% at over 500 ppm.

Further analysis shows that 11% of samples have 'visible debris' and that over 12% of samples show viscosity erosion, through either a poor mix of grades or additive breakdown, 6.8% of samples being flagged as 'caution' and 5.5% flagged as 'serious'.

From this analysis it is quite clear that insufficient emphasis is placed on oil condition to the detriment of machine performance and reliability and overall running costs.

Healthy hydraulics will also cover the use of affordable to advanced condition monitoring equipment that can establish harmful trends in a machine's hydraulic system that can also lead to premature wear or catastrophic component failure.

www.healthyhydraulics.com advocates regular condition monitoring ('health checks') for machines with hydraulic systems and shows how this can be achieved in the minimum of time and at a relatively low cost. In the vast majority of cases the cost of a health check can be recovered through increased productivity, increased reliability, or lower fuel consumption.

Partners in developing the web site, and the concept of healthy hydraulics, include Hydrotechnik UK, Filtertechnik, Pirtek UK, the market leader in emergency on-site hose replacement and a long-time advocate of internal hose cleaning, and Schroeder Industries, a leader in fluid conditioning technology.