



Engine block cleaning machine at completion of pre-shipment testing.

WANNER
Hydra-Cell[®]
 Seal-less Pump Technology

Case Study

System builder chooses Hydra-Cell pumps for 'toughest' cleaning challenge

Two bespoke cleaning units built by UK cleaning machine specialist MecWash Systems for a major truck manufacturer in India are the first-ever MecWash machines to include high-pressure low-volume washing in their cleaning capability.

Designed for production-line cleaning of, respectively, cylinder heads and engine blocks, each incorporates a high-pressure cleaning system fed by a seal-less Wanner Hydra-Cell pump delivering water and detergent at 80°C temperature and a pressure of 40 bar.

This is a radical step, taken in response to what one project engineer termed a double challenge:

“ Probably our toughest cleaning assignment so far, and the most demanding cleanliness specification we have been asked to meet.”

The company manufactures systems that clean, degrease and remove swarf from small or large engineering components after machining. MecWash has been satisfying the needs of individual customers across a global market for 20 years. Typically each unit is purpose-designed, not only matching cleaning and drying requirements but also ensuring it is equipped for easy integration into the customer's production process.

MecWash does not use solvents in its cleaning systems, basing them instead on environmentally



Pump code: G35XKBTHFEMA

preferred aqueous solutions – water and detergents. Nor previously has the company chosen to use high pressure, even for cleaning narrow passages such as oil and fuel ways. MecWash systems have relied on the flooding effect of large volumes of cleaning solution pumped and sprayed at low-pressure.

Similar requirements, to an exceptionally high level, apply on the Indian production lines. But the scale and complexity of the truck-engine components, as well as the amount of swarf to be removed, prompted MecWash to review its normal practice.

With narrow internal galleries 1.5 metres in length and some 500 grammes of metal swarf to be shifted from each engine block, it was not practical to rely wholly on low-pressure flooding or spraying. Long, narrow bores would need jetting at higher pressures.

Customer – MecWash

MecWash is one of the numerous equipment manufacturers whose customers are enjoying the practical benefits of Hydra-Cell seal-less pump technology.



To deliver hot cleaning liquid at the required 40 bar pressure MecWash preferred the Hydra-Cell because of its known success on similar applications. Unlike piston pumps and other high-pressure alternatives, the Hydra-Cell has no dynamic seals. That rules out seal wear: a major threat to long-term reliability on systems that would be working on 24/7 continuous duty for long periods.

The Hydra-Cell has other practical advantages on this application.

Build is simple and compact, reducing 'footprint' and the cost of spares. Maintenance is minimal. The pumps are energy efficient. They can be run dry without damage, in the event of a blocked filter or other inlet problem. The 3 x diaphragms combined in one head pump liquid smoothly and without stress regardless of discharge pressure. They also separate wetted parts from the permanently lubricated drive end of the pump, allowing it to handle non-lubricating liquids and even abrasive solids.

MecWash has adopted a 2-chamber approach on this contract..

Each system has a chamber for high-pressure cleaning of the internal oil and fuel ways and a second chamber for general low-pressure wash, rinse and dry. High and low pressure cycles each take 6 minutes but they run

simultaneously, which means a new block, thoroughly cleaned, washed and dried, is produced every 8 minutes – if 2 minutes is allowed for loading and transfer.

Cleaning impact in the first chamber is achieved by means of carriage-mounted long, retractable spray lances, moving through narrow passages to target the network of oil and fuel ways with high-pressure jets at close range. All is planned and positioned for maximum impact, precise targeting and efficient swarf removal.

In the second chamber the block, revolving in a fixture, is put through an intensive 6-minute cycle of general cleaning, comprising spray wash, flood wash, drain, spray rinse, flood rinse, drain, hot air dry and vacuum dry.

All water used is recycled, filtered and re-used.

Pumping duties are shared between centrifugal pumps for low-pressure high-volume work and the Hydra-Cell pumps (model G25 on the cylinder head machine, G35 on the block cleaning machine). The centrifugal pump on the block machine, with 18.5kW motor is operating at pressures ranging from 1-5 bar and delivering 1500 l/min. The G35, with 11kW motor, is working at 40 bar pressure and delivering 125 l/min.

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