



CLEAN OIL
BRIGHT IDEAS

**Application Study
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Hydraulic Oil Steering Gear, Passenger Vessel

CJC™ Application Study

CUSTOMER

The Danish shipping company DFDS A/S in Copenhagen runs a fleet of passenger vessels and Ro-Ro / Ro-Pax ferries.

THE SYSTEM

Onboard the Ro-Pax ferry M/S "Dana Sirena", they have two hydraulic steering gear systems of the rotary vane type, manufactured by Rolls-Royce Tenfjord. The system is holding 400 litres of BP Bartran HV 68 hydraulic oil.

THE PROBLEM

An oil sample was taken from one of the steering gear systems and sent to Filtrex for analysis. The report from Filtrex indicated high amount of resin and an ISO code as high as 22/19/14, which is such a high level, that it could cause a severe breakdown of vital components of the steering gear.

DFDS have their oil analysed by an oil company on a regular basis, but the analysis carried out do not take in account cleanliness level (no particle counts), only total acid number (TAN), water content ($</> 0.05\%$), viscosity, and spectral analysis (wear particles and additive compounds). The condition rating was rated NORMAL (given ratings are: NORMAL / WARNING / CRITICAL) - A particle count would have indicated a critical condition!

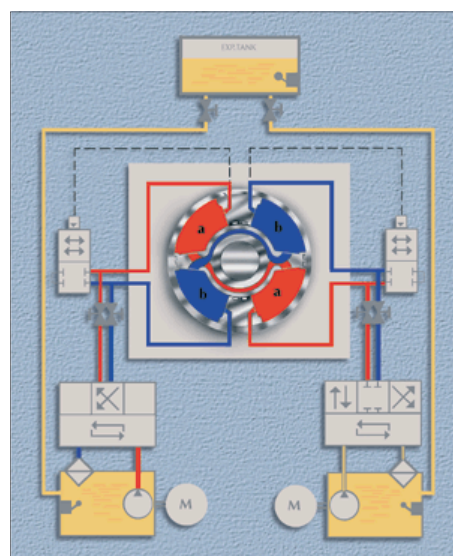
However, the report indicated a rise of acid number (TAN) from 0.08 to 0.12. This is a clear indication of oxidation of the oil, and that the system needs equipment for oil maintenance. Resin is a chemical residue from the oil oxidation process, and is, along with particles and water, catalysts for further oil degradation.

THE SOLUTION

It was decided to install a **CJC™ Fine Filter HDU 15/25 PV-Z** with a **CJC™ Filter Insert BG** and a flow rate of 120 litres per hour, in order to clean up the system and to maintain a cleanliness level of approximately ISO 15/14/11. At this cleanliness level operational failures are eliminated and costs for spare parts and repairs are reduced.



M/V "Dana Sirena"



Steering Gear drawing



HDU 15/25 PV

THE RESULT

	Before	After 1 month
ISO Code	22/19/14	17/15/11
Water	52 ppm	14 ppm