



Hydraulic Control Valve Failure : Patrick Stevedores, Sydney

The straddle carriers were having hydraulic control valve failures on a regular basis. This was not only costly but downtime of the machine caused lost container movements.

A custom filtration unit was developed for three purposes:

1. to filter all oil from the supply drum to the machine
2. to connect to the machine at 1000 hour intervals as a kidney loop system for the hydraulic system
3. to utilise the tank at the major 4000 hour service when all the oil was drained out of the straddle's reservoir into the tank and polished while the machine underwent servicing. It was then pumped back into the machine after the major service was completed.

Since commissioning the unit, Patrick's have had only one failure and it was due to a broken spring in the solenoid. The custom unit is also used to filter the bromma spreader bar on the container cranes unloading the ships as they were having spreader control solenoids stick during operation due to contamination. This has been eliminated now that filtering is done on a regular basis.



Sample 20763 from straddle carrier SS21's hydraulic system shows a particle count of 21/18. After two passes the particle count was 14/11. This would mean an anticipated life extension of components of up to 7 times on maintaining the oil cleanliness at this level.

Client	Filter Technology Australia Pty Ltd / New South Wales			Site	Botany Bay
Contact	Phillip Mahline	Unit ID/Name	OAO82RF / Patrick Stevedores		
Address		Manufacture/Model	21		
Telephone	(02) 4932 9666	Origin	Hydraulic - After		
Fax	(02) 4932 9667	Fuel/Oil Type	BPTH B46		

Diagnosis:						
20695-Cr and Cu levels are elevated. Possible bearing and sleeve wear. Viscosity is low for iso 46 oil. 20540- Cr is too high, possible wear on sleeves etc. Viscosity is low but acceptable for iso 46 oil. PC is elevated. Suggest oil be filtered then reassembled.						
Sample Number	20556	20540	20763			Indicative Levels
Date	23/05/2000	22/05/2000	21/05/2000			
Total Hours/Km			?			
Hours/Km on Oil						
Oil Changed	NO	NO	NO			
Oil Added						
Condition Tests						
Fuel Dilution (%)						
WT Solids (%)						
Volume Water (%)	ND	ND	ND			
Water PPM						
Viscosity @ -40C (cST)	39	38	42			
TAN (mg/KOH/g)	0.83	0.44	0.64			
TBN (mg/KOH/g)						
ApH						
PQ90 Index						
Wear Metals						
Aluminum (Al)	<1	<1	<1			
Silicon (Si)	<1	0	<1			
Tin (Sn)	<1	0	<1			
Iron (Fe)	18	17	13			
Lead (Pb)	<1	<1	2			
Copper (Cu)	32	30	31			
Chromium (Cr)	79	53	41			
Sodium (Na)	1	1	3			
Cleanliness						
ISO6406	14/11	18/16	21/18			
Gravi-Metric						
>2 micron	341	4131	25881			
>5 micron	136	1651	10335			
>15 micron	17	210	1314			
Contamination	Low	Elevated	High			