

**Patrick Stevedores - Sydney, Australia - Straddle Carriers**

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		
Contact	Phillip Mahine	Site	Botany Bay
Address		Unit ID/Name	QA082RF / Patrick Stevedores
Telephone	(02) 4932 9666	Manufacture/Model	21
Fax	(02) 4932 9667	Origin	Hydraulic - After
		Fuel/Oil Type	BPTH B46

Diagnosis:		20654-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 reanalysed.		
Sample Number	20556	20540	20763	
Date	23/05/2000	22/05/2000	21/05/2000	Indicative Levels
Total Hours/Km			?	
Hours/Km on Oil				
Oil Changed	NO	NO	NO	
Oil Added				
Fuel Dilution (%)				
WT Solids (%)				
Volume Water (%)	ND	ND	ND	
Water PPM				
Viscosity @ 40C (cST)	38	38	42	
TAN (mg/KOH/g)	0.83	0.44	0.64	
TBN (mg/KOH/g)				
pH				
PQ80 Index				
Aluminium (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	
ISO4406	14/11	18/15	21/18	
Grav-Metric				
>2 micron	341	4131	26981	
>5 micron	136	1651	10335	
>15 micron	17	210	1314	
Contamination	Low	Elevated	High	