

CUSTOMER:	PAINT SHOP	
PLANT:	HYDRAULICS PLANT	
MACHINE NAME:	XXXX-36 HYD	Machine Condition CRITICAL
LOCATION:		
MACHINE TYPE:	HYDRAULIC	
LUBE TYPE:	PCA HYDREX XV ALL SEASON	
MACH MFGR:	Unknown	
MACH MOD:	1997,BACKHOE,LOADER/SF,CA	Lubricant Condition MARGINAL
RECEIVED:	07-AUG-14	
CONTACT 1:	JOHN SMITH	
REPORT:	12-AUG-14 08:30:15	
SAMPLE NO:	XXXX-X-1-6	
PO NUMBER:	XXXXX	

RECOMMENDATIONS

- In accordance with the logic below, change oil if lubricant (indicated above) in service is really HYDREX XV ALL SEASON
- Closely monitor unit for changes in operating parameters.
- Oil should be discarded if viscosity has risen 35% or one SAE grade, or reduced 25% or one SAE grade from the original oil.
- Inspect system pump for abnormal operation.
- Locate and eliminate the source of water entry and resample.

LOGIC

- Particulate contamination for hydraulic systems should be lower than ISO 20/19/15
- Particle count results could be imprecise due to the presence of water.
- Viscosity level determined at 40 degree C for this grade of oil is low. The viscosity is 31.6 cSt compared to unused HYDREX XV ALL SEASON (44.73 cSt)
- Hydraulic systems should show very low concentrations of wear metals. Increases usually signal pump problems.
- Free water or water in the form of an emulsion was present. An electronic particle count is imprecise in these circumstances. Water in hydraulic or transformer oils is usually a cause for concern.
- Possible causes of low viscosity: thermal cracking of oil molecules, shear thinning of VI improvers, fuel dilution, improper grade of oil.
- Abnormally high copper wear can come from copper alloy journal bearings, bushings or spacers or copper alloy cages of anti-friction bearings.

MISCELLANEOUS

- Lubricant refers to oil, fuel, biofuel, grease, coolant or varnish.
- Samples are spaced too far apart for accurate trends.
- The hours on lube: calculated based on 168 hr/wk.
- Please advise the operating pressure (psi) of this unit.
- For greater diagnostic, please advise if unit contains any: Servo valve, Proportional valve, Cartridge valve, Fixed piston pump, Vane pump, Pressure/Flow Control Valve, Solenoid valve or Gear pump as it can change the lubricant condition for determining correct ISO code.
- Please supply the manufacturer and part number of the filtration element, so that we can record this information for you.
- Our data base indicates that the symptom HI CU has been observed.

- Our database indicates no site contaminant for this unit.
- The cleanliness of oil is based on ISO CODE 4406.

SAMPLING HISTORY

LabNo	SAMPLE DATE DD-MM-YYYY	TIME ON OIL / TSN	TIME SINCE OVER- HAUL / TSO	OIL CHANGED (Y/N)	PREVIOUS CONDI- TION MACH/OIL
997266	20-11-2013	71727	7618	N	(n/a)
697298	14-06-2011	50367	50367	N	M/M
605761	29-10-2009	36135	36135	N	N/M
596745	18-08-2009	34407	34407	N	N/M
549234	08-08-2008	25407	25407	N	N/M
400674	26-10-2005	999	999	N	N/M

(SP) SPECTROSCOPIC ANALYSIS [ASTM D5185] (elements seen in ppm)

TESTED ELEMENTS ARE:Fe, Cu, Pb, Sn, Cr, Al, Ni, Ti, Ag, V, Mg, Si, B, Na, Ba, Ca, P, Mn, Zn, Mo, Cd, K.

Date(DD/MM/YY)	20-11-13	14-06-11	29-10-09	18-08-09	08-08-08	26-10-05	(n/a)	(n/a)	REF
Labno	997266	697298	605761	596745	549234	400674			802830
Fe-IRON	24	15	12	15	10	7.0			-
Cu-COPPER	360	127	23	15	9.0	10			-
Pb-LEAD	7.0	5.0	2.0	-	-	-			-
Sn-TIN	-	-	-	-	1.0	-			-
Al-ALUMINIUM	3.0	2.0	2.0	2.0	2.0	-			-
Cr-CHROMIUM	3.0	1.0	1.0	1.0	-	-			1.0
Mo-MOLYBDENUM	2.0	1.0	2.0	2.0	2.0	7.0			1.0
Ag-SILVER	2.0	1.0	1.0	-	-	-			-
Si-SILICON	12	12	8.0	10	5.0	4.0			1.0
Mg-MAGNESIUM	82	101	113	136	139	44			1.0
B-BORON	50	104	27	18	24	16			-
Na-SODIUM	34	51	5.0	5.0	3.0	7.0			-
Ca-CALCIUM	1564	1903	2306	2679	2477	2001			276
P-PHOSPHORUS	710	758	861	986	1011	916			464
Mn-MANGANESE	1.0	-	-	-	-	-			-
Zn-ZINC	751	911	964	1204	1122	996			669
Cd-CADMIUM	2.0	-	-	-	-	-			-

(FTIR) FOURIER TRANSFORM INFRARED ANALYSIS (Absorbance)

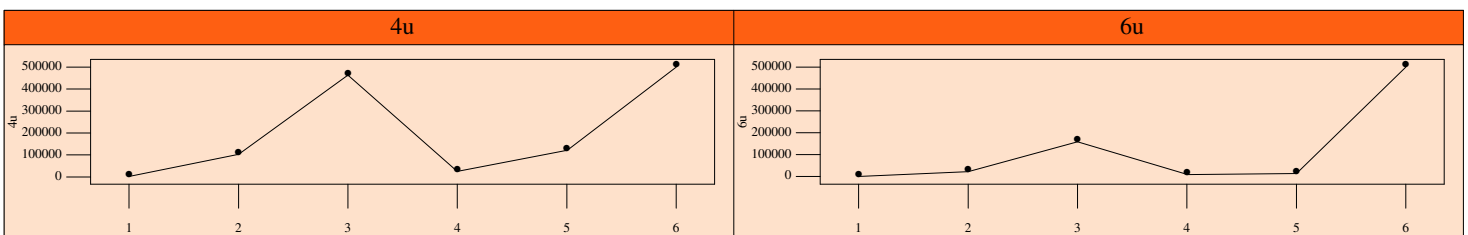
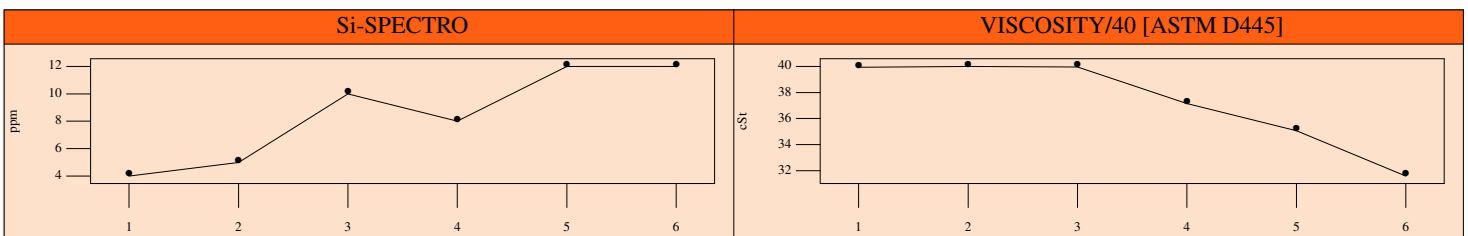
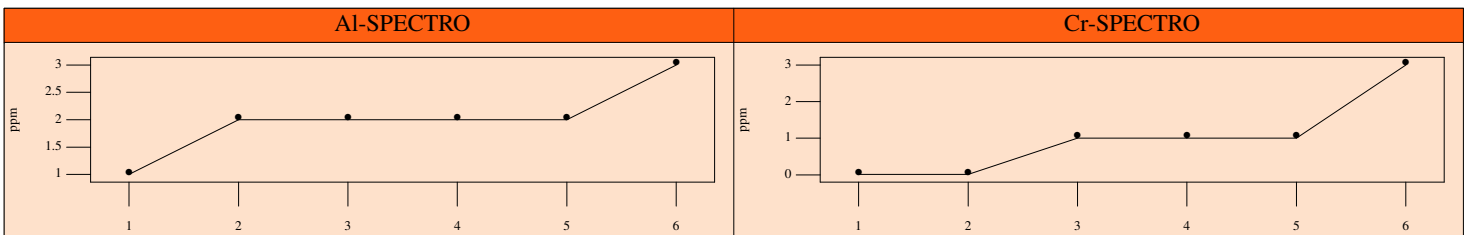
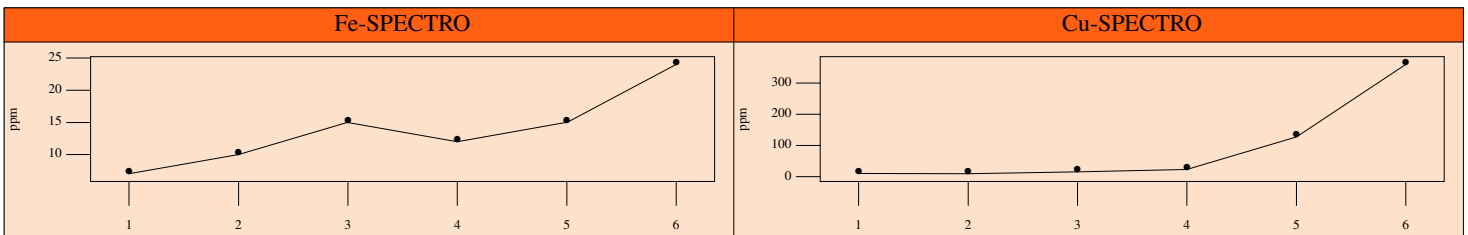
Date(DD/MM/YY)	20-11-13	14-06-11	29-10-09	18-08-09	08-08-08	26-10-05	(n/a)	(n/a)	REF
Labno	997266	697298	605761	596745	549234	400674			802830
AW/EP	14	16	20	20	9	18			17
OXIDATION	18	21	23	25	10	20			30
SULFATE	24	27	34	34	13	25			40
NITRATION	4	4	5	5	2	5			3
GLYCOL	1	5	0	0	0	1			1
WATER	19	62	18	21	6	15			9

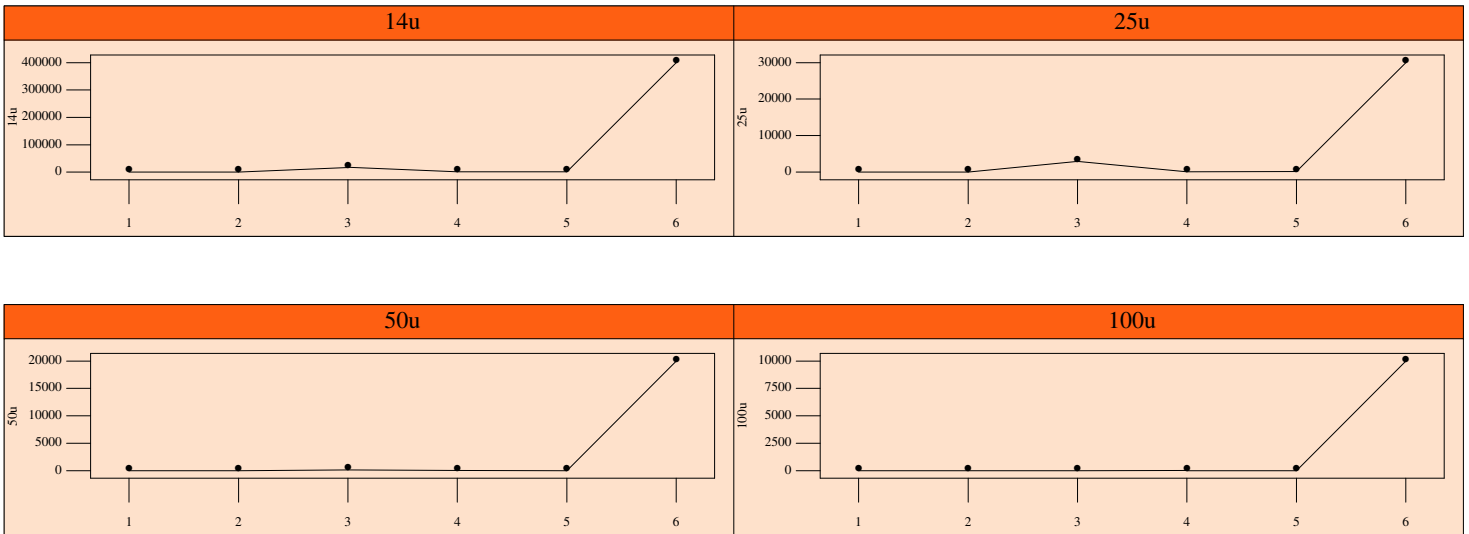
VISCOSITY/40 [ASTM D445]

Date(DD/MM/YY)	20-11-13	14-06-11	29-10-09	18-08-09	08-08-08	26-10-05	(n/a)	(n/a)	REF
Labno	997266	697298	605761	596745	549234	400674			802830
in cSt 40°C	31.60	35.08	37.15	39.95	40.00	39.94			44.73

(PC) PARTICLE COUNT [ISO 4406] (/ml) ISO 4/6/14,µicron

Date(DD/MM/YY)	20-11-13	14-06-11	29-10-09	18-08-09	08-08-08	26-10-05	(n/a)	(n/a)	REF
Labno	997266	697298	605761	596745	549234	400674			802830
> 4µ	500000	119671	24583	463065	101667	1280			3738
> 6µ	500000	14475	9354	158774	23052	232			378
> 14µ	400000	897	1056	17510	364	15			7
> 25µ	30000	150	94	2898	3.0	0.0			3
> 50µ	20000	0.0	27	98	0.0	0.0			0
> 100µ	10000	0.0	10	0.0	0.0	0.0			0
ISO 4406(1999)	N/A	24/ 21/ 17	22/ 20/ 17	26/ 24/ 21	24/ 22/ 16	17/ 15/ 11			19/ 16/ 10
ISO 4406(1989)	99/ 99/ 99	23/ 17	21/ 17	25/ 21	23/ 15	16/ 10			-





PAINT SHOP assumes sole responsibility for the total copy, reproduction, application of and reliance upon results and recommendations reported by Predictive Maintenance Corporation, whose obligation is limited to good faith performance. Report released under authority of employee number 1026.