

CUSTOMER:	PAINT SHOP	
PLANT:	HYDRAULICS PLANT	
MACHINE NAME:	1234-36 HYD	Machine Condition CRITICAL
LOCATION:		
MACHINE TYPE:	HYDRAULIC	
LUBE TYPE:	PCA HYDREX XV ALL SEASON	
MACH MFR:	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:	1234-1-1-6	
PO NUMBER:	12345	

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 CONDITION 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)

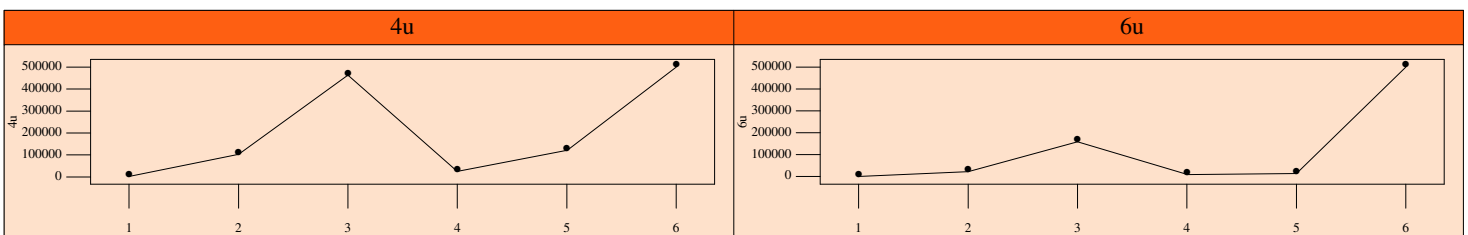
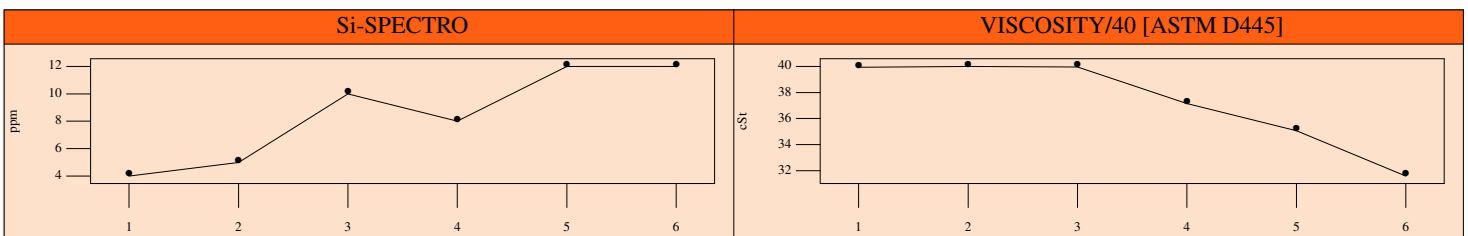
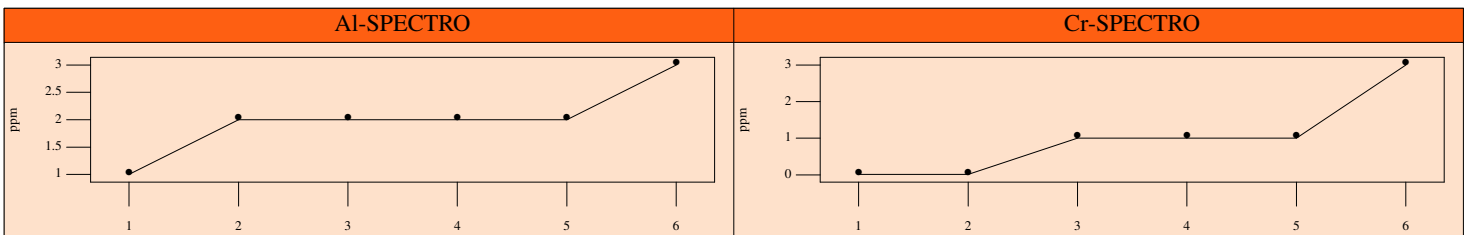
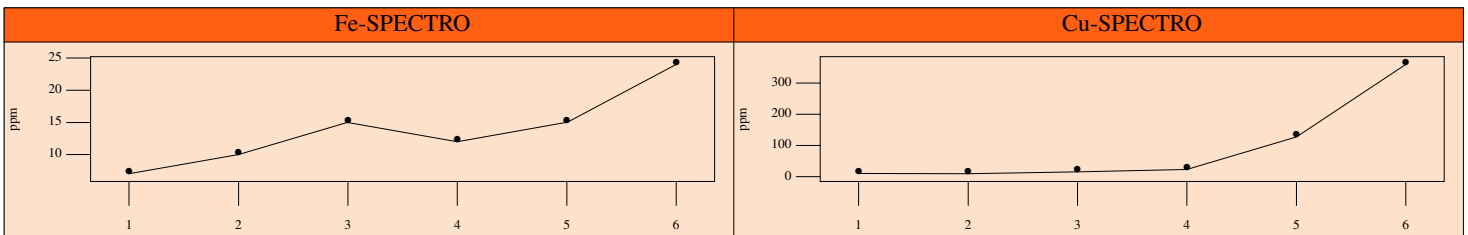
Date(DD/MM/YY)	20-11-13	14-06-11	29-10-09	18-08-09	08-08-08	26-10-05	(n/a)	(n/a)	REF
Labno	997266	697298	605761	596745	549234	400674			802830
AW/EP	14	16	20	20	9	18			17
OXIDATION	18	21	23	25	10	20			30
SULFATE	24	27	34	34	13	25			40
NITRATION	4	4	5	5	2	5			3
GLYCOL	1	5	0	0	0	1			1
WATER	19	62	18	21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

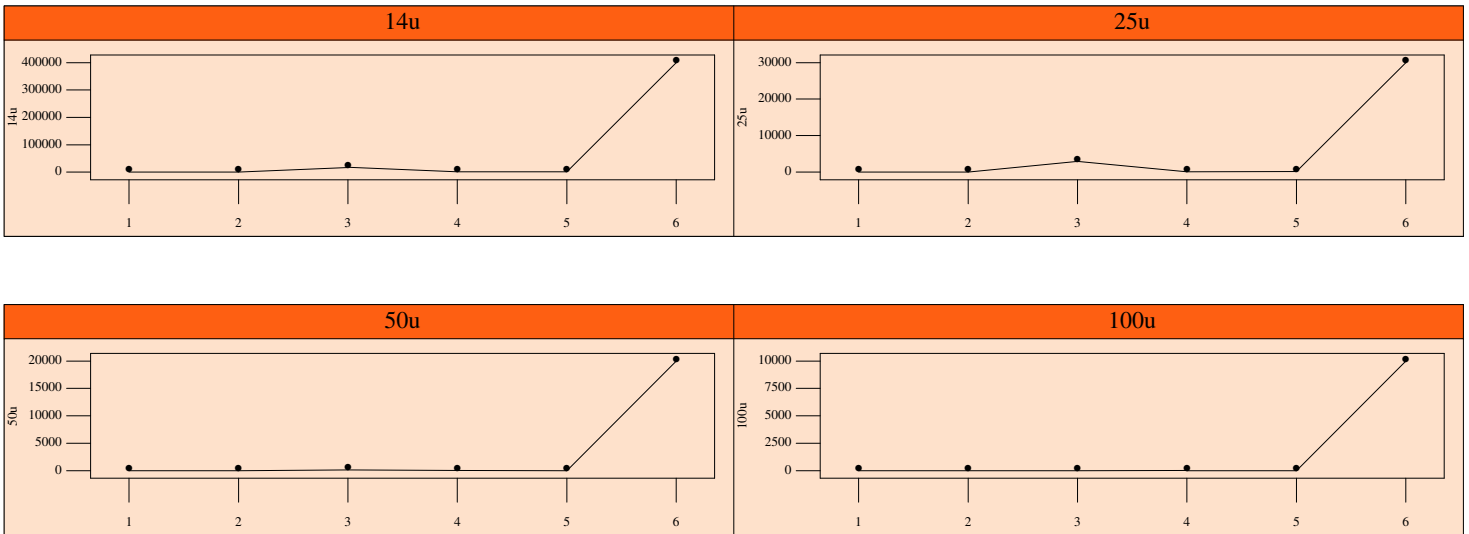
VISCOSITY/40 [ASTM D445]

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			-





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