

# **OIL ANALYSIS REPORT**

### Sample Rating Trend



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Calcium     ppm     ASTM D5185m     0     0     0     2     0       Phosphorus     ppm     ASTM D5185m     1800     994     1037     1034       Zinc     ppm     ASTM D5185m     0     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0     0       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >20     1     0     2       Water     %     ASTM D5185m     >20     1     0.027     0.036     0.050       ppm     ASTM D5185m     >20     1     0.027     0.036     0.050       ppm     ASTM D5185m     >20     1     0.027     0.036     0.050       ppm     ASTM D5185m     >20     136     196     423  Particles >4µm     ASTM D7647			Jan2021	Jun2021 Dec2021	Jun2022 Dec2022 May2023	Nov2023	
Sample Date     Client Info     29 Nov 2023     18 Aug 2023     22 May 202       Machine Age     hrs     Client Info     0     0     0       Oil Age     hrs     Client Info     0     0     0       Oil Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     Client Info     N/A     N/A     N/A     N/A       WEAR METALS     method     Imit/base     current     history1     history1       Iron     ppm     ASTM 05185m     >5     <1     0     0       Chromium     ppm     ASTM 05185m     >3     <1     0     0       Silver     ppm     ASTM 05185m     >3     0     0     0     0       Lead     ppm     ASTM 05185m     >12     0     0     1     1       Vanadium     ppm     ASTM 05185m     0     0     0     0     0       Kardinum     ppm     ASTM 05185m     0     0     0     0	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age     hrs     Client Info     0     0     0       Oil Age     hrs     Client Info     0     0     0       Oil Age     hrs     Client Info     N/A     N/A     N/A       Sample Status     Imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >5     0     0     0       Nickel     ppm     ASTM D5185m     >5     0     0     0       Silver     ppm     ASTM D5185m     >3     1     0     0       Copper     ppm     ASTM D5185m     >3     0     0     0       Copper     ppm     ASTM D5185m     >3     0     0     0       Copper     ppm     ASTM D5185m     >3     0     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0     0     0       ASTM D5185m     0     0     0     0     0     0     0     0 <td< td=""><td>Sample Number</td><td></td><td>Client Info</td><td></td><th>USPM31959</th><td>USPM29403</td><td>USPM2841</td></td<>	Sample Number		Client Info		USPM31959	USPM29403	USPM2841
Oil Age     Inrs     Client Info     0     0     0       Oil Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185n     >90     0     0     0       Othormium     ppm     ASTM D5185n     >5     0     0     0       Othormium     ppm     ASTM D5185n     >3     <1	Sample Date		Client Info		29 Nov 2023	18 Aug 2023	22 May 202
Oil Changed Sample Status     Client Info     N/A     N/A     N/A     N/A       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM 05185m     >90     0     0     0       Chromium     ppm     ASTM 05185m     >5     <1	Machine Age	hrs	Client Info		0	0	0
Sample Status     Intervention     NORMAL     NORMAL     NORMAL     NORMAL       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM 05185m     >5     <1	Oil Age	hrs	Client Info		0	0	0
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM 05185m     >90     0     0     0       Othromium     ppm     ASTM 05185m     >5     0     0     -1       Nickel     ppm     ASTM 05185m     >3     <1	Oil Changed		Client Info		N/A	N/A	N/A
Iron     ppm     ASTM D5185m     >90     0     0     0       Chromium     ppm     ASTM D5185m     >5     0     0     <1	Sample Status				NORMAL	NORMAL	NORMAL
Dromium     ppm     ASTM D5185m     >5     •1     0     <1       Nickel     ppm     ASTM D5185m     >5     0     0     <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     >5     0     0     <1       Titanium     ppm     ASTM D5185m     >3     <1	Iron	ppm	ASTM D5185m	>90	0	0	0
Titanium     ppm     ASTM D5185m     >3     <1     0     0       Silver     ppm     ASTM D5185m     >3     0     0     0       Aluminum     ppm     ASTM D5185m     >7     0     0     0       Lead     ppm     ASTM D5185m     >12     0     0     1       Copper     ppm     ASTM D5185m     >30     0     0     0       Tin     ppm     ASTM D5185m     >9     0     <1	Chromium	ppm	ASTM D5185m	>5	<1	0	<1
Silver     ppm     ASTM D5185m     >3     0     0     0       Aluminum     ppm     ASTM D5185m     >7     0     0     0       Lead     ppm     ASTM D5185m     >12     0     0     1       Copper     ppm     ASTM D5185m     >30     0     0     0     1       Vanadium     ppm     ASTM D5185m     >30     0     0     0     1     1       Vanadium     ppm     ASTM D5185m     0     0     0     0     1     1       Cadmium     ppm     ASTM D5185m     0     0     0     0     0       Boron     ppm     ASTM D5185m     0     0     0     0     0       Magnesium     ppm     ASTM D5185m     0     0     2     0     0       Phosphorus     ppm     ASTM D5185m     0     0     0     0     0     0     0     0     0     0     0     0     0     0	Nickel	ppm	ASTM D5185m	>5	0	0	<1
Atuminum     ppm     ASTM D5185m     >7     0     0     0       Lead     ppm     ASTM D5185m     >12     0     0     1       Copper     ppm     ASTM D5185m     >30     0     0     0       Tin     ppm     ASTM D5185m     >9     0     <1	Titanium	ppm	ASTM D5185m	>3	<1	0	0
Lead     ppm     ASTM D5185m     >12     0     0     1       Copper     ppm     ASTM D5185m     >30     0     0     0     0       Tin     ppm     ASTM D5185m     >9     0     <1	Silver	ppm	ASTM D5185m	>3	0	0	0
Lead     ppm     ASTM D5185m     >12     0     0     1       Copper     ppm     ASTM D5185m     >30     0     0     0     0       Tin     ppm     ASTM D5185m     >9     0     <1	Aluminum	ppm	ASTM D5185m	>7	0	0	0
Tin     ppm     ASTM D5185m     >0     <1     <1       Vanadium     ppm     ASTM D5185m     0     0     0     <1	Lead	ppm	ASTM D5185m	>12	0	0	1
Tin     ppm     ASTM D5185m     >9     0     <1     <1       Vanadium     ppm     ASTM D5185m     0     0     0     <1	Copper		ASTM D5185m	>30	0	0	0
Vanadium     ppm     ASTM D5185m     0     0     <1       Cadmium     ppm     ASTM D5185m     0     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     0     0       Barium     ppm     ASTM D5185m     0     0     0     0       Malyddenum     ppm     ASTM D5185m     0     0     0     0       Magnese     ppm     ASTM D5185m     0     0     2     0       Magnesium     ppm     ASTM D5185m     0     0     2     0       Phosphorus     ppm     ASTM D5185m     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0       Sulfur     ppm     ASTM D5185m     >60     27     19     16					0	<1	<1
Cadmium     ppm     ASTM D5185m     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     0     0     0       Barium     ppm     ASTM D5185m     0     0     0     0     0       Malybdenum     ppm     ASTM D5185m     0     0     0     0     0       Magnesium     ppm     ASTM D5185m     0     0     2     0       Astm D5185m     0     0     0     2     0     2     0       Magnesium     ppm     ASTM D5185m     0     0     2     0     2     0       Phosphorus     ppm     ASTM D5185m     0     0     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0     0	Vanadium		ASTM D5185m		-	0	<1
Boron     ppm     ASTM D5185m     0     0     0     0     0       Barium     ppm     ASTM D5185m     0     0     0     0       Molybdenum     ppm     ASTM D5185m     0     0     0     0       Manganese     ppm     ASTM D5185m     0     0     -<1					-		
Barium     ppm     ASTM D5185m     0     0     0     0     0       Molybdenum     ppm     ASTM D5185m     0     0     0     <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185m     0     0     0     0       Manganese     ppm     ASTM D5185m     0     0     <1	Boron	ppm	ASTM D5185m	0	0	0	0
Manganese     ppm     ASTM D5185m     0     0     <1       Magnesium     ppm     ASTM D5185m     0     0     <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium     ppm     ASTM D5185m     0     0     <1     <1       Calcium     ppm     ASTM D5185m     0     0     2     0       Phosphorus     ppm     ASTM D5185m     0     0     2     0       Phosphorus     ppm     ASTM D5185m     0     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0     0       Solicon     ppm     ASTM D5185m     0     0     0     0     0       Sodium     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >20     1     0     2       Water     %     ASTM D5304     >1     0.027     0.036     0.050       pmWater     pm     ASTM D7647     >1000     272     367.0     507.8       FLUID CLEANLINES     Method <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>0</th> <td>0</td> <td>0</td>	Molybdenum	ppm	ASTM D5185m	0	0	0	0
Calcium     ppm     ASTM D5185m     0     0     0     2     0       Phosphorus     ppm     ASTM D5185m     1800     994     1037     1034       Zinc     ppm     ASTM D5185m     0     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0     0       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >20     1     0     2       Water     %     ASTM D5185m     >20     1     0.036     0.050       ppm     MSTM D5185m     >20     1     0.027     0.036     0.050       ppm     ASTM D5185m     >20     1     0.027     0.036     0.050       ppm     MSTM D5185m	Manganese	ppm	ASTM D5185m		0	0	<1
Calcium     ppm     ASTM D5185m     0     0     0     2     0       Phosphorus     ppm     ASTM D5185m     1800     994     1037     1034       Zinc     ppm     ASTM D5185m     0     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0     0       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >20     1     0     2       Water     %     ASTM D5185m     >20     1     0.036     0.050       ppm     MSTM D5185m     >20     1     0.027     0.036     0.050       ppm     ASTM D5185m     >20     1     0.027     0.036     0.050       ppm     MSTM D5185m	Magnesium	ppm	ASTM D5185m	0	0	<1	<1
Zinc     ppm     ASTM D5185m     0     0     0     0     0     0       Sulfur     ppm     ASTM D5185m     0		ppm	ASTM D5185m	0	0	2	0
Zinc     ppm     ASTM D5185m     0     0     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     0     0     0       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >20     1     0     2       Water     %     ASTM D6304     >.1     0.027     0.036     0.050       ppm Water     ppm     ASTM D6304     >.1000     272     367.0     507.8       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     470     1338     2060       Particles >6µm     ASTM D7647     >2500     136     196     423       Particles >21µm <td< td=""><td>Phosphorus</td><td>ppm</td><td>ASTM D5185m</td><td>1800</td><th>994</th><td>1037</td><td>1034</td></td<>	Phosphorus	ppm	ASTM D5185m	1800	994	1037	1034
Sulfur     ppm     ASTM D5185m     0     0     0     0     0       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     >20     1     0     2       Water     %     ASTM D5185m     >20     1     0.027     0.036     0.050       ppm     ASTM D5185m     >20     1     0.027     0.036     0.050       ppm Water     ppm     ASTM D6304     >.1     0.027     0.036     0.050       ppm Water     ppm     ASTM D7647     >1000     272     367.0     507.8       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     470     1338     2060       Particles >21µm     ASTM D			ASTM D5185m	0	0	0	0
Silicon     ppm     ASTM D5185m     >60     27     19     16       Sodium     ppm     ASTM D5185m     0     0     0     0       Potassium     ppm     ASTM D5185m     >20     1     0     2       Water     %     ASTM D6304     >.1     0.027     0.036     0.050       ppm Water     ppm     ASTM D6304     >.1000     272     367.0     507.8       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     470     1338     2060       Particles >6µm     ASTM D7647     >2500     136     196     423       Particles >6µm     ASTM D7647     >640     11     15     33       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >38µm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/1	Sulfur		ASTM D5185m	0	0	0	0
Sodium     ppm     ASTM D5185m     0     0     0       Potassium     ppm     ASTM D5185m     >20     1     0     2       Water     %     ASTM D6304     >.1     0.027     0.036     0.050       ppm     Water     ppm     ASTM D6304     >.1     0.027     0.036     0.050       ppm     Water     ppm     ASTM D6304     >1000     272     367.0     507.8       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     470     1338     2060       Particles >6µm     ASTM D7647     >2500     136     196     423       Particles >14µm     ASTM D7647     >640     11     15     33       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >38µm     ASTM D7647     >10     0     0     0       Particles >71µm     ASTM D7647     >10     0     0     0	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium     ppm     ASTM D5185m     0     0     0     0       Potassium     ppm     ASTM D5185m     >20     1     0     2       Water     %     ASTM D6304     >.1     0.027     0.036     0.050       ppm Water     ppm     ASTM D6304     >.1     0.027     367.0     507.8       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     470     1338     2060       Particles >6µm     ASTM D7647     >2500     136     196     423       Particles >6µm     ASTM D7647     >640     11     15     33       Particles >14µm     ASTM D7647     >160     3     4     9       Particles >38µm     ASTM D7647     >10     0     0     0       Particles >71µm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12 <td>Silicon</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;60</td> <th>27</th> <td>19</td> <td>16</td>	Silicon	ppm	ASTM D5185m	>60	27	19	16
Water     %     ASTM D6304     >.1     0.027     0.036     0.050       ppm Water     ppm     ASTM D6304     >.1000     272     367.0     507.8       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     470     1338     2060       Particles >6µm     ASTM D7647     >2500     136     196     423       Particles >6µm     ASTM D7647     >640     11     15     33       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >38µm     ASTM D7647     >10     0     0     0       Particles >71µm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2	Sodium	ppm	ASTM D5185m		0	0	0
ppm Water     ppm     ASTM D6304     >1000     272     367.0     507.8       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     470     1338     2060       Particles >6µm     ASTM D7647     >2500     136     196     423       Particles >14µm     ASTM D7647     >640     11     15     33       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >38µm     ASTM D7647     >10     0     0     0       Particles >71µm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2	Potassium	ppm	ASTM D5185m	>20	1	0	2
ppm Water     ppm     ASTM D6304     >1000     272     367.0     507.8       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     470     1338     2060       Particles >6µm     ASTM D7647     >2500     136     196     423       Particles >14µm     ASTM D7647     >640     11     15     33       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >38µm     ASTM D7647     >10     0     0     0       Particles >71µm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2	Water	%	ASTM D6304	>.1	0.027	0.036	0.050
Particles >4μm     ASTM D7647     >10000     470     1338     2060       Particles >6μm     ASTM D7647     >2500     136     196     423       Particles >14μm     ASTM D7647     >640     11     15     33       Particles >21μm     ASTM D7647     >160     3     4     9       Particles >21μm     ASTM D7647     >160     3     4     9       Particles >38μm     ASTM D7647     >40     0     1     0       Particles >71μm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2	ppm Water				272		507.8
Particles >6µm     ASTM D7647     >2500     136     196     423       Particles >14µm     ASTM D7647     >640     11     15     33       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >38µm     ASTM D7647     >40     0     1     0       Particles >71µm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2	FLUID CLEANLIN	ESS	method	limit/base	current	history1	history2
Particles >6µm     ASTM D7647     >2500     136     196     423       Particles >14µm     ASTM D7647     >640     11     15     33       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >38µm     ASTM D7647     >40     0     1     0       Particles >71µm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2	Particles >4µm		ASTM D7647	>10000	470	1338	2060
Particles >14µm     ASTM D7647     >640     11     15     33       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >21µm     ASTM D7647     >160     3     4     9       Particles >38µm     ASTM D7647     >40     0     1     0       Particles >71µm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2							
Particles >21μm     ASTM D7647     >160     3     4     9       Particles >38μm     ASTM D7647     >40     0     1     0       Particles >38μm     ASTM D7647     >40     0     1     0       Particles >71μm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2							
Particles >38μm     ASTM D7647     >40     0     1     0       Particles >71μm     ASTM D7647     >10     0     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2	•						
Particles >71µm     ASTM D7647     >10     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2							
Oil Cleanliness     ISO 4406 (c)     >20/18/16     16/14/11     18/15/11     18/16/12       FLUID DEGRADATION     method     limit/base     current     history1     history2					-		
					-		
	FLUID DEGRADA		method	limi <u>t/base</u>	current	history1	history2
	Acid Number (AN)	mg KOH/g	ASTM D8045	0.05	0.065	0.062	

## Machine Id Component Pump Fluid **USPI VAC 100 (--- LTR)**

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable.

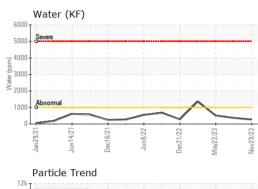
#### Fluid Condition

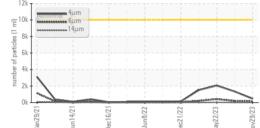
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

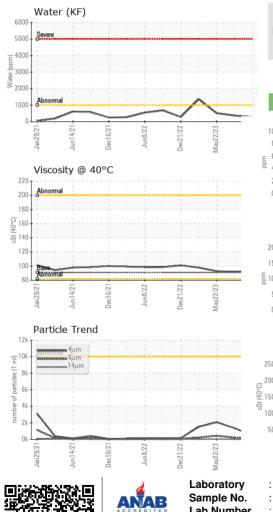
Contact/Location: JOHN KONRAD - KRADAV



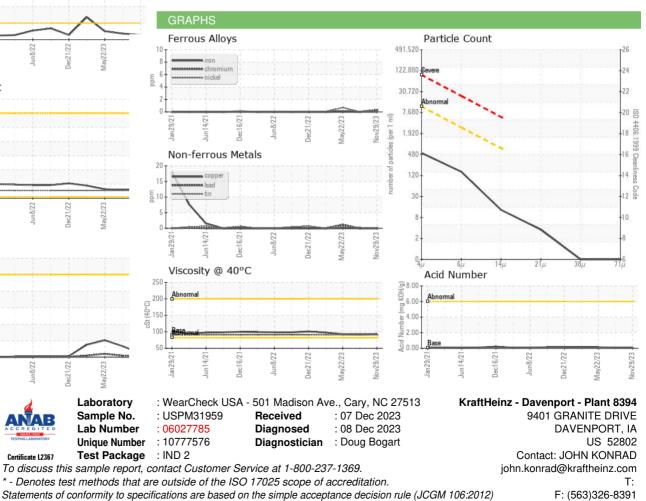
# **OIL ANALYSIS REPORT**







VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPER	TIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	91	93.4	91.6	92.8
SAMPLE IMAGE	S	method	limit/base	current	history1	history2
Color						
Bottom						



Contact/Location: JOHN KONRAD - KRADAV