

OIL ANALYSIS REPORT

Sample Rating Trend



VACUUM K2 (S/N OF204092)

Pump Fluid USPI VAC 100 (--- GAL)

DIAGNOSIS

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.

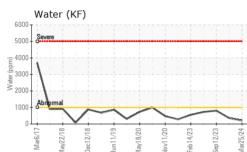
Fluid Condition

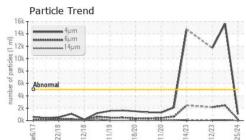
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

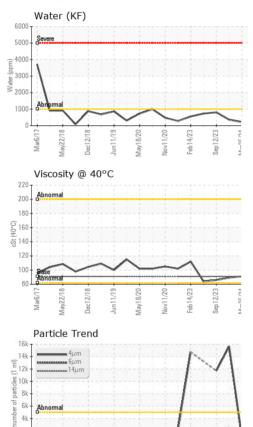
SAMPLE INFORMATION method imit/base current history1 history2 Sample Number Client Info USPM36503 USPM31556 USPM29716 Sample Date Client Info 0 0 0 0 Machine Age hrs Client Info 0 0 0 0 Oil Ghanged Client Info N/A N/A N/A N/A Sample Status method Imit/base current history1 history2 Iron ppm ASTM 05185n >50 0 5 3 Chromium ppm ASTM 05185n >5 <1 0 0 Silver ppm ASTM 05185n >3 0 0 0 0 Capper ppm ASTM 05185n >12 0 0 0 1 Vanadium ppm ASTM 05185n >2 <1 0 0 1 Vanadium ppm ASTM 05185n >20 0 <th></th> <th></th> <th>Aar2017 May2</th> <th>018 Dec2018 Jun2019</th> <th>May2020 Nov2020 Feb2023 Sep</th> <th>2023 Mar202</th> <th></th>			Aar2017 May2	018 Dec2018 Jun2019	May2020 Nov2020 Feb2023 Sep	2023 Mar202	
Sample Date Client Info 25 Mar 2024 18 Dec 2023 12 Sep 2023 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 method Imit/base current history1 history2 Iron ppm ASTM 05185m >5 <1	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 0 0 0 Oil Age hrs Client Info N/A N/A N/A Sample Status Client Info N/A N/A N/A ABNORMAL WEAR METALS method Imit/base current history1 history2 Iron ppm ASTM 05185m >5 <1 <1 0 Nickel ppm ASTM 05185m >3 0 0 0 Silver ppm ASTM 05185m >3 0 0 0 Lead ppm ASTM 05185m >2 <1 0 0 Cadmium ppm ASTM 05185m >3 0 0 0 Cadmium ppm ASTM 05185m >12 0 0 0 Cadmium ppm ASTM 05185m 0 0 0 <1 Manganese ppm ASTM 05185m 0 0 0 <1	Sample Number		Client Info		USPM36503	USPM31556	USPM29716
Oil Age International action of the second of	Sample Date		Client Info		25 Mar 2024	18 Dec 2023	12 Sep 2023
Oil Changed Sample Status Client Info N/A N/A N/A ABNORMAL WEAR METALS method imit/base current history1 history2 Iron ppm ASIM D5185m >50 0 5 3 Chromium ppm ASIM D5185m >55 <1 0 0 Nickel ppm ASIM D5185m >53 0 0 0 Silver ppm ASIM D5185m >33 0 0 0 Lead ppm ASIM D5185m >12 0 0 0 Cadmium ppm ASIM D5185m >2 0 0 0 Cadmium ppm ASIM D5185m 9 <1 0 0 <1 Cadmium ppm ASIM D5185m 0 0 0 0 0 <1 Maaduum ppm ASIM D5185m 0 0 0 0 0 0 0 0 0	Machine Age	hrs	Client Info		0	0	0
Sample Status method Imilians Current ABNORMAL ABNORMAL WEAR METALS method Imilians current history1 history2 Iron ppm ASTM D5185m >50 <1 <1 0 Nickel ppm ASTM D5185m >55 <1 <1 0 0 Silver ppm ASTM D5185m >3 0 0 0 Auminum ppm ASTM D5185m >3 0 0 0 Copper ppm ASTM D5185m >12 0 0 0 Copper ppm ASTM D5185m >30 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method imilibase current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 0 0	Oil Age	hrs	Client Info		0	0	0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05185m >90 0 5 3 Chromium ppm ASTM 05185m >5 <1 0 0 Nickel ppm ASTM 05185m >5 <1 0 0 Silver ppm ASTM 05185m >3 0 0 0 Auminum ppm ASTM 05185m >3 0 0 0 Lead ppm ASTM 05185m >30 0 0 0 1 Vanadium ppm ASTM 05185m >0 0 0 <1 Vanadium ppm ASTM 05185m 0 0 0 <1 Adminum ppm ASTM 05185m 0 0 0 <1 Vanadium ppm ASTM 05185m 0 0 0 <1 Adminum ppm ASTM 05185m 0 0 0 </th <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>N/A</th> <th>N/A</th> <th>N/A</th>	Oil Changed		Client Info		N/A	N/A	N/A
Iron ppm ASTM D5185m >90 0 5 3 Chromium ppm ASTM D5185m >5 <1 0 0 Nickel ppm ASTM D5185m >5 <1 0 0 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >7 <1 0 0 Lead ppm ASTM D5185m >7 <1 0 0 Copper ppm ASTM D5185m >30 0 0 <1 Vanadium ppm ASTM D5185m >9 <1 0 <1 ADDITIVES method imit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Magnese ppm ASTM D5185m 0 0 <1 0 Magnesium ppm ASTM D5185m 0 0 <1 0 </th <th>Sample Status</th> <th></th> <th></th> <th></th> <th>NORMAL</th> <th>ABNORMAL</th> <th>ABNORMAL</th>	Sample Status				NORMAL	ABNORMAL	ABNORMAL
Chromium ppm ASTM D5185m >5 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >5 <1	Iron	ppm	ASTM D5185m	>90	0	5	3
Titanium ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >7 <1 0 0 Lead ppm ASTM D5185m >12 0 0 0 Copper ppm ASTM D5185m >12 0 0 0 Vanadium ppm ASTM D5185m >9 <1 0 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 0 0 0 <1 Magnesium ppm ASTM D5185m 0 0 2 0 0 Sulfur ppm ASTM D5185m 0 0 13	Chromium	ppm	ASTM D5185m	>5	<1	<1	0
Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >7 <1 0 0 Lead ppm ASTM D5185m >12 0 0 0 Copper ppm ASTM D5185m >30 0 0 <1 Vanadium ppm ASTM D5185m 9 <1 0 <1 Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method imit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 0 0 <1 0 Calcium ppm ASTM D5185m 0 0 <1 0 Calcium ppm ASTM D5185m 0 0 <1 0 Suffur ppm ASTM D5185m 0 0 0 70	Nickel	ppm	ASTM D5185m	>5	<1	0	0
Aluminum ppm ASTM D5185m >7 <1	Titanium	ppm	ASTM D5185m	>3	0	0	0
Lead ppm ASTM D5185m >12 0 0 0 Copper ppm ASTM D5185m >30 0 0 0 1 Vanadium ppm ASTM D5185m >9 <1 0 <1 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method Imit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 0 1 0 Magnese ppm ASTM D5185m 0 0 0 1 0 1 0 1 0 1 0 1 0 1 1 0 1 1 0 1 1 0 1 1 1 0 1 1 1 1 1 1 1 1 1 1	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper ppm ASTM D5185m >30 0 0 0 Tin ppm ASTM D5185m >9 <1 0 <1 Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Marganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 0 0 0 0 Calcium ppm ASTM D5185m 0 0 4 1 Phosphorus ppm ASTM D5185m 0 0 24 0 Sulfur ppm ASTM D5185m 0 0 1 0 Solitom ppm ASTM D5185m 0 0 1 0 Sulfur </th <th>Aluminum</th> <th>ppm</th> <th>ASTM D5185m</th> <th>>7</th> <th><1</th> <th>0</th> <th>0</th>	Aluminum	ppm	ASTM D5185m	>7	<1	0	0
Tin ppm ASTM D5185m >9 <1	Lead	ppm	ASTM D5185m	>12	0	0	0
Vanadium ppm ASTM D5185m 0 0 <1	Copper	ppm	ASTM D5185m	>30	0	0	0
Cadmium ppm ASTM D5185m 0 0 <1	Tin	ppm	ASTM D5185m	>9	<1	0	<1
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 Molybdenum ppm ASTM D5185m 0 0 0 0 0 Magnesium ppm ASTM D5185m 0 0 4 1 Phosphorus ppm ASTM D5185m 0 0 4 1 Phosphorus ppm ASTM D5185m 0 0 24 0 Sulfur ppm ASTM D5185m 0 0 0 70 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >20 1 3 3 Sodium ppm ASTM D5185m	Vanadium	ppm	ASTM D5185m		0	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 0 Magnesium ppm ASTM D5185m 0 0 -<1 0 Calcium ppm ASTM D5185m 0 0 4 1 Phosphorus ppm ASTM D5185m 0 0 24 0 Sulfur ppm ASTM D5185m 0 0 0 70 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >20 1 <1 3 Water % ASTM D5185m >20 1	Cadmium	ppm	ASTM D5185m		0	0	<1
Barium ppm ASTM D5185m 0 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 <1 Magnesium ppm ASTM D5185m 0 0 <1 0 Calcium ppm ASTM D5185m 0 0 4 1 Phosphorus ppm ASTM D5185m 0 0 4 1 Phosphorus ppm ASTM D5185m 0 0 24 0 Sulfur ppm ASTM D5185m 0 0 0 70 70 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >20 1 <1 0 Potassium ppm ASTM D5185m >20 1 <1 1 Patticles >4µm ASTM D6304	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 0	Boron	ppm	ASTM D5185m	0	0	0	0
Manganese ppm ASTM D5185m 0 0 <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 0 0 <1	Molybdenum		ASTM D5185m	0	0	0	0
Calcium ppm ASTM D5185m 0 0 4 1 Phosphorus ppm ASTM D5185m 1800 570 747 691 Zinc ppm ASTM D5185m 0 0 24 0 Sulfur ppm ASTM D5185m 0 0 0 70 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 0 0 <1 0 Potassium ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >20 1 <1 3 Vater % ASTM D5044 >.1 0.021 0.035 0.080 ppm Water ppm ASTM D7647 >5000 1042 15632 11711 Particles >4µm ASTM D7647 >1300 199 2451 2156 Particles >4µm	Manganese	ppm	ASTM D5185m		0	0	<1
Phosphorus ppm ASTM D5185m 1800 570 747 691 Zinc ppm ASTM D5185m 0 0 0 24 0 Sulfur ppm ASTM D5185m 0 0 0 24 0 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >20 1 <1	Magnesium	ppm	ASTM D5185m	0	0	<1	0
Zinc ppm ASTM D5185m 0 0 0 24 0 Sulfur ppm ASTM D5185m 0 0 0 0 70 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >20 1 <1 3 Potassium ppm ASTM D6304 >.1 0.021 0.035 0.080 ppm Water ppm ASTM D6304 >1000 214 357 806.3 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >5000 1042 15632 11711 Particles >6µm ASTM D7647 >1300 199 2451 2156 Particles >21µm ASTM D7647 <t< th=""><th>Calcium</th><th>ppm</th><th>ASTM D5185m</th><th>0</th><th>0</th><th>4</th><th>1</th></t<>	Calcium	ppm	ASTM D5185m	0	0	4	1
Sulfur ppm ASTM D5185m 0 0 0 0 70 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >20 1 <1 3 Potassium ppm ASTM D6304 >.1 0.021 0.035 0.080 ppm Water ppm ASTM D6304 >.1 0.021 0.035 0.080 ppm Water ppm ASTM D7647 >5000 1042 ▲ 15632 ▲ 11711 Particles >4µm ASTM D7647 >1300 199 ≥2451 ≥2156 Particles >6µm ASTM D7647 >160 15 115 119 Particles >21µm ASTM D7647 >40 4 30 32 Particles >71µm ASTM D7647 >3 0	Phosphorus	ppm	ASTM D5185m	1800	570	747	691
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m >0 <1 0 Potassium ppm ASTM D5185m >20 1 <1 3 Water % ASTM D50804 >.1 0.021 0.035 0.080 ppm Water ppm ASTM D6304 >.1 0.021 0.035 0.080 ppm Water ppm ASTM D6304 >.1000 214 357 806.3 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >5000 1042 15632 11711 Particles >6µm ASTM D7647 >1300 199 2451 2156 Particles >14µm ASTM D7647 >160 15 115 119 Particles >38µm ASTM D7647 3 0 1	Zinc	ppm	ASTM D5185m	0	0	24	0
Silicon ppm ASTM D5185m >60 10 13 13 Sodium ppm ASTM D5185m 0 <1	Sulfur	ppm	ASTM D5185m	0	0	0	70
Sodium ppm ASTM D5185m 0 <1	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 0 <1	Silicon	maa	ASTM D5185m	>60	10	13	13
Potassium ppm ASTM D5185m >20 1 <1					-		
Water % ASTM D6304 >.1 0.021 0.035 0.080 ppm Water ppm ASTM D6304 >.100 214 357 806.3 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >5000 1042 15632 11711 Particles >6µm ASTM D7647 >1300 199 2451 2156 Particles >14µm ASTM D7647 >160 15 115 119 Particles >21µm ASTM D7647 >40 4 30 32 Particles >38µm ASTM D7647 >10 0 3 1 Particles >71µm ASTM D7647 >3 0 1 0 Oil Cleanliness ISO 4406 (c) >19/17/14 17/15/11 21/18/14 21/18/14 FLUID DEGRADATION method limit/base current history1 history2	Potassium		ASTM D5185m	>20	-	<1	3
ppm Water ppm ASTM D6304 >1000 214 357 806.3 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >5000 1042 15632 11711 Particles >6µm ASTM D7647 >1300 199 2451 2156 Particles >14µm ASTM D7647 >160 15 115 119 Particles >14µm ASTM D7647 >40 4 300 32 Particles >21µm ASTM D7647 >10 0 3 1 Particles >38µm ASTM D7647 >3 0 1 0 Particles >71µm ASTM D7647 >3 0 1 0 Oil Cleanliness ISO 4406 (c) 19/17/14 17/15/11 21/18/14 21/18/14 FLUID DEGRADATION method limit/base current history1 history2	Water		ASTM D6304	>.1		0.035	0.080
Particles >4µm ASTM D7647 >5000 1042 15632 11711 Particles >6µm ASTM D7647 >1300 199 2451 2156 Particles >14µm ASTM D7647 >160 15 115 119 Particles >21µm ASTM D7647 >40 4 30 32 Particles >21µm ASTM D7647 >10 0 3 1 Particles >38µm ASTM D7647 >3 0 1 0 Particles >71µm ASTM D7647 >3 0 1 0 Oil Cleanliness ISO 4406 (c) >19/17/14 17/15/11 21/18/14 21/18/14 FLUID DEGRADATION method limit/base current history1 history2							
Particles >6μm ASTM D7647 >1300 199 2451 2156 Particles >14μm ASTM D7647 >160 15 115 119 Particles >21μm ASTM D7647 >40 4 30 32 Particles >38μm ASTM D7647 >10 0 3 1 Particles >71μm ASTM D7647 >3 0 1 0 Oil Cleanliness ISO 4406 (c) >19/17/14 17/15/11 ≥1/18/14 ≥1/18/14 FLUID DEGRADATION method limit/base current history1 history2	FLUID CLEANLIN	ESS	method	limit/base	current	history1	history2
Particles >6µm ASTM D7647 >1300 199 2451 2156 Particles >14µm ASTM D7647 >160 15 115 119 Particles >21µm ASTM D7647 >40 4 30 32 Particles >38µm ASTM D7647 >10 0 3 1 Particles >71µm ASTM D7647 >3 0 1 0 Oil Cleanliness ISO 4406 (c) >19/17/14 17/15/11 ≥1/18/14 ≥1/18/14 FLUID DEGRADATION method limit/base current history1 history2	Particles >4µm		ASTM D7647	>5000	1042	▲ 15632	▲ 11711
Particles >14µm ASTM D7647 >160 15 115 119 Particles >21µm ASTM D7647 >40 4 30 32 Particles >38µm ASTM D7647 >10 0 3 1 Particles >38µm ASTM D7647 >3 0 1 0 Particles >71µm ASTM D7647 >3 0 1 0 Oil Cleanliness ISO 4406 (c) >19/17/14 17/15/11 ≥1/18/14 ≥1/18/14 FLUID DEGRADATION method limit/base current history1 history2			ASTM D7647	>1300	199	2451	2156
Particles >21μm ASTM D7647 >40 4 30 32 Particles >38μm ASTM D7647 >10 0 3 1 Particles >38μm ASTM D7647 >30 0 1 0 Particles >71μm ASTM D7647 >3 0 1 0 Oil Cleanliness ISO 4406 (c) >19/17/14 17/15/11 21/18/14 21/18/14 FLUID DEGRADATION method limit/base current history1 history2	Particles >14µm		ASTM D7647	>160	15	115	119
Particles >38μm ASTM D7647 >10 0 3 1 Particles >71μm ASTM D7647 >3 0 1 0 Oil Cleanliness ISO 4406 (c) >19/17/14 17/15/11 21/18/14 21/18/14 FLUID DEGRADATION method limit/base current history1 history2	Particles >21µm		ASTM D7647	>40	4		32
Particles >71μm ASTM D7647 >3 0 1 0 Oil Cleanliness ISO 4406 (c) >19/17/14 17/15/11 ▲ 21/18/14 ▲ 21/18/14 FLUID DEGRADATION method limit/base current history1 history2				>10		3	1
Oil Cleanliness ISO 4406 (c) >19/17/14 17/15/11 21/18/14 21/18/14 FLUID DEGRADATION method limit/base current history1 history2			ASTM D7647	>3	0		0
						2 1/18/14	▲ 21/18/14
Acid Number (AN) mg KOH/g ASTM D8045 0.05 0.087 0.74 0.61	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
	Acid Number (AN)	mg KOH/g	ASTM D8045	0.05	0.087	0.74	0.61



OIL ANALYSIS REPORT

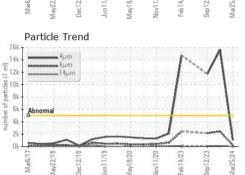






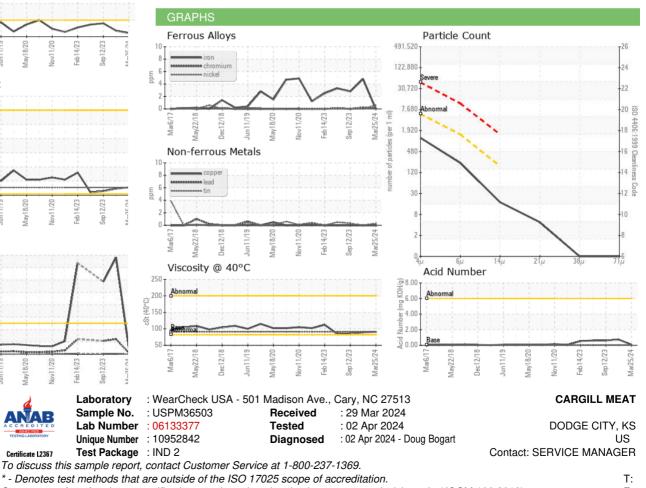
Al

2





Bottom



Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Page 2 of 2

Contact/Location: SERVICE MANAGER - CARDOD