

### **OIL ANALYSIS REPORT**

#### Sample Rating Trend

#### NORMAL

# VILTER TYSOMA 19 VILTER (S/N TDSH193L3129D)

**Refrigeration Compressor** 

USPI 1009-68 SC (--- 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.

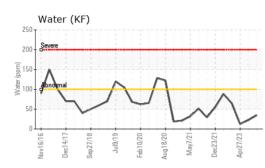
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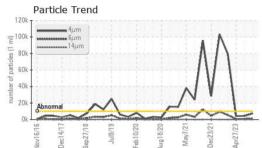


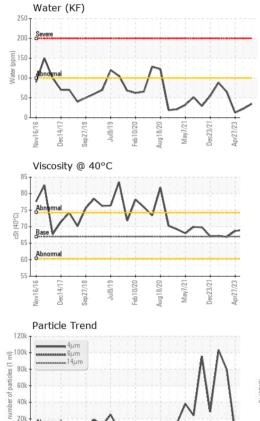
Sample Number     Client Info     USP0003258     USP000752     USP248319       Sample Date     Client Info     30 Oct 2023     31 Jul 2023     27 Apr 2023       Machine Age     hrs     Client Info     7405     5683     3783       Oil Age     Client Info     N/A     N/A     N/A     N/A       Sample Status     Elient Info     N/A     N/A     N/A     N/A       VEAR METALS     method     Imit/base     current     history1     history2       Iron     ppm     ASTM 05185m     >8     0     0     -1       Nickel     ppm     ASTM 05185m     2     0     -1     0       Aluminum     ppm     ASTM 05185m     2     0     -1     0       Gopper     ppm     ASTM 05185m     2     0     -1     0     -1       Vanadium     ppm     ASTM 05185m     2     0     -1     0     -1       Gradmium     ppm     ASTM 05185m     2     0     -1     0	SAMPLE INFORM	1ATION	method	limit/base	current	history1	history2
Sample Date     Client Info     30 Oct 2023     31 Jul 2023     27 Apr 2023       Machine Age     hrs     Client Info     7405     5683     3783       Oil Age     hrs     Client Info     0     0     0       Oil Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     0     0     0     0     0       WEAR METALS     method     Imit/base     current     history1     history1       Nickel     ppm     ASTM 05185m     >8     0     0     -1       Nickel     ppm     ASTM 05185m     2     0     0     -1       Lead     ppm     ASTM 05185m     2     0     0     -1       Vanadium     ppm     ASTM 05185m     2     0     0     -1       Vanadium     ppm     ASTM 05185m     0     0     0     0       Addimium     ppm     ASTM 05185m     0     0     0     -1       Vanadium     ppm							
Machine Age     hrs     Client Info     7405     5683     3783       Oil 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       Sample Status     Imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >2     0     0     <1							
Oil Age     hrs     Client Info     0     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 05155m     >8     0     0     -1       Nickel     ppm     ASTM 05155m     >2     0     -1     0       Silver     ppm     ASTM 05155m     >2     0     -1     0       Auminum     ppm     ASTM 05155m     >2     0     -1     0       Auminum     ppm     ASTM 05155m     2     0     -1     0       Auminum     ppm     ASTM 05155m     2     0     0     -1       Capper     ppm     ASTM 05155m     2     0     0     -1       Vanadium     ppm     ASTM 05155m     0     0     0     0       Capper     ppm     ASTM 05155m     0     0     0     0		bro					
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 D5185m     >8     0     0     0       Chromium     ppm     ASTM D5185m     >2     0     0     <1	•						
Sample Status     NORMAL     NORMAL     NORMAL     NORMAL     NORMAL       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >8     0     0     <1	•	1115					
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >8     0     0     0       Nickel     ppm     ASTM D5185m     >2     0     0     <1	U		Client Inio				
Iron     ppm     ASTM D5185m     >8     0     0	Sample Status				NORMAL	NORMAL	NORIVIAL
Ppm     ASTM D5185m     >2     0     0     <1       Nickel     ppm     ASTM D5185m     0     0     0     0       Silver     ppm     ASTM D5185m     2     0     <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     0     0     <1       Titanium     ppm     ASTM D5185m     >2     0     <1	Iron	ppm	ASTM D5185m	>8			0
Titanium     ppm     ASTM D5185m     0     0     0     0       Silver     ppm     ASTM D5185m     >2     0     <1	Chromium	ppm	ASTM D5185m	>2	0	0	<1
Silver     ppm     ASTM D5185m     >2     0     <1     0       Aluminum     ppm     ASTM D5185m     >3     0     0     <1	Nickel	ppm	ASTM D5185m		0	0	<1
Aluminum     ppm     ASTM D5185m     >3     0     0     <1       Lead     ppm     ASTM D5185m     >2     0     0     <1	Titanium	ppm	ASTM D5185m		0	0	0
Lead     ppm     ASTM D5185m     >2     0     0     <1       Copper     ppm     ASTM D5185m     >8     0     0     <1	Silver	ppm	ASTM D5185m	>2	0	<1	0
Copper     ppm     ASTM D5185m     >8     0     0     <1       Tin     ppm     ASTM D5185m     >4     0     0     <1	Aluminum	ppm	ASTM D5185m	>3	0	0	<1
Tin     ppm     ASTM D5185m     >4     0     0     <1       Vanadium     ppm     ASTM D5185m     0     0     0     0       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       Magnaese     ppm     ASTM D5185m     0     0     0     0       Magnesium     ppm     ASTM D5185m     0     0     0     0       Phosphorus     ppm     ASTM D5185m     0     0     0     0       Sulfur     ppm     ASTM D5185m     50     0     0     1       Sodium     ppm     ASTM D5185m     >15     0     0     1       Sodium     ppm     ASTM D5185m     >20     0     <1	Lead	ppm	ASTM D5185m	>2	0	0	<1
Vanadium     ppm     ASTM D5185m     0     0     0     0       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       Maganese     ppm     ASTM D5185m     0     0     0     0       Magnesium     ppm     ASTM D5185m     0     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0     0       Zinc     ppm     ASTM D5185m     0     0     0     0       Sulfur     ppm     ASTM D5185m     50     0     0     1       Sodium     ppm     ASTM D5185m     50     0     1     1       Sodium     ppm     ASTM D5185m     20     0     <1	Copper	ppm	ASTM D5185m	>8	0	0	<1
Cadmium     ppm     ASTM D5185m     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       Molybdenum     ppm     ASTM D5185m     0     0     0     0       Magnese     ppm     ASTM D5185m     0     0     0     0       Magnesium     ppm     ASTM D5185m     0     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0     0       Sulfur     ppm     ASTM D5185m     0     0     0     1       Sodium     ppm     ASTM D5185m     20     0     1     1       Sodium     ppm     ASTM D5185m     20     0     1     2	Tin	ppm	ASTM D5185m	>4	0	0	<1
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     0       Barium     ppm     ASTM D5185m     0     0     0       Molybdenum     ppm     ASTM D5185m     0     0     0       Magnese     ppm     ASTM D5185m     0     0     0       Magnesium     ppm     ASTM D5185m     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0       Zinc     ppm     ASTM D5185m     0     0     0       Sulfur     ppm     ASTM D5185m     50     0     0     1       Sodium     ppm     ASTM D5185m     20     0     <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron     ppm     ASTM D5185m     0     0     0       Barium     ppm     ASTM D5185m     0     0     0       Molybdenum     ppm     ASTM D5185m     0     0     0       Magnese     ppm     ASTM D5185m     0     0     0     0       Magnesium     ppm     ASTM D5185m     0     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0     0       Calcium     ppm     ASTM D5185m     <1	Cadmium		ASTM D5185m		0	0	0
Barium     ppm     ASTM D5185m     0     0     0       Molybdenum     ppm     ASTM D5185m     0     0     0       Maganese     ppm     ASTM D5185m     0     0     0       Magnesium     ppm     ASTM D5185m     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0       Zinc     ppm     ASTM D5185m     50     0     0     0       Sulfur     ppm     ASTM D5185m     50     0     0     1       Sodium     ppm     ASTM D5185m     >15     0     0     1       Sodium     ppm     ASTM D5185m     >20     0     <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185m     0     0     0       Manganese     ppm     ASTM D5185m     0     0     <1	Boron	ppm	ASTM D5185m		0	0	0
Manganese     ppm     ASTM D5185m     0     0     <1       Magnesium     ppm     ASTM D5185m     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0       Phosphorus     ppm     ASTM D5185m     <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium     ppm     ASTM D5185m     0     0     0       Calcium     ppm     ASTM D5185m     0     0     0       Phosphorus     ppm     ASTM D5185m      0     0     0       Zinc     ppm     ASTM D5185m     0     0     0     0       Sulfur     ppm     ASTM D5185m     50     0     0     0       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     50     0     0     1       Sodium     ppm     ASTM D5185m     >15     0     0     1       Sodium     ppm     ASTM D5185m     >20     0     <1	Molybdenum	ppm	ASTM D5185m		0	0	0
Calcium     ppm     ASTM D5185m     0     0     0     0       Phosphorus     ppm     ASTM D5185m     <1	Manganese	ppm	ASTM D5185m		0	0	<1
Phosphorus     ppm     ASTM D5185m     <1     0     0       Zinc     ppm     ASTM D5185m     0     0     0     0       Sulfur     ppm     ASTM D5185m     50     0     0     0     0       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >15     0     0     1       Sodium     ppm     ASTM D5185m     >15     0     0     1       Potassium     ppm     ASTM D5185m     >20     0     <1     2       Water     %     ASTM D5185m     >20     0     <1     2       Water     %     ASTM D5034     >0.01     0.003     0.002     0.001       ppm     ASTM D7647     >1000     7344     4315     4217       Particles >4µm     ASTM D7647     >200     1093     694     671       Particles >14µm     ASTM D7647     >20     0     0     0     0 <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>0</th> <td>0</td> <td>0</td>	Magnesium	ppm	ASTM D5185m		0	0	0
Zinc     ppm     ASTM D5185m     0     0     0     0       Sulfur     ppm     ASTM D5185m     50     0     0     0     0       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >15     0     0     1       Sodium     ppm     ASTM D5185m     >15     0     0     1       Sodium     ppm     ASTM D5185m     >20     0     <1     2       Water     %     ASTM D6304     >0.01     0.003     0.002     0.001       ppm     ASTM D6304     >0.01     0.003     0.002     0.001       ppm     ASTM D6304     >100     34.8     22.4     12.6       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     7344     4315     4217       Particles >1µm     ASTM D7647     2500     1093     694	Calcium	ppm	ASTM D5185m		0	0	0
Sulfur     ppm     ASTM D5185m     50     0     0     0       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >15     0     0     1       Sodium     ppm     ASTM D5185m     >15     0     0     <1	Phosphorus	ppm	ASTM D5185m		<1	0	0
CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >15     0     0     1       Sodium     ppm     ASTM D5185m     >15     0     0     <1	Zinc	ppm	ASTM D5185m		0	0	0
Silicon     ppm     ASTM D5185m     >15     0     0     1       Sodium     ppm     ASTM D5185m     0     0     <1	Sulfur	ppm	ASTM D5185m	50	0	0	0
Sodium     ppm     ASTM D5185m     0     0     <1       Potassium     ppm     ASTM D5185m     >20     0     <1	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium     ppm     ASTM D5185m     >20     0     <1     2       Water     %     ASTM D6304     >0.01     0.003     0.002     0.001       ppm Water     ppm     ASTM D6304     >100     34.8     22.4     12.6       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4μm     ASTM D7647     >10000     7344     4315     4217       Particles >6μm     ASTM D7647     >2500     1093     694     671       Particles >14μm     ASTM D7647     >320     13     11     19       Particles >21μm     ASTM D7647     >80     2     1     5       Particles >38μm     ASTM D7647     >20     0     0     0       Particles >71μm     ASTM D7647     >4     0     0     0     0       OIl Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1 <td>Silicon</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;15</td> <th>0</th> <td>0</td> <td>1</td>	Silicon	ppm	ASTM D5185m	>15	0	0	1
Water     %     ASTM D6304     >0.01     0.003     0.002     0.001       ppm Water     ppm     ASTM D6304     >100     34.8     22.4     12.6       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     7344     4315     4217       Particles >6µm     ASTM D7647     >2500     1093     694     671       Particles >14µm     ASTM D7647     >320     13     11     19       Particles >21µm     ASTM D7647     >80     2     1     5       Particles >38µm     ASTM D7647     >20     0     0     0       Particles >71µm     ASTM D7647     >4     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	Sodium	ppm	ASTM D5185m		0	0	<1
Water     %     ASTM D6304     >0.01     0.003     0.002     0.001       ppm Water     ppm     ASTM D6304     >100     34.8     22.4     12.6       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     7344     4315     4217       Particles >6µm     ASTM D7647     >2500     1093     694     671       Particles >14µm     ASTM D7647     >320     13     11     19       Particles >21µm     ASTM D7647     >80     2     1     5       Particles >38µm     ASTM D7647     >20     0     0     0       Particles >71µm     ASTM D7647     >4     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	Potassium	ppm	ASTM D5185m	>20	0	<1	2
ppm Water     ppm     ASTM D6304     >100     34.8     22.4     12.6       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >10000     7344     4315     4217       Particles >6µm     ASTM D7647     >2500     1093     694     671       Particles >6µm     ASTM D7647     >320     13     11     19       Particles >14µm     ASTM D7647     >80     2     1     5       Particles >21µm     ASTM D7647     >20     0     0     0       Particles >38µm     ASTM D7647     >4     0     0     0       Particles >71µm     ASTM D7647     >4     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	Water		ASTM D6304	>0.01	0.003	0.002	0.001
Particles >4μm     ASTM D7647     >10000     7344     4315     4217       Particles >6μm     ASTM D7647     >2500     1093     694     671       Particles >14μm     ASTM D7647     >320     13     11     19       Particles >21μm     ASTM D7647     >80     2     1     5       Particles >21μm     ASTM D7647     >80     2     1     5       Particles >38μm     ASTM D7647     >20     0     0     0       Particles >71μm     ASTM D7647     >4     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	ppm Water	ppm	ASTM D6304	>100	34.8	22.4	12.6
Particles >6μm     ASTM D7647     >2500     1093     694     671       Particles >14μm     ASTM D7647     >320     13     11     19       Particles >21μm     ASTM D7647     >80     2     1     5       Particles >38μm     ASTM D7647     >20     0     0     0       Particles >38μm     ASTM D7647     >20     0     0     0       Particles >38μm     ASTM D7647     >4     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	FLUID CLEANLIN	ESS	method	limit/base	current	history1	history2
Particles >14µm     ASTM D7647     >320     13     11     19       Particles >21µm     ASTM D7647     >80     2     1     5       Particles >38µm     ASTM D7647     >20     0     0     0       Particles >38µm     ASTM D7647     >20     0     0     0       Particles >71µm     ASTM D7647     >4     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	Particles >4µm		ASTM D7647	>10000	7344	4315	4217
Particles >21μm     ASTM D7647     >80     2     1     5       Particles >38μm     ASTM D7647     >20     0     0     0       Particles >38μm     ASTM D7647     >20     0     0     0       Particles >71μm     ASTM D7647     >4     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	Particles >6µm		ASTM D7647	>2500	1093	694	671
Particles >38μm     ASTM D7647     >20     0     0     0       Particles >71μm     ASTM D7647     >4     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	Particles >14µm		ASTM D7647	>320	13	11	19
Particles >71μm     ASTM D7647     >4     0     0     0       Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	Particles >21µm		ASTM D7647	>80	2	1	5
Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	Particles >38µm		ASTM D7647	>20	0	0	0
Oil Cleanliness     ISO 4406 (c)     >20/18/15     20/17/11     19/17/11     19/17/11       FLUID DEGRADATION     method     limit/base     current     history1     history2	Particles >71µm		ASTM D7647	>4	0	0	0
			ISO 4406 (c)	>20/18/15	20/17/11	19/17/11	19/17/11
Acid Number (AN) mg KOH/g ASTM D974 0.005 0.014 0.014 0.031	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
	Acid Number (AN)	mg KOH/g	ASTM D974	0.005	0.014	0.014	0.031



## **OIL ANALYSIS REPORT**







Abnorma

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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	>0.01	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	67	67.3	69.0	68.7
SAMPLE IMAGES	6	method	limit/base	current	history1	history2
Color				NH3 - 540 War 4582 War 50190 War 5000 War 500		
Bottom						

Particle Count Ferrous Alloys 491 520 122,88 30,72 7,68 20 2 Dec14/17 Sep27/18 ah10/70 Ja 18/20 lov16/16 4406 Der 1,920 19999 Non-ferrous Metals 480 10 120 2 de 30 Dec14/1 ar73/7 Vov16/1 Sep27/ 611 Viscosity @ 40°C Acid Number (<sup>0</sup>,0.05 HOX 0.04 90 Ē 0.03 ළි 0.02 Abnormal 0.01 0.00 50 Apr27/23 -Mav7/21 Dec23/21 Dec23/21 pr27/23 May7/21 9/19/19 ah10/70 1/19/19



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

T: (402)895-4101 F:

Contact/Location: BOBBY WILLIAMS - TYSOMA