

## **OIL ANALYSIS REPORT**

Particles >21µm

Particles >38µm

Particles >71µm

**Oil Cleanliness** 

Acid Number (AN)

FLUID DEGRADATION

## **SLAUGHTER** FES / KOBI TYSPASS 5 FES (S/N 129355) Component

# **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.



Sample Date         Client Info         21 Nov 2023         01 Aug 2023         03 Apr 2023           Machine Age         hrs         Client Info         0         0         394           Oil Age         hrs         Client Info         0         0         0         0           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Imit/base         current         history1         history2           fron         ppm         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0         0           Aduminum         ppm         ASTM D5185m         >2         0         0         0         0         0           Cadmium         ppm         ASTM D5185m         >3         0         <1         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0 </th <th>SAMPLE INFORM</th> <th>IATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age         hrs.         Client Info         0         0         394           Dil Age         hrs.         Client Info         0         0         0           Dil Age         hrs.         Client Info         N/A         N/A         N/A           Sample Status         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >8         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Capper         ppm         ASTM D5185m         >2         0         0         0           Capper         ppm         ASTM D5185m         >2         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Admaduim         ppm	Sample Number		Client Info		USP0003566	USP248728	USP245583
Dil Age         hrs         Client Info         0         0         0           Oli Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Image: Client Info         N/A         N/A         N/A         N/A           WEAR METALS         method         limit/base         current         history1         history1           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >2         0         0         0           Tin         ppm         ASTM D5185m         >2         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Addition         ppm         ASTM D5185m         0         0         0         0	Sample Date		Client Info		21 Nov 2023	01 Aug 2023	03 Apr 2023
Dil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         nethod         imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >8         0         0         0           Chromium         ppm         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Lead         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >2         0         0         0           Cadmium         ppm         ASTM D5185m         >2         0         0         0           Cadmium         ppm         ASTM D5185m         >2         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0	Machine Age	hrs	Client Info		0	0	394
Sample Status         NORMAL         NORMAL         ATTENTION           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >8         0         0         0           Nickel         ppm         ASTM D5185m         2         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >2         0         0         0           Cadmium         ppm         ASTM D5185m         >4         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ASTM D5185m         0         0         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Barinu         ppm<	Oil Age	hrs	Client Info		0	0	0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m<>8         0         0         0           Chromium         ppm         ASTM D5185m<>2         0         0         0           Nickel         ppm         ASTM D5185m         2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m<>2         0         0         0           Aluminum         ppm         ASTM D5185m<>2         0         0         0           Copper         ppm         ASTM D5185m<>2         0         0         0           Cademium         ppm         ASTM D5185m         8         0         0         0           Cadmium         ppm         ASTM D5185m         8         0         0         0           Cadmium         ppm         ASTM D5185m         8         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Boron         ppm         ASTM D5185m	Oil Changed		Client Info		N/A	N/A	N/A
Iron         ppm         ASTM D5185m         >8         0         0         0           Chromium         ppm         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         0         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >2         0         0         0           Lead         ppm         ASTM D5185m         >3         0         <1         <1           Copper         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >8         0         0         0           Copper         ppm         ASTM D5185m         >8         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Boron         ppm         ASTM D5185m         0         0         0         0           Magnese         ppm         ASTM D5185m         0         0         0           <	Sample Status				NORMAL	NORMAL	ATTENTION
Prime         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >2         0         0         0           Lead         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >2         0         0         0           Tin         ppm         ASTM D5185m         >4         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Boron         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Magnese         ppm         ASTM D5185m         0         0         0         0           Sulfur         p	WEAR METALS		method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >2         0         0         0           Lead         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >2         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Boron         ppm         ASTM D5185m         0         0         0         0           Magnese         ppm         ASTM D5185m         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         0         0         0	Iron	ppm	ASTM D5185m	>8	0	0	0
Titanium       ppm       ASTM D5185m       O       O       O         Silver       ppm       ASTM D5185m       >2       0       0       O         Aluminum       ppm       ASTM D5185m       >3       0       <1       <1         Lead       ppm       ASTM D5185m       >2       0       0       0         Copper       ppm       ASTM D5185m       >2       0       0       0         Tin       ppm       ASTM D5185m       >4       0       0       0         Cadmium       ppm       ASTM D5185m       0       <1       0         Cadmium       ppm       ASTM D5185m       0       0       0         ADDITIVES       method       limit/base       current       history1       history2         Boron       ppm       ASTM D5185m       0       0       0       0         Maganese       ppm       ASTM D5185m       0       0       0       0         Magnesium       ppm       ASTM D5185m       0       0       0       0         Caluim       ppm       ASTM D5185m       0       0       0       0       0         Sulfurp	Chromium	ppm	ASTM D5185m	>2	0	0	0
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >3         0         <1	Nickel	ppm	ASTM D5185m		0	0	0
Aluminum         ppm         ASTM D5185m         >3         0         <1	Titanium	ppm	ASTM D5185m		0	0	0
Lead         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >8         0         0         0           Tin         ppm         ASTM D5185m         >4         0         0         0           Vanadium         ppm         ASTM D5185m         >4         0         0         0           Cadmium         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           Magnese         ppm         ASTM D5185m         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         0         0         0           Calcium         ppm         ASTM D5185m         0         0         0         0           Sulfur         ppm         ASTM D5185m         50         0         0         0	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >8         0         0         0           Tin         ppm         ASTM D5185m         >4         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         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           Magnese         ppm         ASTM D5185m         0         0         0         0           Calcium         ppm         ASTM D5185m         0         0         0         0           Phosphorus         ppm         ASTM D5185m         0         0         0         0           Sulfur         ppm         ASTM D5185m         50         0         <1         <1 <th>Aluminum</th> <th>ppm</th> <th>ASTM D5185m</th> <th>&gt;3</th> <th>0</th> <th>&lt;1</th> <th></th>	Aluminum	ppm	ASTM D5185m	>3	0	<1	
Tin         ppm         ASTM D5185m         >4         0         0         0           Vanadium         ppm         ASTM D5185m         0         <1         0           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           Magnesium         ppm         ASTM D5185m         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         0         0         0           Calcium         ppm         ASTM D5185m         0         0         0         0           Phosphorus         ppm         ASTM D5185m         0         0         0         0           Sulfur         ppm         ASTM D5185m         50         0         0         0           Sulfur         ppm         ASTM D5185m         50         0         <1         <1           Sodium <th>Lead</th> <th>ppm</th> <th>ASTM D5185m</th> <th>&gt;2</th> <th>0</th> <th>0</th> <th>0</th>	Lead	ppm	ASTM D5185m	>2	0	0	0
Vanadium         ppm         ASTM D5185m         0         <1	Copper	ppm	ASTM D5185m	>8	0	0	0
CadmiumppmASTM D5185m000ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m000BariumppmASTM D5185m000MolybdenumppmASTM D5185m000MagneseeppmASTM D5185m000MagnesiumppmASTM D5185m000CalciumppmASTM D5185m000PhosphorusppmASTM D5185m000ZincppmASTM D5185m000SulfurppmASTM D5185m000SulfurppmASTM D5185m000CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m200<10PotassiumppmASTM D5185m>200<10PotassiumppmASTM D5185m>200<10Water%ASTM D5185m>200<10Water%ASTM D5185m>200<10PomASTM D5185m>200<10PomASTM D5185m>200<10PomASTM D5185m>200<10PomASTM D5185m>200<10PomAST	Tin	ppm	ASTM D5185m	>4	0	0	0
ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m000BariumppmASTM D5185m000MolybdenumppmASTM D5185m000MagneseeppmASTM D5185m000MagnesiumppmASTM D5185m000CalciumppmASTM D5185m000CalciumppmASTM D5185m000PhosphorusppmASTM D5185m000ZincppmASTM D5185m000SulfurppmASTM D5185m000CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>150<1<1PotassiumppmASTM D5185m>200<10Water%ASTM D5185m>200<10Water%ASTM D5185m>200.0030.004ppmASTM D5185m>200<10Water%ASTM D6304>1005235.741.9FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>100005219193611336	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron         ppm         ASTM D5185m         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         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           Character         ppm         ASTM D5185m         50         0         0         0           Sulfur         ppm         ASTM D5185m         50         0         0         0           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         0         <1         0           Potassium         ppm         ASTM D6304         >0.01         0.003         0.004	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0           Manganese         ppm         ASTM D5185m         0         0         0           Magnesium         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           Phosphorus         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         50         0         0         0           Sulfur         ppm         ASTM D5185m         50         0         <1         <1           Sodium         ppm         ASTM D5185m         >15         0         <1         <1           Sodium         ppm         ASTM D5185m         >20         0         <1         0           Potassium         ppm         ASTM D6304         >0.01         0.003	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         0         0         0           Manganese         ppm         ASTM D5185m         <1         0         <1           Magnesium         ppm         ASTM D5185m         0         0         0           Calcium         ppm         ASTM D5185m         0         0         0           Calcium         ppm         ASTM D5185m         0         0         0           Calcium         ppm         ASTM D5185m         0         0         0           Phosphorus         ppm         ASTM D5185m         0         0         0           Zinc         ppm         ASTM D5185m         50         0         0         0           Sulfur         ppm         ASTM D5185m         50         0         0         0           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         0         <1         <1           Sodium         ppm         ASTM D5185m         >20         0         <1         0           Potassium         ppm         ASTM D6304         >0.01	Boron	ppm	ASTM D5185m		0	0	0
Manganese         ppm         ASTM D5185m         <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium         ppm         ASTM D5185m         0         0         0           Calcium         ppm         ASTM D5185m         1         0         0           Phosphorus         ppm         ASTM D5185m         0         0         0         0           Zinc         ppm         ASTM D5185m         0         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         >15         0         <1         <1           Sodium         ppm         ASTM D5185m         >20         0         <1         0           Potassium         ppm         ASTM D5185m         >20         0         <1         0           Water         %         ASTM D6304         >0.01         0.005         0.003         0.004           opm         MSTM D6304         >100         52         35.7         41.9           FLUID	Molybdenum	ppm	ASTM D5185m		0	0	0
Calcium         ppm         ASTM D5185m         1         0         0           Phosphorus         ppm         ASTM D5185m         0         0         0         0           Zinc         ppm         ASTM D5185m         0         0         0         0           Sulfur         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         <1         <1           Sodium         ppm         ASTM D5185m         >0         <1         0         0           Potassium         ppm         ASTM D5185m         >20         0         <1         0           Water         %         ASTM D6304         >0.01         0.005         0.003         0.004           opm Water         ppm         ASTM D6304         >100         52         35.7         41.9           FLUID CLEANLINESS         method         limit/base         current         h	Manganese	ppm	ASTM D5185m		<1	0	<1
Phosphorus         ppm         ASTM D5185m         0         0         0         0           Zinc         ppm         ASTM D5185m         0         1         1         0	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         <1         <1           Sodium         ppm         ASTM D5185m         >15         0         <1         <1           Sodium         ppm         ASTM D5185m         >20         0         <1         0           Potassium         ppm         ASTM D6304         >0.01         0.005         0.003         0.004           oppm Water         ppm         ASTM D6304         >100         52         35.7         41.9           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >10000         5219         1936         11336	Calcium	ppm	ASTM D5185m		1	0	0
Sulfur         ppm         ASTM D5185m         50         0         0         0           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         0         <1         <1           Sodium         ppm         ASTM D5185m         >15         0         <1         0           Potassium         ppm         ASTM D5185m         >20         0         <1         0           Water         %         ASTM D6304         >0.01         0.005         0.003         0.004           oppm Water         ppm         ASTM D6304         >100         52         35.7         41.9           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >10000         5219         1936         11336	Phosphorus	ppm	ASTM D5185m		0	0	0
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m<>15         0         <1         <1           Sodium         ppm         ASTM D5185m<>20         0         <1         0           Potassium         ppm         ASTM D5185m<>20         0         <1         0           Water         %         ASTM D6304<>0.01         0.005         0.003         0.004           opm Water         ppm         ASTM D6304<>100         52         35.7         41.9           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647<>10000         5219         1936         11336	Zinc	ppm	ASTM D5185m		0	0	0
Silicon         ppm         ASTM D5185m         >15         0         <1	Sulfur	ppm	ASTM D5185m	50	0	0	0
Sodium         ppm         ASTM D5185m         0         <1	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         <1	Silicon	ppm	ASTM D5185m	>15	0	<1	<1
Water         %         ASTM D6304         >0.01         0.005         0.003         0.004           opm Water         ppm         ASTM D6304         >100         52         35.7         41.9           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >10000         5219         1936         11336	Sodium	ppm	ASTM D5185m		0	<1	0
opm Water         ppm         ASTM D6304         >100         52         35.7         41.9           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >10000         5219         1936         11336	Potassium	ppm	ASTM D5185m	>20	0	<1	0
FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4μm       ASTM D7647       >10000       5219       1936       ▲ 11336	Water	%	ASTM D6304	>0.01	0.005	0.003	0.004
Particles >4μm ASTM D7647 >10000 5219 1936 ▲ 11336	ppm Water	ppm	ASTM D6304	>100	52	35.7	41.9
	FLUID CLEANLIN	IESS	method	limit/base	current	history1	history2
Particles >6um	Particles >4µm		ASTM D7647	>10000	5219	1936	🔺 11336
αιιώσο νομπ Αστικι μίστη 2200 Ιστι 040 Δ 2024	Particles >6µm		ASTM D7647	>2500	1311	640	<b>a</b> 2524
Particles >14μm         ASTM D7647         >320         54         51         56	Particles >14µm		ASTM D7647	>320	54	51	56

ASTM D7647 >80

ASTM D7647 >20

ASTM D7647 >4

>20/18/15

ISO 4406 (c)

mg KOH/g ASTM D974 0.005

Sample Rating Trend

Contact/Location: RICK DUVALL - TYSWAL

10

0

0

18/16/13

0.014

8

1

0

0.01

20/18/13

6

1

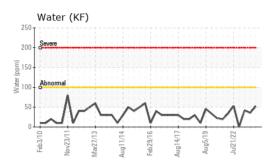
0

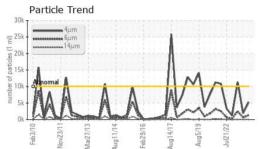
21/19/13

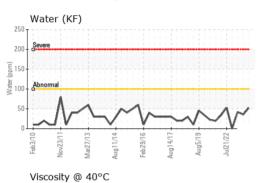
0.013

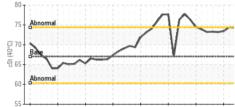


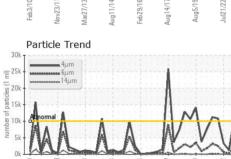
# **OIL ANALYSIS REPORT**







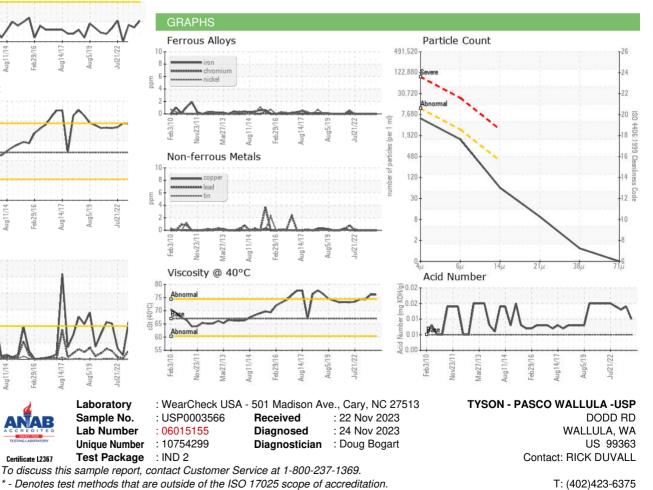




11000

Mar27/1

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	LIGHT	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 PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	67	76.1	76.1	74.3
SAMPLE IMAGE	S	method	limit/base	current	history1	history2
Color						
Bottom				(6)		



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

Page 2 of 2

F: (402)423-6661