

## **OIL ANALYSIS REPORT**

Area HINO [600380383] Machine Id 50WEA81860

Component Hydraulic System Fluid SHELL TELLUS ARTIC 32 (--- LTR)

#### DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

#### Wear

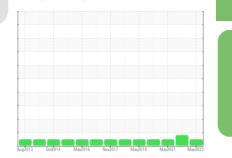
All component wear rates are normal.

#### 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 Rating Trend

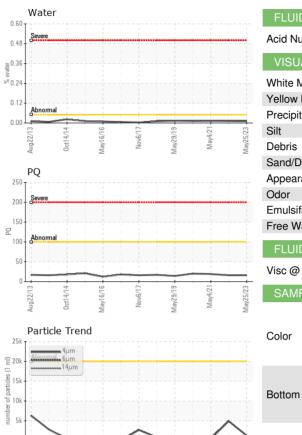


NORMAL

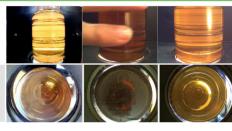
SAMPLE INFORMATION         method         limit/base         current         history1         history2           Sample Date         Client Info         NX0559221144         NX05502275         NX05387395           Sample Date         Client Info         0         0         0           Oil Age         hrs         Client Info         0         0         0           Oil Changed         Client Info         0         0         0         0           Oil Changed         Client Info         NARA         NAA         N/A           Sample Status         Imethod         Imulbase         current         history1         history2           PQ         ASTM D8185         >20         6         20         8           Chromium         ppm         ASTM D8185         >20         0         -1         -1           Nickel         ppm         ASTM D8185         >20         0         -1         0         0           Intanium         ppm         ASTM D8185         >20         -1         2         -1         1         1         1         1         1         1         1         1         1         1         1         1         1         1			Aug2013	Oct2014 May2016	Nov2017 May2019 May2021	May2023	
Sample Date         Client Info         25 May 2023         07 Jun 2022         04 May 2021           Machine Age         hrs         Client Info         0         0         0           Oil Age         hrs         Client Info         0         0         0           Oil Changed         Client Info         N/A         N/A         NA           Sample Status         Imit/base         Current         History1         History2           PQ         ASTM DB184         16         16         19           Iron         ppm         ASTM DB185         >20         6         400         81           Chromium         ppm         ASTM DB185         >20         0         <1         0         1           Nickel         ppm         ASTM DB185         >20         0         <1         0         0           Aluminum         ppm         ASTM DB185         >20         <1         2         <1         0           Astm DB185         >20         <1         2         <1         <1         1         1           Nickel         ppm         ASTM DB185         >20         <1         2         <1         1         1         1	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machtine Age         hrs         Client Info         0         0         0           Oil Age         irrs         Client Info         0         0         0           Oil Changed         Client Info         N/A         N/A         N/A           Sample Status         I         Imit/base         current         History1         History2           PQ         ASTM D8184         16         16         19           Iron         ppm         ASTM D8185         >20         6         ▲ 20         8           Chromium         ppm         ASTM D8186         >20         0         <1         0           Nickel         ppm         ASTM D8186         >20         0         <1         0           Nickel         ppm         ASTM D8186         >20         <1         0         0           Aluminum         ppm         ASTM D8186         >20         <1         2         <1           Copper         ppm         ASTM D8186         >20         <1         2         <1           Antimony         ppm         ASTM D8186         0         0         0         0           Antimony         ppm         ASTM D8186	Sample Number		Client Info		NX05928184	NX05602775	NX05387395
Oil Age         hrs         Client Info         0         0         0           Oil Changed         Client Info         N/A         N/A         N/A           Sample Status         I         Image         N/A         N/A         N/A           WEAR METALS         method         limit/base         current         history1         history2           PQ         ASTM D5186m         >20         6         A 20         8           Tran         ppm         ASTM D5186m         >20         0         <1         0           Nickel         ppm         ASTM D5186m         >20         0         <1         0           Silver         ppm         ASTM D5185m         >20         -1         0         0           Lead         ppm         ASTM D5185m         >20         <1         2         <1           Tin         ppm         ASTM D5185m         >20         <1         2         <1           Vanadium         ppm         ASTM D5185m         >20         <1         2         <1           Vanadium         ppm         ASTM D5185m         20         <1         2         <1           Manages         ppm	Sample Date		Client Info		25 May 2023	07 Jun 2022	04 May 2021
Oil Changed Sample Status         Client Info         N/A         N/A         N/A         N/A         N/A           WEAR METALS         method         imit/base         current         history1         history2           PQ         ASTM DB184         16         16         19           Iron         ppm         ASTM DB185         >20         6         400         81           Chromium         ppm         ASTM DB185         >20         0         <1         1           Nickel         ppm         ASTM DB185         >20         0         <10         0           Aluminum         ppm         ASTM DB185         >20         <1         0         0           Aluminum         ppm         ASTM DB185         >20         <1         0         0           Lead         ppm         ASTM DB185         >20         <1         2         <1           Antimony         ppm         ASTM DB185         >20         <1         0         0           Antimony         ppm         ASTM DB185         0         0         0         0           Antimony         ppm         ASTM DB185         0         0         0         0	Machine Age	hrs	Client Info		0	0	0
Sample Status         Imitable         NORMAL         ABNORMAL         NORMAL           WEAR METALS         method         limit/base         current         history1         history2           PQ         ASTM D8184         16         16         19           Iron         ppm         ASTM D8185m         >20         6         ▲         20         8           Chromium         ppm         ASTM D5185m         >20         0         <1         <1           Nickel         ppm         ASTM D5185m         >20         0         <1         0           Silver         ppm         ASTM D5185m         >20         <1         0         0           Lead         ppm         ASTM D5185m         >20         <1         2         <1           Copper         ppm         ASTM D5185m         >20         <1         2         <1           Tin         ppm         ASTM D5185m         >20         <1         2         <1           Cadmium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         26           Manga	Oil Age	hrs	Client Info		0	0	0
WEAR METALS         method         limit/base         current         history1         history2           PQ         ASTM D8184         16         16         19           Iron         ppm         ASTM D8186         20         6         20         8           Chromium         ppm         ASTM D8186         20         0         <1         0           Nickel         ppm         ASTM D8186         0         0         0         0           Silver         ppm         ASTM D5186m         20         <1         0         0           Aluminum         ppm         ASTM D5186m         20         <1         2         <1           Copper         ppm         ASTM D5185m         20         <1         2         <1           Tin         ppm         ASTM D5185m         20         <1         2         <1           Copper         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Barium	Oil Changed		Client Info		N/A	N/A	N/A
PQ         ASTM D8184         16         16         19           Iron         ppm         ASTM D8185         >20         6         ▲ 20         8           Chromium         ppm         ASTM D5185         >20         0         <1         <1           Nickel         ppm         ASTM D5185         >20         0         <1         0           Silver         ppm         ASTM D5185         >20         <1         0         0           Aluminum         ppm         ASTM D5185         >20         <1         0         0           Lead         ppm         ASTM D5185         >20         <1         2         <1           Copper         ppm         ASTM D5185         >20         <1         2         <1           Antimony         ppm         ASTM D5185         >0         <1         2         <1           Antimony         ppm         ASTM D5185         0         0         0         0           Cadadium         ppm         ASTM D5185         0         0         0         0           Antimony         ppm         ASTM D5185         0         0         0         0           Baridum <th>Sample Status</th> <th></th> <th></th> <th></th> <th>NORMAL</th> <th>ABNORMAL</th> <th>NORMAL</th>	Sample Status				NORMAL	ABNORMAL	NORMAL
iron         ppm         ASTM D5185m         >20         6         A 20         8           Chromium         ppm         ASTM D5185m         >20         0         <1         <1           Nickel         ppm         ASTM D5185m         >20         0         <1         0           Titanium         ppm         ASTM D5185m         >20         0         <1         0           Aluminum         ppm         ASTM D5185m         >20         <1         0         0           Lead         ppm         ASTM D5185m         >20         <1         2         <1           Copper         ppm         ASTM D5185m         >20         <1         2         <1           Antimony         ppm         ASTM D5185m         >20         <1         2         <1           Antimony         ppm         ASTM D5185m         0         0         0         0           Cadadium         ppm         ASTM D5185m         0         0         0         0           AstM D5185m         0         0         0         0         0         0           AstM D5185m         0         0         0         0         0         0	WEAR METALS		method	limit/base	current	history1	history2
Drive         Part M         ASTM D5185m         >20         0         <1	PQ		ASTM D8184		16	16	19
Nickel         ppm         ASTM D5185m         >20         0         <1	Iron	ppm	ASTM D5185m	>20	6	<u> </u>	8
Titanium         ppm         ASTM D5185m         0         <1	Chromium	ppm	ASTM D5185m	>20	0	<1	<1
Silver         ppm         ASTM D5185m         >20         <1	Nickel	ppm	ASTM D5185m	>20	0	<1	0
Aluminum         ppm         ASTM D5185m         >20         <1	Titanium	ppm	ASTM D5185m		0	0	0
Lead         ppm         ASTM D5185m         >20         <1	Silver	ppm	ASTM D5185m		0	<1	0
Copper         ppm         ASTM D5185m         >20         <1	Aluminum	ppm	ASTM D5185m	>20	<1	0	0
Tin         ppm         ASTM D5185m         >20         <1	Lead	ppm	ASTM D5185m	>20	<1	2	<1
Antimony         ppm         ASTM D5185m           0           Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         <1         0           Barium         ppm         ASTM D5185m         0         0         0         0           Manganese         ppm         ASTM D5185m         0         0         <1         1           Magnesium         ppm         ASTM D5185m         0         0         <1         <1           Magneses         ppm         ASTM D5185m         0         0         <1         <1           Magneses         ppm         ASTM D5185m         0         0         <1         <1           Magnese         ppm         ASTM D5185m         50         585         548         479           Zinc         ppm         ASTM D5185m         900         737         891         729           CONTA	Copper	ppm	ASTM D5185m	>20	<1	<1	<1
Number         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         <1	Tin	ppm	ASTM D5185m	>20	<1	2	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         <1         0           Barium         ppm         ASTM D5185m         0         0         0         0           Magnaese         ppm         ASTM D5185m         0         0         0         26           Magnesium         ppm         ASTM D5185m         0         0         0         <1         1           Magnesium         ppm         ASTM D5185m         0         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         0         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         50         585         548         479           Zinc         ppm         ASTM D5185m         50         588         72         66           Sulfur         ppm         ASTM D5185m         90         737         891         729           CONTAMINANTS         method         limit/base	Antimony	ppm	ASTM D5185m				0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         <1         0           Barium         ppm         ASTM D5185m         0         0         0         0           Maganese         ppm         ASTM D5185m         0         0         0         26           Magnesium         ppm         ASTM D5185m         0         0         0         21         1           Magnesium         ppm         ASTM D5185m         0         0         0         <1         1           Calcium         ppm         ASTM D5185m         5         4         0         30           Phosphorus         ppm         ASTM D5185m         50         58         548         479           Zinc         ppm         ASTM D5185m         50         58         72         66           Sulfur         ppm         ASTM D5185m         900         737         891         729           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         20<	Vanadium	ppm	ASTM D5185m		0	0	0
Boron         ppm         ASTM D5185m         5         0         <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         26           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         0         0         0         <1           Calcium         ppm         ASTM D5185m         5         4         0         30           Phosphorus         ppm         ASTM D5185m         600         585         548         479           Zinc         ppm         ASTM D5185m         50         58         72         66           Sulfur         ppm         ASTM D5185m         900         737         891         729           CONTAMINANTS         method         imit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >20         0         0         0           Water         %         ASTM D6304         >0.05	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         0         0         0         26           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         0         0         0         <1           Calcium         ppm         ASTM D5185m         5         4         0         30           Phosphorus         ppm         ASTM D5185m         600         585         548         479           Zinc         ppm         ASTM D5185m         600         585         548         479           Zinc         ppm         ASTM D5185m         900         737         891         729           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >20         0         0         <1           Potassium         ppm         ASTM D5185m         >20         0         0         <13           ppm Water         ppm         ASTM D504         >000         10.0.	Boron	ppm	ASTM D5185m	5	0	<1	0
Manganese         ppm         ASTM D5185m         0         0         <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         0         0         0         <1	Molybdenum	ppm	ASTM D5185m	0	0	0	26
Calcium         ppm         ASTM D5185m         5         4         0         30           Phosphorus         ppm         ASTM D5185m         600         585         548         479           Zinc         ppm         ASTM D5185m         50         58         72         66           Sulfur         ppm         ASTM D5185m         900         737         891         729           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >20         0         0         <1           Potassium         ppm         ASTM D6304         >0.05         0.011         0.012         0.013           ppm Water         ppm         ASTM D7647         >20000         1267         4921         528           Particles >4µm         ASTM D7647         >20000         1267         4921         528           Particles >6µm         ASTM D7647         >20000         17	Manganese	ppm	ASTM D5185m	0	0	<1	<1
Phosphorus         ppm         ASTM D5185m         600         585         548         479           Zinc         ppm         ASTM D5185m         50         58         72         66           Sulfur         ppm         ASTM D5185m         900         737         891         729           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >20         0         0         <11	Magnesium	ppm	ASTM D5185m	0	0	0	<1
Zinc         ppm         ASTM D5185m         50         58         72         66           Sulfur         ppm         ASTM D5185m         900         737         891         729           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >15         3         3         3           Potassium         ppm         ASTM D5185m         >20         0         0         <1           Potassium         ppm         ASTM D6304         >0.05         0.011         0.012         0.013           ppm Water         ppm         ASTM D6304         >500         110.9         121.1         133.4           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >20000         1267         4921         528           Particles >6µm         ASTM D7647         >2000         270         614         168           Particles >14µm         ASTM D7647         >320         17	Calcium	ppm	ASTM D5185m	5	4	0	30
Sulfur         ppm         ASTM D5185m         900         737         891         729           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >20         0         0         <11	Phosphorus	ppm	ASTM D5185m	600	585	548	479
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         >15         3         3         3           Potassium         ppm         ASTM D5185m         >20         0         0         <1           Potassium         ppm         ASTM D6304         >0.05         0.011         0.012         0.013           ppm Water         ppm         ASTM D6304         >500         110.9         121.1         133.4           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >20000         1267         4921         528           Particles >6µm         ASTM D7647         >2000         270         614         168           Particles >14µm         ASTM D7647         >320         17         33         18           Particles >21µm         ASTM D7647         >20         1         0         0           Particles >38µm         ASTM D7647         20         1         0 <td< th=""><th>Zinc</th><th>ppm</th><th>ASTM D5185m</th><th>50</th><th>58</th><th>72</th><th>66</th></td<>	Zinc	ppm	ASTM D5185m	50	58	72	66
Silicon         ppm         ASTM D5185m         >15         3         3         3           Sodium         ppm         ASTM D5185m         0         0         <1           Potassium         ppm         ASTM D5185m         >20         0         0         <1           Potassium         ppm         ASTM D5185m         >20         0         0         0         <1           Water         %         ASTM D6304         >0.05         0.011         0.012         0.013           ppm Water         ppm         ASTM D6304         >500         110.9         121.1         133.4           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >20000         1267         4921         528           Particles >6µm         ASTM D7647         >2000         270         614         168           Particles >14µm         ASTM D7647         >320         17         33         18           Particles >21µm         ASTM D7647         >20         1         0         0           Particles >38µm         ASTM D7647         >20         1         0         0	Sulfur	ppm	ASTM D5185m	900	737	891	729
Sodium         ppm         ASTM D5185m         0         0         <1	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         0         0           Water         %         ASTM D6304         >0.05         0.011         0.012         0.013           ppm Water         ppm         ASTM D6304         >500         110.9         121.1         133.4           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >20000         1267         4921         528           Particles >6µm         ASTM D7647         >2500         270         614         168           Particles >14µm         ASTM D7647         >320         17         33         18           Particles >21µm         ASTM D7647         >20         1         0         0           Particles >38µm         ASTM D7647         >20         1         0         0           Particles >71µm         ASTM D7647         >4         0         0         0	Silicon	ppm	ASTM D5185m	>15	3	3	3
Water         %         ASTM D6304         >0.05         0.011         0.012         0.013           ppm Water         ppm         ASTM D6304         >500         110.9         121.1         133.4           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >20000         1267         4921         528           Particles >6µm         ASTM D7647         >2500         270         614         168           Particles >14µm         ASTM D7647         >320         17         33         18           Particles >21µm         ASTM D7647         >20         1         0         0           Particles >38µm         ASTM D7647         >20         1         0.0         0           Particles >71µm         ASTM D7647         >4         0         0         0	Sodium	ppm	ASTM D5185m		0	0	<1
ppm Water         ppm         ASTM D6304         >500         110.9         121.1         133.4           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >20000         1267         4921         528           Particles >6µm         ASTM D7647         >2500         270         614         168           Particles >14µm         ASTM D7647         >320         17         33         18           Particles >21µm         ASTM D7647         >80         6         8         5           Particles >38µm         ASTM D7647         >20         1         0         0           Particles >71µm         ASTM D7647         >4         0         0         0	Potassium	ppm	ASTM D5185m	>20	0	0	0
FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >20000         1267         4921         528           Particles >6μm         ASTM D7647         >2500         270         614         168           Particles >14μm         ASTM D7647         >320         17         33         18           Particles >21μm         ASTM D7647         >80         6         8         5           Particles >38μm         ASTM D7647         >20         1         0         0           Particles >71μm         ASTM D7647         >4         0         0         0	Water	%	ASTM D6304	>0.05	0.011	0.012	0.013
Particles >4μm         ASTM D7647         >20000         1267         4921         528           Particles >6μm         ASTM D7647         >2500         270         614         168           Particles >14μm         ASTM D7647         >320         17         33         18           Particles >21μm         ASTM D7647         >80         6         8         5           Particles >38μm         ASTM D7647         >20         1         0         0           Particles >71μm         ASTM D7647         >4         0         0         0	ppm Water	ppm	ASTM D6304	>500	110.9	121.1	133.4
Particles >6μm         ASTM D7647         >2500         270         614         168           Particles >14μm         ASTM D7647         >320         17         33         18           Particles >21μm         ASTM D7647         >80         6         8         5           Particles >38μm         ASTM D7647         >20         1         0         0           Particles >71μm         ASTM D7647         >4         0         0         0	FLUID CLEANLIN	ESS	method	limit/base	current	history1	history2
Particles >14μm         ASTM D7647         >320         17         33         18           Particles >21μm         ASTM D7647         >80         6         8         5           Particles >38μm         ASTM D7647         >20         1         0         0           Particles >71μm         ASTM D7647         >4         0         0         0	Particles >4µm		ASTM D7647	>20000	1267	4921	528
Particles >21μm         ASTM D7647         >80         6         8         5           Particles >38μm         ASTM D7647         >20         1         0         0           Particles >71μm         ASTM D7647         >4         0         0         0	Particles >6µm		ASTM D7647	>2500	270	614	168
Particles >38μm         ASTM D7647         >20         1         0         0           Particles >71μm         ASTM D7647         >4         0         0         0	Particles >14µm		ASTM D7647	>320	17	33	18
Particles >71µm         ASTM D7647         >4         0         0         0	Particles >21µm		ASTM D7647	>80	6	8	5
· · · · · · · · · · · · · · · · · · ·	Particles >38µm		ASTM D7647	>20	1	0	0
Oil Cleanliness ISO 4406 (c) >21/18/15 17/15/11 19/16/12 16/15/11	Particles >71µm		ASTM D7647	>4	0	0	0
	Oil Cleanliness		ISO 4406 (c)	>21/18/15	17/15/11	19/16/12	16/15/11

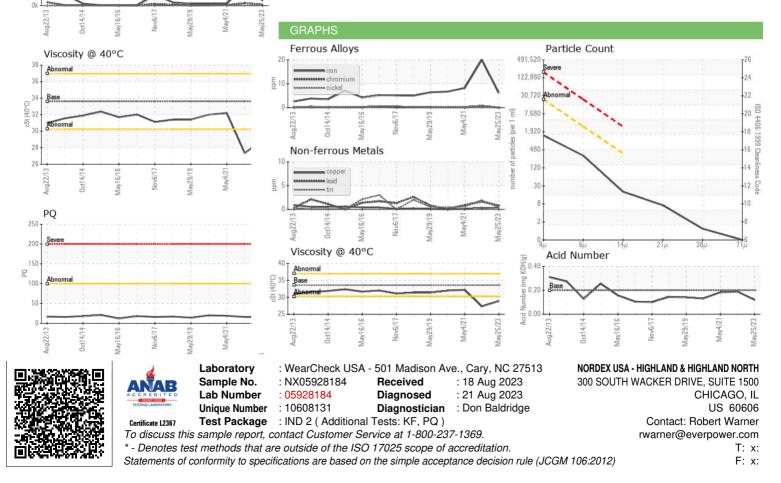


# **OIL ANALYSIS REPORT**



FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	0.20	0.12	0.19	0.183
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	>0.05	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	33.6	28.9	27.34	32.2
SAMPLE IMAGES	S	method	limit/base	current	history1	history2





Contact/Location: Robert Warner - NORHIG