

## **OIL ANALYSIS REPORT**

### **CHEATHAM ANNEX** 2B 2BLW CRANE 2B (S/N 62510227) Component

Gearbox

Fluid SHELL OMALA S4 WE 220 (--- GAL)

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

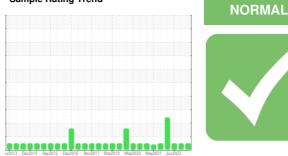
All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

### Fluid Condition

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



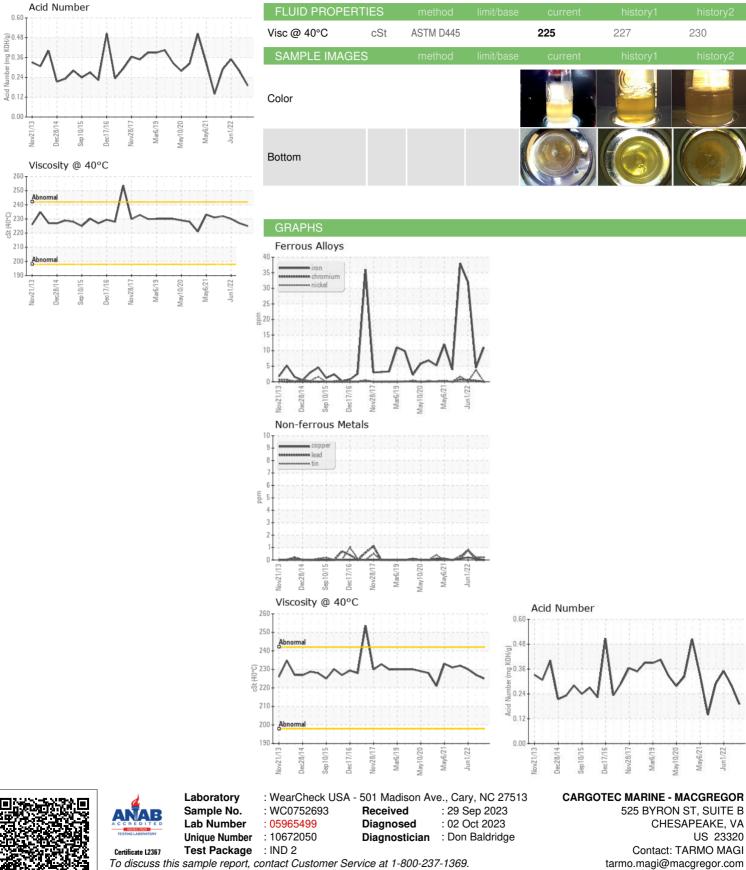
Sample Rating Trend



Sample Number Client Info VC0752783 WC0752783 WC0753793   Sample Date Client Info 01 Ot Oct 202 22 Jan 2023 01 Jun 2022   Machine Age hrs Client Info 0 0 0   Oll Age hrs Client Info N/A N/A N/A   Sample Status Image Client Info N/A N/A N/A   WEAR METALS method Imit/base current NoRMAL NORMAL   Iron ppm ASTM 05185m >200 11 4 32   Chromium ppm ASTM 05185m >200 1 4 0   Silver ppm ASTM 05185m >15 0 4 0   Copper ppm ASTM 05185m >25 9 1 16   Lead ppm ASTM 05185m >25 <1 <1 1   Copper ppm ASTM 05185m 25 <1 <1 1   Copper	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 I NORMAL NORMAL NORMAL   WEAR METALS method Imit/base current history1 history2   Iron ppm ASTM DS185m >200 11 4 32   Chromium ppm ASTM DS185m >15 0 <1 0   Nickel ppm ASTM DS185m 0 0 <1 0   Silver ppm ASTM DS185m >25 9 1 16   Lead ppm ASTM DS185m >200 0 <1 0   Cadmium ppm ASTM DS185m >20 <1 0 0   Vanadium ppm ASTM DS185m 0 <1 0 0   Adminum ppm ASTM DS185m 0 <1 0 0   Vanadium	Sample Number		Client Info		WC0752693	WC0752728	WC0573793
Oil AgehrsClient Info000Oil ChangedClient InfoN/AN/AN/AN/ASample StatusClient InfoN/AN/AN/AWEAR METALSmethodlimit/basecurrenthistory1history2IronppmASTM 05185n>20011432ChromiumppmASTM 05185n>150<1<1NickelppmASTM 05185n>150<10AluminumppmASTM 05185n>2591116LeadppmASTM 05185n>2591116LeadppmASTM 05185n>2000<1<1CopperppmASTM 05185n>2000<10AdminumppmASTM 05185n0<100AdminumppmASTM 05185n0<100AdminumppmASTM 05185n0<100AdminumppmASTM 05185n0<100AdminumppmASTM 05185n0<100AdminumppmASTM 05185n0<100AdminumppmASTM 05185n0<100AdminumppmASTM 05185n5<151ManganesiumppmASTM 05185n5<151MarganeseppmASTM 05185n50	Sample Date		Client Info		01 Oct 2023	22 Jan 2023	01 Jun 2022
Oil Changed Client Info N/A N/A N/A N/A   Sample Status Image of the status Image of the status Image of the status NORMAL NORMAL NORMAL NORMAL   WEAR METALS method limit/base current history1 history2   Iron ppm ASTM D518m >200 11 4 32   Chromium ppm ASTM D518m >15 0 <1	Machine Age	hrs	Client Info		0	0	0
Sample Status Initial Morent Mor	Oil Age	hrs	Client Info		0	0	0
WEAR METALS method limit/base current history1 history2   Iron ppm ASTM 05185m >200 11 4 32   Chromium ppm ASTM 05185m >15 0 <1 <1   Nickel ppm ASTM 05185m >15 0 <1 0   Aluminum ppm ASTM 05185m >255 9 1 16   Lead ppm ASTM 05185m >250 0 <1 <1   Copper ppm ASTM 05185m >250 0 <1 <1 <1   Vanadium ppm ASTM 05185m >250 <1 <1 <1 <1   Vanadium ppm ASTM 05185m >200 0 <1 4   Barum ppm ASTM 05185m 0 <1 4   Manganese ppm ASTM 05185m 518 392 444   Zinc pm ASTM 05185m 518 392	Oil Changed		Client Info		N/A	N/A	N/A
IronppmASTM D5185n>20011432ChromiumppmASTM D5185n>150<1<1NickelppmASTM D5185n>15040TitaniumppmASTM D5185n0<10<1SilverppmASTM D5185n0<10<1AluminumppmASTM D5185n>259116LeadppmASTM D5185n>2000<1<1CopperppmASTM D5185n>2000<10TinppmASTM D5185n>200<10YanadiumppmASTM D5185n0<10<1YanadiumppmASTM D5185n0<144BariumppmASTM D5185n0<1<1<1MolybdenumppmASTM D5185n0<1<1<1MolybdenumppmASTM D5185n5183924444ZincppmASTM D5185n5183924444ZincppmASTM D5185n518392444ZincppmASTM D5185n518392424ZincppmASTM D5185n518392424ZincppmASTM D5185n518392444ZincppmASTM D5185n52016SulfurppmASTM D5185n52016Sulfur <td< th=""><th>Sample Status</th><th></th><th></th><th></th><th>NORMAL</th><th>NORMAL</th><th>NORMAL</th></td<>	Sample Status				NORMAL	NORMAL	NORMAL
Chromium ppm ASTM D5185m >15 0 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >15 0 4 0   Titanium ppm ASTM D5185m 0 <1	Iron	ppm	ASTM D5185m	>200	11	4	32
Intanium ppm ASTM D5185m 0 <1   Silver ppm ASTM D5185m 0 <1	Chromium	ppm	ASTM D5185m	>15	0	<1	<1
Silver ppm ASTM D5185m 0 <1 0   Aluminum ppm ASTM D5185m >25 9 1 16   Lead ppm ASTM D5185m >100 0 <1	Nickel	ppm	ASTM D5185m	>15	0	4	0
Atuminum ppm ASTM D5185m >25 9 1 16   Lead ppm ASTM D5185m >100 0 <1	Titanium	ppm	ASTM D5185m		0	0	<1
LeadppmASTM D5185m>10000<1<1CopperppmASTM D5185m>2000<1	Silver	ppm	ASTM D5185m		0	<1	0
Copper ppm ASTM D5185m >200 0 <1 <1   Tin ppm ASTM D5185m >25 <1	Aluminum	ppm	ASTM D5185m	>25	9	1	16
Tin ppm ASTM D5185m >25 <1 <1 <1   Vanadium ppm ASTM D5185m 0 <1	Lead	ppm	ASTM D5185m	>100	0	0	<1
TinppmASTM D5185m>25<1<1<1<1VanadiumppmASTM D5185m0<1	Copper		ASTM D5185m	>200	0	<1	<1
VanadiumppmASTM D5185m0<10CadmiumppmASTM D5185m0<1			ASTM D5185m	>25	<1	<1	<1
ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m0<1	Vanadium	ppm	ASTM D5185m		0	<1	0
BoronppmASTM D5185m0<14BariumppmASTM D5185m0<1	Cadmium	ppm	ASTM D5185m		0	<1	0
BariumppmASTM D5185m0<1	ADDITIVES		method	limit/base	current	history1	history2
MolybdenumppmASTM D5185m00<1ManganeseppmASTM D5185m5<1	Boron	ppm	ASTM D5185m		0	<1	4
MolybdenumppmASTM D5185m00<1MagnesseppmASTM D5185m5<1	Barium	ppm	ASTM D5185m		0	<1	0
ManganeseppmASTM D5185m0<1<1MagnesiumppmASTM D5185m5<1	Molybdenum		ASTM D5185m		0	0	<1
MagnesiumppmASTM D5185m5<15CalciumppmASTM D5185m0<1	,		ASTM D5185m			<1	<1
CalciumppmASTM D5185m0<110PhosphorusppmASTM D5185m518392444ZincppmASTM D5185m026SulfurppmASTM D5185m467771CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>5018542SodiumppmASTM D5185m>5018542SodiumppmASTM D5185m>20516FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D80450.190.280.35VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONEDebrisscalar*VisualNONENONENONENONEAdd/Dirtscalar*VisualNORMLNORMLNORMLNORMLAcid Numerscalar*VisualNORMLNORMLNORMLNORMLPrecipitatescalar*VisualNONENONENONENONESiltscalar*V	-		ASTM D5185m			<1	5
PhosphorusppmASTM D5185m518392444ZincppmASTM D5185m026SulfurppmASTM D5185m467771CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>5018542SodiumppmASTM D5185m>5018542SodiumppmASTM D5185m>20516FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D80450.190.280.35VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONEAstad/Diritscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLAdorscalar*VisualNORMLNORMLNORMLNORMLAcid Numerscalar*VisualNORMLNORMLNORMLNORMLAdorscalar <th>Calcium</th> <td></td> <td>ASTM D5185m</td> <td></td> <th></th> <td></td> <td>10</td>	Calcium		ASTM D5185m				10
ZincppmASTM D5185m0026SulfurppmASTM D5185m467771CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>5018542SodiumppmASTM D5185m>5018542SodiumppmASTM D5185m>20516FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D80450.190.280.35VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONENONENONESiltscalar*VisualNONENONENONENONENONESiltscalar*VisualNONENONENONENONENONESand/Dirtscalar*VisualNONENONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLCodorscalar*VisualNORMLNORMLNORMLNORMLNORMLCodorscalar*VisualNORMLNORMLNORMLNORMLNORMLCodorscalar*VisualNORMLNORMLNORMLNORMLNORMLC	Phosphorus		ASTM D5185m		518	392	444
SulfurppmASTM D5185m467771CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>5018542SodiumppmASTM D5185m>5018542PotassiumppmASTM D5185m>20516FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D80450.190.280.35VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONENONENONESiltscalar*VisualNONENONENONENONENONESoldurscalar*VisualNONENONENONENONENONESiltscalar*VisualNONENONENONENONENONESand/Dirtscalar*VisualNONENONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLCdorscalar*VisualNORMLNORMLNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEGNEG			ASTM D5185m		0	2	6
SiliconppmASTM D5185m>5018542SodiumppmASTM D5185m04<1	Sulfur		ASTM D5185m		46		
SodiumppmASTM D5185m04<1	CONTAMINANTS		method	limit/base	current	history1	history2
PotassiumppmASTM D5185m>20516FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D80450.190.280.35VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONENONEPrecipitatescalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONEDebrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNORMLNORMLNORMLNORMLAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORMLFree Waterscalar*Visual>0.2NEGNEGNEG	Silicon	ppm	ASTM D5185m	>50	18	5	42
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D80450.190.280.35VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONENONEPrecipitatescalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONEDebrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEG	Sodium	ppm	ASTM D5185m		0	4	<1
Acid Number (AN)mg KOHgASTM D80450.190.280.35VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONENONEPrecipitatescalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONEDebrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEG	Potassium	ppm	ASTM D5185m	>20	5	1	6
VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONENONENONENONEYellow Metalscalar*VisualNONENONENONENONENONEPrecipitatescalar*VisualNONENONENONENONENONESiltscalar*VisualNONENONENONENONENONEDebrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEGFree Waterscalar*VisualNEGNEGNEGNEG	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
White Metalscalar*VisualNONENONENONENONEYellow Metalscalar*VisualNONENONENONENONEPrecipitatescalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONEDebrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEG	Acid Number (AN)	mg KOH/g	ASTM D8045		0.19	0.28	0.35
Yellow Metalscalar*VisualNONENONENONENONEPrecipitatescalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONEDebrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEG	VISUAL		method	limit/base	current	history1	history2
Precipitatescalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONEDebrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGFree Waterscalar*VisualNEGNEGNEG	White Metal	scalar	*Visual	NONE		NONE	NONE
Siltscalar*VisualNONENONENONENONEDebrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGFree Waterscalar*VisualNEGNEG	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Debrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEGFree Waterscalar*VisualImage: StalarNEGNEGNEG	Precipitate	scalar	*Visual		NONE	NONE	NONE
Sand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGFree Waterscalar*VisualNEGNEGNEG	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearancescalar*VisualNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEGFree Waterscalar*VisualImage: ScalarNEGNEGNEG	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Odorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGFree Waterscalar*VisualNEGNEGNEG	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Emulsified Waterscalar*Visual>0.2NEGNEGFree Waterscalar*VisualNEGNEGNEG	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Free Water scalar *Visual NEG NEG NEG	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG



# **OIL ANALYSIS REPORT**



\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

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

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May6/21.

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