

OIL ANALYSIS REPORT

Area West Virginia [West Virginia] Oil - Starboard Genset

Starboard Genset

Fluid MARATHON 15W40 (8 GAL)

Recommendation

Resample at the next service interval to monitor.

Wear

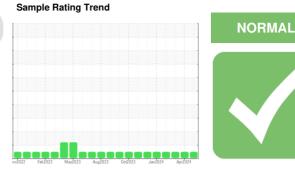
All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

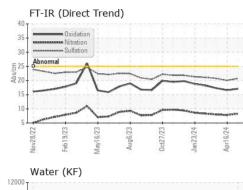




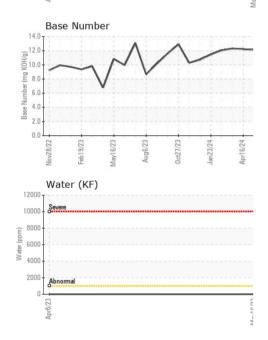
Sample Date Client Info 13 May 2024 16 Apr 2024 18 Mar 2024 Machine Age hrs Client Info 28385 28202 27985 Dil Age hrs Client Info 585 401 184 Dil Changed Client Info Not Changd N/A Not Changd Sample Status Imit/base current history1 NoRMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >4.0 <1.0 <1.0 <1.0 Glycol WC Method >4.0 <1.0 <1.0 <1.0 WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185m >50 3 5 4 Chromium ppm ASTM D5185m >4 <1 0 Silver ppm ASTM D5185m >5 <1 <1 0 Silver <td< th=""><th>Oil Age hr Oil Changed Sample Status Sample Status Image: Contamination Fuel Glycol WEAR METALS</th><th>Client Info S Client Info S Client Info Client Info Client Info WC Method</th><th>limit/başe</th><th>13 May 2024 28385 585 Not Changd</th><th>16 Apr 2024 28202 401 N/A</th><th>18 Mar 2024 27985 184</th></td<>	Oil Age hr Oil Changed Sample Status Sample Status Image: Contamination Fuel Glycol WEAR METALS	Client Info S Client Info S Client Info Client Info Client Info WC Method	limit/başe	13 May 2024 28385 585 Not Changd	16 Apr 2024 28202 401 N/A	18 Mar 2024 27985 184
Machine AgehrsClient Info283852820227985Dil AgehrsClient Info585401184Dil ChangedClient InfoNot ChangdN/ANot ChangdSample StatusImit/basecurrenthistory1history2FuelWC Method>4.0<1.0<1.0<1.0GlycolWC Method>4.0<1.0<1.0<1.0WEAR METALSmethodlimit/basecurrenthistory1history2ronppmASTM D5185m>50354ChromiumppmASTM D5185m>2<1<10NickelppmASTM D5185m>5<1<10SilverppmASTM D5185m>5<1<10AluminumppmASTM D5185m>12231eadppmASTM D5185m>17<1<1<1CopperppmASTM D5185m>15<11<1VanadiumppmASTM D5185m<1<10<1Astm D5185m>15<11<10<1AbanduimppmASTM D5185m<1<10<1CopperppmASTM D5185m<1<1<10AbanduimppmASTM D5185m<1<1<10AbanduimppmASTM D5185m<1<1<10AbanduimppmASTM D5185m <td< th=""><th>Machine Age hr Oil Age hr Oil Changed Sample Status CONTAMINATION Fuel Glycol WEAR METALS</th><th>s Client Info s Client Info Client Info Client Info WC Method</th><th>limit/başe</th><th>28385 585 Not Changd</th><th>28202 401 N/A</th><th>27985 184</th></td<>	Machine Age hr Oil Age hr Oil Changed Sample Status CONTAMINATION Fuel Glycol WEAR METALS	s Client Info s Client Info Client Info Client Info WC Method	limit/başe	28385 585 Not Changd	28202 401 N/A	27985 184
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Sample StatusNORMALNORMALNORMALNORMALCONTAMINATIONmethodlimit/basecurrenthistory1history2FuelWC Method>4.0<1.0<1.0<1.0<1.0GlycolWC MethodNEGNEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2ronppmASTM D5185m>50354ChromiumppmASTM D5185m>2<1<10NickelppmASTM D5185m>2<1<10SilverppmASTM D5185m>5<1<10AluminumppmASTM D5185m>12231_eadppmASTM D5185m>17<12<1CopperppmASTM D5185m>15<11<1VanadiumppmASTM D5185m<1<10<1ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m<1<10<1BariumppmASTM D5185m<1<10<1MolybdenumppmASTM D5185m<100<1ManganeseppmASTM D5185m<10<1<1Horibusfinit/basecurrenthistory1history2CopperppmASTM D5185m<1<10<1Mandumppm	Sample Status CONTAMINATION Fuel Glycol WEAR METALS	method WC Method	limit/başe	-		Not Chanad
CONTAMINATIONmethodlimit/basecurrenthistory1history2FuelWC Method>4.0<1.0<1.0<1.0<1.0GlycolWC MethodNEGNEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2ronppmASTM D5185m>50354ChromiumppmASTM D5185m>4<1<10NickelppmASTM D5185m>2<1<1<1CitaniumppmASTM D5185m>5<1<10SilverppmASTM D5185m>5<1<10AluminumppmASTM D5185m>12231_eadppmASTM D5185m>17<12<1CopperppmASTM D5185m>15<11<1FinppmASTM D5185m<1<10<1CadmiumppmASTM D5185m<1<10<1ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m<100<1ADDITIVESmethodlimit/basecurrenthistory1history2BariumppmASTM D5185m<100<1ADDITIVESmethodlimit/basecurrenthistory1history2BariumppmASTM D5185m<10<1<1 <th>CONTAMINATION Fuel Glycol WEAR METALS</th> <th>WC Method</th> <th>limit/base</th> <th>NORMAL</th> <th></th> <th>not chango</th>	CONTAMINATION Fuel Glycol WEAR METALS	WC Method	limit/base	NORMAL		not chango
Fuel WC Method >4.0 <1.0	Fuel Glycol WEAR METALS	WC Method	limit/base		NORMAL	NORMAL
GlycolWC MethodNEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2ronppmASTM D5185m>50354ChromiumppmASTM D5185m>4<1<10NickelppmASTM D5185m>2<1<1<1FitaniumppmASTM D5185m>2<1<10SilverppmASTM D5185m>5<1<10AluminumppmASTM D5185m>12231LeadppmASTM D5185m>17<12<1CopperppmASTM D5185m>70<1<1<1CopperppmASTM D5185m>15<11<1VanadiumppmASTM D5185m>15<110CadmiumppmASTM D5185m<1<10<1ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m<100<1ADUTIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m<100<1MolybdenumppmASTM D5185m<100<1MarganeseppmASTM D5185m<10<1<1	Glycol WEAR METALS			current	history1	history2
WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185m >50 3 5 4 Chromium ppm ASTM D5185m >4 <1 <1 0 Nickel ppm ASTM D5185m >2 <1 <1 <1 0 Silver ppm ASTM D5185m >5 <1 <1 0 0 Aluminum ppm ASTM D5185m >5 <1 <1 0 Aluminum ppm ASTM D5185m >12 2 3 1 Lead ppm ASTM D5185m >17 <1 <1 <1 Copper ppm ASTM D5185m >15 <1 1 <1 <1 Vanadium ppm ASTM D5185m >15 <1 1 <1 <1 Vanadium ppm ASTM D5185m <1 <1 0 <1 ADDITIVES method	WEAR METALS		>4.0	<1.0	<1.0	<1.0
ron ppm ASTM D5185m >50 3 5 4 Chromium ppm ASTM D5185m >4 <1 <1 0 Nickel ppm ASTM D5185m >2 <1 <1 <1 Titanium ppm ASTM D5185m >2 <1 <1 0 Silver ppm ASTM D5185m >5 <1 <1 0 Aluminum ppm ASTM D5185m >5 <1 <1 0 Aluminum ppm ASTM D5185m >12 2 3 1 Lead ppm ASTM D5185m >17 <1 2 <1 Copper ppm ASTM D5185m >15 <1 1 <1 Vanadium ppm ASTM D5185m >15 <1 1 <1 Vanadium ppm ASTM D5185m <1 <1 0 <1 ADDITIVES method limit/base current history1		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >4 <1		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 <1	Iron pp	ASTM D5185m	>50	3	5	4
Initial ppm ASTM D5185m <1			>4	<1	<1	0
Silver ppm ASTM D5185m >5 <1	Nickel pp	ASTM D5185m	>2	<1	<1	<1
Aluminum ppm ASTM D5185m >12 2 3 1 Lead ppm ASTM D5185m >17 <1 2 <1 Copper ppm ASTM D5185m >70 <1 <1 <1 Copper ppm ASTM D5185m >70 <1 <1 <1 Tin ppm ASTM D5185m >15 <1 1 <1 <1 Vanadium ppm ASTM D5185m <1 <1 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 1 <1	Titanium pp	ASTM D5185m		<1	<1	0
Lead ppm ASTM D5185m >17 <1	Silver pp	ASTM D5185m	>5	<1	<1	0
Copper ppm ASTM D5185m >70 <1	Aluminum pp	ASTM D5185m	>12	2	3	1
Tin ppm ASTM D5185m >15 <1	Lead pp	ASTM D5185m	>17	<1	2	<1
Vanadium ppm ASTM D5185m <1	Copper pp	ASTM D5185m	>70	<1	<1	<1
CadmiumppmASTM D5185m<1	Tin pp	ASTM D5185m	>15	<1	1	
ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m121619BariumppmASTM D5185m<100MolybdenumppmASTM D5185m677066ManganeseppmASTM D5185m<10<1	Vanadium pp	ASTM D5185m				
Boron ppm ASTM D5185m 12 16 19 Barium ppm ASTM D5185m <1	Cadmium pp	ASTM D5185m		<1	<1	0
Barium ppm ASTM D5185m <1	ADDITIVES	method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 67 70 66 Manganese ppm ASTM D5185m <1	Boron pp	ASTM D5185m		12	16	19
Manganese ppm ASTM D5185m <1	Barium pp	ASTM D5185m		<1	0	0
						66
Magnesium ppm ASTM D5185m 1417 1533 1399	•					
		ASTM D5185m		3242	3659	3755
CONTAMINANTS method limit/base current history1 history2	CONTAMINANTS	method	limit/base	current		
Silicon ppm ASTM D5185m >25 4 6 6				4	6	
				2	<1	3
Sodium ppm ASTM D5185m 2 <1						
Sodium ppm ASTM D5185m 2 <1	Water %	ASTM D6304	>0.1	NEG	NEG	NEG
Sodium ppm ASTM D5185m 2 <1	INFRA-RED	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 2 <1		*ASTM D7844		0.1	0.1	0.1
Sodium ppm ASTM D5185m 2 <1		s/cm *ASTM D7624	>20	8.3	7.8	8.0
Sodium ppm ASTM D5185m 2 <1	Sulfation Abs	s/.1mm *ASTM D7415	>30	20.7	20.0	20.7
Sodium ppm ASTM D5185m 2 <1	FLUID DEGRADATIO	ON method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 2 <1						
Sodium ppm ASTM D5185m 2 <1	Oxidation Abs	s/.1mm *ASTM D7414	>25	17.1	16.6	17.3



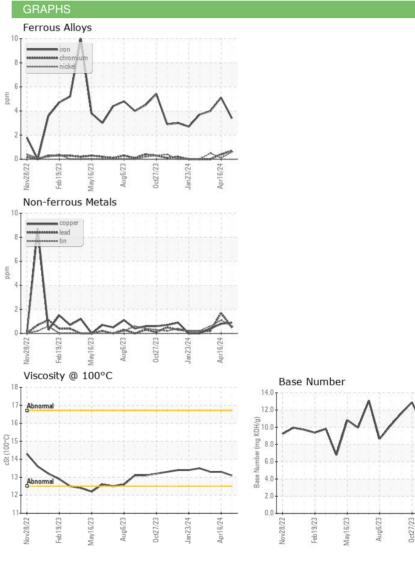
OIL ANALYSIS REPORT







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	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		13.1	13.3	13.3



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 MARATHON PETROLEUM CO. Sample No. : WC0874546 Received : 16 May 2024 101 12TH ST Lab Number : 06181549 Tested : 20 May 2024 CATLETTSBURG, KY Unique Number : 11032875 Diagnosed : 20 May 2024 - Sean Felton US 41169 Test Package : IND 2 (Additional Tests: KF) Contact: CORY GUMBERT Certificate 12367 cagumbert@marathonpetroleum.com To discuss this sample report, contact Customer Service at 1-800-237-1369. T: (606)585-3950 * - 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) F: x:

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Submitted By: Barry Bridges

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