

## **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Ic **MACK 423086** Component

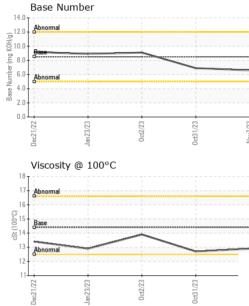
**Diesel Engine** Fluid

DIESEL ENGINE OIL SAE 15W40 (--- GAL)

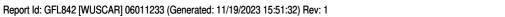
Sample Date         Otes specify the brand, type, and viscosity of the lon your next sample.         Sample Date         Otes filter         Of Nov 2023         31 Oct 2023         02 Oct 2023           Machine Age         mils         Citent Info         45685         420944         0           I component wear rates are normal.         Oid Age         mils         Citent Info         445685         420944         0           NorRMAL         NORMAL         NORMAL         NORMAL         NORMAL         NORMAL         NORMAL           I component wear rates are normal.         Indicatos filts in the re is suitable for further service.         CONTAMINATION         restroid         Indicatos filt         NORMAL		· ·	,	Dec2022	Jan2023	0ct2023 0ct2023	Nov2023	
Searage lattine and strat service interval to montor.         Sample Data         Oli Age         Oli Age <t< th=""><th>DIAGNOSIS</th><th>SAMPLE INFOR</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	DIAGNOSIS	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Hease sequely the brand, type, and viscosity of the         Acer         Ide on your next sample.         Acer         Id combaintable         here is no indication of any contamination in the it.         tail combaintable         here is no indication of any contamination in the it.         tail combaintable         here is no indication of any contamination         he ISN result indicates that there is suitable kinithy remaining in the oil. The condition of the issuitable for further service.         Visit and the issuitable is in the issuitable is outable is suitable for further service.         Nickel       ppm         Nickel       ppm         Approx       ASTM Diskin       >2.0       <1.0	Recommendation	Sample Number		Client Info		GFL0083721	GFL0099155	GFL0083724
I on your next sample.       Oil Age mits       Client Info       445695       462994       0         Arear       component wear rates are normal.       Oil Age mits       Client Info       Changed       N/A       N/A         Sample Status       Client Info       Changed       N/A       N/A       N/A         Uid Condition       he EM result indicates that there is suitable       CONTAMINATION       method       Introbuse       Current       Heldry/       Heldry/         Is is suitable for further service.       N/C Method       3.0       <1.0	Resample at the next service interval to monitor.	Sample Date		Client Info		07 Nov 2023	31 Oct 2023	02 Oct 2023
Trans       Cuit age       Pails		Machine Age	mls	Client Info		463347	462994	0
II component wear rates are normal.       Sample Status       NORMAL       NORMAL       NORMAL       NORMAL         Sample Status       CONTAMINATION       method       limitbase       current       History1       History2         Fuel       WC Method       S.0       41.0       <1.0	il on your next sample.	Oil Age	mls	Client Info		445685	462994	0
Contamination here is no indication of any contamination in hi.         CONTAMINATION         method         initibase         current         history1         history2           Fuel         WC Method         3.0         <1.0	Vear	Oil Changed		Client Info		Changed	N/A	N/A
CONTRAMINATION       Inched       Indicates       Instany1       Instany2         Muid Condition       he BN result indicates that there is suitable knihtly remaining in the 01. The condition of the BN result indicates that there is suitable for further service.       WC Method       >3.0       <1.0	Il component wear rates are normal.	Sample Status				NORMAL	NORMAL	NORMAL
Build Condition     Big cold     WC Method     NEG     NEG       he BM result indicates that there is suitable it is suitable for further service.     WEAR METALS     method     imit/base     current     history1     history2       from     ppm     ASTM 05186n     >120     30     28     3       Chromium     ppm     ASTM 05186n     >5     <1	Contamination here is no indication of any contamination in the	CONTAMINAT	ION	method	limit/base	current	history1	history2
Be BM result indicates that there is suitable for further service.         WEAR METALS         method         Initibase         current         history1         history2           Iron         ppm         ASTM 2518/m         >12.0         30         2.8         3           Chromium         ppm         ASTM 2518/m         >2.0         <1	il.	Fuel		WC Method	>3.0			
WEART METALS         method         introbase         current         history/         history/           Ion         ppm         ASTM05185m         >12.0         30         2.8         3           Ion         ppm         ASTM05185m         >2.0         -1         -1         -1           Nickel         ppm         ASTM05185m         >2.0         -1         -1         0           Silver         ppm         ASTM05185m         >2.0         -1         0         0           Auminum         ppm         ASTM05185m         >2.0         -1         -1         0           Auminum         ppm         ASTM05185m         >2.0         -1         -1         0           Auminum         ppm         ASTM05185m         >2.0         -1         -1         0           Auminum         ppm         ASTM05185m         >0         -1         -1         -1           Vanadium         ppm         ASTM05185m         >0         -1         -1         0           ADDITIVES         method         Imit/base         current         History/1         History/2           Boron         ppm         ASTM05185m         100         -1         -	luid Condition	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D3185m         >20         <1         <1         <1           Nickel         ppm         ASTM D3185m         >5         <1		WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >5         <1         1         <1           Titanium         ppm         ASTM D5185m         >2         <1	I is suitable for further service.	Iron	ppm	ASTM D5185m	>120	30	28	3
Titanium         ppm         ASTM D5185m         >2         <1         <1         0           Silver         ppm         ASTM D5185m         >20         2         2         11           Lead         ppm         ASTM D5185m         >20         2         2         11           Lead         ppm         ASTM D5185m         >20         2         2         11           Qanadium         ppm         ASTM D5185m         >20         2         2         11           Vanadium         ppm         ASTM D5185m         >330         7         8         <1		Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver         ppm         ASTM D5185m         >2         0         <1         0           Aluminum         ppm         ASTM D5185m         >20         2         2         11           Lead         ppm         ASTM D5185m         >20         2         2         11           Copper         ppm         ASTM D5185m         >330         7         8         <1           Tin         ppm         ASTM D5185m         >15         0         <1         <1           Cadmium         ppm         ASTM D5185m         15         0         <1         0         <1         0           ADDITIVES         method         Imit/base         current         history1         history2           Boron         ppm         ASTM D5185m         10         <1         <1         0           Molybdenum         ppm         ASTM D5185m         100         S6         891         1059           Calcium         ppm         ASTM D5185m         100         S66         981         1130           Magnesium         ppm         ASTM D5185m         155         S66         911         1167           Phosphorus         ppm         ASTM D5185m		Nickel	ppm	ASTM D5185m	>5	<1	1	<1
Atuminum       ppm       ASTM D5165m       >20       2       2       11         Lead       ppm       ASTM D5165m       >40       <1		Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Lead       ppm       ASTM D5185m       >>40       <1		Silver	ppm	ASTM D5185m	>2	0	<1	0
Copper         ppm         ASTM D5185m         >330         7         8         <1           Tin         ppm         ASTM D5185m         >15         0         <1		Aluminum	ppm	ASTM D5185m	>20	2	2	11
Tin         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         <1		Lead	ppm	ASTM D5185m	>40	<1	<1	<1
Tin       ppm       ASTM D5185m<>15       0       <1		Copper	ppm	ASTM D5185m	>330	7	8	<1
Vanadium         ppm         ASTM D5185m         0         <1           Cadmium         ppm         ASTM D5185m         0         <1			ppm	ASTM D5185m	>15	0	<1	<1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         2         2         8           Barium         ppm         ASTM D5185m         100         <1		Vanadium		ASTM D5185m		0	0	<1
Boron       ppm       ASTM D5185m       250       2       2       8         Barium       ppm       ASTM D5185m       10       <1       <1       0         Molybdenum       ppm       ASTM D5185m       100       59       63       70         Manganese       ppm       ASTM D5185m       00       <1       <1       <1         Magnesium       ppm       ASTM D5185m       450       856       891       1059         Calcium       ppm       ASTM D5185m       3000       1015       1112       1167         Phosphorus       ppm       ASTM D5185m       1350       1113       1186       1410         Sulfur       ppm       ASTM D5185m       1350       1113       1186       1410         Sulfur       ppm       ASTM D5185m       1350       1113       1186       1410         Sulfur       ppm       ASTM D5185m       255       4       4       2         Sodium       ppm       ASTM D5185m       >25       4       4       2         Sodium       ppm       ASTM D5185m       >20       4       3       3       3         Potassium       ppm       AST		Cadmium	ppm	ASTM D5185m		0	<1	0
Barium       ppm       ASTM D5185m       10       <1       <1       0         Molybdenum       ppm       ASTM D5185m       100       59       63       70         Manganese       ppm       ASTM D5185m       0       <1       <1         Magnesium       ppm       ASTM D5185m       450       856       891       1059         Calcium       ppm       ASTM D5185m       3000       1015       1112       1167         Phosphorus       ppm       ASTM D5185m       1150       866       968       1130         Zinc       ppm       ASTM D5185m       1350       1113       1186       1410         Sulfur       ppm       ASTM D5185m       4250       2807       2799       4148         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >158       3       0       1         Potassium       ppm       ASTM D5185m       >20       4       3       <1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D784		ADDITIVES		method	limit/base	current	history1	history2
Barium       ppm       ASTM D5185m       10       <1		Boron	ppm	ASTM D5185m	250	2	2	8
Molybdenum       ppm       ASTM D5185m       100       59       63       70         Manganese       ppm       ASTM D5185m       Image State       0       <1		Barium			10			
Manganese       ppm       ASTM D5185m       0       <1       <1         Magnesium       ppm       ASTM D5185m       450       856       891       1059         Calcium       ppm       ASTM D5185m       3000       1015       1112       1167         Phosphorus       ppm       ASTM D5185m       1150       866       968       1130         Zinc       ppm       ASTM D5185m       1350       1113       1186       1410         Sulfur       ppm       ASTM D5185m       4250       2807       2799       4148         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       4       4       2         Sodium       ppm       ASTM D5185m       >158       3       0       1         Potassium       ppm       ASTM D5185m       >20       4       3       <1		Molybdenum				59	63	70
Magnesium       ppm       ASTM D5185m       450       856       891       1059         Calcium       ppm       ASTM D5185m       3000       1015       1112       1167         Phosphorus       ppm       ASTM D5185m       1150       866       968       1130         Zinc       ppm       ASTM D5185m       1350       1113       1186       1410         Sulfur       ppm       ASTM D5185m       4250       2807       2799       4148         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       4       4       2         Sodium       ppm       ASTM D5185m       >25       4       4       2         Sodium       ppm       ASTM D5185m       >158       3       0       1         Potassium       ppm       ASTM D5185m       >20       4       3       <1		-						
Calcium       ppm       ASTM D5185m       3000       1015       1112       1167         Phosphorus       ppm       ASTM D5185m       1150       866       968       1130         Zinc       ppm       ASTM D5185m       1350       1113       1186       1410         Sulfur       ppm       ASTM D5185m       4250       2807       2799       4148         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       4       4       2         Sodium       ppm       ASTM D5185m       >158       3       0       1         Potassium       ppm       ASTM D5185m       >20       4       3       <1		0			450	856		
Phosphorus       ppm       ASTM D5185m       1150       866       968       1130         Zinc       ppm       ASTM D5185m       1350       1113       1186       1410         Sulfur       ppm       ASTM D5185m       4250       2807       2799       4148         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       4       4       2         Sodium       ppm       ASTM D5185m       >158       3       0       1         Potassium       ppm       ASTM D5185m       >20       4       3       <1         Nitration       Abs/cm       'ASTM D7844       >4       0.6       0.6       0.1         Nitration       Abs/cm       'ASTM D7624       >20       9.3       9.3       5.4         Sulfation       Abs/cm       'ASTM D7415       >30       20.9       20.3       17.0         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/tm       'ASTM D7414       >25       16.9       16.7       13.0		-		ASTM D5185m	3000		1112	1167
Zinc       ppm       ASTM D5185m       1350       1113       1186       1410         Sulfur       ppm       ASTM D5185m       4250       2807       2799       4148         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       4       4       2         Sodium       ppm       ASTM D5185m       >158       3       0       1         Potassium       ppm       ASTM D5185m       >158       3       0       1         INFRA-RED       method       limit/base       current       history1       history2         Sooto %       %       *ASTM D7844       >4       0.6       0.6       0.1         Nitration       Abs/cm       *ASTM D7624       >20       9.3       9.3       5.4         Sulfation       Abs/tmm       *ASTM D7415       >30       20.9       20.3       17.0         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/tmm       *ASTM D7414       >25       16.9       16.7       13.0 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
SulfurppmASTM D5185m4250280727994148CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25442SodiumppmASTM D5185m>158301PotassiumppmASTM D5185m>2043<1								
SiliconppmASTM D5185m>25442SodiumppmASTM D5185m>158301PotassiumppmASTM D5185m>2043<1								
Sodium         ppm         ASTM D5185m         >158         3         0         1           Potassium         ppm         ASTM D5185m         >20         4         3         <1		CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium       ppm       ASTM D5185m       >20       4       3       <1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >4       0.6       0.6       0.1         Nitration       Abs/cm       *ASTM D7624       >20       9.3       9.3       5.4         Sulfation       Abs/.1mm       *ASTM D7415       >30       20.9       20.3       17.0         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       16.9       16.7       13.0		Silicon	ppm	ASTM D5185m	>25	4	4	2
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.60.60.1NitrationAbs/cm*ASTM D7624>209.39.35.4SulfationAbs/.1mm*ASTM D7415>3020.920.317.0FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2516.916.713.0		Sodium	ppm	ASTM D5185m	>158	3	0	1
Soot %       %       *ASTM D7844       >4       0.6       0.6       0.1         Nitration       Abs/cm       *ASTM D7624       >20       9.3       9.3       5.4         Sulfation       Abs/.1mm       *ASTM D7415       >30       20.9       20.3       17.0         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       16.9       16.7       13.0		Potassium	ppm	ASTM D5185m	>20	4	3	<1
Nitration         Abs/cm         *ASTM D7624         >20         9.3         9.3         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.9         20.3         17.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.9         16.7         13.0		INFRA-RED		method	limit/base	current	history1	history2
SulfationAbs/.1mm*ASTM D7415>3020.920.317.0FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2516.916.713.0		Soot %	%	*ASTM D7844	>4	0.6	0.6	0.1
Sulfation         Abs/.1mm         *ASTM D7415         >30         20.9         20.3         17.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.9         16.7         13.0		Nitration	Abs/cm	*ASTM D7624	>20	9.3	9.3	5.4
Oxidation         Abs/.1mm         *ASTM D7414         >25         16.9         16.7         13.0		Sulfation						
		FLUID DEGRA	DATION	method	limit/base	current	history1	history2
		Oxidation	Abs/.1mm	*ASTM D7414	>25	16.9	16.7	13.0
						6.6	6.9	9.1



## **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
0ct2/23	0ct31/23 Nov7/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
00	Nor	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG	
		FLUID PROP	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	14.4	12.9	12.7	13.9
		GRAPHS						
		Ferrous Alloys						
23	23	iron		T				
0ct2/23	0ct31/23	25 - needed chromium		/				
		20		/				
		튭 15 -		/				
		10	/					
		5						
		53 53	23		23			
		Jec21/22 Jan23/23	0ct2/23	0ct31/23	Nov7/23			
			0	~				
	Non-ferrous Met	als						
		copper						
		8 - tin						
		8		$\square$	<u> </u>			
		6		$\square$	_			
		8 - Ead 6		$\square$				
		6	/	$\square$				
		6		$\square$				
			et2/23	11/23	22/Loo			
		be d 4 2 0 22/1/22 0 22/1/22 0 20/200/20	0ct2/23	0ed31/23	Nov7/23			
		Viscosity @ 100°		0ct31/23	Nov7/23	Base Number		
		Viscosity @ 100°		0cd31/23	EZ/LOON	<sup>0</sup> T;;T		
		Viscosity @ 100°		0ct31/23	14.	Abnomal		
		Viscosity @ 100°		0cd31/23	14.	0 <b>Abnormal</b>		
		Viscosity @ 100°		06431/23	14.	0 - Abnormal		
		Viscosity @ 100°		0ct31/23	14.	0 - Abnormal 0 - Action and a second		
		Viscosity @ 1000		0ed31/23	14.	D - Abnormal D - Base D - Abnormal		
		Viscosity @ 1000 Abnomal Base Abnomal		0dd31/23	14.) 12.) (0) HOX HOX Bull Jaquer 4.) eseg	Abnormal		
		Viscosity @ 1000 Abnomal Abnomal Abnomal		0d31/23	14.1 12.1 (0)HOX 00.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1	Abnormal Base Abnormal Abnormal Abnormal		
		Viscosity @ 1000 Abnomal Base Abnomal	c	<u> </u>	14.1 12.1 (b)(HO) Bul) Jaquenny argumn	Abnormal Abnormal Abnormal		73
		Viscosity @ 1000 Abnomal Base Abnomal		0d31/23	14.1 12.1 (0)HOX 00.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1	Abnormal Abnormal Abnormal	0ct2/23	0d31/23
		Uiscosity @ 1000 Abnomal Abnomal C2/C2/E2/EF Viscosity @ 1000 Base C2/C2/E2/EF C2/C2/E2/EF	C Oct2/23	0ct31/23	14.1 (9)(HOX bru) = 0 (9)(HOX bru) = 0 (	Abnormal Becc1/123 Pau 23/23 Pau 23/	0ct2/23	
4	Laboratory	Viscosity @ 1000 Abnomal Cooling Base EZECZUE Viscosity @ 1000 Cooling Coolin	C	Son Ave., Ca	14.1 (9)HOX DBU BU BU BU BU BU BU BU BU BU BU BU BU B	Abnormal Becc1/123 Pau 23/23 Pau 23/	EZZPO ironmental - 842 -	Lewisport Hauli
	Sample No.	Viscosity @ 1000 Abnomal Cooling EXECUTE Base EXECUTE EXECUT	501 Madia Received	son Ave., Ca	14.1 (P)(HO) (D) (P)(HO) (D)(D) (P)(HO) (D) (P)((D)(D) (D) (P)(HO) (D) (P)(HO) (D) (P)(HO)	Abnormal Becc1/123 Pau 23/23 Pau 23/	EZZPO ironmental - 842 -	<b>Lewisport Hauli</b> ighway 60 We
	Sample No. Lab Number	Viscosity @ 1000 Abnomal Base : WearCheck USA - : GFL0083721 : 06011233	501 Madia Received Diagnos	son Ave., Ca d : 17 ed : 19	14.1 (P)(10.1 (P)(10.1 (P)(10.1 (P)(10.1 (P)(10.1 (P)(10.1) (P)(10	Abnormal Becc1/123 Pau 23/23 Pau 23/	EZZPO ironmental - 842 -	<b>Lewisport Hauli</b> i ighway 60 We Lewisport, K
	Sample No.	Viscosity @ 1000 Abnomal Base : WearCheck USA - : GFL0083721 : 06011233 r : 10750377	501 Madia Received	son Ave., Ca d : 17 ed : 19	14.1 (P)(HO) (D) (P)(HO) (D)(D) (P)(HO) (D) (P)((D)(D) (D) (P)(HO) (D) (P)(HO) (D) (P)(HO)	Abnormal Becc1/123 Pau 23/23 Pau 23/	EZZPO ironmental - 842 - 4995 US Hi	Lewisport Haulin ighway 60 We



Submitted By: AUSTIN FRALIEX