

### **OIL ANALYSIS REPORT**

Sample Rating Trend



# Machine Id

#### Component Diesel Engine

Fluid

#### KENDALL SUPER-D XA DIESEL ENGINE OIL 15W40 (--- GAL)

#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

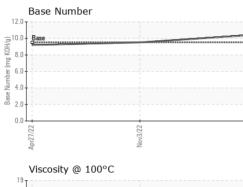
#### Fluid Condition

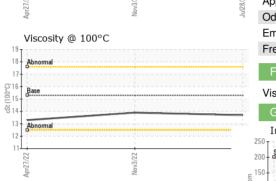
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	<b>IATION</b>	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0524364	WC0721199	WC0570158
Sample Date		Client Info		28 Jul 2023	03 Nov 2022	27 Apr 2022
Machine Age	hrs	Client Info		3346	3086	2550
Oil Age	hrs	Client Info		250	250	250
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATIO	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	23	29	30
Chromium	ppm	ASTM D5185m	>20	<1	1	<1
Nickel	ppm	ASTM D5185m	>4	<1	1	0
Titanium	ppm	ASTM D5185m		66	49	47
Silver	ppm	ASTM D5185m	>3	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	2	0	3
Lead	ppm	ASTM D5185m	>40	_ <1	4	<1
Copper	ppm	ASTM D5185m	>330	4	5	4
Tin	ppm	ASTM D5185m	>15	<1	1	0
Vanadium	ppm	ASTM D5185m		<1	2	<1
Cadmium	ppm	ASTM D5185m		0	<1	0
		method	limit/hase		history1	history/2
ADDITIVES	nnm	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	limit/base	96	65	90
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	96 0	65 0	90 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	96 0 22	65 0 34	90 0 29
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	96 0 22 <1	65 0 34 <1	90 0 29 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	96 0 22 <1 567	65 0 34 <1 651	90 0 29 <1 600
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	96 0 22 <1 567 1856	65 0 34 <1 651 1602	90 0 29 <1 600 1860
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		96 0 22 <1 567 1856 999	65 0 34 <1 651 1602 1035	90 0 29 <1 600 1860 1095
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		96 0 22 <1 567 1856 999 1302	65 0 34 <1 651 1602 1035 1286	90 0 29 <1 600 1860 1095 1368
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1260	96 0 22 <1 567 1856 999 1302 4303	65 0 34 <1 651 1602 1035 1286 4113	90 0 29 <1 600 1860 1095 1368 3160
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1260 limit/base	96 0 22 <1 567 1856 999 1302 4303 current	65 0 34 <1 651 1602 1035 1286 4113 history1	90 0 29 <1 600 1860 1095 1368 3160 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	1260 limit/base	96 0 22 <1 567 1856 999 1302 4303 current 5	65 0 34 <1 651 1602 1035 1286 4113 history1 5	90 0 29 <1 600 1860 1095 1368 3160 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	1260 limit/base >25	96 0 22 <1 567 1856 999 1302 4303 current 5 4	65 0 34 <1 651 1602 1035 1286 4113 history1 5 4	90 0 29 <1 600 1860 1095 1368 3160 history2 5 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	1260 limit/base >25 >20	96 0 22 <1 567 1856 999 1302 4303 <u>current</u> 5 4 10	65 0 34 <1 651 1602 1035 1286 4113 history1 5 4 14	90 0 29 <1 600 1860 1095 1368 3160 history2 5 1 1 10
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	1260 limit/base >25	96 0 22 <1 567 1856 999 1302 4303 current 5 4 10 current	65 0 34 <1 651 1602 1035 1286 4113 history1 5 4 14 14 history1	90 0 29 <1 600 1860 1095 1368 3160 history2 5 1 1 10 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	1260 limit/base >25 >20 limit/base	96 0 22 <1 567 1856 999 1302 4303 <u>current</u> 5 4 10	65 0 34 <1 651 1602 1035 1286 4113 <b>history1</b> 5 4 14 14 <b>history1</b> 0.4	90 0 29 <1 600 1860 1095 1368 3160 history2 5 1 1 10 history2 0.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	1260 limit/base >25 >20 limit/base >3	96 0 22 <1 567 1856 999 1302 4303 current 5 4 10 current	65 0 34 <1 651 1602 1035 1286 4113 history1 5 4 14 14 history1	90 0 29 <1 600 1860 1095 1368 3160 history2 5 1 1 0 <i>history2</i> 0.3 8.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	1260 limit/base >25 >20 limit/base >3	96 0 22 <1 567 1856 999 1302 4303 <u>current</u> 5 4 10 <u>current</u> 0.3	65 0 34 <1 651 1602 1035 1286 4113 <b>history1</b> 5 4 14 14 <b>history1</b> 0.4	90 0 29 <1 600 1860 1095 1368 3160 history2 5 1 1 10 history2 0.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	1260 1260 >25 >20 1imit/base >20 1imit/base >3 >20	96 0 22 <1 567 1856 999 1302 4303 <u>current</u> 5 4 10 <u>current</u> 0.3 8.4	65 0 34 <1 651 1602 1035 1286 4113 history1 5 4 14 14 history1 0.4 9.0	90 0 29 <1 600 1860 1095 1368 3160 history2 5 1 1 0 <i>history2</i> 0.3 8.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	1260 1260 >25 >20 1imit/base >3 >20 >3 >20	96 0 22 <1 567 1856 999 1302 4303 <u>current</u> 5 4 10 <u>current</u> 0.3 8.4 19.2	65 0 34 <1 651 1602 1035 1286 4113 history1 5 4 14 14 history1 0.4 9.0 21.1	90 0 29 <1 600 1860 1095 1368 3160 <b>history2</b> 5 1 10 <b>history2</b> 0.3 8.2 19.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	1260 1260 225 >22 1imit/base >3 >20 30 1imit/base >25	96 0 22 <1 567 1856 999 1302 4303 Current 5 4 10 Current 0.3 8.4 19.2 Current	65 0 34 <1 651 1602 1035 1286 4113 history1 5 4 14 5 4 14 0.4 9.0 21.1 history1	90 0 29 <1 600 1860 1095 1368 3160 history2 5 1 10 history2 0.3 8.2 19.2 history2



## **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
Nov3/22 Jul28/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jul	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	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	15.3	13.7	13.9	13.3
	GRAPHS						
	Iron (ppm)			100	Lead (ppm)		
22	200 Severe				Severe		
Nov3/22	150-			= 60			
	150 Abnormal			E 40	Abnormal		
	50 -			20			
	0			0			
	Apr27/22	Nov3/22		Jul28/23	Apr27/22	Nov3/22	c c c
		ž		ηr			
	Aluminum (ppm)			50	Chromium (pp	om)	
	40 - Severe			40	Severe		
	= <sup>30</sup>			= <sup>30</sup>			
	20 Abnormal			<sup>30</sup> 20	Abnormal		
	10-			10	-		
		5					
	Apr27/22	Nov3/22		Jul28/23	Apr27/22	Nov3/22	
	⊲ Copper (ppm)	_		7	⊲ Silicon (ppm)		
	400 Severe			80			
	300 -			60			
E	200			튭.40			
				4	Abnormal		
	100-			20			
		22		- 0	52	22 +	
	Apr27/22	Nov3/22		Jul28/23	Apr27/22	Nov3/22	
	Viscosity @ 100°C				Base Number		
	20 18 <b>Abnormal</b>			12.0 E 10.0	Base		
	ų			0.01 8.0 4.0 4.0 8.0 4.0 8.0 4.0 2.0			
	16 - Base						
	Abnormal						
	10				1		
	Apr27/22	Nov3/22		Jul28/23	Apr27/22	Nov3/22.	5 5 5
	Apri	No		Juľ	Apri	No	-
Laboratory Sample No. Lab Number Unique Number Test Package	: WearCheck USA - 5 : WC0524364 I : 05925537 I : 10605484 I : MOB 2	DEXTER & HARPEL 2352 MAIN S CONCORD, M US 0174 Contact: SCOTT BRUNEAU dhloam52@gmail.cor					

Contact/Location: SCOTT BRUNEAU - DEXCON