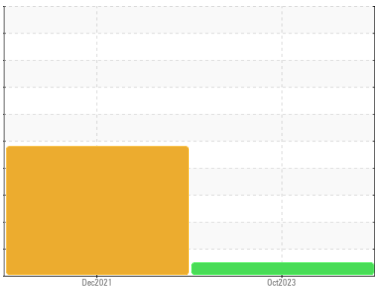
FUEL REPORT

Sample Rating Trend



NORMAL

Machine Id
DUKE RALEIGH AST-2
Component
Diesel Fuel
Fluid
No.2 DIESEL FUEL (ULTRALOW SULPHUR) (--- GAL)

DIAGNOSIS

Recommendation
No corrective action is recommended at this time. All laboratory tests indicate that this sample meets specifications for No.2 ultra-low-sulfur diesel fuel.

Corrosion
All metal levels are normal indicating no corrosion in the system.

Contaminants
There is a high amount of silt (particulates < 14 microns in size) present in the fuel. The water content is negligible. There is no bacteria or fungus (yeast and/or mold) present in the sample.

Fuel Condition
Sulfur value derived by ASTM D5453 method for ULSD validation. Sulfur level is acceptable for ULSD specification.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0869450**	WC0643835	---
Sample Date		Client Info		**10 Oct 2023**	09 Dec 2021	---
Machine Age	hrs	Client Info		**0**	0	---
Sample Status				**NORMAL**	ABNORMAL	---

PHYSICAL PROPERTIES		method	limit/base	current	history1	history2
Specific Gravity		*ASTM D1298	0.839	**0.839**	0.834	---
Fuel Color	text	*Visual Screen	Yllow	**Red**	Red	---
ASTM Color	scalar	*ASTM D1500		**L4.5**	L5.5	---
Visc @ 40°C	cSt	ASTM D445	3.0	**2.37**	2.26	---
Pensky-Martens Flash Point	°C	*PMCC Calculated	52	**58**	61	---

SULFUR CONTENT		method	limit/base	current	history1	history2
Sulfur	ppm	ASTM D5185m	10	**0**	2	---
Sulfur (UVF)	ppm	ASTM D5453		**8**	7	---

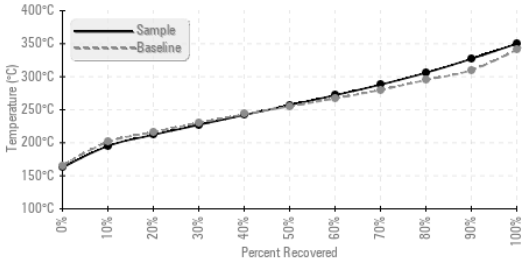
DISTILLATION		method	limit/base	current	history1	history2
Initial Boiling Point	°C	ASTM D86	165	**162**	169	---
5% Distillation Point	°C	ASTM D86		**184**	189	---
10% Distill Point	°C	ASTM D86	201	**195**	195	---
15% Distillation Point	°C	ASTM D86		**203**	202	---
20% Distill Point	°C	ASTM D86	216	**212**	209	---
30% Distill Point	°C	ASTM D86	230	**227**	222	---
40% Distill Point	°C	ASTM D86	243	**242**	235	---
50% Distill Point	°C	ASTM D86	255	**257**	250	---
60% Distill Point	°C	ASTM D86	267	**272**	267	---
70% Distill Point	°C	ASTM D86	280	**288**	285	---
80% Distill Point	°C	ASTM D86	295	**306**	305	---
85% Distillation Point	°C	ASTM D86		**316**	315	---
90% Distill Point	°C	ASTM D86	310	**327**	326	---
95% Distillation Point	°C	ASTM D86		**342**	340	---
Final Boiling Point	°C	ASTM D86	341	**350**	350	---
Distillation Residue	%	ASTM D86	3.0	**1.4**	1.4	---
Distillation Loss	%	ASTM D86	3.0	**0.7**	0.6	---

IGNITION QUALITY	method	limit/base	current	history1	history2
API Gravity	ASTM D7777	37.7	**37.2**	38.2	---
Cetane Index	ASTM D4737	<40.0	**47.8**	48.5	---

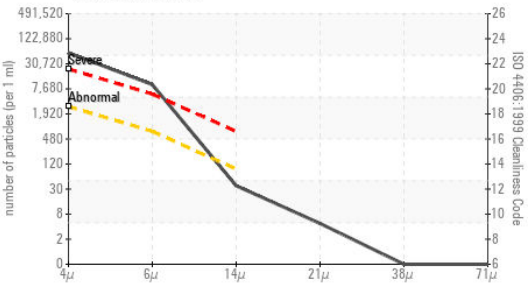
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	<1.0	**0**	0	---
Sodium	ppm	ASTM D5185m	<0.1	**0**	0	---
Potassium	ppm	ASTM D5185m	<0.1	**<1**	<1	---
Water	%	ASTM D6304	<0.05	**0.013**	0.007	---
ppm Water	ppm	ASTM D6304	<500	**137.6**	78.5	---
% Gasoline	%	*In-House	<0.50	**0.0**	0.0	---
% Biodiesel	%	*In-House	<20.0	**2.3**	5.0	---

FUEL REPORT

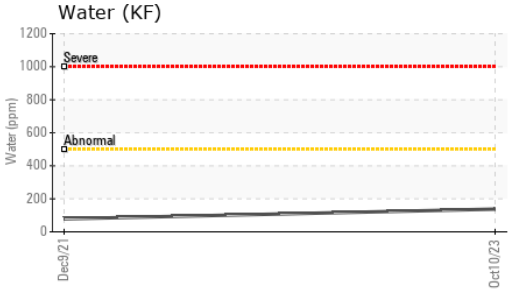
Fuel Distillation Curve



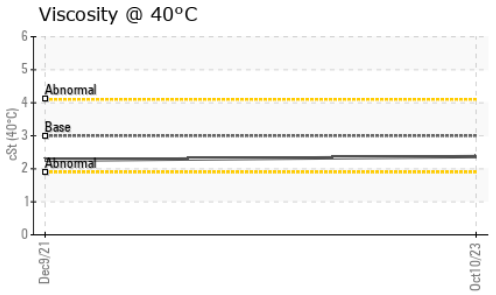
Particle Count



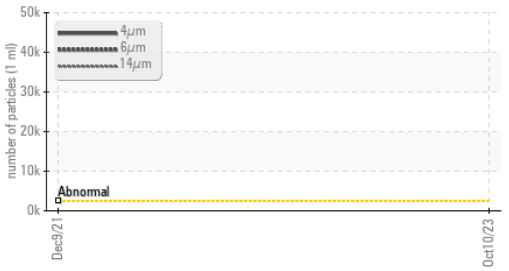
Water (KF)



Viscosity @ 40°C



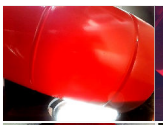
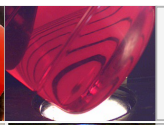
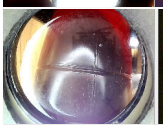
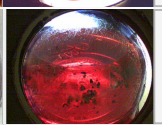
Particle Trend



FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>2500	**48856**	---	---
Particles >6µm		ASTM D7647	>640	**8438**	---	---
Particles >14µm		ASTM D7647	>80	**32**	---	---
Particles >21µm		ASTM D7647	>20	**4**	---	---
Particles >38µm		ASTM D7647	>4	**0**	---	---
Particles >71µm		ASTM D7647	>3	**0**	---	---
Oil Cleanliness		ISO 4406 (c)	>18/16/13	**23/20/12**	---	---

MICROBIAL		method	limit/base	current	history1	history2
Bacteria	CFU/ml	WC-Method	>=100000	**0**	0	---
Yeast	CFU/ml	WC-Method	>=100000	**0**	▲ 100	---
Mold	Colonies	WC-Method	MODER	**---**	---	---

HEAVY METALS		method	limit/base	current	history1	history2
Aluminum	ppm	ASTM D5185m	<0.1	**0**	0	---
Nickel	ppm	ASTM D5185m	<0.1	**0**	0	---
Lead	ppm	ASTM D5185m	<0.1	**0**	0	---
Vanadium	ppm	ASTM D5185m	<0.1	**0**	0	---
Iron	ppm	ASTM D5185m	<0.1	**0**	0	---
Calcium	ppm	ASTM D5185m	<0.1	**<1**	0	---
Magnesium	ppm	ASTM D5185m	<0.1	**<1**	0	---
Phosphorus	ppm	ASTM D5185m	<0.1	**7**	5	---
Zinc	ppm	ASTM D5185m	<0.1	**0**	0	---

SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					*no image*
Bottom					*no image*

Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0869450 **Received** : 17 Oct 2023
Lab Number : 05981545 **Diagnosed** : 08 Nov 2023
Unique Number : 10698840 **Diagnostician** : Doug Bogart
Test Package : DF-2 (Additional Tests: Bacteria, Screen)

To discuss this sample report, contact Customer Service at 1-800-237-1369.
** - 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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