

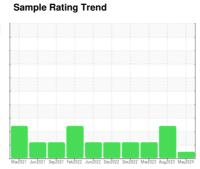
OIL ANALYSIS REPORT



COLORADO/443/EG - TRUCK-OFF-HWY-HEAVY HAUL 69.101L [COLORADO^443^EG - TRUCK-OFF-HWY-HEAVY HAUL]

Diesel Engine

MOBIL DELVAC 1300 SUPER15W40 (11 GAL)





DIAGNOSIS

Recommendation

The oil change at the time of sampling has been noted. Resample at the next service interval to monitor. No other corrective action is recommended at this time.

Wear

All component wear rates are normal.

Contamination

Light fuel dilution occurring. No other contaminants were detected in the oil.

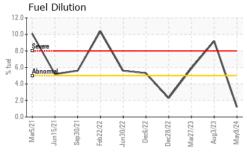
Fluid Condition

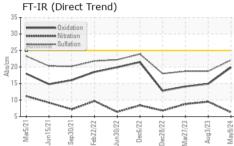
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

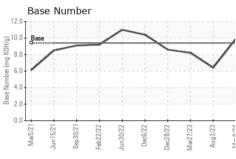
Sample Date Client Info 09 May 2024 03 Aug 2023 27 Mar 2023 Machine Age hrs Client Info 0 0 0 230 Oil Age hrs Client Info 0 0 230 Oil Changed Client Info Changed Changed Not Changed Sample Status Contaged Normal Normal Neg NEG NEG ABNORMAL CONTAMINATION method Imitibase current Inistory1 history2 Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG VEAR METALS method Imitibase current history1 history1 history2 Iron ppm ASTM 05185m >10 6 15 7 Chromium pm Mistory2 1 -1 0 0 0 0 0 0 0 0 0 0 0	10PEN15W40 (1	· GAL)		UZI SEPZUZI FEDZUZZ JUNZ			
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 7761 7483 7231 Oil Age hrs Client Info 0 0 230 Oil Changed Client Info Changed Changed Not Changd Normal Normal Sample Status Ned Ned NEG NEG NEG WEART METALS WC Method NeG NEG NEG NEG WEAR METALS method limit base current history1 history2 Iron ppm ASTM D5185m >100 6 15 7 Ohromium ppm ASTM D5185m >20 <1 <1 0 Nickel ppm ASTM D5185m >20 <1 <1 0 Niker ppm ASTM D5185m >20 0 <1 <1 Incard ppm ASTM D5185m >22 0 0 <1 <1 Uranium ppm ASTM D5185m >22 0 0 <1	Sample Number		Client Info		WC0928731	WC0823042	WC0799145
Oil Age hrs Client Info 0 0 230 Oil Changed Sample Status Client Info Changed Changed Changed Not Changed Not Changed ABNORMAL Not Changed Normal Normal Not Changed Normal Normal Severe ABNORMAL CONTAMINATION method Imilibase current history1 history2 Water WC Method >0.2 NEG NEG NEG Wear METALS method Imilibase current history1 history2 Iron ppm ASTM D5185m >100 6 15 7 Chromium ppm ASTM D5185m >20 <1	Sample Date		Client Info		09 May 2024	03 Aug 2023	27 Mar 2023
Colient Info Changed Changed Not Changed Not Changed Not Changed Not Changed Not Changed Not Changed ABNORMAL	Machine Age	hrs	Client Info		7761	7483	7231
CONTAMINATION	Oil Age	hrs	Client Info		0	0	230
Water WC Method Imit/base current history1 history2	Oil Changed		Client Info		Changed	Changed	Not Changd
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 6 15 7 Chromium ppm ASTM D5185m >20 <1 <1 0 Nickel ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >330 1 4 2 Tin ppm ASTM D5185m 0 <1 <1 <1 Vanadium ppm ASTM D5185m 0 63 58 76 <td>Sample Status</td> <td></td> <td></td> <td></td> <th>NORMAL</th> <td>SEVERE</td> <td>ABNORMAL</td>	Sample Status				NORMAL	SEVERE	ABNORMAL
WEAR METALS	CONTAMINATIO	Ν	method	limit/base	current	history1	history2
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1 <1 0 Nickel ppm ASTM D5185m >20 <1 <1 0 Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 1 3 1 Lead ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >15 0 <1 <1 <1 Vanadium ppm ASTM D5185m >15 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	6	15	7
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	0
Silver	Nickel	ppm	ASTM D5185m	>2	0	0	0
Aluminum ppm ASTM D5185m >25 1 3 1 Lead ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >330 1 4 2 Tin ppm ASTM D5185m >15 0 <1 <1 0 Cadmium ppm ASTM D5185m >15 0 <1 0 Cadmium ppm ASTM D5185m 0 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 40 11 10 Manganese ppm ASTM D5185m 0 40 11 10 Manganese ppm ASTM D5185m 0 505 695 704 Calcium ppm ASTM D5185m 1784 1473 1456 Phosphorus ppm ASTM D5185m 805 683 721 Zinc ppm ASTM D5185m 924 802 844 Sulfur ppm ASTM D5185m 924 802 844 Sulfur ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D5185m >20 0 0 1 3 Fuel % A	Titanium	ppm	ASTM D5185m	>2	0	<1	<1
Lead ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >330 1 4 2 Tin ppm ASTM D5185m >15 0 <1 <1 Vanadium ppm ASTM D5185m 0 <1 0 <1 Cadmium ppm ASTM D5185m 0 63 58 76 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 40 11 10 Manganese ppm ASTM D5185m -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	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >330 1 4 2 Tin ppm ASTM D5185m >15 0 <1	Aluminum	ppm	ASTM D5185m	>25	1	3	1
Tin ppm ASTM D5185m > 15 0 < 1 <1	Lead	ppm	ASTM D5185m	>40	<1	<1	0
Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 63 58 76 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 40 11 10 Manganese ppm ASTM D5185m <1 <1 <1 <1 Magnesium ppm ASTM D5185m 0 505 695 704 Calcium ppm ASTM D5185m 1784 1473 1456 Phosphorus ppm ASTM D5185m 805 683 721 Zinc ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2 Silicon	Copper	ppm	ASTM D5185m	>330	1	4	2
Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 63 58 76 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 40 11 10 Manganese ppm ASTM D5185m <1 <1 <1 <1 Magnesium ppm ASTM D5185m 0 505 695 704 Calcium ppm ASTM D5185m 1784 1473 1456 Phosphorus ppm ASTM D5185m 805 683 721 Zinc ppm ASTM D5185m 924 802 844 Sulfur ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2	Tin	ppm	ASTM D5185m	>15	0	<1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 40 11 10 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 0 505 695 704 Calcium ppm ASTM D5185m 1784 1473 1456 Phosphorus ppm ASTM D5185m 805 683 721 Zinc ppm ASTM D5185m 924 802 844 Sulfur ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m 7 17 12 Potassium ppm ASTM D5185m >20 0 1 3 Fuel %	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 0 40 11 10 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 0 505 695 704 Calcium ppm ASTM D5185m 1784 1473 1456 Phosphorus ppm ASTM D5185m 805 683 721 Zinc ppm ASTM D5185m 924 802 844 Sulfur ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D5185m >20 0 1 3 Fuel % ASTM D7844 >3 0.2 0.4 0.2 Nitration	Boron	ppm	ASTM D5185m	0	63	58	76
Manganese ppm ASTM D5185m <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 <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 <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>0</th> <td>0</td> <td>0</td>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 0 505 695 704 Calcium ppm ASTM D5185m 1784 1473 1456 Phosphorus ppm ASTM D5185m 805 683 721 Zinc ppm ASTM D5185m 924 802 844 Sulfur ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m 7 17 12 Potassium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D3524 >5 1.2 9.2 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.2 Nitration <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>40</th> <td>11</td> <td>10</td>	Molybdenum	ppm	ASTM D5185m	0	40	11	10
Calcium ppm ASTM D5185m 1784 1473 1456 Phosphorus ppm ASTM D5185m 805 683 721 Zinc ppm ASTM D5185m 924 802 844 Sulfur ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m 7 17 12 Potassium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D3524 >5 1.2 4 9.2 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7	Manganese	ppm	ASTM D5185m		<1	<1	<1
Phosphorus ppm ASTM D5185m 805 683 721 Zinc ppm ASTM D5185m 924 802 844 Sulfur ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m 7 17 12 Potassium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D5185m >20 0 1 3 Fuel % ASTM D3524 >5 1.2 4 9.2 4 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>505</th> <td>695</td> <td>704</td>	Magnesium	ppm	ASTM D5185m	0	505	695	704
Zinc ppm ASTM D5185m 924 802 844 Sulfur ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m 7 17 12 Potassium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D3524 >5 1.2 ▲ 9.2 ▲ 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7 FLUID DEGRADATION method limit/base current history1 <td>Calcium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>1784</th> <td>1473</td> <td>1456</td>	Calcium	ppm	ASTM D5185m		1784	1473	1456
Sulfur ppm ASTM D5185m 2921 3327 3286 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m 7 17 12 Potassium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D3524 >5 1.2 4 9.2 4 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414	Phosphorus	ppm	ASTM D5185m		805	683	721
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m 7 17 12 Potassium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D3524 >5 1.2 ▲ 9.2 ▲ 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.9 14.9 14.1	Zinc	ppm	ASTM D5185m		924	802	844
Silicon ppm ASTM D5185m >25 12 24 8 Sodium ppm ASTM D5185m 7 17 12 Potassium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D3524 >5 1.2 ▲ 9.2 ▲ 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.9 14.9 14.1	Sulfur	ppm	ASTM D5185m		2921	3327	3286
Sodium ppm ASTM D5185m 7 17 12 Potassium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D3524 >5 1.2 ▲ 9.2 ▲ 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.9 14.9 14.1	CONTAMINANTS	5	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 0 1 3 Fuel % ASTM D3524 >5 1.2 ▲ 9.2 ▲ 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.9 14.9 14.1	Silicon	ppm	ASTM D5185m	>25	12	24	8
Fuel % ASTM D3524 >5 1.2	Sodium	ppm	ASTM D5185m		7	17	12
INFRA-RED	Potassium	ppm	ASTM D5185m	>20		1	3
Soot % % *ASTM D7844 >3 0.2 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.9 14.9 14.1	Fuel	%	ASTM D3524	>5	1.2	▲ 9.2	▲ 5.9
Nitration Abs/cm *ASTM D7624 >20 6.3 9.5 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.9 14.9 14.1	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 22.1 18.7 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.9 14.9 14.1	Soot %	%	*ASTM D7844	>3	0.2	0.4	0.2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.9 14.9 14.1	Nitration	Abs/cm	*ASTM D7624	>20	6.3	9.5	8.8
Oxidation Abs/.1mm *ASTM D7414 >25 19.9 14.9 14.1	Sulfation	Abs/.1mm	*ASTM D7415	>30	22.1	18.7	18.7
	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.4 9.9 6.4 8.2	Oxidation	Abs/.1mm	*ASTM D7414	>25	19.9	14.9	14.1
	Base Number (BN)	mg KOH/g	ASTM D2896	9.4	9.9	6.4	8.2

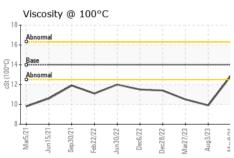


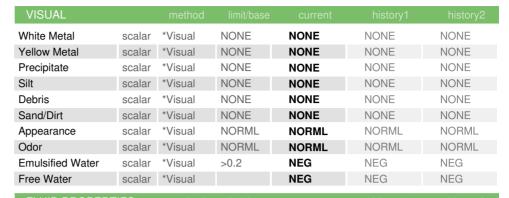
OIL ANALYSIS REPORT





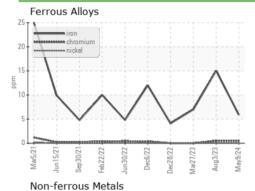


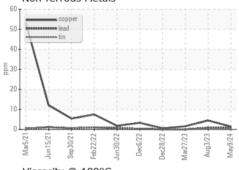


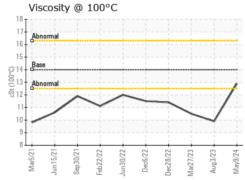


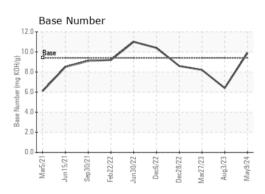
FLUID PROPERTIES		method	ilmit/base		nistory i	nistoryz
Visc @ 100°C	cSt	ASTM D445	14	12.9	9.9	△ 10.5

GRAPHS













Certificate 12367

Laboratory Sample No.

: WC0928731 Lab Number : 06176955 Unique Number : 11023008

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received Tested

Diagnosed Test Package : CONST (Additional Tests: PercentFuel, TBN)

: 13 May 2024 : 15 May 2024 : 15 May 2024 - Wes Davis

3219 WEST MAY ST WICHITA, KS US 67213 Contact: DOUG KING

SHERWOOD CONSTRUCTION CO INC

To discuss this sample report, contact Customer Service at 1-800-237-1369. st - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

doug.king@sherwood.net T: (316)617-3161

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

F: x: Submitted By: BRANDEN JAQUIAS