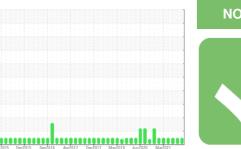


# **OIL ANALYSIS REPORT**

### Sample Rating Trend



NORMAL



WESTERN STAR 505

Component

**Front Diesel Engine** 

**SERVICE PRO 15W40 SYN BLEND (12 GAL)** 

## DIAGNOSIS

### 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

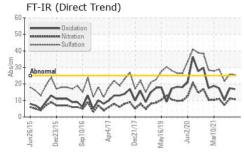
## **Fluid Condition**

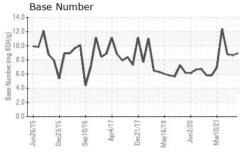
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

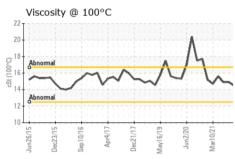
Machine Age         mls         Client Info         841261         829327         816853           Oil Age         mls         Client Info         11934         10474         11787           Oil Changed         Client Info         Changed         Changed         Changed         Changed         Changed         Changed         Changed         Changed         Changed         NORMAL         1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0	-)		nzuis Deczu	15 Sepzul6 Aprzul7	Deczol/ Mayzola Junzozo	Marzuzi	
Client Info	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date   Client Info   05 Apr 2024   12 Feb 2024   22 Dec 2023   Machine Age   mis   Client Info   11934   10474   11787   1178	Sample Number		Client Info		RW0005404	RW0004773	RW0004767
Machine Age         mls         Client Info         841261         829327         816853           Oil Age         mls         Client Info         11934         10474         11787           Oil Changed         Client Info         Changed         Changed         Changed         Changed           Sample Status         NORMAL         NORMAL         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0	Sample Date		Client Info		05 Apr 2024	12 Feb 2024	22 Dec 2023
Client Info   Changed   Changed   Changed   NORMAL   NORMAL   NORMAL   NORMAL	Machine Age	mls	Client Info		-	829327	816853
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   militibase   current   history1   history2	Oil Age	mls	Client Info		11934	10474	11787
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   militibase   current   history1   history2	-		Client Info		Changed	Changed	Changed
Fuel	Sample Status				_		
Water Glycol         WC Method WC Method         >0.2         NEG NEG         NEG NEG         NEG NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >165         48         51         54           Chromium         ppm         ASTM D5185m         >5         2         2         2           Nickel         ppm         ASTM D5185m         >4         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >20         3         2         4           Lead         ppm         ASTM D5185m         >20         3         2         4           Lead         ppm         ASTM D5185m         >90         0         <1         1           Tin         ppm         ASTM D5185m         >5         1         1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         <	CONTAMINATIO	N	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >5         2         2         2         2           Nickel         ppm         ASTM D5185m         >4         0         0         0           Titanium         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         3         2         4           Aluminum         ppm         ASTM D5185m         >20         3         2         4           Lead         ppm         ASTM D5185m         >90         0         <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>165	48	51	54
Titanium	Chromium	ppm	ASTM D5185m	>5	2	2	2
Silver	Nickel	ppm	ASTM D5185m	>4	0	0	0
Aluminum         ppm         ASTM D5185m         >20         3         2         4           Lead         ppm         ASTM D5185m         >150         7         6         3           Copper         ppm         ASTM D5185m         >90         0         <1	Titanium	ppm	ASTM D5185m	>2	0	0	0
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >90         0         <1         1           Tin         ppm         ASTM D5185m         >5         1         1         <1	Aluminum	ppm	ASTM D5185m	>20	3	2	4
Tin	Lead	ppm	ASTM D5185m	>150	7	6	3
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         9         15         21           Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         61         52         46           Manganese         ppm         ASTM D5185m         906         825         739           Calcium         ppm         ASTM D5185m         906         825         739           Calcium         ppm         ASTM D5185m         1029         980         1004           Zinc         ppm         ASTM D5185m         1029         980         1004           Zinc         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         1         <1 <td>Copper</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;90</td> <th>0</th> <td>&lt;1</td> <td>1</td>	Copper	ppm	ASTM D5185m	>90	0	<1	1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         9         15         21           Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         61         52         46           Manganese         ppm         ASTM D5185m         -1         -1         1           Magnesium         ppm         ASTM D5185m         906         825         739           Calcium         ppm         ASTM D5185m         1116         1256         1365           Phosphorus         ppm         ASTM D5185m         1029         980         1004           Zinc         ppm         ASTM D5185m         1228         1242         1256           Sulfur         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         1	Tin	ppm	ASTM D5185m	>5	1	1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	0
Boron   ppm   ASTM D5185m   ppm   ppm   ASTM D5185m   ppm   ppm   ASTM D5185m   ppm   ppm   ASTM D5185m   ppm   pp	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         61         52         46           Manganese         ppm         ASTM D5185m         <1         <1         1           Magnesium         ppm         ASTM D5185m         906         825         739           Calcium         ppm         ASTM D5185m         1116         1256         1365           Phosphorus         ppm         ASTM D5185m         1029         980         1004           Zinc         ppm         ASTM D5185m         1228         1242         1256           Sulfur         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         >20         1         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         "ASTM D7844         >7.5	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         61         52         46           Manganese         ppm         ASTM D5185m         <1         <1         1           Magnesium         ppm         ASTM D5185m         906         825         739           Calcium         ppm         ASTM D5185m         1116         1256         1365           Phosphorus         ppm         ASTM D5185m         1029         980         1004           Zinc         ppm         ASTM D5185m         1228         1242         1256           Sulfur         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         >20         1         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >7.5         3.3         3.5         3.1           Nitration         Abs/:mm         *ASTM D7	Boron	ppm	ASTM D5185m		9	15	21
Manganese         ppm         ASTM D5185m         <1         <1         1           Magnesium         ppm         ASTM D5185m         906         825         739           Calcium         ppm         ASTM D5185m         1116         1256         1365           Phosphorus         ppm         ASTM D5185m         1029         980         1004           Zinc         ppm         ASTM D5185m         1228         1242         1256           Sulfur         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         >20         1         <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium         ppm         ASTM D5185m         906         825         739           Calcium         ppm         ASTM D5185m         1116         1256         1365           Phosphorus         ppm         ASTM D5185m         1029         980         1004           Zinc         ppm         ASTM D5185m         1228         1242         1256           Sulfur         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         >20         1         <1	Molybdenum	ppm	ASTM D5185m		61	52	46
Calcium         ppm         ASTM D5185m         1116         1256         1365           Phosphorus         ppm         ASTM D5185m         1029         980         1004           Zinc         ppm         ASTM D5185m         1228         1242         1256           Sulfur         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         >20         1         <1	Manganese	ppm	ASTM D5185m		<1	<1	1
Phosphorus         ppm         ASTM D5185m         1029         980         1004           Zinc         ppm         ASTM D5185m         1228         1242         1256           Sulfur         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         4         3         3         3           Potassium         ppm         ASTM D5185m         >20         1         <1	Magnesium	ppm	ASTM D5185m		906	825	739
Zinc         ppm         ASTM D5185m         1228         1242         1256           Sulfur         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         20         1         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         3.3         3.5         3.1           Nitration         Abs/cm         *ASTM D7624         >20         10.8         11.1         7.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         25.9         21.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.9         17.3         10.1	Calcium	ppm	ASTM D5185m		1116	1256	1365
Sulfur         ppm         ASTM D5185m         3301         2831         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         4         3         3           Potassium         ppm         ASTM D5185m         >20         1         <1	Phosphorus	ppm	ASTM D5185m		1029	980	1004
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         4         3         3           Potassium         ppm         ASTM D5185m         >20         1         <1	Zinc	ppm	ASTM D5185m		1228	1242	1256
Silicon         ppm         ASTM D5185m         >35         4         4         4           Sodium         ppm         ASTM D5185m         4         3         3           Potassium         ppm         ASTM D5185m         >20         1         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         3.3         3.5         3.1           Nitration         Abs/cm         *ASTM D7624         >20         10.8         11.1         7.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         25.9         21.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.9         17.3         10.1	Sulfur	ppm	ASTM D5185m		3301	2831	3008
Sodium         ppm         ASTM D5185m         4         3         3           Potassium         ppm         ASTM D5185m         >20         1         <1	CONTAMINANTS	S	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         1         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         3.3         3.5         3.1           Nitration         Abs/cm         *ASTM D7624         >20         10.8         11.1         7.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         25.9         21.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.9         17.3         10.1	Silicon	ppm	ASTM D5185m	>35	4	4	4
INFRA-RED	Sodium	ppm	ASTM D5185m		4	3	3
Soot %         *ASTM D7844         >7.5         3.3         3.5         3.1           Nitration         Abs/cm         *ASTM D7624         >20         10.8         11.1         7.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         25.9         21.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.9         17.3         10.1	Potassium	ppm	ASTM D5185m	>20	1	<1	2
Nitration         Abs/cm         *ASTM D7624         >20         10.8         11.1         7.2           Sulfation         Abs/.1mm         *ASTM D7615         >30         25.5         25.9         21.6           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.9         17.3         10.1	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         25.9         21.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.9         17.3         10.1	Soot %	%	*ASTM D7844	>7.5	3.3	3.5	3.1
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     16.9     17.3     10.1	Nitration	Abs/cm	*ASTM D7624	>20	10.8	11.1	7.2
Oxidation Abs/.1mm *ASTM D7414 >25 <b>16.9</b> 17.3 10.1	Sulfation	Abs/.1mm	*ASTM D7415	>30	25.5	25.9	21.6
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.9	17.3	10.1
	Base Number (BN)						



# **OIL ANALYSIS REPORT**



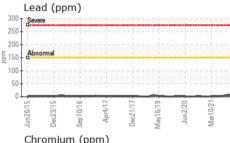


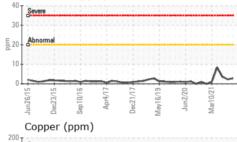


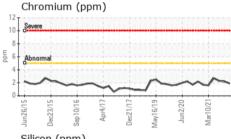
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

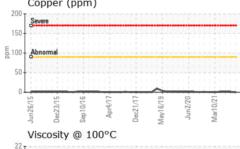
FLUID PROPE	111EO	method		riistory i	nistory∠
Visc @ 100°C	cSt	ASTM D445	14.5	14.9	14.9

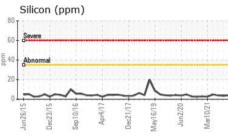
	n (ppi	m)						
300   Seve	ere							
200 - Abn	ormal							
50	^							
0			$\overline{}$	$\sim$		$\leq$	~	
Jun26/15	Dec23/15	Sep10/16	Apr4/17	Dec21/17	May16/19	Jun2/20	Mar10/21	
Aluminum (ppm)								
40 Seve	ere				11777			
30		+++++			+++++		++++	

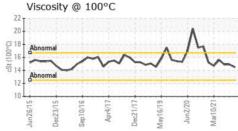


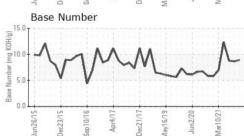
















Certificate 12367

Laboratory Sample No.

: RW0005404 Lab Number : 06157103 Unique Number : 10992526

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

Test Package : MOB 2

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 22 Apr 2024 **Tested** 

: 23 Apr 2024 Diagnosed

: 23 Apr 2024 - Wes Davis

US 49795 Contact: STEVE WOLFE sbeyer@ntimberlands.com T: (989)983-2485

**MICHIGAN WOOD CARRIERS** 

\* - 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) P.O. BOX 337

VANDERBILT, MI

F: (989)983-9678