

# **OIL ANALYSIS REPORT**

# Area **51000 series** Navistar 51842

**Diesel Engine** 

Fluic PETRO CANADA DURON SHP 15W40 (40 LTR)

## DIAGNOSIS

## A Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

# Wear

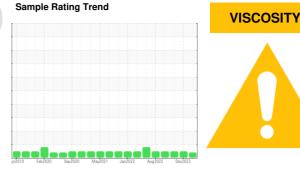
All component wear rates are normal.

#### Contamination

Fuel content negligible. There is no indication of any contamination in the oil.

## Fluid Condition

Viscosity of sample indicates oil is within SAE 30 range, advise investigate. The condition of the oil is acceptable for the time in service.



SAMPLE INFORMA	ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0915041	WC0837196	WC0771262
Sample Date		Client Info		21 Mar 2024	13 Dec 2023	21 Jan 2023
Machine Age r	mls	Client Info		679747	651030	900609
Oil Age r	mls	Client Info		28717	31089	226573
Oil Changed		Client Info		N/A	Changed	Changed
Sample Status				ABNORMAL	NORMAL	NORMAL
CONTAMINATION		method	limit/base	current	history1	history2
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron p	ppm	ASTM D5185(m)	>90	65	36	29
	ppm	ASTM D5185(m)	>20	2	3	1
Nickel	ppm	ASTM D5185(m)	>2	<1	<1	<1
Titanium p	ppm	ASTM D5185(m)	>2	0	0	<1
Silver	ppm	ASTM D5185(m)	>2	0	0	0
	ppm	ASTM D5185(m)	>20	8	4	3
	ppm	ASTM D5185(m)	>40	2	5	2
Copper p	ppm	ASTM D5185(m)	>330	2	1	<1
	ppm	ASTM D5185(m)	>15	0	<1	<1
	ppm	ASTM D5185(m)		0	0	0
Vanadium	ppm	ASTM D5185(m)		0	0	0
	ppm	ASTM D5185(m)		0	0	0
		( /				
Cadmium p	ppm	ASTM D5185(m)		0	0	0
ADDITIVES	ppm	ASTM D5185(m) method	limit/base	0 current	0 history1	0 history2
ADDITIVES	ppm ppm	( )	limit/base	-		-
ADDITIVES		method	0	current	history1	history2
ADDITIVES Boron p Barium p	ppm	method ASTM D5185(m)	0	current 2	history1 1	history2 5
ADDITIVES Boron p Barium p Molybdenum p	ppm ppm	method ASTM D5185(m) ASTM D5185(m)	0	current 2 0	history1 1 0	history2 5 0
ADDITIVES Boron p Barium p Molybdenum p Manganese p	ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 60	current 2 0 64	history1 1 0 63	history2 5 0 64
ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p	ppm ppm ppm ppm	methodASTM D5185(m)ASTM D5185(m)ASTM D5185(m)ASTM D5185(m)	0 0 60 0	current 2 0 64 0	history1 1 0 63 0 1012 1128	history2 5 0 64 <1 1017 1201
ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p	ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 60 0 1010	current 2 0 64 0 1049	history1 1 0 63 0 1012	history2 5 0 64 <1 1017
ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p	ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 60 0 1010 1070	current           2           0           64           0           1049           1098	history1 1 0 63 0 1012 1128	history2 5 0 64 <1 1017 1201
ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p Zinc p Sulfur p	ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 60 0 1010 1070 1150	current           2           0           64           0           1049           1098           1046	history1 1 0 63 0 1012 1128 1047	history2 5 0 64 <1 1017 1201 1127
ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p Zinc p Sulfur p	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	0 0 60 0 1010 1070 1150 1270	current           2           0           64           0           1049           1098           1046           1269	history1 1 0 63 0 1012 1128 1047 1250	history2 5 0 64 <1 1017 1201 1127 1284
ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p Zinc p Sulfur p	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	0 0 60 0 1010 1070 1150 1270	current           2           0           64           0           1049           1098           1046           1269           2355	history1  1  0  63  0  1012  1128  1047  1250  2558	history2 5 0 64 <1 1017 1201 1127 1284 2432
ADDITIVES Boron  Barium  F Barium  Molybdenum  Manganese  Magnesium  Calcium  Phosphorus  Zinc  Sulfur  Lithium  CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	0 0 60 1010 1070 1150 1270 2060	current           2           0           64           0           1049           1098           1046           1269           2355           <1	history1 1 0 63 0 1012 1128 1047 1250 2558 <1	history2 5 0 64 <1 1017 1201 1127 1284 2432 <1
ADDITIVES Boron   Barium   Molybdenum   Manganese   Magnesium   Calcium   Phosphorus   Zinc   Sulfur   Lithium   CONTAMINANTS  Silicon   Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	0 0 60 1010 1070 1150 1270 2060	current           2           0           64           0           1049           1098           1046           1269           2355           <1           current	history1         1         0         63         0         1012         1128         1047         1250         2558         <1	history2           5           0           64           <1
ADDITIVES Boron Barium Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	0 0 60 1010 1070 1150 1270 2060	current           2           0           64           0           1049           1098           1046           1269           2355           <1           current           3	history1         1         0         63         0         1012         1128         1047         1250         2558         <1	history2           5           0           64           <1
ADDITIVES Boron  Barium  Polybdenum  Manganese  Magnesium  Calcium  Phosphorus  Cinc  Sulfur  Lithium  CONTAMINANTS Silicon  Sodium  Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	0 0 60 1010 1070 1150 1270 2060 limit/base >25	current           2           0           64           0           1049           1098           1046           1269           2355           <1           current           3           2	history1         1         0         63         0         1012         1128         1047         1250         2558         <1         history1         4         2	history2         5         0         64         <1         1017         1201         1127         1284         2432         <1         history2         3         2
ADDITIVES Boron Barium Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20	current           2           0           64           0           1049           1098           1046           1269           2355           <1           current           3           2           2           2	history1         1         0         63         0         1012         1128         1047         1250         2558         <1	history2           5           0           64           <1
ADDITIVES Boron   Barium   Molybdenum   Manganese   Magnesium   Calcium   Phosphorus   Contamination   Solium   Potassium   Fuel   INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)           ASTM D5185(m)	0 0 0 1010 1070 1150 1270 2060 iimit/base >25 >20 >20	current         2         0         64         0         1049         1098         1046         1269         2355         <1         current         3         2         2         0	history1         1         0         63         0         1012         1128         1047         1250         2558         <1	history2         5         0         64         <1
ADDITIVES Boron Barium Barium Molybdenum Manganese Magnesium Calcium Phosphorus Cinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Fuel CNFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)           ASTM D5185(m)	0 0 0 1010 1070 1150 1270 2060 imit/base >25 >20 >20 >3.0	current         2         0         64         0         1049         1098         1046         1269         2355         <1         current         3         2         0.7	history1         1         0         63         0         1012         1128         1047         1250         2558         <1	history2         5         0         64         <1



# **OIL ANALYSIS REPORT**

Severe Abnormal	Oxidation	Abs/.1mm									
Abnormal		A03/.111111	ASTM D7414*	>25		20.2		21.1		23.0	
Abnormal	VISUAL		method	limit/bas	е	curren	t	histor	/1	hist	ory2
T	White Metal	scalar	Visual*	NONE		NONE					
	Yellow Metal	scalar	Visual*	NONE		NONE					
$\sim \sim \sim$	Precipitate	scalar	Visual*	NONE		NONE					
Apr6/19 Feb22/20 - May/22/21 - Jan5/22 - Aug2/22 -	Silt	scalar	Visual*	NONE		NONE					
Apr6/19 Feb22/20 Sep29/20 May22/21 Jan5/22 Aug2/22 Dec13/23	Debris	scalar	Visual*	NONE		VLITE					
FT-IR (Direct Trend)	Sand/Dirt	scalar	Visual*	NONE		NONE					
	Appearance	scalar	Visual*	NORML		NORML					
Oxidation	Odor	scalar	Visual*	NORML		NORML		NORM		NOR	ML
Abnormal	Emulsified Water	scalar	Visual*	>0.2		NEG		NEG		NEG	
	Free Water	scalar	Visual*			NEG		NEG		NEG	
	FLUID PROPER	<b>FIES</b>	method	limit/bas	е	curren	t	histor	/1	hist	ory2
	Visc @ 100°C	cSt	ASTM D7279(m)	15.4		11.8		11.6		11.9	
Apr6/19 - Apr6/19 - Feb22/20 - Sep29/20 - Jan5/22 - Jan5/22 - Aug2/22 - Aug2/22 - Bec13/23 - Bec13/	GRAPHS										
Ap Febi Jar Aur	Iron (ppm)					_ead (ppr	n)				
FT-IR (Direct Trend)	250 200 Severe	1 1 1 1			100 80	Severe					
					60-						
Oxidation Nitration	E 150 - Abnomal			Had	40-	Abnormal					-
Abnormal	50	~~~	$\sim$	1	20-		_				
	/20	2/21+	122	1/23	5	//20	1/20	2/21	122	/22	//23
	Apr6/19 Feb22/20 Sep29/20	May22/21	Jan5/22 Aug2/22	Dec13/23	01/2007	Feb22/20	Sep29/20	May22/2	Jan5/22	Aug2/22	Dec13/23
And a state of the	Aluminum (ppm)				(	Chromiun	n (ppn	n)			
20 - 20 - 20 - 22 - 22 - 22 - 22 - 22 -	50 40 Severe	111111	in in the		50 T	Severe			n en		11
Apr6/19 Feb22/20 Sep29/20 May22/21 Jan5/22 Aug2/22 Dec13/23					40	0					
F S M	and the second s			-	E 30 - 1	Abnormal					
	10	~	$\Lambda$		10						
	20 - 50 - 10 - 10 - 10 - 10 - 10 - 10 - 1	21+		23	_ o	20-02	20	21	22	22	23.
	Apr6/19 Feb22/20 Sep29/20	May22/21	Jan5/22 Aug2/22	Dec13/23	01/2007	Feb22/20	Sep 29/20	May22/21	Jan5/22	Aug2/22	Dec13/23
	Copper (ppm)	-		_	9	Silicon (p	om)	-			
	400 Severe					Severe					
	300				60-						
	톱 200				특 40 -	Abnormal					
	100-				20-						
	<sup>20</sup> <sup>20</sup> <sup>13</sup>	21	22	23	٥L	20	20-	21-	22	22	23 -
	Apr6/19 Feb22/20 Sep29/20	May22/21	Jan5/22 Aug2/22	Dec13/23	01/2	Feb22/20	Sep29/20	May22/21	Jan5/22	Aug2/22	Dec13/23
	▲ Viscosity @ 100°C	2				Soot %	\$	2			
	<sup>20</sup> T					Severe					
	E 18 Abnormal				6.U T	Abnormal					
	Со 16 - Вазе 2014 - Авротра				e 4.0-						
	tig 14 Abnormal			°	2.0						
	10				0.0				~ ~	2	
	Apr6/19 Feb22/20 Sep29/20	May22/21	Jan5/22 Aug2/22	Dec13/23	01/0	Feb22/20	Sep29/20	May22/21	Jan5/22	Aug2/22	Dec13/23
ISO 17025:2017 Accredited Laboratory To discuss this sample report	: WearCheck - C8-117 : WC0915041 • : 02626368 • : 5759500 • : MOB 1 ( Additional Te	5 Appleby Recei Teste Diagr ests: Fuel	/ Line, Burlin ved : 03 d : 04 nosed : 04 Dilution, Per	gton, ON I 3 Apr 2024 4 Apr 2024 Apr 2024 - k centFuel, V	_7L { (evin	5H9 MA Marson	NITOU	I <b>LIN TRA</b> 1335	NSPO SHAV MISSI	<b>RT (GAI</b> NSON I SSAUG CA L4\ Fravis S	RAG DRIN A, C W 10 Spen

Contact/Location: Travis Spence - MANMIS Page 2 of 2