

OIL ANALYSIS REPORT

Sample Rating Trend





Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- LTR)

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

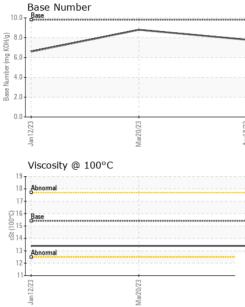
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI		method	limit/base	current	history1	history2
			mmbase			
Sample Number		Client Info		GFL0089469	GFL0071470	GFL0071460
Sample Date Machine Age	bro	Client Info Client Info		18 Apr 2023 2436	20 Mar 2023	12 Jan 2023
0	hrs	Client Info			1803 0	1466 0
Oil Age Oil Changed	hrs			0 N/A		
-		Client Info			Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>110	16	9	30
Chromium	ppm	ASTM D5185m	>4	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>2	0	<1	<1
Aluminum	ppm	ASTM D5185m	>25	5	4	10
Lead	ppm	ASTM D5185m	>45	0	0	<1
Copper	ppm	ASTM D5185m	>85	2	2	13
Tin	ppm	ASTM D5185m	>4	<1	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method				history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current 2	history1 2	history2 2
	ppm ppm					
Boron		ASTM D5185m	0	2	2	2
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	2 0	2 0	2
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 0 66	2 0 62	2 0 58
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 0 66 <1	2 0 62 <1	2 0 58 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	2 0 66 <1 1128	2 0 62 <1 984	2 0 58 <1 970
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	2 0 66 <1 1128 1167	2 0 62 <1 984 1135	2 0 58 <1 970 1193
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	0 0 60 0 1010 1070 1150	2 0 66 <1 1128 1167 1158	2 0 62 <1 984 1135 1058	2 0 58 <1 970 1193 970
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	2 0 66 <1 1128 1167 1158 1474 4033	2 0 62 <1 984 1135 1058 1318	2 0 58 <1 970 1193 970 1278
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	0 0 60 0 1010 1070 1150 1270 2060	2 0 66 <1 1128 1167 1158 1474 4033	2 0 62 <1 984 1135 1058 1318 3786	2 0 58 <1 970 1193 970 1278 3144
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	2 0 66 <1 1128 1167 1158 1474 4033 current	2 0 62 <1 984 1135 1058 1318 3786 history1	2 0 58 <1 970 1193 970 1278 3144 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm 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	0 0 60 1010 1070 1150 1270 2060 Limit/base	2 0 66 <1 1128 1167 1158 1474 4033 <u>current</u> 3	2 0 62 <1 984 1135 1058 1318 3786 history1 3	2 0 58 <1 970 1193 970 1278 3144 history2 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 Limit/base	2 0 66 <1 1128 1167 1158 1474 4033 <u>current</u> 3 0	2 0 62 <1 984 1135 1058 1318 3786 history1 3 1	2 0 58 <1 970 1193 970 1278 3144 history2 4 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >30	2 0 66 <1 1128 1167 1158 1474 4033 <u>current</u> 3 0 3	2 0 62 <1 984 1135 1058 1318 3786 history1 3 1 4	2 0 58 <1 970 1193 970 1278 3144 history2 4 2 14
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >30	2 0 66 <1 1128 1167 1158 1474 4033 <u>current</u> 3 0 3 <u>current</u> 0.7	2 0 62 <1 984 1135 1058 1318 3786 history1 3 1 4 <u>history1</u> 0.3	2 0 58 <1 970 1193 970 1278 3144 history2 4 2 14 14 history2 0.7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >30 20 limit/base	2 0 66 <1 1128 1167 1158 1474 4033 current 3 0 3 Current	2 0 62 <1 984 1135 1058 1318 3786 history1 3 1 4 4 history1	2 0 58 <1 970 1193 970 1278 3144 history2 4 2 14 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >30 <i>limit/base</i> >20	2 0 66 <1 1128 1167 1158 1474 4033 current 3 0 3 current 0.7 9.4	2 0 62 <1 984 1135 1058 1318 3786 history1 3 1 4 history1 0.3 7.2	2 0 58 <1 970 1193 970 1278 3144 history2 4 2 14 kistory2 0.7 9.5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 2060 2060 2060 2060 2060 2060 2	2 0 66 <1 1128 1167 1158 1474 4033 current 3 0 3 current 0.7 9.4 20.3 current	2 0 62 <1 984 1135 1058 1318 3786 history1 3 1 4 history1 0.3 7.2 19.2 history1	2 0 58 <1 970 1193 970 1278 3144 history2 4 2 14 history2 0.7 9.5 21.2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >30 imit/base >3 20	2 0 66 <1 1128 1167 1158 1474 4033 <u>current</u> 3 0 3 <u>current</u> 0.7 9.4 20.3	2 0 62 <1 984 1135 1058 1318 3786 history1 3 1 4 <u>history1</u> 0.3 7.2 19.2	2 0 58 <1 970 1193 970 1278 3144 history2 4 2 14 2 14 bistory2 0.7 9.5 21.2



OIL ANALYSIS REPORT

VISUAL



	VISUAL		method	limit/base	current	history1	history2
	White Metal	scalar *	Visual	NONE	NONE	NONE	NONE
	Yellow Metal	scalar *	Visual	NONE	NONE	NONE	NONE
	Precipitate		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
Mar20/23	Appearance	scalar *	Visual	NORML	NORML	NORML	NORML
Mar2	Odor	scalar *	Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar *	Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar *	Visual		NEG	NEG	NEG
	FLUID PROPE	ERTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt A	ASTM D445	15.4	13.4	13.4	13.4
	GRAPHS						
····	Ferrous Alloys						
3	iron						
Mar20/23	25 - chromium						
N	20						
	<u>ة</u> 15						
		\sim					
	10						
	5						
	0						
	Jan 12/23	Mar20/23		Apr18/23			
	Jan	Mar		Apr			
	Non-ferrous Meta	ils					
	14 copper						
	12 - Internet lead						
	10						
	Ē 6-						
	4						
	2 -						
	0						
	Jan 12/23	Mar20/23		Apr18/23			
	, an	Mari		Apr			
	Viscosity @ 100°	С			Base Number		
	19			10.0 T			
	18 - Abnormal						
	17-			(B)HO			
	Solution Base			₩ ₽ 6.0			
	0 ¹⁶ 115 83	1		(0,740 6,0- 0,00 0,00 0,00 0,00 0,00 0,00 0,0			
	10	1		4.0- N 85			
	13 Abnormal			⁶⁶ 2.0-			
	12						
	114	/23		-0.0	53	- 123	
	Jan 1 2/23	Mar20/23		Apr18/23	Jan 12/23	Mar20/23	
	7	2			~	4	
				V NC 27513	GFL Env	ironmental - 91	8 - Hartland H
Laborator	y : WearCheck USA -	501 Madiso	: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0089469 Received : 08 Aug 2023				
Sample N	o. : GFL0089469	Received	: 08 A	ug 2023			
Sample N Lab Numb	o. : GFL0089469 per : 05918411	Received Diagnosed	: 08 A : 09 A	ug 2023 ug 2023			Industrial Driv Hartland, N
Sample N Lab Numb Unique Nur	o. : GFL0089469 per : 05918411 nber : 10590325	Received	: 08 A : 09 A	ug 2023		630 E	Industrial Driv Hartland, V US 5302
Sample N Lab Numb Unique Nur icate 12367 Test Pack	o. : GFL0089469 per : 05918411 nber : 10590325	Received Diagnosed Diagnostic	: 08 A I : 09 A ian : Wes	ug 2023 ug 2023 Davis		630 E Contact	Industrial Driv Hartland, N



Contact/Location: David McCall - GFL918