

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 412017 Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- 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

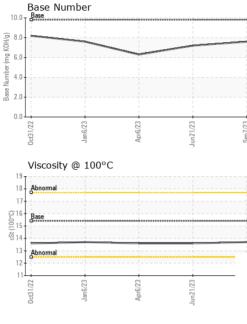
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0089508	GFL0084538	GFL0078797
Sample Date		Client Info		07 Sep 2023	21 Jun 2023	06 Apr 2023
Machine Age	hrs	Client Info		5144	4539	4003
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Glycol		WC Method	20.0	NEG	NEG	NEG
-						
WEAR METAL	S	method	limit/base		history1	history2
Iron	ppm		>120	10	11	12
Chromium	ppm	ASTM D5185m		<1	<1	<1
Nickel	ppm	ASTM D5185m		<1	3	<1
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m		0	<1	0
Aluminum	ppm	ASTM D5185m	>20	<1	6	2
Lead	ppm	ASTM D5185m	>40	<1	4	0
Copper	ppm	ASTM D5185m	>330	2	3	1
Tin	ppm	ASTM D5185m	>15	<1	2	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 2	history1 2	history2 0
	ppm ppm					
Boron		ASTM D5185m	0	2	2	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	2 0	2 0	0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 0 61	2 0 65	0 1 60
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 0 61 1	2 0 65 2	0 1 60 <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 61 1 1006	2 0 65 2 1057	0 1 60 <1 958
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 61 1 1006 1106	2 0 65 2 1057 1143	0 1 60 <1 958 1026
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 61 1 1006 1106 1012	2 0 65 2 1057 1143 1057	0 1 60 <1 958 1026 960
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 61 1 1006 1106 1012 1285 3268	2 0 65 2 1057 1143 1057 1329	0 1 60 <1 958 1026 960 1219
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 61 1 1006 1106 1012 1285 3268	2 0 65 2 1057 1143 1057 1329 3439	0 1 60 <1 958 1026 960 1219 2970
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 61 1 1006 1106 1012 1285 3268 current	2 0 65 2 1057 1143 1057 1329 3439 history1	0 1 60 <1 958 1026 960 1219 2970 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 0 1010 1070 1150 1270 2060 Limit/base >25	2 0 61 1 1006 1106 1012 1285 3268 <u>current</u> 4	2 0 65 2 1057 1143 1057 1329 3439 history1 4	0 1 60 <1 958 1026 960 1219 2970 history2 3
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	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >25	2 0 61 1 1006 1106 1012 1285 3268 current 4 6 5	2 0 65 2 1057 1143 1057 1329 3439 history1 4 4	0 1 60 <1 958 1026 960 1219 2970 history2 3 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 >25 >20	2 0 61 1 1006 1106 1012 1285 3268 current 4 6 5	2 0 65 2 1057 1143 1057 1329 3439 history1 4 4 4	0 1 60 <1 958 1026 960 1219 2970 history2 3 2 1
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 2060 225 >25 >20 Limit/base >20	2 0 61 1 1006 1106 1012 1285 3268 Current 4 6 5	2 0 65 2 1057 1143 1057 1329 3439 history1 4 4 4 4 4	0 1 60 <1 958 1026 960 1219 2970 history2 3 2 1 history2
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 2060 225 >25 >20 Limit/base >20	2 0 61 1 1006 1106 1012 1285 3268 <u>current</u> 4 6 5 5 <u>current</u> 0	2 0 65 2 1057 1143 1057 1329 3439 history1 4 4 4 4 4 4 0.4	0 1 60 <1 958 1026 960 1219 2970 history2 3 2 1 history2 0.4
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> >25 >20 <i>limit/base</i> >4 >20	2 0 61 1 1006 1012 1285 3268 <u>current</u> 4 6 5 <u>current</u> 0 9.1 23.1	2 0 65 2 1057 1143 1057 1329 3439 history1 4 4 4 4 4 4 4 4 4 4 4 4 4	0 1 60 <1 958 1026 960 1219 2970 history2 3 2 1 history2 0.4 8.0
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 D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 220 220 220 220 230 20 20 20 20 20 20 20 20 20 20 20 20 20	2 0 61 1 1006 1012 1285 3268 Current 4 6 5 Current 0 9.1 23.1 Current	2 0 65 2 1057 1143 1057 1329 3439 history1 4 4 4 4 4 4 0.4 8.2 20.3 history1	0 1 60 <1 958 1026 960 1219 2970 history2 3 2 1 history2 0.4 8.0 17.9 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 2060 225 20 225 20 imit/base >20 20 20	2 0 61 1 1006 1012 1285 3268 <u>current</u> 4 6 5 <u>current</u> 0 9.1 23.1	2 0 65 2 1057 1143 1057 1329 3439 history1 4 4 4 4 4 5 0.4 8.2 20.3	0 1 60 <1 958 1026 960 1219 2970 history2 3 2 1 history2 0.4 8.0 17.9



OIL ANALYSIS REPORT

VISUAL



		VISUAL		memou	IIIIII/Dase	current	riistory i	Thistory2
		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
Apr6/23	un21/23 - Sen7/23 -		scalar	*Visual	NORML	NORML	NORML	NORML
Apri	Jun21/23 Sen7/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual	20.2	NEG	NEG	NEG
		FLUID PROP		method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445		13.7	13.6	13.6
		GRAPHS						
		Ferrous Alloys						
				·				
Apr6/23	Jun21/23	12 - chromium						
A	Jur	10 -						
		ε 8						
		ed 6						
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		2						
				CONTRACTOR DESCRIPTION	and the second			
		ct31/22	3/23 -	/23-	//23			
		0ct31/22 Jan6/23	Apr6/23	Jun21/23	Sep 7/23			
		Non-ferrous Meta	als	,				
		¹⁰ T						
		copper						
		8 - management tin	1					
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					and the second s			
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		0		ηΓ	60			
		Viscosity @ 100°	С			Base Number		
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		18 Abromal						
		18 - Abnormal			- 80-			1
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		17-			-0.8 -0.0 KOH/0) -0.0 uper (un		~	
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		17- 16- Base 15- 15- 15- 14- Abnomal			• 0.9 per (mg			
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		17- 17- Base Base 14- 13- Abnomal 12- 11- 14- 12- 11- 14- 14- 12- 11- 14- 12- 14- 14- 14- 14- 14- 14- 14- 14	53	23-	0.04(0 4.0- 8ase Number 2.0-	22	23	23
		17- 17- Base Base 14- 13- Abnomal 12- 11- 14- 12- 11- 14- 14- 12- 11- 14- 12- 14- 14- 14- 14- 14- 14- 14- 14	Apr6/23	in21/23	0.04(0 4.0- 8ase Number 2.0-	cd31/22	Aor6/23	n21/23
	Laboratory	17 16 16 15 14 13 14 13 14 13 12 11 12 11 12 11 12 12 12 12	El Madia	son Ave. Ca	0.0 HOU States (with Kong)	GEL Em	vironmental - 9	EZUZunr 18 - Hartland I
	Laboratory Sample No.	17- 17- Base Base 14- 13- Abnomal 12- 11- 14- 12- 11- 14- 14- 12- 11- 14- 12- 14- 14- 14- 14- 14- 14- 14- 14		son Ave., Ca	ykuo y ykuo y bu yaquuny arguny see 2.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0.0- 0	0	/ironmental - 9	
LAB	Laboratory Sample No. Lab Number	Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base Base	501 Madis	son Ave., Ca d : 21 \$ ed : 25 \$	ry, NC 27513 Sep 2023 Sep 2023	0	/ironmental - 9	18 - Hartland H
	Sample No. Lab Number Unique Numbe	: WearCheck USA - : GFL0089508 : 05957530 r : 10658743	501 Madis Received	son Ave., Ca d : 21 \$ ed : 25 \$	ry, NC 27513 Sep 2023	0	/ironmental - 9	18 - Hartland I Industrial Dri
	Sample No. Lab Number Unique Numbe Test Package	: WearCheck USA - : GFL0089508 : 05957530 r : 10658743	501 Madis Received Diagnose Diagnost	son Ave., Ca d : 21 \$ ed : 25 \$ tician : Wes	ry, NC 27513 Sep 2023 Sep 2023 S Davis	0	/ironmental - 9 630 E Contad	18 - Hartland I Industrial Dri Hartland, V

Contact/Location: David McCall - GFL918