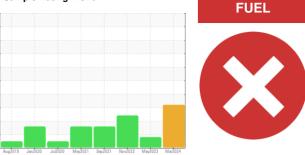


# **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id

Component Diesel Engine

Fluid PETRO CANADA DURON UHP 5W40 (5 LTR)

# DIAGNOSIS

### Recommendation

We advise that you check the fuel injection system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

## Wear

All component wear rates are normal.

### Contamination

There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

#### Fluid Condition

Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

Sample Date     Client Info     12 Mar 2024     10 May 2023     18 Nov 2022       Aachine Age     hrs     Client Info     5802     4870     4378       Dil Age     hrs     Client Info     0     500     0       Dil Age     hrs     Client Info     0     500     0       Dil Age     hrs     Client Info     0     500     0     0       Sample Status     Client Info     Changed     Marce     Net	SAMPLE INFORM	<b>/IATION</b>	method	limit/base	current	history1	history2
Arachine Age   hrs   Client Info   5802   4870   4378     Dil Age   hrs   Client Info   0   500   0     Dil Age   hrs   Client Info   Changed   Changed   Changed     Sample Status   Client Info   Changed   Changed   Changed   Changed     CONTAMINATION   method   Imit/base   current   history1   history2     Water   WC Method   >0.2   NEG   NEG   NEG     Wear METALS   method   imit/base   current   history1   history2     ron   ppm   ASTM D5185(m)   >100   28   42   109     Chromium   ppm   ASTM D5185(m)   >20   <1   1   2     kickel   ppm   ASTM D5185(m)   >20   <1   <1   1     kiker   ppm   ASTM D5185(m)   >20   <4   7   1     kikel   ppm   ASTM D5185(m)   >30   0   0   0     Vuenium   ppm   ASTM D5185(m)   330   22   3 <t< th=""><th>Sample Number</th><th></th><th>Client Info</th><th></th><th>PC0078479</th><th>PC0058477</th><th>PC0056637</th></t<>	Sample Number		Client Info		PC0078479	PC0058477	PC0056637
Dil Age hrs Client Info 0 500 0   Dil Changed Client Info Changed Changed Changed Changed   Sample Status Imit/Dase current History1 ABNORMAL   CONTAMINATION method Imit/Dase current History1 History2   Water WC Method >0.2 NEG NEG NEG   Diromium ppm ASTM D5185(m) >100 28 42 A 109   Diromium ppm ASTM D5185(m) >20 <1 1 2   Vickel ppm ASTM D5185(m) >20 <1 <1 <1   Diromium ppm ASTM D5185(m) >20 <1 <1 <1   Vickel ppm ASTM D5185(m) >20 <1 <1 <1   Silver ppm ASTM D5185(m) >20 <1 <1 <1   Silver ppm ASTM D5185(m) >20 <1 <1 <1   Need ppm ASTM D5185(m) >20 <1 <1 <1   Astm D5185(m) >20 <1 <1 <1 <1   Astm D5185(m) >30 0	Sample Date		Client Info		12 Mar 2024	10 May 2023	18 Nov 2022
Dil Changed Sample StatusClient InfoChanged SEVEREChanged MARGINALChanged ABNORMALCONTAMINATIONmethodlimit/basecurrenthistory1history2WaterWC Method>0.2NEGNEGNEGSlycolWC Method>0.2NEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2ronppmASTM D5185(m)>1002842▲109ChromiumppmASTM D5185(m)>20<11<1SilverppmASTM D5185(m)>20<1<1<1SilverppmASTM D5185(m)>20447seadppmASTM D5185(m)>20447seadppmASTM D5185(m)>20447seadppmASTM D5185(m)>33000NuminumppmASTM D5185(m)>330235TinppmASTM D5185(m)0<1<1<1ArandiumppmASTM D5185(m)0<1<1<1ArandiumppmASTM D5185(m)0<1<1<1ArandiumppmASTM D5185(m)0<000AdminumppmASTM D5185(m)0<1<1<1ArandiumppmASTM D5185(m)0<000AdmanueppmASTM D5185(m) <th>Machine Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>5802</th> <th>4870</th> <th>4378</th>	Machine Age	hrs	Client Info		5802	4870	4378
Sample Status     method     Imit/base     current     history1     ABNORMAL       CONTAMINATION     method     imit/base     current     history1     history2       Water     WC Method     >0.2     NEG     NEG     NEG       Slycol     WC Method     >0.2     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       ron     ppm     ASTM D5185(m)     >100     28     42     ▲ 109       Dhromium     ppm     ASTM D5185(m)     >20     <1     1     2       Vickel     ppm     ASTM D5185(m)     >20     <1     1     <1       Silver     ppm     ASTM D5185(m)     >20     4     7     <1       Veriationum     ppm     ASTM D5185(m)     >20     4     7     <1       Veriationum     ppm     ASTM D5185(m)     >20     4     7     <1       Veriationum     ppm     ASTM D5185(m)     >20     4 <td< th=""><th>Oil Age</th><th>hrs</th><th>Client Info</th><th></th><th>0</th><th>500</th><th>0</th></td<>	Oil Age	hrs	Client Info		0	500	0
CONTAMINATION     method     limit/base     current     history1     history2       Water     WC Method     >0.2     NEG     NEG     NEG       Slycol     WC Method     NEG     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       ron     ppm     ASTM D5185(m)     >100     28     42     ▲     109       Chromium     ppm     ASTM D5185(m)     >20     <1     1     2       Vickel     ppm     ASTM D5185(m)     >20     <1     1     2       Silver     ppm     ASTM D5185(m)     >3     0     0     0       Silver     ppm     ASTM D5185(m)     >330     2     3     5       Cin     ppm     ASTM D5185(m)     >330     2     3     5       Cin     ppm     ASTM D5185(m)     >15     0     <1     <1       Antimony     ppm     ASTM D5185(m)     0     0     0	Oil Changed		Client Info		Changed	Changed	Changed
Water     WC Method     >0.2     NEG     NEG     NEG       Silycol     WC Method     Imit/base     current     history1     history2       WEAR METALS     method     Imit/base     current     history1     history2       ron     ppm     ASTM D5185(m)     >100     28     42     109       Dhromium     ppm     ASTM D5185(m)     >20     <1	Sample Status				SEVERE	MARGINAL	ABNORMAL
BalycolWC MethodNEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2ronppmASTM 05185(m)>1002842109ChromiumppmASTM 05185(m)>20<112slickelppmASTM 05185(m)>20<11<1FitaniumppmASTM 05185(m)>30<1<1SilverppmASTM 05185(m)>3000AuminumppmASTM 05185(m)>30235SilverppmASTM 05185(m)>44447e.adppmASTM 05185(m)>400<1<1c.adappmASTM 05185(m)>330235TinppmASTM 05185(m)>150<1<1AntimonyppmASTM 05185(m)>150<1<1AntimonyppmASTM 05185(m)0000CadmiumppmASTM 05185(m)65223422BariumppmASTM 05185(m)65485955AanganeseppmASTM 0518(m)65485955AanganeseppmASTM 0518(m)11607761076931AlagnesiumppmASTM 05185(m)126090212211134ChroneppmASTM 05185(m)126090212211134	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS     method     limit/base     current     history1     history2       ron     ppm     ASTM D5185(m)     >100     28     42     ▲ 109       Chromium     ppm     ASTM D5185(m)     >20     <1     1     2       Nickel     ppm     ASTM D5185(m)     >4     <1     <1     <1       Titanium     ppm     ASTM D5185(m)     >4     <1     <1     <1       Silver     ppm     ASTM D5185(m)     >3     0     0     0       Lead     ppm     ASTM D5185(m)     >20     4     4     7       Lead     ppm     ASTM D5185(m)     0     0     <1     1       Astmony     ppm     ASTM D5185(m)     0     0 <td< th=""><th>Water</th><th></th><th>WC Method</th><th>&gt;0.2</th><th>NEG</th><th>NEG</th><th>NEG</th></td<>	Water		WC Method	>0.2	NEG	NEG	NEG
ron     ppm     ASTM D5185(m)     >100     28     42     ▲ 109       Chromium     ppm     ASTM D5185(m)     >20     <1     1     2       Lickel     ppm     ASTM D5185(m)     >4     <1     <1     <1       Titanium     ppm     ASTM D5185(m)     >4     <1     <1     <1       Silver     ppm     ASTM D5185(m)     >3     0     0     0       Silver     ppm     ASTM D5185(m)     >20     4     4     7       e.ead     ppm     ASTM D5185(m)     >40     0     0     <1     <1       Copper     ppm     ASTM D5185(m)     >330     2     3     5     5       Tin     ppm     ASTM D5185(m)     >10     <1     <1     <1       Vanadium     ppm     ASTM D5185(m)     0     0     0     0       Cadmium     ppm     ASTM D5185(m)     0     0     0     0       Astin D5185(m)     65     22	Glycol		WC Method		NEG	NEG	NEG
Chromium     ppm     ASTM D5185(m)     >20     <1	WEAR METALS	S	method	limit/base	current	history1	history2
Chromium     ppm     ASTM D5185(m)     >20     <1	Iron	ppm	ASTM D5185(m)	>100	28	42	<b>1</b> 09
Nickel     ppm     ASTM D5185(m)     >4     <1	Chromium				<1	1	
Titanium     ppm     ASTM D5185(m)     0     <1	Nickel			>4	<1	<1	<1
Silver     ppm     ASTM D5185(m)     >3     0     0     0       Aluminum     ppm     ASTM D5185(m)     >20     4     4     7       Lead     ppm     ASTM D5185(m)     >40     0     0     <1       Copper     ppm     ASTM D5185(m)     >330     2     3     5       Tin     ppm     ASTM D5185(m)     >15     0     <1     <1       Antimony     ppm     ASTM D5185(m)     >15     0     <1     <1       Antimony     ppm     ASTM D5185(m)     Image: Current     0     0     0       Antimony     ppm     ASTM D5185(m)     Imit/base     current     history1     history2       Antimony     ppm     ASTM D5185(m)     65     22     34     22       Cadmium     ppm     ASTM D5185(m)     65     48     59     55       Barium     ppm     ASTM D5185(m)     0     0     1     1       Magnesium     ppm     ASTM D5185(m)	Titanium		. ,		0	<1	<1
ead     ppm     ASTM D5185(m)     >40     0     0     <1	Silver	ppm	ASTM D5185(m)	>3	0	0	0
ead     ppm     ASTM D5185(m)     >40     0     0     <1	Aluminum			>20	4	4	7
ppm     ASTM D5185(m)     >15     0     <1	Lead	ppm		>40	0	0	<1
Tin     ppm     ASTM D5185(m)     >15     0     <1	Copper		. ,	>330	2	3	5
Antimony     ppm     ASTM D5185(m)     0     <1	Tin	ppm	ASTM D5185(m)	>15	0	<1	<1
Beryllium     ppm     ASTM D5185(m)     0     0     0       Cadmium     ppm     ASTM D5185(m)     0     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185(m)     65     22     34     22       Barium     ppm     ASTM D5185(m)     0     0     0     0       Adolybdenum     ppm     ASTM D5185(m)     65     48     59     55       Manganese     ppm     ASTM D5185(m)     0     0     <<1     1       Magnesium     ppm     ASTM D5185(m)     1160     863     1113     1004       Calcium     ppm     ASTM D5185(m)     1160     776     1076     931       Phosphorus     ppm     ASTM D5185(m)     1260     902     1221     1134       Sulfur     ppm     ASTM D5185(m)     3000     2216     2824     2583	Antimony	ppm			0	<1	<1
Cadmium     ppm     ASTM D5185(m)     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185(m)     65     22     34     22       Barium     ppm     ASTM D5185(m)     0     0     0     0     0       Alganesium     ppm     ASTM D5185(m)     65     48     59     55       Manganese     ppm     ASTM D5185(m)     0     0     0     <11	Vanadium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185(m)     65     22     34     22       Barium     ppm     ASTM D5185(m)     0     0     0     0       Molybdenum     ppm     ASTM D5185(m)     65     48     59     55       Manganese     ppm     ASTM D5185(m)     0     0     <1     1       Magnesium     ppm     ASTM D5185(m)     1160     863     1113     1004       Calcium     ppm     ASTM D5185(m)     1160     776     1076     931       Phosphorus     ppm     ASTM D5185(m)     1260     902     1221     1134       Sulfur     ppm     ASTM D5185(m)     3000     2216     2824     2583	Beryllium	ppm	ASTM D5185(m)		0	0	0
Boron     ppm     ASTM D5185(m)     65     22     34     22       Barium     ppm     ASTM D5185(m)     0     0     0     0     0       Molybdenum     ppm     ASTM D5185(m)     65     48     59     55       Manganese     ppm     ASTM D5185(m)     0     0     <1     1       Magnesium     ppm     ASTM D5185(m)     1160     863     1113     1004       Calcium     ppm     ASTM D5185(m)     1160     867     884     801       Phosphorus     ppm     ASTM D5185(m)     1160     776     1076     931       Cinc     ppm     ASTM D5185(m)     1260     902     1221     1134       Sulfur     ppm     ASTM D5185(m)     3000     2216     2824     2583	Cadmium		ASTM D5185(m)		0	0	0
Barium     ppm     ASTM D5185(m)     0      11     0     3     11     1     0     4     3     1     1     1     0     4     3     1     1     1     0     4     3     1     1     1     0     4     3     1     1     1     0     4     3     1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185(m)     65     48     59     55       Manganese     ppm     ASTM D5185(m)     0     0     0     <1	Boron	ppm	ASTM D5185(m)	65	22	34	22
Manganese     ppm     ASTM D5185(m)     0     0     <1	Barium	ppm	ASTM D5185(m)	0	0	0	0
Magnesium     ppm     ASTM D5185(m)     1160     863     1113     1004       Calcium     ppm     ASTM D5185(m)     820     687     884     801       Phosphorus     ppm     ASTM D5185(m)     1160     776     1076     931       Zinc     ppm     ASTM D5185(m)     1260     902     1221     1134       Sulfur     ppm     ASTM D5185(m)     3000     2216     2824     2583	Molybdenum	ppm	ASTM D5185(m)	65	48	59	55
Calcium     ppm     ASTM D5185(m)     820     687     884     801       Phosphorus     ppm     ASTM D5185(m)     1160     776     1076     931       Zinc     ppm     ASTM D5185(m)     1260     902     1221     1134       Sulfur     ppm     ASTM D5185(m)     3000     2216     2824     2583	Manganese	ppm	ASTM D5185(m)	0	0	<1	1
Phosphorus     ppm     ASTM D5185(m)     1160     776     1076     931       Zinc     ppm     ASTM D5185(m)     1260     902     1221     1134       Sulfur     ppm     ASTM D5185(m)     3000     2216     2824     2583	Magnesium	ppm	ASTM D5185(m)	1160	863	1113	1004
Zinc     ppm     ASTM D5185(m)     1260     902     1221     1134       Sulfur     ppm     ASTM D5185(m)     3000     2216     2824     2583	Calcium	ppm	ASTM D5185(m)	820	687	884	801
Sulfur     ppm     ASTM D5185(m)     3000     2216     2824     2583	Phosphorus	ppm	ASTM D5185(m)	1160	776	1076	931
	Zinc	ppm	ASTM D5185(m)	1260	902	1221	1134
ithium     ppm     ASTM D5185(m)     <1	Sulfur	ppm	ASTM D5185(m)	3000	2216	2824	2583
	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
CONTAMINANTS method limit/base current history1 history2	CONTAMINAN	TS	method	limit/base	current	history1	history2
Silicon ppm ASTM D5185(m) >25 4 6 11	Silicon	ppm	ASTM D5185(m)	>25	4	6	11
Sodium     ppm     ASTM D5185(m)     4     7     10	Sodium	ppm	ASTM D5185(m)		4	7	10
Potassium     ppm     ASTM D5185(m)     >20     1     1     4	Potassium	ppm	ASTM D5185(m)	>20	1	1	4
Suel     %     ASTM D7593*     >5     ▲ 19.8     ▲ 4.4     ▲ 7.1	Fuel	%	ASTM D7593*	>5	<b>1</b> 9.8	<b>4</b> .4	▲ 7.1
INFRA-RED method limit/base current history1 history2	INFRA-RED		method	limit/base	current	history1	history2
Soot % % ASTM D7844* >3 0.7 0.4 1.1	Soot %	%	ASTM D7844*	>3	0.7	0.4	1.1
	Nitration	Abs/cm					
Sulfation     Abs/.1mm     ASTM D7415*     >30     21.2     21.6     25.0							



# **OIL ANALYSIS REPORT**

Viscosity @ 40° Abnormal	<b>.</b>		FLUID DEGRA	DATION	method	limit/base	current	history1	history2
			Oxidation	Abs/.1mm	ASTM D7414*	>25	20.6	21.8	23.8
Base			VISUAL		method	limit/base	current	history1	history2
Abnormal			Emulsified Water	scalar	Visual*	>0.2	NEG	NEG	NEG
		$\langle \rangle$	Free Water	scalar	Visual*		NEG	NEG	NEG
		5	FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Aug27/19 Jan20/20 Jul8/20	May18/21 Sep2/21	Nov18/22 May10/23 Mar12/24	Visc @ 40°C	cSt	ASTM D7279(m)	95.1	<b>50.6</b>	79.4	<b>71.5</b>
4		~ ~ ~	Visc @ 100°C	cSt	ASTM D7279(m)	14.3	<b>9</b> .3	13.1	<mark>▲</mark> 12.0
Viscosity @ 100	J°C		Viscosity Index (VI)	Scale	ASTM D2270*	169	168	166	165
Abnormal	1 1 		GRAPHS						
Base			Iron (ppm)			10	Lead (ppm)		
Abhreanal			200 - Severe			8	) - Severe		
			150 - Abnormal			e 6	)		
	+ +	33 5	abnormal		$\wedge$	udd 4	) - Abnormal		
Aug27/19 Jan20/20 Jul8/20	May18/21 Sep2/21	Nov18/22 May10/23 Acceter	50	/	$\sim$	2	)-		
		2 2 4	Jul8/20	2/21	/22	/24	02//201 02//201 02//8/nL	8/21-	/22
Viscosity @ 40° Abnormal	γ <b>΄</b>		Aug27/19 Jan20/20 Jul8/20	May18/21 Sep2/21	Nov18/22 May10/23	Mar12/24	Aug27/19 Jan20/20 Jul8/20	May18/21	Nov18/22 May10/23
Base			Aluminum (ppm)			5	Chromium (pp	om)	
			40 - Severe			4	Smuoro		
Abnownal			30 Abnormal			3	) <b>-</b>		
			E 20 - Abnormal			und 2	Abnormal		
	21	13 13	10			1	)-		
Aug27/19 Jan20/20 Jul8/20	May18/21 Sep2/21	Nov18/22 May10/23		21	22	24	20	21	22
			Aug27/19 Jan20/20 Jul8/20	May18/21 Sep2/21	Nov18/22 May10/23	Mar12/24	Aug27/19 . Jan20/20 . Jul8/20 .	May18/21 Sep2/21	Nov18/22 May10/23
			Copper (ppm)				Silicon (ppm)		_
			400 Severe			8	Severe	I I I I	
			300 -			6			
			톱 200			튭 4	Abnormal		
			100 -				)-		
					3 2	4			3
			Aug27/19 Jan20/20 Jul8/20	May18/21 Sep2/21	Nov18/22 May10/23	Mar12/24	Aug27/19 Jan20/20 Jul8/20	May18/2 Sep2/2	Nov18/22 May10/23
			Viscosity @ 100°C		~ 2		Fuel Dilution	2	~ 2
			18 Abnormal			20.	) T		
			16			15.	)-		/
			0014 3014 3012		~	필 과 2 <sup>10.1</sup>	Severe		/
			83 12 10			5.	Abasenal		
			8						
			Aug27/19 Jan20/20	May18/21 Sep2/21	Nov18/22 May10/23	Mar12/24	Aug27/19 Jan20/20 Jul8/20	May18/21 Sep2/21	Nov18/22 May10/23
			Auç Jar	S. S	Nov	Ma	Aug Jar J	Na S	May
326393.61	CALA	Laboratory	: WearCheck - C8-1175				_ 5H9 Green Infrastru		) - 286 - Shoring & Foundati
	Testing Accreditation No. 1005218	Sample No. Lab Number	: PC0078479	Recei Teste		3 Mar 2024 9 Mar 2024		151	Ram Forest R Stouffville, C
	ISO 17025:2017 Accredited Laboratory	Unique Number	: 5747761	Diagn	iosed : 19	Mar 2024 - W			CA L4A 20
			: MOB 1 ( Additional Te contact Customer Servi				uel, VI )		Shannon Abbo abbott@gipi.co
			e of accreditation, (m) m						: (905)750-59