

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 913061

Fluid

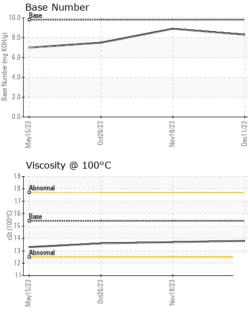
Component **Diesel Engine**

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

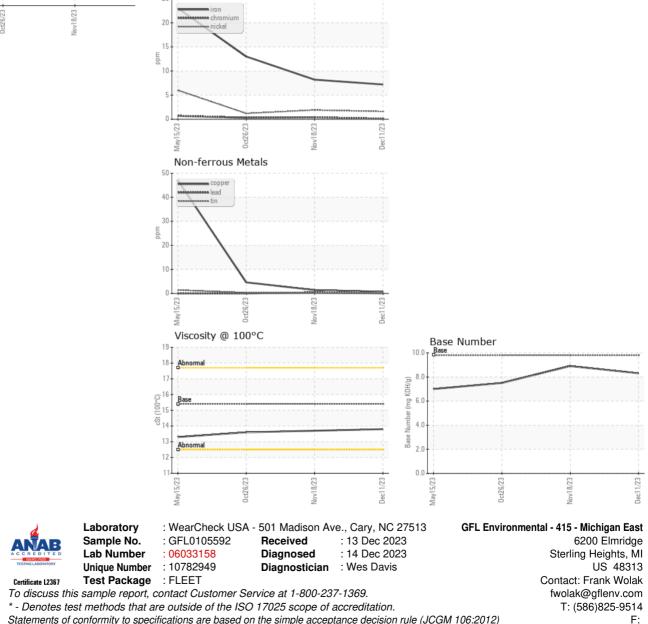
seample Data Client Info 11 Dec 2031 16 Nov 2002 26 Oct 2023 Wach Component wear rates are normal. Dil Age his Client Info 3115 2997 1837 Dirace Is no indication of any contamination in the it. Northand Northand <t< th=""><th>DIAGNOSIS</th><th>SAMPLE INFOR</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	DIAGNOSIS	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Ware Use component wear rates are normal. Machine Age (Ni Age) Inside (Ni Age) Inside (Ni Age) No Mathematical (Ni Age) Mathema	Recommendation	Sample Number		Client Info		GFL0105592	GFL0089167	GFL0093147
Out Age http://http	Resample at the next service interval to monitor.	Sample Date		Client Info		11 Dec 2023	18 Nov 2023	26 Oct 2023
Id component wear rates are normal. Dorthamination Dir Léanged Cilen Info 313 2997 1837 Dir Changed Cilen Info Nor Changed Nor Changed Nor Changed Nor MALL Normal. Find Condition The BN result indicates that there is suitable for further service. Imbebase current Hetory1 Hetory2 Fuel WC Method -3.0 <1.0 <1.0 <1.0 <1.0 Water Nor Method -3.0 <1.0 <1.0 <1.0 <1.0 Water WC Method -3.0 <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 <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	Wear	Machine Age	hrs	Client Info		3311	3135	2997
Charannet in indication of any contamination in the interpret in solutable of any contamination in the interpret in solutable in the interpret interpret in solutable in the interpret in	All component wear rates are normal.	Oil Age	hrs	Client Info		3135	2997	1837
Sample Status NORMAL NORMAL NORMAL NORMAL Mulcing membrane is suitable within yreaning in the oil. The condition of the bill is suitable for further service. CONTAMINATION method Imitbase current history1 History2 Viel WC Method S.0 <1.0 <1.0 <1.0 <1.0 Water WC Method S.0 NEG NEG NEG Bill is suitable for further service. WC Method NEG NEG NEG Vice AR METALS method Imitbase current history1 history1 Non ppm ASTM05/Km >20 <1 <1 1 Non ppm ASTM05/Km >20 <1 <1 0 Silver ppm ASTM05/Km >20 <1 2 <1 Lead ppm ASTM05/Km >20 <1 2 <1 Lead ppm ASTM05/Km >60 <1 <1 <1 Lead ppm ASTM05	•	Oil Changed		Client Info			N/A	Changed
Particition CONTIAMINATION methods imbibase current inatory inatory The BM result indicates that there is suitable all is suitable for further service. Fuel WC Method >0.0 <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 <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 <1.0 <1.0	There is no indication of any contamination in the					-	NORMAL	
The BJ result indicates that there is suitable dividintly remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The condition of the vidiality remaining in the 01. The vidiality remaining remaininithe remaininining remaining remaining remaining remaining remain	oil.	CONTAMINAT	ION	method	limit/base	current	history1	history2
Water Work (Wethod is)0.2 NEG NEG NEG NEG NEG Is suitable for further service. WO (Method is)0.2 NEG NEG NEG NEG VVCAP Department Neg NEG NEG NEG NEG Iron ppm ASTM 05/85m >12.0 7 8 13 Chromium ppm ASTM 05/85m >2.0 <1 <1 1 Niced ppm ASTM 05/85m >2.0 0 <1 0 Silver ppm ASTM 05/85m >2.0 0 <1 0 Aluminum ppm ASTM 05/85m >2.0 0 <1 1 0 Copper ppm ASTM 05/85m >0 <1 <1 <1 1 Vanadium ppm ASTM 05/85m 0 <1 <1 <1 Vanadium ppm ASTM 05/85m 0 <1 <1 <1 Vanadium ppm AS		Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Glycol WC Method NEG NEG NEG ii is suitable for further service. Glycol WC Method Imitbase current history1 history2 Iron ppm ASTIM 56166 >120 7 8 13 Chromium ppm ASTIM 56166 >20 <1 <1 1 Nickel ppm ASTIM 56166 >2 0 <1 0 Silver ppm ASTIM 56166 >2 0 <1 0 Aluminum ppm ASTIM 56166 >30 <1 1 5 Tin ppm ASTIM 56166 >30 <1 1 5 Tin ppm ASTIM 56166 >0 0 <1 <1 Vaaduim ppm ASTIM 56166 0 0 <1 <1 Vaaduim ppm ASTIM 56166 0 0 <4 <4 Vaaduim ppm ASTIM 56166 0 5 68		Water		WC Method	>0.2	NEG	NEG	NEG
Iron ppm ASTM D5185m >120 7 8 13 Chromium ppm ASTM D5185m >20 <1	bil is suitable for further service.	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM DS185m >20 <1		WEAR METAL	.S	method	limit/base	current	history1	history2
Chromium ppm ASTM D5185m >20 <1		Iron	ppm	ASTM D5185m	>120	7	8	13
Nickel ppm ASTM D5185m >5 2 2 1 Titanium ppm ASTM D5185m >2 0 <1 0 Silvor ppm ASTM D5185m >20 <1 2 <1 Aluminum ppm ASTM D5185m >20 <1 2 <1 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >40 0 <1 <1 Vanadium ppm ASTM D5185m >10 <11 <5 Vanadium ppm ASTM D5185m 0 <11 <1 <1 Vanadium ppm ASTM D5185m 0 <11 <1 <1 Barium ppm ASTM D5185m 0 <1 <1 <1 Molybdenum ppm ASTM D5185m 0 <1 <1 <1< Marganese ppm ASTM D5185m 1010 993		Chromium						
Titanium ppm ASTM D5185m >2 0 <1		Nickel				2		
Silver ppm ASTU D5185m >2 0 0 <1								
Aluminum ppm ASTM D5185m >20 <1								
Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >330 <1 1 5 Tin ppm ASTM D5185m >0 <1 <1 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 <1 0 0 ADDITIVES method imit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 <1 3 Barlum ppm ASTM D5185m 0 <1 <1 3 Magnesse ppm ASTM D5185m 0 <1 <1 <1 Magnessium ppm ASTM D5185m 0 <1 <1 <1 Magnessium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 120 104 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>								
Copper ppm ASTM D5185m >330 <1								
Tin ppm ASTM D5185m >15 0 <1								
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 <1 3 Barium ppm ASTM D5185m 0 <1 <1 3 Molybdenum ppm ASTM D5185m 0 52 68 58 Manganese ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1092 1233 1113 Sulfur ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 20 3044 3440 2430 Contation ppm ASTM D5185m 20 304 3								
Cadimium ppm ASTM D5185m 0 <1								
Boron ppm ASTM D5185m 0 <1 <1 3 Barium ppm ASTM D5185m 0 0 9 4 Molybdenum ppm ASTM D5185m 60 52 68 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1010 102 1223 9243 Phosphorus ppm ASTM D5185m 1070 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >206 3044 3344 2430 Dotassium ppm ASTM D5185m >20 <1 3 0 INFFRA-RED method								
Barium ppm ASTM D5185m 0 0 9 4 Molybdenum ppm ASTM D5185m 60 52 68 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3444 2430 CONTAMINANTS method imit/base current history1 history2 Silicon ppm ASTM D5185m 20 <1 3 0 INFRA-RED ppm ASTM D7844 <th></th> <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>		ADDITIVES		method	limit/base	current	history1	history2
Barium ppm ASTM D5185m 0 0 9 4 Molybdenum ppm ASTM D5185m 60 52 68 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 20 3044 344 2430 Contassium ppm ASTM D5185m 20 4 5 3 Sodium ppm ASTM D5185m 20 5 4 5 3 Sodium ppm <th></th> <th>Boron</th> <th>ppm</th> <th>ASTM D5185m</th> <th>0</th> <th><1</th> <th><1</th> <th>3</th>		Boron	ppm	ASTM D5185m	0	<1	<1	3
Molybdenum ppm ASTM D5185m 60 52 68 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1150 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 31 3 0 Sodium ppm ASTM D5185m >20 <1 3 0 INFRA-RED method limit/base current history1 history2 Soot % % 'ASTM D7844 >4 0.5 0.3 0.7 Nitration Abs/m 'A		Barium					9	
Marganese prm ASTM D5185m 0 <1		Molvbdenum				52	68	58
Magnesium ppm ASTM D5185m 1010 993 1014 842 Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1070 1092 1123 983 Zinc ppm ASTM D5185m 1150 1049 1145 983 Sulfur ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >20 <1		-						
Calcium ppm ASTM D5185m 1070 1092 1223 924 Phosphorus ppm ASTM D5185m 1150 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >20 <1 3 0 INFRA-RED ppm ASTM D5185m >20 <1 3 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.3 0.7 Nitration Abs/rm *ASTM D7844 >4 0.5 0.3 0.7 Sulfation Abs/rm *ASTM D7844 >4 0.5 0.3 0.7 Sulfation Abs/rm <		-						
Phosphorus ppm ASTM D5185m 1150 1049 1145 983 Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >20 41 34 4 Potassium ppm ASTM D5185m >20 <1		-						
Zinc ppm ASTM D5185m 1270 1236 1333 1113 Sulfur ppm ASTM D5185m 2060 3044 3344 2430 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >25 4 5 3 Sodium ppm ASTM D5185m >20 4 5 3 Sodium ppm ASTM D5185m >20 <1								
SulfurppmASTM D5185m2060304433442430CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25453SodiumppmASTM D5185m>20244PotassiumppmASTM D5185m>20<130INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.50.30.7NitrationAbs/cm*ASTM D7624>206.76.17.5SulfationAbs/.1mm*ASTM D7415>3018.818.719.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2514.414.714.5								
SiliconppmASTM D5185m>25453SodiumppmASTM D5185m224PotassiumppmASTM D5185m>20<1								
SodiumppmASTM D5185m224PotassiumppmASTM D5185m>20<130INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.50.30.7NitrationAbs/cm*ASTM D7624>206.76.17.5SulfationAbs/.1mm*ASTM D7415>3018.818.719.1FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2514.414.714.5		CONTAMINAN	ITS	method	limit/base	current	history1	history2
PotassiumppmASTM D5185m>20<1		Silicon	ppm		>25	4		3
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.3 0.7 Nitration Abs/cm *ASTM D7624 >20 6.7 6.1 7.5 Sulfation Abs/.tmm *ASTM D7415 >30 18.8 18.7 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 14.4 14.7 14.5		Sodium	ppm	ASTM D5185m		2		4
Soot % % *ASTM D7844 >4 0.5 0.3 0.7 Nitration Abs/cm *ASTM D7624 >20 6.7 6.1 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.7 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.4 14.7 14.5		Potassium	ppm	ASTM D5185m	>20	<1	3	0
Nitration Abs/cm *ASTM D7624 >20 6.7 6.1 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.7 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.4 14.7 14.5		INFRA-RED		method	limit/base	e current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.7 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.4 14.7 14.5		Soot %	%	*ASTM D7844	>4	0.5	0.3	0.7
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2514.414.714.5		Nitration	Abs/cm	*ASTM D7624	>20	6.7	6.1	7.5
Oxidation Abs/.1mm *ASTM D7414 >25 14.4 14.7 14.5		Sulfation	Abs/.1mm	*ASTM D7415	>30	18.8	18.7	19.1
		FLUID DEGRAI	DATION	method	limit/base	e current	history1	history2
		Oxidation	Abs/.1mm	*ASTM D7414	>25	14.4	14.7	14.5
		Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.3	8.9	7.5



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
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.8	13.7	13.6
GRAPHS						
Ferrous Alloys						



Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Submitted By: Frank Wolak