

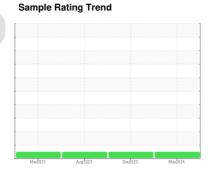
OIL ANALYSIS REPORT



(TB7705) 412005

Front Center Diesel Engine

PETRO CANADA DURON SHP 15W40 (42 QTS)





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

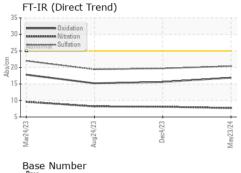
Fluid Condition

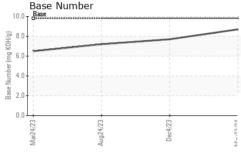
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

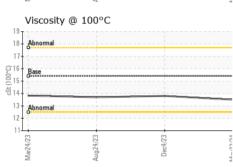
Sample Number	SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 4161 3964 3582 Oil Age hrs Client Info 0 382 0 Oil Changed Client Info Changed Changed Changed Changed Sample Status Description Changed	Sample Number		Client Info		GFL0115635	GFL0095966	GFL0066985
Oil Age hrs Client Info 0 382 0 Oil Changed	Sample Date		Client Info		23 May 2024	04 Dec 2023	24 Aug 2023
Oil Changed Sample Status Client Info Changed NORMAL Change Alphae Change Alphae Change Alphae Changed NoRMAL Change Alphae Changed NoRMAL Change Alphae Change Alphae Change Alphae Change Alphae Change Alphae Change A	Machine Age	hrs	Client Info		4161	3964	3582
Oil Changed Sample Status Client Info Changed NORMAL Change Alphae Change Alphae Change Alphae Changed NoRMAL Change Alphae Changed NoRMAL Change Alphae Change Alphae Change Alphae Change Alphae Change Alphae Change A		hrs	Client Info		0	382	0
NORMAL NORMAL NORMAL	-		Client Info		Changed	Changed	Changed
Fuel							
Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imilibase Current history1 history2 WEAR METALS method limil/base current history1 history2 Iron ppm ASTM D5185m >120 10 8 13 Chromium ppm ASTM D5185m >20 <1	CONTAMINATIO	NC	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1	WEAR METALS		method	limit/base	current	history1	history2
Chromium ppm ASTM D5185m >20 <1 0 <1 Nickel ppm ASTM D5185m >5 3 1 <1 Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 <1 Aluminum ppm ASTM D5185m >20 3 <1 2 Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >15 0 0 1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 3 7 8 Barium ppm ASTM D5185m 0 3 7 8 Barium ppm ASTM D5185m 0 0 0 0	Iron	ppm	ASTM D5185m	>120	10	8	13
Nickel			ASTM D5185m	>20	<1	0	<1
Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 <1			ASTM D5185m	>5	3	1	<1
Silver ppm ASTM D5185m >2 0 0 <1 Aluminum ppm ASTM D5185m >20 3 <1 2 Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 3 2 3 Tin ppm ASTM D5185m 0 0 0 1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 7 8 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 52 64 Manganesium ppm ASTM D5185m 1010 954 86							
Aluminum							
Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 3 2 3 Tin ppm ASTM D5185m >15 0 0 1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 7 8 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 Magnesium ppm ASTM D5185m 0 <1 0 1 1 Calcium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1270							
Copper ppm ASTM D5185m >330 3 2 3 Tin ppm ASTM D5185m >15 0 0 1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 7 8 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 -1 0 1 Manganese ppm ASTM D5185m 0 -1 0 1 Magnesium ppm ASTM D5185m 1010 954 867 963 Calcium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1270 1241 <t< td=""><td></td><td></td><td></td><td></td><th></th><td></td><td></td></t<>							
Tin ppm ASTM D5185m >15 0 0 1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 7 8 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 41 0 1 Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1270 1241 1113 1269 Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base cur							
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 7 8 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 60 52 64 Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1150 1068 869 1013 Zinc ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 <th< td=""><td></td><td></td><td></td><td></td><th>-</th><td></td><td></td></th<>					-		
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 7 8 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 -1 0 1 Manganese ppm ASTM D5185m 0 -1 0 1 Magnesium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1270 1241 1113 1269 Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 <td></td> <td></td> <td></td> <td>>10</td> <th></th> <td></td> <td></td>				>10			
ADDITIVES							
Boron		ppm					
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 60 52 64 Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1010 954 867 963 Calcium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1150 1068 869 1013 Zinc ppm ASTM D5185m 1270 1241 1113 1269 Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 3 4 Potassium ppm ASTM D5185m >20 8 <1 5 INFRA-RED method li	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 60 52 64 Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1010 954 867 963 Calcium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1150 1068 869 1013 Zinc ppm ASTM D5185m 1270 1241 1113 1269 Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 3 4 Potassium ppm ASTM D5185m >20 8 <1 5 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844	Boron	ppm					
Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1010 954 867 963 Calcium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1150 1068 869 1013 Zinc ppm ASTM D5185m 1270 1241 1113 1269 Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 3 4 Potassium ppm ASTM D5185m >20 8 <1 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.4 0.6 0.6 Nitration Abs/m		ppm	ASTM D5185m	0			
Magnesium ppm ASTM D5185m 1010 954 867 963 Calcium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1150 1068 869 1013 Zinc ppm ASTM D5185m 1270 1241 1113 1269 Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 3 Sodium ppm ASTM D5185m >20 8 <1 5 INFRA-RED method limit/base current history1 history2 Soot % "ASTM D7624 >20 7.7 8.1 8.2 Sulfation Abs/:mm "ASTM D7415 >30 20.4 19.7 19.4 FLUID DEGRADATION "ASTM D7414	Molybdenum	ppm			60		
Calcium ppm ASTM D5185m 1070 1130 1050 1183 Phosphorus ppm ASTM D5185m 1150 1068 869 1013 Zinc ppm ASTM D5185m 1270 1241 1113 1269 Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 3 Sodium ppm ASTM D5185m >20 8 <1	Manganese	ppm	ASTM D5185m	0	<1	0	1
Phosphorus ppm ASTM D5185m 1150 1068 869 1013 Zinc ppm ASTM D5185m 1270 1241 1113 1269 Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 3 Sodium ppm ASTM D5185m >20 8 <1	Magnesium	ppm			954	867	963
Zinc ppm ASTM D5185m 1270 1241 1113 1269 Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 3 Sodium ppm ASTM D5185m >20 8 <1	Calcium	ppm	ASTM D5185m	1070	1130	1050	1183
Sulfur ppm ASTM D5185m 2060 3700 2652 3425 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 3 Sodium ppm ASTM D5185m >20 8 <1	Phosphorus	ppm	ASTM D5185m	1150	1068	869	1013
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 3 Sodium ppm ASTM D5185m 3 3 4 Potassium ppm ASTM D5185m >20 8 <1	Zinc	ppm	ASTM D5185m	1270	1241	1113	1269
Silicon ppm ASTM D5185m >25 2 3 3 Sodium ppm ASTM D5185m 3 3 4 Potassium ppm ASTM D5185m >20 8 <1 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.4 0.6 0.6 Nitration Abs/cm *ASTM D7624 >20 7.7 8.1 8.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.9 15.6 15.2	Sulfur	ppm	ASTM D5185m	2060	3700	2652	3425
Sodium ppm ASTM D5185m 3 3 4 Potassium ppm ASTM D5185m >20 8 <1	CONTAMINANT	S	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 8 <1 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.4 0.6 0.6 Nitration Abs/cm *ASTM D7624 >20 7.7 8.1 8.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.9 15.6 15.2	Silicon	ppm	ASTM D5185m	>25	2		3
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.4 0.6 0.6 Nitration Abs/cm *ASTM D7624 >20 7.7 8.1 8.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.9 15.6 15.2	Sodium	ppm	ASTM D5185m		3	3	4
Soot % % *ASTM D7844 >4 0.4 0.6 0.6 Nitration Abs/cm *ASTM D7624 >20 7.7 8.1 8.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.9 15.6 15.2	Potassium	ppm	ASTM D5185m	>20	8	<1	5
Nitration Abs/cm *ASTM D7624 >20 7.7 8.1 8.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.9 15.6 15.2	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.4 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.9 15.6 15.2	Soot %	%	*ASTM D7844	>4	0.4	0.6	0.6
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.9 15.6 15.2	Nitration	Abs/cm	*ASTM D7624	>20	7.7	8.1	8.2
Oxidation Abs/.1mm *ASTM D7414 >25 16.9 15.6 15.2	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.4	19.7	19.4
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.9	15.6	15.2
			ASTM D2896	9.8	8.7	7.7	7.2



OIL ANALYSIS REPORT



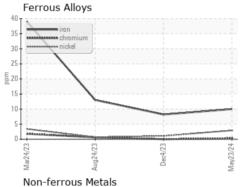


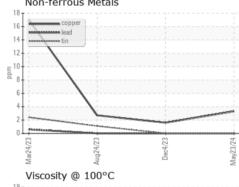


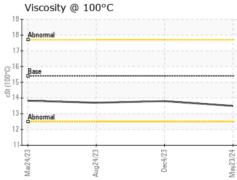
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

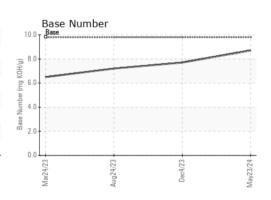
FLUID PROPERTIES		method				history2	
Visc @ 100°C	cSt	ASTM D445	15.4	13.5	13.8	13.7	

GRAPHS













Certificate 12367

Laboratory Sample No.

Lab Number : 06197323 Unique Number : 11059446

Test Package : FLEET

: GFL0115635

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 03 Jun 2024 **Tested** : 03 Jun 2024 Diagnosed

: 03 Jun 2024 - Wes Davis

GFL Environmental - 916 - Greenbay HC

1799 County Trunk PP DePere, WI US 54115

Contact: Travis Runge travis.runge@gflenv.com T: (920)351-2341

To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)