

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 7830M

Component Diesel Engine

Fluid

PETRO CANADA DURON SHP 15W40 (28 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

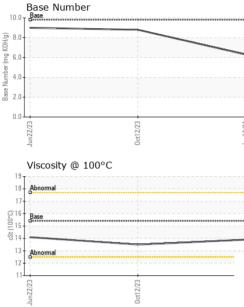
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number Client Info GFL0108858 GFL0089135 GFL0069822 Sample Date Client Info 16 Jan 2024 12 Oct 2023 22 Jun 2023 Machine Age hrs Client Info 4126 4096 Oil Age hrs Client Info 4126 2400 600 Oil Changed Client Info 4126 2400 600 Oil Changed Client Info 4126 2400 600 Oil Changed Client Info 4126 2400 600 Sample Status Imit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Chromium ppm ASTM 0565m >20 1 <1 0 Nickel ppm ASTM 0565m >20 <1 <1 0 Auminum ppm ASTM 0565m >20 <1 <1 0	SAMPLE INFORM	/IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 4689 4126 4096 Oil Age hrs Client Info 4126 2400 600 Oil Changed Client Info Changed Changed Changed Changed NORMAL Sample Status Imit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Water WC Method >0.2 NEG NEG NEG Wear WC Method >0.2 1 <1 0 Nickel ppm ASTM D5185m >2 0 <1 <1 Silver ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >2 0 <1 <1 Noreprim ppm	Sample Number		Client Info		GFL0108858	GFL0089135	GFL0069822
Oil Age hrs Client Info 4126 2400 600 Oil Changed Client Info Changed Change	Sample Date		Client Info		16 Jan 2024	12 Oct 2023	22 Jun 2023
Oil Changed Sample StatusClient InfoChanged NORMALChanged NORMALChanged NORMALChanged NORMALChanged NORMALCONTAMINATIONmethodlimil/basecurrenthistory1history2FuelWC Method>3.0<1.0<1.0<1.0<1.0WaterWC Method>0.2NEGNEGNEGGlycolWC Method>0.2NEGNEGNEGWEAR METALSmethodlimi/basecurrenthistory1history2IronppmASTM D5185m>201<10NickelppmASTM D5185m>20<1<1NickelppmASTM D5185m>20<1<1AtuminumppmASTM D5185m>20<1<1AtuminumppmASTM D5185m>20572LeadppmASTM D5185m>30324TinppmASTM D5185m150<10VanadiumppmASTM D5185m0<10<1AdminumppmASTM D5185m0<10<1DammappmASTM D5185m0<10<1CademiumppmASTM D5185m0<10<1MandiumppmASTM D5185m0<10<1MandiumppmASTM D5185m0<10<1CademiumppmASTM	Machine Age	hrs	Client Info		4689	4126	4096
Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >20 1 <1 0 Nickel ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >330 3 2 4 <1	Oil Age	hrs	Client Info		4126	2400	600
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 27 9 3 Chromium ppm ASTM D5185m >20 1 <1 0 Nickel ppm ASTM D5185m >20 1 <1 0 Silver ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >20 5 7 2 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m 0 <1 0 Vanadium	Oil Changed		Client Info		Changed	Changed	Changed
Fuel WC Method >3.0 <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 27 9 3 Chromium ppm ASTM D5185m >20 1 <1 0 Nickel ppm ASTM D5185m >2 0 <1 <1 Itanium ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >2 0 <1 0 Copper ppm ASTM D5185m >20 5 7 2 Lead ppm ASTM D5185m >20 0 <1 0 Cadmium ppm ASTM D5185m >330 3 2 4 Tin ppm ASTM D5185m 0 <1 0 <1	CONTAMINATI	ON	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG WEAR METALS method imit/base current history1 history2 Iron ppm ASTM D5185m >90 27 9 3 Chromium ppm ASTM D5185m >20 1 <1 0 Nickel ppm ASTM D5185m >20 0 <1 <1 Nickel ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >2 0 <1 0 Copper ppm ASTM D5185m >20 5 7 2 Lead ppm ASTM D5185m >30 3 2 4 Tin ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDTIVES method	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 27 9 3 Chromium ppm ASTM D5185m >20 1 <1 0 Nickel ppm ASTM D5185m >2 0 <1 <1 Titanium ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >20 5 7 2 Lead ppm ASTM D5185m >20 5 7 2 Lead ppm ASTM D5185m >30 3 2 4 Tin ppm ASTM D5185m 0 0 <1 0 Cadmium ppm ASTM D5185m 0 0 <1 0 ADDITIVES method Imit/base current history1 hist	Water		WC Method	>0.2	NEG	NEG	NEG
Iron ppm ASTM D5185m >90 27 9 3 Chromium ppm ASTM D5185m >20 1 <1 0 Nickel ppm ASTM D5185m >2 0 <1 <1 Titanium ppm ASTM D5185m >2 0 <1 <1 Silver ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >20 5 7 2 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >330 3 2 4 Tin ppm ASTM D5185m >15 0 0 <1 0 Cadmium ppm ASTM D5185m 0 0 <1 0 <1 0 Molybdenum ppm ASTM D5185m	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 1 <1	WEAR METALS	5	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 0 <1	Iron	ppm	ASTM D5185m	>90	27	9	3
Titanium ppm ASTM D5185m >2 <1	Chromium		ASTM D5185m	>20	1	<1	0
Silver ppm ASTM D5185m >2 0 <1	Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Aluminum ppm ASTM D5185m >20 5 7 2 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >330 3 2 4 Tin ppm ASTM D5185m >15 0 0 <1 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 <1 0 Molybdenum ppm ASTM D5185m 0 1 0 <1 Magnesium ppm ASTM D5185m 0 1 0 <1 Magnesium ppm ASTM D5185m 1010 911 835 950 Calcium <th>Titanium</th> <th>ppm</th> <th>ASTM D5185m</th> <th>>2</th> <th><1</th> <th><1</th> <th>0</th>	Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Lead ppm ASTM D5185m >40 0 <1	Silver	ppm	ASTM D5185m	>2	0	<1	<1
Copper ppm ASTM D5185m >330 3 2 4 Tin ppm ASTM D5185m >15 0 0 <1 Vanadium ppm ASTM D5185m >15 0 0 <1 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 <1 0 Molybdenum ppm ASTM D5185m 0 0 <11 0 <1 Magnesium ppm ASTM D5185m 0 1 0 <1 0 <1 Magnesium ppm ASTM D5185m 0 1 0 <1 0 <1 Magnesium ppm ASTM D5185m 1010 911 835 950 <1015 Phosphorus ppm	Aluminum	ppm	ASTM D5185m	>20	5	7	2
Tin ppm ASTM D5185m >15 0 0 <1	Lead	ppm	ASTM D5185m	>40	0	<1	0
Vanadium ppm ASTM D5185m 0 <1	Copper	ppm	ASTM D5185m	>330	3	2	4
Cadmium ppm ASTM D5185m 0 <1	Tin	ppm	ASTM D5185m	>15	0	0	<1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 6 6 Barium ppm ASTM D5185m 0 0 <1 0 Molybdenum ppm ASTM D5185m 0 0 <1 0 Maganese ppm ASTM D5185m 60 59 56 56 Magnesium ppm ASTM D5185m 0 1 0 <1 Magnesium ppm ASTM D5185m 1010 911 835 950 Calcium ppm ASTM D5185m 1070 1017 975 1015 Phosphorus ppm ASTM D5185m 1270 1217 1160 1263 Sulfur ppm ASTM D5185m 2060 2668 3328 3165 CONTAMINANTS method imit/base current history1 history2 Silicon ppm ASTM D5185m >25	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron ppm ASTM D5185m 0 0 0 6 6 Barium ppm ASTM D5185m 0 0 <1 0 Molybdenum ppm ASTM D5185m 60 59 56 56 Manganese ppm ASTM D5185m 0 1 0 <1 Magnesium ppm ASTM D5185m 1010 911 835 950 Calcium ppm ASTM D5185m 1070 1017 975 1015 Phosphorus ppm ASTM D5185m 1070 1018 955 1059 Zinc ppm ASTM D5185m 1270 1217 1160 1263 Sulfur ppm ASTM D5185m 2060 2668 3328 3165 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m <th>Cadmium</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th>0</th> <th><1</th> <th>0</th>	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium ppm ASTM D5185m 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 59 56 56 Manganese ppm ASTM D5185m 0 1 0 <1 Magnesium ppm ASTM D5185m 1010 911 835 950 Calcium ppm ASTM D5185m 1010 911 835 950 Calcium ppm ASTM D5185m 1070 1017 975 1015 Phosphorus ppm ASTM D5185m 1150 1018 955 1059 Zinc ppm ASTM D5185m 1270 1217 1160 1263 Sulfur ppm ASTM D5185m 2060 2668 3328 3165 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 0 4 4	Boron	ppm	ASTM D5185m	0	0	6	6
Manganese ppm ASTM D5185m 0 1 0 <1	Barium	ppm	ASTM D5185m	0	0	<1	0
Magnesium ppm ASTM D5185m 1010 911 835 950 Calcium ppm ASTM D5185m 1070 1017 975 1015 Phosphorus ppm ASTM D5185m 1150 1018 955 1059 Zinc ppm ASTM D5185m 1270 1217 1160 1263 Sulfur ppm ASTM D5185m 2060 2668 3328 3165 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 0 4 4	Molybdenum	ppm	ASTM D5185m	60	59	56	56
Calcium ppm ASTM D5185m 1070 1017 975 1015 Phosphorus ppm ASTM D5185m 1150 1018 955 1059 Zinc ppm ASTM D5185m 1270 1217 1160 1263 Sulfur ppm ASTM D5185m 2060 2668 3328 3165 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >26 5 5 5 Potassium ppm ASTM D5185m >20 0 4 4	Manganese	ppm	ASTM D5185m	0	1	0	<1
Phosphorus ppm ASTM D5185m 1150 1018 955 1059 Zinc ppm ASTM D5185m 1270 1217 1160 1263 Sulfur ppm ASTM D5185m 2060 2668 3328 3165 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 0 4 4	Magnesium	ppm	ASTM D5185m	1010	911	835	950
Zinc ppm ASTM D5185m 1270 1217 1160 1263 Sulfur ppm ASTM D5185m 2060 2668 3328 3165 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m 5 5 5 Potassium ppm ASTM D5185m >20 0 4 4	Calcium	ppm	ASTM D5185m	1070	1017	975	1015
Sulfur ppm ASTM D5185m 2060 2668 3328 3165 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m 5 5 5 Potassium ppm ASTM D5185m >20 0 4 4	Phosphorus	ppm	ASTM D5185m	1150	1018	955	1059
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25434SodiumppmASTM D5185m555PotassiumppmASTM D5185m>20044	Zinc	ppm	ASTM D5185m	1270	1217	1160	1263
Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m 5 5 5 Potassium ppm ASTM D5185m >20 0 4 4	Sulfur	ppm	ASTM D5185m	2060	2668	3328	3165
Sodium ppm ASTM D5185m 5 5 Potassium ppm ASTM D5185m >20 0 4 4	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 0 4 4	Silicon	ppm	ASTM D5185m	>25	4	3	4
	Sodium	ppm	ASTM D5185m		5	5	5
INFRA-RED method limit/base current history1 history2	Potassium	ppm	ASTM D5185m	>20	0	4	4
	INFRA-RED		method	limit/base	current	history1	history2
Soot % % *ASTM D7844 >6 0.8 0.2 0.1	Soot %	%	*ASTM D7844	>6	0.8	0.2	0.1
Nitration Abs/cm *ASTM D7624 >20 10.7 5.1 4.6		Abs/cm	*ASTM D7624	>20	10.7	5.1	4.6
Sulfation Abs/.1mm *ASTM D7415 >30 21.7 17.7 16.7	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.7	17.7	16.7
FLUID DEGRADATION method limit/base current history1 history2	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
Oxidation Abs/.1mm *ASTM D7414 >25 18.8 13.5 12.4	Ouidation	∆he/1mm	*ASTM D7414	>25	18.8	13.5	124
Base Number (BN) mg KOH/g ASTM D2896 9.8 6.3 8.8 9.0	Oxidation	A03/.111111	101101414	F = 0	10.0	10.0	



OIL ANALYSIS REPORT

VISUAL



White Metal Yellow Metal Precipitate Silt Debris Sand/Dirt	scalar scalar scalar scalar	*Visual *Visual *Visual	NONE NONE	NONE NONE	NONE	NONE NONE
Precipitate Silt Debris	scalar scalar		NONE	NONE		NONE
Silt Debris	scalar	*Visual				
Debris			NONE	NONE	NONE	NONE
		*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water						NEG
						NEG
			limit/base			history2
						14.1
	COL	A0110 0445	10.4	10.0	10.0	14.1
T						
chromium			1			
nickel						
		/				
	/	/				
23	23		24			
un22/	lct12/		an 16/			
-			<u>ت</u>			
Non-ferrous Metals	5					
copper						
essesses tin						
			4			
2/22/	t12/2.		16/2			
	_		Jan			
Viscosity @ 100°C				Base Number		
			10.0	Base		
			- 8.0			
			KOH/g			
Base			E 6.0-			
			Jaque 4.0			
			N.T.U N BS			
Abnormal			²⁰ 2.0 -			
Jun22/23	0ct12/23		10.0	/23	/23 -	
S	12		Jan 16/24	Jun22/23	0ct12/23	
	risc @ 100°C GRAPHS Ferrous Alloys	irree Water scalar FLUID PROPERTIES //isc @ 100°C cSt GRAPHS Ferrous Alloys iron iron nickal //ickal //ickal	irree Water scalar *Visual FLUID PROPERTIES method Viscosity @ 100°C cSt ASTM D445 GRAPHS Ferrous Alloys Image: State of the	rree Water scalar *Visual FLUID PROPERTIES method limit/base Fisc @ 100°C cSt ASTM D445 15.4 GRAPHS Ferrous Alloys Communication of the second of the s	reve Water scalar *Visual NEG FLUID PROPERTIES method imit/base current Visc @ 100°C cSt ASTM D445 15.4 13.9 GRAPHS Ferrous Alloys Non-ferrous Metals Viscosity @ 100°C	Incereinant Scalar *Visual NEG NEG FLUID PROPERTIES method limit/base current history1 Ifise @ 100°C cSt ASTM D445 15.4 13.9 13.5 GRAPHS Ferrous Alloys Image: Strength of the strengt of the strength of the strength of the strength of the strength o

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

50