

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 4708M Component Diesel Engine

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

### Recommendation

Resample at the next service interval to monitor.

Fluid

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

#### Fluid Condition

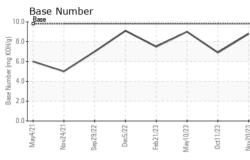
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

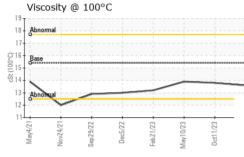
SAMPLE INFORM	<b>MATION</b>	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0089083	GFL0093199	GFL0081454
Sample Date		Client Info		20 Nov 2023	11 Oct 2023	10 May 2023
Machine Age	hrs	Client Info		11734	11413	10173
Oil Age	hrs	Client Info		200	10173	9675
Oil Changed		Client Info		Not Changd	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATI	ON	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
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	36	35	29
Chromium	ppm	ASTM D5185m	>5	1	2	2
Nickel	ppm	ASTM D5185m	>4	<1	<1	<1
Titanium	ppm	ASTM D5185m	>2	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	7	10	10
Lead	ppm	ASTM D5185m	>25	<1	<1	<1
Copper	ppm	ASTM D5185m	>100	4	2	<1
Tin	ppm	ASTM D5185m	>4	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	0
Cadmium ADDITIVES	ppm	ASTM D5185m method	limit/base	0 current	0 history1	0 history2
	ppm ppm		limit/base 0		-	-
ADDITIVES		method ASTM D5185m		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 8	history1 <1	history2 4
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0	current 8 0	history1 <1 12	history2 4 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 8 0 57	history1 <1 12 64	history2 4 0 63
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 8 0 57 <1	history1 <1 12 64 <1	history2 4 0 63 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	current 8 0 57 <1 921	history1 <1 12 64 <1 990 1102 1073	history2 4 0 63 <1 975 1081 1068
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	current           8           0           57           <1           921           1059	history1 <1 12 64 <1 990 1102	history2 4 0 63 <1 975 1081 1068 1315
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	current           8           0           57           <1           921           1059           879	history1 <1 12 64 <1 990 1102 1073	history2 4 0 63 <1 975 1081 1068
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	method 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	current           8           0           57           <1           921           1059           879           1175	history1 <1 12 64 <1 990 1102 1073 1299 3128 history1	history2         4         0         63         <1         975         1081         1068         1315         3746         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method 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	current           8           0           57           <1           921           1059           879           1175           2999	history1           <1           12           64           <1           990           1102           1073           1299           3128           history1           8	history2           4           0           63           <1           975           1081           1068           1315           3746           history2           7
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	current           8           0           57           <1           921           1059           879           1175           2999           current	history1           <1           12           64           <1           990           1102           1073           1299           3128           history1           8           57	history2           4           0           63           <1           975           1081           1068           1315           3746           history2           7           73
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method 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 <b>limit/base</b> >25	current           8           0           57           <1           921           1059           879           1175           2999           current           6	history1           <1           12           64           <1           990           1102           1073           1299           3128           history1           8	history2           4           0           63           <1           975           1081           1068           1315           3746           history2           7
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	method           ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	current           8           0           57           <1           921           1059           879           1175           2999           current           6           28	history1           <1           12           64           <1           990           1102           1073           1299           3128           history1           8           57	history2           4           0           63           <1           975           1081           1068           1315           3746           history2           7           73
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	method ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20	current         8         0         57         <1         921         1059         879         1175         2999         current         6         28         7	history1         <1         12         64         <1         990         1102         1073         1299         3128         history1         8         57         17	history2         4         0         63         <1         975         1081         1068         1315         3746         history2         7         73         19         history2         0.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >20 20	current         8         0         57         <1         921         1059         879         1175         2999         current         6         28         7         current	history1         <1         12         64         <1         990         1102         1073         1299         3128         history1         8         57         17         history1	history2         4         0         63         <1         975         1081         1068         1315         3746         history2         7         73         19         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sodium Potassium INFRA-RED Soot %	ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >20	current         8         0         57         <1         921         1059         879         1175         2999         current         6         28         7         current         0.5	history1         <1         12         64         <1         990         1102         1073         1299         3128         history1         8         57         17         history1         0.9	history2         4         0         63         <1         975         1081         1068         1315         3746         history2         7         73         19         history2         0.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method         ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20 <b>imit/base</b> >20	current         8         0         57         <1         921         1059         879         1175         2999         current         6         28         7         current         0.5         8.2	history1         <1         12         64         <1         990         1102         1073         1299         3128         history1         8         57         17         history1         0.9         10.1	history2         4         0         63         <1         975         1081         1068         1315         3746         history2         7         73         19         history2         0.4         7.8
ADDITIVES 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	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20 <b>imit/base</b> >20 >20	current         8         0         57         <1         921         1059         879         1175         2999         current         6         28         7         current         0.5         8.2         18.8	history1         <1         12         64         <1         990         1102         1073         1299         3128         history1         8         57         17         history1         0.9         10.1         19.5	history2         4         0         63         <1         975         1081         1068         1315         3746         history2         7         73         19         history2         0.4         7.8         19.6



# **OIL ANALYSIS REPORT**

VISUAL





			01 Madison Ave., C Received : 22 Diagnosed : 23 Diagnostician : W ce at 1-800-237-13 7025 scope of accre				GFL Environmental - 415 - Michigan East 6200 Elmridge Sterling Heights, MI US 48313 Contact: Frank Wolak fwolak@gflenv.com T: (586)825-9514		
		13 Abnormal	Dec5/22 Feb 21/23	May10/23 - 0ct11/23 -	4.0. 8 2.0. 9 0.0.	May4/21 Nov24/21 Sep29/22	Dec5/22	May10/23	
		17- 16- 15- 15- 15- 14-			(5,HOX Burn Jack 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,	$\checkmark$		$\checkmark$	
		19 18 <b>- Abnormal</b>			10.0		~	<u> </u>	
		Viscosity @ 100°C		M	2	Base Number			
		May4/21	Dec5/22 - Feb21/23 -	May10/23 - 0ct11/23 -	Nov20/23 -				
					10 bead (141)				
					/				
		G de							
		8 - copper lead							
		Non-ferrous Meta	ls						
			Dec5/22 Feb21/23	May10/23	Nov20/23				
		20 -							
		40		< _					
	E	80							
Dec5/22 - Feb21/23 -	May10/23 . 0ct11/23 -	120 - iron 100 - nickel							
		Ferrous Alloys							
		GRAPHS							
		Visc @ 100°C	cSt	ASTM D445		13.6	13.8	13.9	
		FLUID PROPE		method	limit/base	current	history1	history2	
°C		Emulsified Water Free Water	scalar scalar	*Visual *Visual	>0.2	NEG NEG	NEG NEG	NEG NEG	
Teb De	May Nov		scalar	*Visual	NORML	NORML	NORML	NORML	
Dec5/22 -	May10/23 0ct11/23 Nov20/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE	
		Debris	scalar scalar	*Visual *Visual	NONE	NONE	NONE	NONE	
		Precipitate Silt	scalar	*Visual	NONE	NONE NONE	NONE NONE	NONE NONE	
	$\sim$	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE	
	$\sim$ /	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE	
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Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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