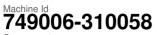


OIL ANALYSIS REPORT

Sample Rating Trend





Component Diesel Engine

Fluid

PETRO CANADA DURON SHP 15W40 (--- 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

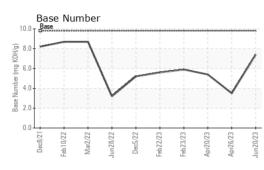
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

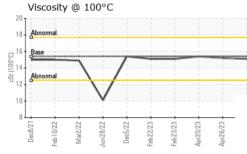
SAMPLE INFORM	ATION	method	limit/base	current	history 1	history 2
Sample Number		Client Info		GFL0084739	GFL0078166	GFL0078094
Sample Date		Client Info		20 Jun 2023	26 Apr 2023	20 Apr 2023
Machine Age	mls	Client Info		137678	13383	133777
Oil Age	mls	Client Info		0	0	0
Oil Changed		Client Info		Not Changd	Changed	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATIO	NC	method	limit/base	current	history 1	history 2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history 1	history 2
Iron	ppm	ASTM D5185m	>100	21	29	67
Chromium	ppm	ASTM D5185m	>20	1	2	3
Nickel	ppm	ASTM D5185m	>4	<1	0	1
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	2	2	3
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	0	0	<1
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history 1	history 2
_	ppm	method ASTM D5185m	limit/base 0	current 21	10	11
Boron	ppm ppm					
Boron Barium		ASTM D5185m	0	21	10	11
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m	0	21 0	10 0	11 0
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	21 0 51	10 0 58	11 0 56
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	21 0 51 <1	10 0 58 1	11 0 56 1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	21 0 51 <1 600	10 0 58 1 574	11 0 56 1 559
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	21 0 51 <1 600 1611	10 0 58 1 574 1780	11 0 56 1 559 1676
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	21 0 51 <1 600 1611 758	10 0 58 1 574 1780 730	11 0 56 1 559 1676 779
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	21 0 51 <1 600 1611 758 976	10 0 58 1 574 1780 730 1018	11 0 56 1 559 1676 779 1032
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT	ppm ppm ppm ppm ppm ppm ppm	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	21 0 51 <1 600 1611 758 976 2905	10 0 58 1 574 1780 730 1018 2453	11 0 56 1 559 1676 779 1032 2432
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon	ppm ppm ppm ppm ppm ppm ppm ppm S	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	21 0 51 <1 600 1611 758 976 2905 current	10 0 58 1 574 1780 730 1018 2453 history 1	11 0 56 1 559 1676 779 1032 2432 history 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm S	ASTM D5185m 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 limit/base >25	21 0 51 <1 600 1611 758 976 2905 current 7	10 0 58 1 574 1780 730 1018 2453 history 1 8	11 0 56 1 559 1676 779 1032 2432 history 2 12
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm S ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	21 0 51 <1 600 1611 758 976 2905 current 7 5	10 0 58 1 574 1780 730 1018 2453 history 1 8 7	11 0 56 1 559 1676 779 1032 2432 2432 history 2 12 8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm S ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	21 0 51 <1 600 1611 758 976 2905 current 7 5 1	10 0 58 1 574 1780 730 1018 2453 history 1 8 7 0	11 0 56 1 559 1676 779 1032 2432 history 2 12 8 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm S ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	21 0 51 <1 600 1611 758 976 2905 current 7 5 1 1 current	10 0 58 1 574 1780 730 1018 2453 history 1 8 7 0 0 history 1	11 0 56 1 559 1676 779 1032 2432 history 2 12 8 1 1 8 1 1 history 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm S ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 1imit/base >20	21 0 51 <1 600 1611 758 976 2905 current 7 5 1 1 current 0.1	10 0 58 1 574 1780 730 1018 2453 history 1 8 7 0 history 1 0	11 0 56 1 559 1676 779 1032 2432 history 2 12 8 1 1 8 1 1 history 2 0.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base >3 >20	21 0 51 <1 600 1611 758 976 2905 current 7 5 1 current 0.1 9.0	10 0 58 1 574 1780 730 1018 2453 history 1 8 7 0 history 1 0 history 1 0 10.3	11 0 56 1 559 1676 779 1032 2432 history 2 12 8 1 1 8 1 history 2 0.1 10.9
Boron Barium Malybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base >3 >20	21 0 51 <1 600 1611 758 976 2905 current 7 5 1 1 current 0.1 9.0 20.0	10 0 58 1 574 1780 730 1018 2453 history 1 8 7 0 history 1 0 history 1 0 10.3 20.5	11 0 56 1 559 1676 779 1032 2432 history 2 12 8 1 1 history 2 0.1 10.9 21.2



OIL ANALYSIS REPORT

Ferrous Alloys





VISUAL		method	limit/base	current	history 1	history 2
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	history 1	history 2
Visc @ 100°C	cSt	ASTM D445	15.4	15.1	15.2	15.4
GRAPHS						

160 140 120 100 Md 80 60 40 20 n Mar2/22 eb10/22 un28/22 Dec8/21 Dec5/22 Feb22/23 eh23/73 Non-ferrous Metals 18 16 14 12 10 Feb10/22 un28/22 c//2/ha eh 73/75 CI CIEW Dec8/ Viscosity @ 100°C Base Number 19 10.0 18 17 (mg KOH/g) 16 () 0015 14 6 | umber ²उँ 13 4 (Base 11 10 0.0 9 Jun20/23 -Dec8/21 Mar2/22 Dec8/21-Feb10/22 Mar2/22 Dec5/22 un28/22 un20/23 Feb10/22 Dec5/22 Feb23/23 pr20/23 Apr26/23 un28/22 Feb22/23 Apr20/23 pr26/23 Feb22/23 Feb23/23 GFL Environmental - 856 - Houston South Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. : GFL0084739 Received : 27 Jun 2023 8515 Highway 6 South Lab Number : 05884948 Diagnosed : 30 Jun 2023 Houston, TX Unique Number : 10535431 Diagnostician : Don Baldridge US 77083 Test Package : FLEET Contact: KEITH ROWALD To discuss this sample report, contact Customer Service at 1-800-237-1369. krowald@gflenv.com T: (303)641-3906

* - 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)

Contact/Location: GFL856, 859, 864 - KEITH ROWALD - GFL856

F:

Certificate L2367