

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend

## GLYCOL

#### Area (71052P) Machine Id 10541

Component Diesel Engine

Fluid

## PETRO CANADA DURON SHP 15W40 (10 GAL)

## DIAGNOSIS

#### Recommendation

We advise that you check for the source of the coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

#### Wear

All component wear rates are normal.

#### Contamination

Sodium and/or potassium levels are high.

#### Fluid Condition

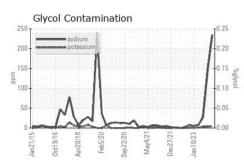
The BN result indicates that there is suitable alkalinity remaining in the oil.

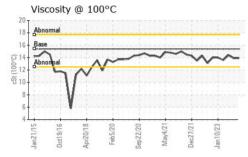
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2015	- 0	:t20	16	-	Apr2	0.1				20	100	-	-	Sep	1	-	-	-	-	av2	0.0	-		-	ic2	0.0	-		Jar	1	-	-	•																			

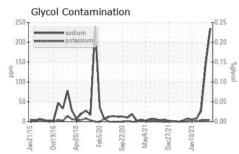
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0093748	GFL0079017	GFL0079038
Sample Date		Client Info		02 Feb 2024	16 Aug 2023	07 Jun 2023
Machine Age	hrs	Client Info		14412	13537	13124
Oil Age	hrs	Client Info		13537	13124	12465
Oil Changed	1110	Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	NORMAL	NORMAL
•	<u></u>					
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
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	22	37	37
Chromium	ppm	ASTM D5185m	>5	<1	2	1
Nickel	ppm	ASTM D5185m	>4	<1	0	0
Titanium	ppm	ASTM D5185m	>2	0	0	0
Silver	ppm	ASTM D5185m	>2	<1	0	0
Aluminum	ppm	ASTM D5185m	>15	3	2	1
Lead	ppm	ASTM D5185m	>25	<1	<1	<1
Copper	ppm	ASTM D5185m	>100	1	4	2
Tin	ppm	ASTM D5185m	>4	<1	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
Caumum	1010	AO HA DO IOOIII		U	0	0
ADDITIVES	le le	method	limit/base	current	history1	history2
ADDITIVES		method		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 12	history1 3	history2 0
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0	current 12 0	history1 3 0	history2 0 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 12 0 69	history1 3 0 68	history2 0 0 64
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0	current           12           0           69           <1	history1 3 0	history2 0 0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	current 12 0 69 <1 959	history1 3 0 68 <1 948	history2 0 0 64 <1 1048
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	methodASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185m	0 0 60 0 1010 1070	current           12           0           69           <1           959           1010	history1 3 0 68 <1 948 1059	history2 0 0 64 <1 1048 1209
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	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           12           0           69           <1           959           1010           1100	history1 3 0 68 <1 948 1059 1049	history2 0 0 64 <1 1048 1209 1074
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	methodASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185m	0 0 60 0 1010 1070	current           12           0           69           <1           959           1010	history1 3 0 68 <1 948 1059	history2 0 0 64 <1 1048 1209
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	current           12           0           69           <1           959           1010           1100           1287	history1 3 0 68 <1 948 1059 1049 1262 3122	history2 0 0 64 <1 1048 1209 1074 1355
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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	0 0 60 1010 1070 1150 1270 2060	current           12           0           69           <1           959           1010           1100           1287           3073	history1 3 0 68 <1 948 1059 1049 1262	history2 0 0 64 <1 1048 1209 1074 1355 3499
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	methodASTM D5185mASTM D5185m	0 0 60 1010 1070 1150 1270 2060	current           12           0           69           <1           959           1010           1100           1287           3073           current           9	history1           3           0           68           <1           948           1059           1049           1262           3122           history1           11	history2           0           0           64           <1           1048           1209           1074           1355           3499           history2           9
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	current           12           0           69           <1           959           1010           1100           1287           3073           current	history1           3           0           68           <1           948           1059           1049           1262           3122           history1	history2           0           0           64           <1           1048           1209           1074           1355           3499           history2
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 1010 1070 1150 1270 2060 limit/base >25	current         12         0         69         <1         959         1010         1100         1287         3073         current         9         235	history1           3           0           68           <1           948           1059           1049           1262           3122           history1           11           146	history2           0           0           64           <1           1048           1209           1074           1355           3499           history2           9           27
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	current         12         0         69         <1         959         1010         1287         3073         current         9         235         4	history1         3         0         68         <1         948         1059         1049         1262         3122         history1         11         146         4	history2         0         0         64         <1         1048         1209         1074         1355         3499         history2         9         27         3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20	current         12         0         69         <1         959         1010         1100         1287         3073         current         9         235         4         NEG         current	history1         3         0         68         <1         948         1059         1049         1262         3122         history1         11         146         4         0.0         history1	history2         0         0         64         <1         1048         1209         1074         1355         3499         history2         9         27         3         NEG         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAM Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           *ASTM D2982           method           *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20	current         12         0         69         <1         959         1010         1187         3073         current         9         235         4         NEG         current         0.8	history1         3         0         68         <1         948         1059         1049         1262         3122         history1         11         146         4         0.0         history1         1.5	history2         0         0         64         <1         1048         1209         1074         1355         3499         history2         9         27         3         NEG         history2         1.5
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol 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 limit/base >25 >20 limit/base >20	current         12         0         69         <1         959         1010         1100         1287         3073         current         9         235         4         NEG         0.8         9.0	history1         3         0         68         <1         948         1059         1049         1262         3122         history1         11         146         4         0.0         history1         1.5         11.5	history2         0         0         64         <1         1048         1209         1074         1355         3499         history2         9         27         3         NEG         history2         1.5         1.5         11.8
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           *ASTM D5185m           *ASTM D7844           *ASTM D7624           *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20 <b>limit/base</b> >20 <b>limit/base</b> >20	current         12         0         69         <1         959         1010         1100         1287         3073         current         9         235         4         NEG         current         0.8         9.0         20.9	history1         3         0         68         <1         948         1059         1049         1262         3122         history1         11         146         4         0.0         history1         1.5         11.5         22.8	history2         0         0         64         <1         1048         1209         1074         1355         3499         history2         9         27         3         NEG         history2         1.5         1.1.8         24.0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           *ASTM D7844           *ASTM D7415           method	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20	current         12         0         69         <1         959         1010         1187         3073         current         9         <235         4         NEG         current         9.0         20.9         current	history1         3         0         68         <1         948         1059         1049         1262         3122         history1         11         146         4         0.0         history1         1.5         11.5         22.8         history1	history2         0         0         64         <1         1048         1209         1074         1355         3499         history2         9         27         3         NEG         history2         1.5         11.8         24.0         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           *ASTM D5185m           *ASTM D7844           *ASTM D7624           *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 imit/base >25 	current         12         0         69         <1         959         1010         1100         1287         3073         current         9         235         4         NEG         current         0.8         9.0         20.9	history1         3         0         68         <1         948         1059         1049         1262         3122         history1         11         146         4         0.0         history1         1.5         11.5         22.8	history2         0         0         64         <1         1048         1209         1074         1355         3499         history2         9         27         3         NEG         history2         1.5         1.1.8         24.0



# **OIL ANALYSIS REPORT**





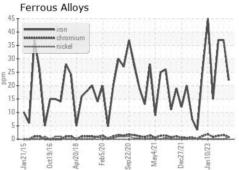


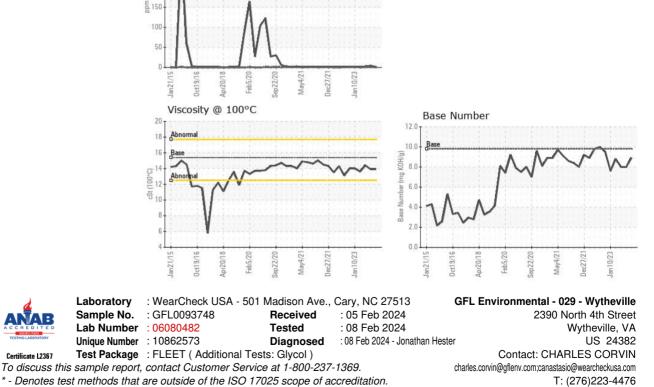
VISUAL method limit/base history1 history2 current NONE NONE White Metal \*Visual NONE NONE scalar Yellow Metal NONE NONE NONE NONE scalar \*Visual Precipitate scalar \*Visual NONE NONE NONE NONE Silt scalar \*Visual NONE NONE NONE NONE Debris \*Visual NONE NONE NONE NONE scalar Sand/Dirt NONE scalar \*Visual NONE NONE NONE NORML Appearance NORML NORML NORML scalar \*Visua NORML NORML NORML Odor scalar \*Visual NORML \*Visual **Emulsified Water** scalar >0.2 NEG NEG NEG Free Water scalar \*Visual NEG NEG NEG **FLUID PROPERTIES** method limit/base curren history history2 Visc @ 100°C cSt ASTM D445 15.4 13.9 13.9 14.4 GRAPHS

Non-ferrous Metals

30

250 200





\* - 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)

Certificate L2367

F: (276)223-1283