

# **OIL ANALYSIS REPORT**

Sample Rating Trend





# Component Diesel Engine Fluic

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.

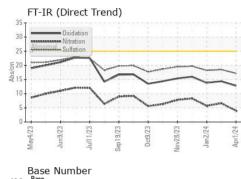
### Fluid Condition

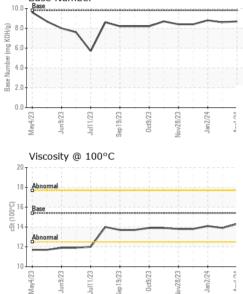
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >20         0         0         <1           Silver         ppm         ASTM D5185m         >3         0         0         <1           Lead         ppm         ASTM D5185m         >20         <1         <1         <1         <1           Lead         ppm         ASTM D5185m         >20         <1         0         <1         <1           Vanadium         ppm         ASTM D5185m         >30         0         0         <1         <1           Vanadium         ppm         ASTM D5185m         >15         0         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         <1         <1           Vanadium         ppm         ASTM D5185m							
SAMPLE INFORMATION         method         imit/base         current         history1         history2           Sample Number         Client Info         GFL0105138         GFL0105327         GFL0105137           Sample Date         Client Info         O1 Apr 2024         GA Mar 2024         O2 Jan 2024           Machine Age         hrs         Client Info         150         600         150           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd           Sample Date         Client Info         Not Changd         Not Changd         Not Changd           Sample Status         Imit/base         current         History1         History2           Fuel         WC Method         >5.5         <1.0         <1.0         <1.0           Water         WC Method         >5.2         <1.0         <1.0         <1.0           Silvel         ppm         ASTM D51655         >20         0         0         <1           Silver         ppm         ASTM D51655         >20         0         0         <1           Silver         ppm         ASTM D51655         >20         0         0         <1           Silver         ppm         AS							
SAMPLE INFORMATION         method         imit/base         current         history1         history2           Sample Number         Client Info         GFL0105138         GFL0105327         GFL0105137           Sample Date         Client Info         O1 Apr 2024         GA Mar 2024         O2 Jan 2024           Machine Age         hrs         Client Info         150         600         150           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd           Sample Date         Client Info         Not Changd         Not Changd         Not Changd           Sample Status         Imit/base         current         History1         History2           Fuel         WC Method         >5.5         <1.0         <1.0         <1.0           Water         WC Method         >5.2         <1.0         <1.0         <1.0           Silvel         ppm         ASTM D51655         >20         0         0         <1           Silver         ppm         ASTM D51655         >20         0         0         <1           Silver         ppm         ASTM D51655         >20         0         0         <1           Silver         ppm         AS							
Sample Number         Client Info         GFL0105108         GFL0105327         GFL0105137           Sample Date         Client Info         11 Apr 2024         06 Mar 2024         02 Jan 2024           Machine Age         hrs         Client Info         2037         1912         1813           Dil Age         hrs         Client Info         150         600         150           Dil Changed         Client Info         Not Changd         Nort MAL         NORMAL         NORMAL           CONTAMINATION         method         Imit/base         current         history1         history2           Fuel         WC Method         >5         <1.0         <1.0         <1.0           Water         WC Method         >0         7         5           Struckisten         ppm         ASTM 05185n         >40         0         0           Vickel         ppm         ASTM 05185n         >30         0         0         1           Silver         ppm         ASTM 05185n         >30         0         0         1           Vickel         ppm         ASTM 05185n         >30         0         0         1           Read         ppm         ASTM 05185n	AL)						
Sample Number         Client Info         GFL0105108         GFL0105327         GFL0105137           Sample Date         Client Info         11 Apr 2024         06 Mar 2024         02 Jan 2024           Machine Age         hrs         Client Info         2037         1912         1813           Dil Age         hrs         Client Info         150         600         150           Dil Changed         Client Info         Not Changd         Nort MAL         NORMAL         NORMAL           CONTAMINATION         method         Imit/base         current         history1         history2           Fuel         WC Method         >5         <1.0			May2023 Jun	limit/base	23 Oct2023 Nov2023 Jan20	history1	history2
Sample Date         Client Info         01 Apr 2024         06 Mar 2024         02 Jan 2024           Vachine Age         hrs         Client Info         2037         1912         1813           Dil Age         hrs         Client Info         150         600         150           Dil Changed         Client Info         Nor Changd         Nor Changd         Nor Changd         Nor Changd           Solic Changed         Client Info         55         <1.0				iiiii/base			
Machine Age         hrs         Client Info         2037         1912         1813           Dil Age         hrs         Client Info         150         600         150           Dil Age         hrs         Client Info         Not Changed         Not Changed         Not Changed           Sample Status         Imit/base         current         NotRMAL         NORMAL         NORMAL           CONTAMINATION         method         imit/base         current         history1         History2           Fuel         WC Method         >5         <1.0	•						
Dil Age         hrs         Client Info         150         600         150           Dil Changed         Client Info         Not Changd         Not Changd         Not Changed         Not Motal         Not Mo		hre			•		
Dil Changed Sample Status     Client Info     Not Changed NORMAL     Normal       CONTAMINATION     method     imit/base     current     history1     history2       Fuel     WC Method     >5     <1.0	•						
Sample Status         NORMAL         NORMAL         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >5         <1.0	-						
CONTAMINATION         method         limit/base         current         history1         history2           Tuel         WC Method         >5         <1.0	0				•	•	
Fuel         WC Method         >5         <1.0         <1.0         <1.0           Mater         WC Method         >0.2         NEG         NEG         NEG           Silycol         WC Method         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5186m         >20         0         0         <1	-	ION	method	limit/base	current	history1	history2
Bilycol         WC Method         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5165m<>100         0         7         5           chromium         ppm         ASTM D5165m<>20         0         0         <1			WC Method	>5	<1.0	<1.0	
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         0         0         <1	Water		WC Method	>0.2	NEG	NEG	NEG
WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5185m         >100         0         7         5           Shromium         ppm         ASTM D5185m         >20         0         0         0         <1	Glycol		WC Method		NEG	NEG	NEG
ron         ppm         ASTM D5185m         >100         0         7         5           Chromium         ppm         ASTM D5185m         >20         0         0         <1	-	S	method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >4         0         0         0           Titanium         ppm         ASTM D5185m         >3         0         0         <1							
Nickel         ppm         ASTM D5185m         >4         0         0         0           Titanium         ppm         ASTM D5185m         >3         0         0         0           Silver         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >20         <1	-			>20	-		
Titanium         ppm         ASTM D5185m         0         0         <1           Silver         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >20         <1	Nickel				-		
Silver         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >20         <1	Titanium				-		
Aluminum         ppm         ASTM D5185m         >20         <1         <1         <1           Lead         ppm         ASTM D5185m         >40         0         0         <1				>3	-		
Lead         ppm         ASTM D5185m         >40         0         0         <1           Copper         ppm         ASTM D5185m         >330         0         0         <1	Aluminum		ASTM D5185m	>20	<1	<1	<1
Dopper         ppm         ASTM D5185m         >330         0         0         <1           Vanadium         ppm         ASTM D5185m         >15         0         0         1           Cadmium         ppm         ASTM D5185m         <1	ead		ASTM D5185m	>40	0	0	<1
Tin         ppm         ASTM D5185m         >15         0         0         1           /anadium         ppm         ASTM D5185m         <1	Copper		ASTM D5185m	>330	0	0	<1
Vanadium         ppm         ASTM D5185m         <1         0         <1           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         <1			ASTM D5185m	>15	0	0	1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0         0           Barium         ppm         ASTM D5185m         0         0         0         0         0           Barium         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         0         0         0         <1	Vanadium		ASTM D5185m		<1	0	<1
Boron         ppm         ASTM D5185m         0         0         0         0         < 1           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         56         55         59           Manganese         ppm         ASTM D5185m         0         0         0         < 1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         56         55         59           Manganese         ppm         ASTM D5185m         0         0         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         56         55         59           Manganese         ppm         ASTM D5185m         0         0         0         <1	Boron	maa	ASTM D5185m	0	0	0	<1
Molybdenum         ppm         ASTM D5185m         60         56         55         59           Manganese         ppm         ASTM D5185m         0         0         0         <1	Barium		ASTM D5185m	0	-		0
Manganese         ppm         ASTM D5185m         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         940         875         950           Calcium         ppm         ASTM D5185m         1070         1040         966         1058           Phosphorus         ppm         ASTM D5185m         1070         1040         966         1057           Zinc         ppm         ASTM D5185m         1150         1016         895         1057           Zinc         ppm         ASTM D5185m         1270         1252         1079         1234           Sulfur         ppm         ASTM D5185m         2060         3697         2748         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Solicon         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.4         0.3           Soot %         %         *ASTM D7415         <	Nolvbdenum		ASTM D5185m	60	56	55	59
Magnesium         ppm         ASTM D5185m         1010         940         875         950           Calcium         ppm         ASTM D5185m         1070         1040         966         1058           Phosphorus         ppm         ASTM D5185m         1150         1016         8955         1057           Zinc         ppm         ASTM D5185m         1270         1252         1079         1234           Sulfur         ppm         ASTM D5185m         2060         3697         2748         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Solicon         ppm         ASTM D5185m         >25         4         2         2           Solicon         ppm         ASTM D5185m         >25         4         2         2           Solicon         ppm         ASTM D5185m         >20         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         0.4         0.3           Solitation         %%         *ASTM D5185m         >20         4.0         6.6         5.7           Solitation         Abs/.1mm         *ASTM D74	-		ASTM D5185m	0	0		<1
Data         ppm         ASTM D5185m         1070         1040         966         1058           Phosphorus         ppm         ASTM D5185m         1150         1016         895         1057           Zinc         ppm         ASTM D5185m         1270         1252         1079         1234           Sulfur         ppm         ASTM D5185m         2060         3697         2748         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         2         2           Sodium         ppm         ASTM D5185m         >25         4         2         2           Sodium         ppm         ASTM D5185m         >20         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20	Magnesium		ASTM D5185m	1010	940	875	950
Zinc         ppm         ASTM D5185m         1270         1252         1079         1234           Sulfur         ppm         ASTM D5185m         2060         3697         2748         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         2         2           Sodium         ppm         ASTM D5185m         >25         4         2         2           Sodium         ppm         ASTM D5185m         >25         4         2         2           Sodium         ppm         ASTM D5185m         >20         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         4.0         6.6         5.7           Sulfation         Abs/tmm         *ASTM D7624         >30         17.2         18.5         18.2           FLUID DEGRADATION         method         limit/base         cu	-		ASTM D5185m	1070	1040	966	1058
SulfurppmASTM D5185m2060369727483129CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25422SodiumppmASTM D5185m>20434PotassiumppmASTM D5185m>20000INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>300.40.3NitrationAbs/cm*ASTM D7624>204.06.65.7SulfationAbs/.1mm*ASTM D7415>3017.218.518.2DxidationAbs/.1mm*ASTM D7414>2512.814.413.8	Phosphorus	ppm	ASTM D5185m	1150	1016	895	1057
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25422SodiumppmASTM D5185m<1	Zinc	ppm	ASTM D5185m	1270	1252	1079	1234
Silicon         ppm         ASTM D5185m         >25         4         2         2           Sodium         ppm         ASTM D5185m         <20         <1         3         4           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.4         0.3           Intration         Abs/cm         *ASTM D7624         >20         4.0         6.6         5.7           Soulfation         Abs/cm         *ASTM D7624         >30         17.2         18.5         18.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Dxidation         Abs/.1mm         *ASTM D7414         >25         12.8         14.4         13.8	Sulfur	ppm	ASTM D5185m	2060	3697	2748	3129
Sodium         ppm         ASTM D5185m         <1         3         4           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         4.0         6.6         5.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.2         18.5         18.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         14.4         13.8	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         4.0         6.6         5.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.2         18.5         18.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         14.4         13.8	Silicon	ppm	ASTM D5185m	>25	4	2	2
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         4.0         6.6         5.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.2         18.5         18.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         14.4         13.8	Sodium	ppm	ASTM D5185m		<1	3	4
Soot %         %         *ASTM D7844         >3         0         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         4.0         6.6         5.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.2         18.5         18.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         14.4         13.8	Potassium	ppm	ASTM D5185m	>20	0	0	0
Nitration         Abs/cm         *ASTM D7624         >20         4.0         6.6         5.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.2         18.5         18.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         14.4         13.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.2         18.5         18.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         14.4         13.8	Soot %	%	*ASTM D7844	>3	0	0.4	0.3
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     12.8     14.4     13.8	Nitration	Abs/cm	*ASTM D7624	>20	4.0	6.6	5.7
Dxidation         Abs/.1mm         *ASTM D7414         >25         12.8         14.4         13.8	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.2	18.5	18.2
	FLUID DEGRAD	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	12.8	14.4	13.8
	Base Number (BN)	mg KOH/g	ASTM D2896		8.7	8.6	8.8

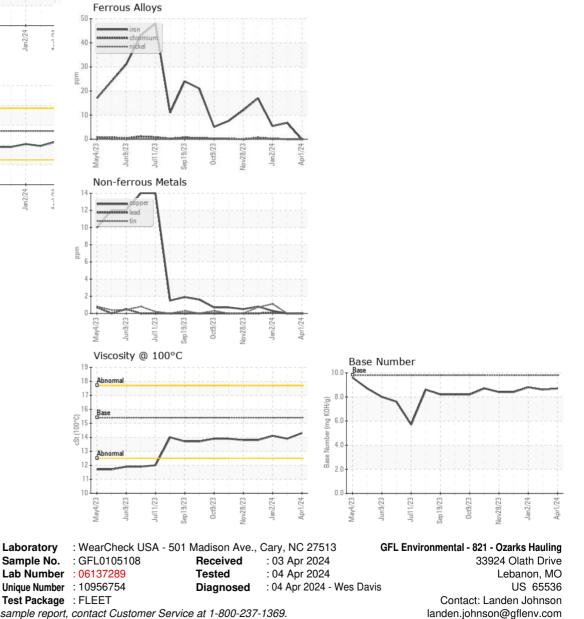


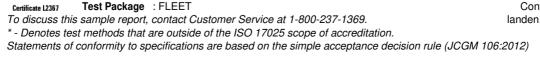
# **OIL ANALYSIS REPORT**





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 PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.3	13.9	14.1
GRAPHS						





Submitted By: GFL821, GFL824 and GFL829 - Landen Johnson Page 2 of 2

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