

# **OIL ANALYSIS REPORT**

Sample Rating Trend

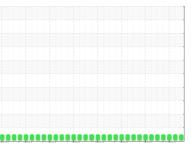
### NORMAL



## MACK 920016-192537 Component

**Diesel Engine** Fluid

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



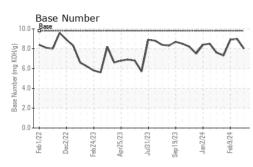


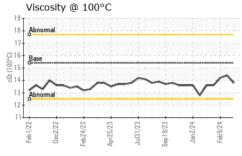
#### 5002 0....002 Le2022 Au-2023 Lu2022 Ca-2023 La-2024 Le2024

Recommendation         Sample Number         Client Info         GFL0115613         GFL0115512         GFL0112522         GFL0112522         GFL0112522         GFL0112513         GFL0112522         GFL0112513         GFL0112522         GFL0112513         GFL0112513 <thgfl0112513< th="">         GFL012513         G</thgfl0112513<>	DIAGNOSIS	SAMPLE INFOR			limit/base	Jul2023 Sep2023 Jan2024 Current	history1	history2
Resample at the next service interval to monitor.       Sample Date       Interval to monitor.       TriA6       11620       11462       11462         Al component wear rates are normal.       Oil Rhanged       hrs       Client Info       376       256       32         Di Rhanged       hrs       Client Info       376       256       32       11462         There is no indication of any contamination in the d.       introbasis       Client Info       NORMAL       NORMAL       NORMAL         The Nr costi indicates that there is suitable alkalinity remaining in the oil. The condition of the alkalinity remaining in the oil. The condition of the condition of the alkalinity remaining in the oil. The condition of the condition of the alkalinity remaining in the oil. The condition of					minubase			GFL0088637
Ware Age ins Cient Info       11746       1162       1162         All component wear rates are normal.       Client Info       376       256       32         Contamination       Nor Changed Info       Nor Changed								09 Feb 2024
Oil Age       No       376       256       327         Id component wear rates are normal.       Oil Ange       No       Chient Info       376       256       327         There is no indication of any contamination in the oil.       Sample Status       No		•	bro					
Contamination       Oli Changed       Client Info       Not Change       Not Change       Not Change       Not Change         The so indication of any contamination in the sit.       Sample Status       Imbody       Imbody       Nor MAL       NoRMAL       <		-						
Sample Status       NORMAL		Ū	1115					
CONTAMINATION       method       limbbas       current       History1       H         The DN result indicates that there is suitable alkalinity remaining in the oil. The condition of the alkalinity remaining remain		-		Client Inio		-		
Fuel Condition         The Sult indicates that there is suitable         Fuel         WC Method         >3.0         <1.0         <1.4           Water         WC Method         So.0         <1.0	-							
Fuel       WC Method       >0.0       <1.0		CONTAMINAT	ION	method	limit/base	current	history1	history2
Bill is suitable for further service.         Glycol         WC Method         NEG         NEG         NEG           Veran Unit is suitable for further service.         method         limit/base         current         history1         history		Fuel				<1.0	<1.0	<1.0
WEAR METALS         method         lim/base         current         history1         hit           Iron         ppm         ASTM 05185n         >12.0         8         0         4           Chromium         ppm         ASTM 05185n         >2.0         0         0         -1           Nickel         ppm         ASTM 05185n         >2.0         0         0         -1           Silver         ppm         ASTM 05185n         >2         0         0         -1           Aluminum         ppm         ASTM 05185n         >2         0         0         -1         0         0           Aluminum         ppm         ASTM 05185n         >20         -1         1         0         0         -1         0         0         -1         0         0         -1         0	alkalinity remaining in the oil. The condition of the	Water		WC Method	>0.2	NEG	NEG	NEG
Iron       ppm       ASTM D5186m       >12.0       8       0       4         Chromium       ppm       ASTM D5186m       >20       0       0       <1         Nickel       ppm       ASTM D5186m       >5       <1       0       0       <1         Titanium       ppm       ASTM D5186m       >2       0       0       0       <1         Silver       ppm       ASTM D5186m       >2       0       0       0       0         Lead       ppm       ASTM D5186m       >20       <1       0       2       0       0       <1       0         Vanadium       ppm       ASTM D5186m       >20       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       <1       0       0       2       4       0       <1       0       0       2       2       2 <td>il is suitable for further service.</td> <td>Glycol</td> <td></td> <td>WC Method</td> <td></td> <th>NEG</th> <td>NEG</td> <td>NEG</td>	il is suitable for further service.	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >5         <1		WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel       ppm       ASTM D5165m       >5       <1       0       0         Titanium       ppm       ASTM D5165m       >2       0       0       <1		Iron	ppm	ASTM D5185m	>120	8	0	4
Titanium       ppm       ASTM D5185m       >2       0       0       <1         Silver       ppm       ASTM D5185m       >2       0       0       0         Auminum       ppm       ASTM D5185m       >20       0       0       0         Lead       ppm       ASTM D5185m       >40       0       <1       0       <1       0         Copper       ppm       ASTM D5185m       >40       0       <1       0       <1       0         Vanadium       ppm       ASTM D5185m       >40       0       <1       0       <1       0         Vanadium       ppm       ASTM D5185m       >15       0       <1       0       12       0       0       0       12       0       0       0       12       0       0       0       12       0       0       12       0       0       0       12       13       0       0       0       12       13       <		Chromium	ppm	ASTM D5185m	>20	0	0	<1
Titanium         ppm         ASTM D5185m         >2         0         0         <1           Silver         ppm         ASTM D5185m         >20         0         0         0           Auminum         ppm         ASTM D5185m         >20         <1		Nickel	ppm	ASTM D5185m	>5	<1	0	0
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         <1		Titanium		ASTM D5185m	>2	0	0	<1
Aluminum       ppm       ASTM D5185m       >20       <1       1       2         Lead       ppm       ASTM D5185m       >40       0       <1		Silver	ppm	ASTM D5185m	>2	0	0	0
Lead         ppm         ASTM D5185m         >440         0         <1         0           Copper         ppm         ASTM D5185m         >330         <1		Aluminum		ASTM D5185m	>20	<1	1	2
Copper         ppm         ASTM D5185m         >330         <1         0         <1           Tin         ppm         ASTM D5185m         >15         0         <1		Lead					<1	0
Tin       ppm       ASTM D5185m       >15       0       <1       0         Vanadium       ppm       ASTM D5185m       0       0       0       0         Cadmium       ppm       ASTM D5185m       0       0       0       0         ADDITIVES       method       limit/base       current       history1       history1       history1         Boron       ppm       ASTM D5185m       0       2       4       0         Barium       ppm       ASTM D5185m       0       0       0       12         Molybdenum       ppm       ASTM D5185m       0       0       <1		Copper				<1	0	<1
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         hil           Boron         ppm         ASTM D5185m         0         2         4         0           Barium         ppm         ASTM D5185m         0         0         0         112           Molybdenum         ppm         ASTM D5185m         0         0         0         12           Magnesium         ppm         ASTM D5185m         0         0         -1         0           Magnesium         ppm         ASTM D5185m         1010         1020         952         914           Calcium         ppm         ASTM D5185m         1070         1113         1049         106           Phosphorus         ppm         ASTM D5185m         1070         11307         1248         117           Sulfur         ppm         ASTM D5185m         1270         1307         1248         117           Sulfur         ppm         ASTM D5185m         2260         3         3         4<						0	<1	0
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         2         4         0           Barium         ppm         ASTM D5185m         0         0         0         0         12           Molybdenum         ppm         ASTM D5185m         60         59         57         58           Manganese         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         1010         1020         952         914           Calcium         ppm         ASTM D5185m         1070         1113         1049         106           Phosphorus         ppm         ASTM D5185m         1070         1113         1049         106           Phosphorus         ppm         ASTM D5185m         1070         1113         1049         106           Solitor         ppm         ASTM D5185m         1270         1307         1248         117           Sulfaro         ppm         ASTM D5185m <td></td> <td>Vanadium</td> <td></td> <td></td> <td></td> <th></th> <td>0</td> <td>0</td>		Vanadium					0	0
Boron       ppm       ASTM D5185m       0       2       4       0         Barium       ppm       ASTM D5185m       0       0       0       12         Molybdenum       ppm       ASTM D5185m       60       59       57       58         Manganese       ppm       ASTM D5185m       0       0       -1       0         Magnesium       ppm       ASTM D5185m       1010       1020       952       914         Calcium       ppm       ASTM D5185m       1010       1020       952       914         Calcium       ppm       ASTM D5185m       1070       1113       1049       106         Phosphorus       ppm       ASTM D5185m       1070       1087       1058       112         Zinc       ppm       ASTM D5185m       1270       1307       1248       117         Sulfur       ppm       ASTM D5185m       2060       3709       3636       366         Sodium       ppm       ASTM D5185m       22       3       3       4         Sodium       ppm       ASTM D5185m       >20       2       0       2         Potassium       ppm       ASTM D5185m <t< td=""><td></td><td>Cadmium</td><td></td><td></td><td></td><th>0</th><td></td><td>0</td></t<>		Cadmium				0		0
Barium       ppm       ASTM D5185m       0       0       0       12         Molybdenum       ppm       ASTM D5185m       60       59       57       58         Manganese       ppm       ASTM D5185m       0       0       <1		ADDITIVES		method	limit/base	current	history1	history2
Molybdenum       ppm       ASTM D5185m       60 <b>59</b> 57       58         Manganese       ppm       ASTM D5185m       0       0       <10       0         Magnesium       ppm       ASTM D5185m       1010       1020       952       914         Calcium       ppm       ASTM D5185m       1010       1020       952       914         Calcium       ppm       ASTM D5185m       1070       1113       1049       1066         Phosphorus       ppm       ASTM D5185m       1070       1087       1058       112         Zinc       ppm       ASTM D5185m       1270       1307       1248       1177         Sulfur       ppm       ASTM D5185m       2060       3709       3636       386         CONTAMINANTS       method       limit/base       current       history1       hit         Silicon       ppm       ASTM D5185m       >20       Q       <1       2         Potassium       ppm       ASTM D5185m       >20       Q       <1       2         NFRA-RED       method       limit/base       current       history1       hit         Soot %       %       'ASTM D784		Boron	ppm	ASTM D5185m	0	2	4	0
Manganesse       ppm       ASTM D5185m       0       0       <1       0         Magnesium       ppm       ASTM D5185m       1010       1020       952       914         Calcium       ppm       ASTM D5185m       1070       1113       1049       1066         Phosphorus       ppm       ASTM D5185m       1070       1113       1049       1066         Phosphorus       ppm       ASTM D5185m       1120       1087       1058       1122         Zinc       ppm       ASTM D5185m       1270       1307       1248       1117         Sulfur       ppm       ASTM D5185m       2060       3709       3636       386         CONTAMINANTS       method       limit/base       current       history1       hit         Silicon       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       >20       0       <11		Barium	ppm	ASTM D5185m	0	0	0	12
Manganesse       ppm       ASTM D5185m       0       0       <1       0         Magnesium       ppm       ASTM D5185m       1010       1020       952       914         Calcium       ppm       ASTM D5185m       1070       1113       1049       1066         Phosphorus       ppm       ASTM D5185m       1070       1113       1049       1066         Phosphorus       ppm       ASTM D5185m       1120       1087       1058       1122         Zinc       ppm       ASTM D5185m       1270       1307       1248       1117         Sulfur       ppm       ASTM D5185m       2060       3709       3636       386         CONTAMINANTS       method       limit/base       current       history1       hit         Silicon       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       >20       0       <11		Molybdenum	ppm	ASTM D5185m	60	59	57	58
Magnesium       ppm       ASTM D5185m       1010       1020       952       914         Calcium       ppm       ASTM D5185m       1070       1113       1049       1066         Phosphorus       ppm       ASTM D5185m       1150       1087       1058       112         Zinc       ppm       ASTM D5185m       1270       1307       1248       117         Sulfur       ppm       ASTM D5185m       2060       3709       3636       3866         CONTAMINANTS       method       limit/base       current       history1       history1       history1         Silicon       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       >20       0       <1		Manganese	ppm	ASTM D5185m	0	0	<1	0
Calcium       ppm       ASTM D5185m       1070       1113       1049       1060         Phosphorus       ppm       ASTM D5185m       1150       1087       1058       112         Zinc       ppm       ASTM D5185m       1270       1307       1248       117         Sulfur       ppm       ASTM D5185m       2060       3709       3636       386         CONTAMINANTS       method       limit/base       current       history1       hist         Silicon       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       >20       0       <1		-	ppm	ASTM D5185m	1010	1020	952	914
Phosphorus       ppm       ASTM D5185m       1150       1087       1058       112         Zinc       ppm       ASTM D5185m       1270       1307       1248       117         Sulfur       ppm       ASTM D5185m       2060       3709       3636       386         CONTAMINANTS       method       limit/base       current       history1       history1       history1         Silicon       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       >20       0       <112       0         Potassium       ppm       ASTM D5185m       >20       0       <11       2         INFRA-RED       method       limit/base       current       history1       history1       history1         Soot %       %       *ASTM D7844       >4       0.5       0.1       0.2         Nitration       Abs/cm       *ASTM D7624       >20       7.3       4.5       4.9         Sulfation       Abs/.1mm       *ASTM D7415       >30       18.3       17.2       17.4 <td></td> <td>-</td> <td></td> <td>ASTM D5185m</td> <td>1070</td> <th>1113</th> <td>1049</td> <td>1065</td>		-		ASTM D5185m	1070	1113	1049	1065
Zinc       ppm       ASTM D5185m       1270       1307       1248       117         Sulfur       ppm       ASTM D5185m       2060       3709       3636       386         CONTAMINANTS       method       limit/base       current       history1       history1         Silicon       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       >20       0       <1								1121
SulfurppmASTM D5185m206037093636386CONTAMINANTSmethodlimit/basecurrenthistory1history1SiliconppmASTM D5185m>25334SodiumppmASTM D5185m>2020PotassiumppmASTM D5185m>200<1		1						1175
Silicon       ppm       ASTM D5185m       >25       3       3       4         Sodium       ppm       ASTM D5185m       C       2       2       0         Potassium       ppm       ASTM D5185m       >20       0       <1       2         INFRA-RED       method       limit/base       current       history1       history1       history1         Soot %       %       *ASTM D7844       >4       0.5       0.1       0.2         Nitration       Abs/cm       *ASTM D7624       >20       7.3       4.5       4.9         Sulfation       Abs/.1mm       *ASTM D7415       >30       18.3       17.2       17.4						3709		3864
Sodium         ppm         ASTM D5185m         2         2         0           Potassium         ppm         ASTM D5185m<>20         0         <1		CONTAMINAN	NTS	method	limit/base	current	history1	history2
Sodium         ppm         ASTM D5185m         2         2         0           Potassium         ppm         ASTM D5185m         >20         0         <1		Silicon	ppm	ASTM D5185m	>25	3	3	4
Potassium         ppm         ASTM D5185m         >20         0         <1         2           INFRA-RED         method         limit/base         current         history1         history1         history1           Soot %         %         *ASTM D7844         >4         0.5         0.1         0.2           Nitration         Abs/cm         *ASTM D7624         >20         7.3         4.5         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.3         17.2         17.5		Sodium		ASTM D5185m		2		0
Soot %       *ASTM D7844       >4 <b>0.5</b> 0.1       0.2         Nitration       Abs/cm       *ASTM D7624       >20 <b>7.3</b> 4.5       4.9         Sulfation       Abs/.1mm       *ASTM D7415       >30 <b>18.3</b> 17.2       17.5		Potassium	ppm	ASTM D5185m	>20	0		2
Soot %         %         *ASTM D7844         >4         0.5         0.1         0.2           Nitration         Abs/cm         *ASTM D7624         >20         7.3         4.5         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.3         17.2         17.5		INFRA-RED		method	limit/base	current	history1	history2
Nitration         Abs/cm         *ASTM D7624         >20         7.3         4.5         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.3         17.2         17.5			%	*ASTM D7844	>4	0.5	0.1	0.2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.3         17.2         17.5								
FLUID DEGRADATION method limit/base current history1 history1								17.5
		FLUID DEGRA	DATION	met <u>hod</u>	limi <u>t/base</u>	current	history1	history2
Oxidation Abs/.1mm *ASTM D7414 >25 <b>14.2</b> 13.4 13.4								13.2
								8.9

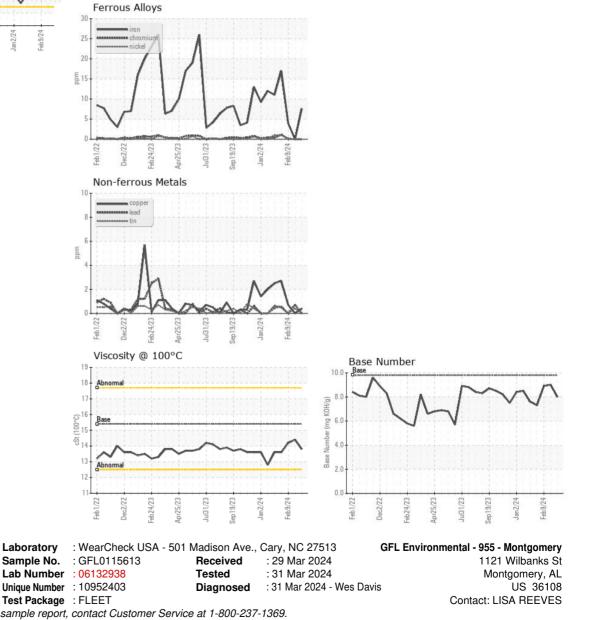


# **OIL ANALYSIS REPORT**





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	13.8	14.4	14.2
GRAPHS						





 Certificate L2367
 Test Package
 : FLEET

 To discuss this sample report, contact Customer Service at 1-800-237-1369.
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 \* - 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)