

#### RECOMMENDATION

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

PROBLEMATIC TEST RESULTS								
Sample Status				ATTENTION	ABNORMAL			
Visc @ 100°C	cSt	ASTM D445	15.4	<b>12.3</b>	<b>9</b> .5			

Customer Id: GFL836 Sample No.: GFL0087735 Lab Number: 05899213 Test Package: FLEET



To manage this report scan the QR code

*To discuss the diagnosis or test data:* Don Baldridge +1 <u>don.b505@comcast.net</u>

*To change component or sample information:* Customer Service +1 1-800-237-1369 <u>customerservice@wearcheck.com</u>

RECOMMENDED ACTIONS							
Action	Status	Date	Done By	Description			
Change Fluid			?	Oil and filter change at the time of sampling has been noted.			
Change Filter			?	Oil and filter change at the time of sampling has been noted.			

### HISTORICAL DIAGNOSIS



#### 15 Dec 2022 Diag: Jonathan Hester

No corrective action is recommended at this time. Resample at the next service interval to monitor.All component wear rates are normal. Fuel content negligible. Elemental level of silicon (Si) above normal indicating ingress of seal material. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.





## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 913036 Component

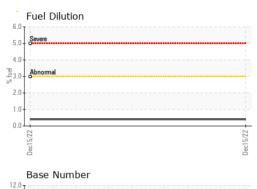
**Diesel Engine** 

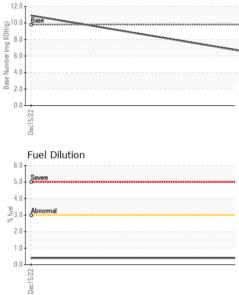
Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

Disc OCSIS     SAMPLE INFORMATION     method     implicance     biology     biology     biology     biology       A Recommendation     Cland filter charge at the time of sampling has been notable. Resample at the time of sampling has been notable. Resample at the time of sampling has been notable. Resample at the time of sample has been notable. Resample at the time of sample has been notable. Resample at the time of sample has been notable. Resample at the time of sample has been notable. Resample at the time of sample has been notable. Resample has been not					Dec2022	Jul2023		
Ol and Iller change at the time of samping has nonice.   Client Info   0   0      War   Al comporter war rates are normal.   Oil Age   hrs   Client Info   0      Al comporter war rates are normal.   Contraination   There is no indication of any contamination in the oil.   Attremmore   NA      Pare is no indication of any contamination in the oil.   CONTAMINATION   method   Imitbase   current   Neico      Pare is no indication of any contamination in the oil.   CONTAMINATION   method   Imitbase   current   Neico      Contamination   Pare is no indicate sharing remaining in the oil. Contimo if par.   Name   Name   Name   Name    Name       Chornium   ppm   ASTU Difficion   20   3   25       Node   ppm   ASTU Difficion   20   3   25       Node   ppm   ASTU Difficion   20   4        Node   ppm   ASTU Difficion   20   4	DIAGNOSIS				limit/base	current	history1	history2
been noted. Resample at the next service interval Nachina Aga n's Client Info 2416 0    Nachina Aga Nis Oil Charged Client Info 0 0    All comport wear rates are normal. Oil Charged Client Info Charged Nachina Aga    Contamination The oil viscosity is lower than normal. The Brite is suitable akalinity remaining it to oil. Confirm oil type. Contamination Ppm All Motions 2     Nachina Aga ppm All Missits >20 1     Nachina Aga ppm								
to monitor.      Oil Age   his   Client Ind   0   0      Wear   Client Ind   Client Ind   Client Ind   NA      Al component wear rates are normal.   Coll Changed   Katter   Katter   Katter   Katter   NA      Prote is no indication of any contamination in the indivectory is down than normal. The District Indivectory Indivectory is down than normal. The District Indivectory Indivectory is down than normal. The District Indivectory Inditing Indivectory Inditind Indivectory Indivectory Indive								
War All company wear rates are normal.Oil Anged Containington Sample StatusClient Into Client Loc Sample StatusClient Into Client Into Contrainington The is to indication of any contamination in the it.Client Into Containington Containington Containington Client IntoClient Into Containington ContainingtonContrainington Contrainington ContainingtonContainington Conta		0	hrs	Client Info		2416	0	
All component wear rates are normal.   Containation   Containation   Containation   Containation   Antice to inclusion of any containination in the oil.   Sample Status   Imit to its   Antice to inclusion of any containination in the oil.   NEG   NEG  NEG   NEG   NEG<		Oil Age	hrs	Client Info		0	0	
Contamination There is no indication of any contamination in biol     CONTAMINATION (9)     method     imitDass     current     Netory     Nistory2       The ol viscosity is lower than normal. The BN strating indicates that there is suitable akalanity remaining in the oll. Confirm oll type.     Pmethod     ImitDass     current     Netory2     Netory2     Netory2     Netory2     Netory2       Name Lable akalanity remaining in the oll. Confirm oll type.     pm     ASTM 05868     >20     33     25		Oil Changed		Client Info		Changed	N/A	
There is a indication of any contamination in the oil.     CON LAMINATION     method     immethod     Current     NetGo     NetGo     NetGo     NetGo	All component wear rates are normal.	Sample Status				ATTENTION	ABNORMAL	
Bit No Indication of all y contrainination in the oil.   Gigod   WC Method   NEG   NEG		CONTAMINAT	ION	method	limit/base	current	historv1	historv2
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.     The DN STM D518m     >120     31     25        Nickel     ppm     ASTM D518m     >20     1         Nickel     ppm     ASTM D518m     >2     3         Nickel     ppm     ASTM D518m     >2     1     0        Aluminum     ppm     ASTM D518m     >2     1     0        Aluminum     ppm     ASTM D518m     >2     1     0        Qopper     ppm     ASTM D518m     >40     2         Vanadium     ppm     ASTM D518m     >40     2         ADDTITVES     method     Imit/base     current     History1     History1     History1       Molyddenum     ppm     ASTM D518m     0     0         ADDTITVES     method     Imit/base     current     History1 <td< td=""><td>•</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	•							
Indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.     Iron     ppm     KNU 6kis     >Cal     33     25     ···       Nickel     ppm     KNU 6kis     >C     2     3     ···     ···       Nickel     ppm     KNU 6kis     >C     2     3     ···     ···       Aluminum     ppm     KNU 6kis     >20     4     6     ···       Lead     ppm     KNU 6kis     >30     2     10     2     -     -     -       Vanadium     ppm     KSIN 058m     >40     2     - <td></td> <td>WEAR METAL</td> <td>S</td> <td>method</td> <td>limit/base</td> <td>current</td> <td>history1</td> <td>history2</td>		WEAR METAL	S	method	limit/base	current	history1	history2
the oil. Confirm oil type.   Chromium   ppm   ASTM D5185n   >20   1   <1		Iron	maa	ASTM D5185m	>120	33	25	
Nickel     ppm     ASTM D518m     >5     2     3	, ,							
Titanium   ppm   ASTM 05186m   ≥2   <1   0      Silver   ppm   ASTM 05186m   >20   4   6      Aluminum   ppm   ASTM 05186m   >40   2   <1								
Silver   ppm   ASTM 0518m   >2   <1   2      Aluminum   ppm   ASTM 0518m   >20   4   6      Lead   ppm   ASTM 0518m   >330   7   433      Copper   ppm   ASTM 0518m   >330   7   433      Tin   ppm   ASTM 0518m   >15   3   3      Cadmium   ppm   ASTM 0518m   0   10   0      ADDITIVES   method   limit/base   current   history1   history2     Barium   ppm   ASTM 0518m   0   19   390      Magnesium   ppm   ASTM 0518m   00   113    123      Magnesium   ppm   ASTM 0518m   00   116   50      Magnesium   ppm   ASTM 0518m   1010   905   621      CohorthaltiNAUT   ppm   ASTM 0518m   1020   1021   786      Sulfur   ppm   AST								
Aluminum     pm     ASTM D518m     >20     4     6        Lead     pp     ASTM D518m     >40     2     -1        Copper     ppm     ASTM D518m     >330     7     430        Tin     ppm     ASTM D518m     >15     3     3        Vanadium     ppm     ASTM D518m     -1     <1								
Lead   ppm   ASTM DS18sm   >40   2   <1								
Copper     ppm     ASTM D5185m     >330     7     433        Tin     ppm     ASTM D5185m     >15     3     3        Vanadium     ppm     ASTM D5185m      <1								
Tin   ppm   ASTM D5185m   >15   3   3      Vanadium   ppm   ASTM D5185m   0   0      Cadmium   ppm   ASTM D5185m   0   0      ADDITIVES   method   limit/base   current   history1   history2     Boron   ppm   ASTM D5185m   0   19   390      Molybdenum   ppm   ASTM D5185m   0   115   123      Magnesse   ppm   ASTM D5185m   0   15   123      Galdium   ppm   ASTM D5185m   010   905   621      Magnesium   ppm   ASTM D5185m   1150   856   647      Caldium   ppm   ASTM D5185m   170   1021   786      Suffer   ppm   ASTM D5185m   160   356   647      Caldium   ppm   ASTM D5185m   200   3546   2773      Suffer   ppm   ASTM D5185m   20   8 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
Vanadium     prm     ASTM D5185m								
CadmiumppmASTM D5168m00ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m00BariumppmASTM D5185m001MolyddenumppmASTM D5185m01512.3MarganeseppmASTM D5185m10109056.21MarganesiumppmASTM D5185m1070146513.83PhosphorusppmASTM D5185m1070146513.83ZincppmASTM D5185m11508566.47SulfurppmASTM D5185m127010217.86SulfurppmASTM D5185m2060354627.73SodiumppmASTM D5185m20.685Fuel%ASTM D5185m20.08.56NitrationppmASTM D5185m2.2085NitrationAbs/rm*ASTM D5185m2.000.4INFRA-REDmethodlimit/basecurrenthistory1history1SulfationAbs/rm*ASTM D7185>3.0025.427.9SulfationAbs/rm*ASTM D7185>3.0025.427.9SulfationAbs/rm*ASTM D7185>3.0025.427.9Sulfation <td></td> <td></td> <td></td> <td></td> <td>&gt;15</td> <td></td> <td></td> <td></td>					>15			
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     19     390        Barium     ppm     ASTM D5185m     0     0     <11								
BoronppmASTM D5185m0193900BariumppmASTM D5185m00<1		Cadmium	ppm	ASTM D5185m		0	0	
Barium   ppm   ASTM D5185m   0   0   <1		ADDITIVES		method	limit/base	current	history1	history2
Molybdenum   ppm   ASTM D5185m   60   15   123      Manganese   ppm   ASTM D5185m   0   1   5      Magnesium   ppm   ASTM D5185m   1010   905   621      Calcium   ppm   ASTM D5185m   1070   1465   1383      Calcium   ppm   ASTM D5185m   1070   1465   1383      Calcium   ppm   ASTM D5185m   1070   1465   1383      Phosphorus   ppm   ASTM D5185m   1270   1021   786      Sulfur   ppm   ASTM D5185m   1260   3546   2773      Sulfur   ppm   ASTM D5185m   2060   3546   2773      Solicon   ppm   ASTM D5185m   >206   8   70      Solicon   ppm   ASTM D5185m   >20   8   5      Potassium   ppm   ASTM D5185m   >20   8   5      Fuel   % <td></td> <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td>19</td> <td>390</td> <td></td>		Boron	ppm	ASTM D5185m	0	19	390	
Marganese   ppm   ASTM D5185m   0   1   5      Magnesium   ppm   ASTM D5185m   1010   905   621      Calcium   ppm   ASTM D5185m   1070   1465   1383      Phosphorus   ppm   ASTM D5185m   1500   856   647      Zinc   ppm   ASTM D5185m   1270   1021   786      Sulfur   ppm   ASTM D5185m   2060   3546   2773      Solicon   ppm   ASTM D5185m   2060   3546       Sulfur   ppm   ASTM D5185m   2060   3546       Solicon   ppm   ASTM D5185m   2060   3546       Solicon   ppm   ASTM D5185m   2060   8        Solicon   ppm   ASTM D5185m   >20   8        Solicon   ppm   ASTM D5185m   >20   8        I		Barium	ppm	ASTM D5185m	0	0	<1	
Magnesium   pm   ASTM D5185m   1010   905   621      Calcium   pm   ASTM D5185m   1070   1465   1383      Phosphorus   ppm   ASTM D5185m   1150   856   647      Zinc   ppm   ASTM D5185m   1270   1021   786      Sulfur   ppm   ASTM D5185m   2060   3546   2773      Sulfur   ppm   ASTM D5185m   2060   3546   2773      Sulfur   ppm   ASTM D5185m   2060   3546   2773      Sulfur   ppm   ASTM D5185m   206   8   70      Sulfur   ppm   ASTM D5185m   >20   8   5      Sodium   ppm   ASTM D5185m   >20   8   5      Fuel   %   ASTM D5185m   >20   8   5      Sodium   ppm   ASTM D5185m   >20   8   0.2      Fuel   %   ASTM D5185m		Molybdenum	ppm	ASTM D5185m	60	15	123	
Calcium   ppm   ASTM D5185m   1070   1465   1383      Phosphorus   ppm   ASTM D5185m   1150   856   647      Zinc   ppm   ASTM D5185m   1270   1021   786      Sulfur   ppm   ASTM D5185m   2060   3546   2773      CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >25   8   70      Sodium   ppm   ASTM D5185m   >25   8   70      Potassium   ppm   ASTM D5185m   >20   8   5      Fuel   %   ASTM D5185m   >20   8   5      Sodium   ppm   ASTM D5185m   >20   8   5      Potassium   ppm   ASTM D5185m   >20   8   0.2      Sodo %   %   *ASTM D7844   >4   0.8   0.2      Nitration   Abs/tm   *ASTM D76242		Manganese	ppm	ASTM D5185m	0	1	5	
PhosphorusppmASTM D5185m1150856647ZincppmASTM D5185m12701021786SulfurppmASTM D5185m206035462773CONTAMINATmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25870SodiumppmASTM D5185m>2085PotassiumppmASTM D5185m>2085Fuel%ASTM D5185m>2085INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.80.2NitrationAbs/rm*ASTM D7624>2010.77.6SulfationAbs/rm*ASTM D7445>3025.427.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/rm*ASTM D7445>20.722.3		Magnesium	ppm	ASTM D5185m	1010	905	621	
Zinc   ppm   ASTM D5185m   1270   1021   786      Sulfur   ppm   ASTM D5185m   2060   3546   2773      CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >25   8   70      Sodium   ppm   ASTM D5185m   >20   8   70      Sodium   ppm   ASTM D5185m   >20   8   5      Potassium   ppm   ASTM D5185m   >20   8   5      Fuel   %   ASTM D5185m   >20   8   5      INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D7844   >4   0.8   0.2      Nitration   Abs/cm   *ASTM D7845   >20   10.7   7.6      Sulfation   Abs/1m   *ASTM D7845   >30   25.4   27.9      FLUID DEGRADATION   method   lim		Calcium	ppm	ASTM D5185m	1070	1465	1383	
ZincppmASTM D5185m12701021786SulfurppmASTM D5185m206035462773CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25870SodiumppmASTM D5185m>20870PotassiumppmASTM D5185m>2085Fuel%ASTM D5185m>2085INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.80.2NitrationAbs/cm*ASTM D7445>2010.77.6SulfationAbs/tm*ASTM D7415>3025.427.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/tm*ASTM D7414>2520.722.3		Phosphorus	ppm			856	647	
SulfurppmASTM D5185m206035462773CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25870SodiumppmASTM D5185m>2085PotassiumppmASTM D5185m>2085Fuel%ASTM D5185m>2085INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D784i>40.80.2NitrationAbs/m*ASTM D762i>2010.77.6SulfationAbs/m*ASTM D764i>3025.427.9FLUID DEGRADTIONmethodlimit/basecurrenthistory1history2OxidationAbs/m*ASTM D784i>2520.722.3				ASTM D5185m	1270	1021	786	
SiliconppmASTM D5185m>25870SodiumppmASTM D5185mPotassiumppmASTM D5185m>2085PotassiumppmASTM D5185m>2085100.4Fuel%ASTM D3524>3.0<1.0		Sulfur				3546	2773	
SodiumppmASTM D5185m6<1		CONTAMINAN	ITS	method	limit/base	current	history1	history2
PotassiumppmASTM D5185m>2085Fuel%ASTM D3524>3.0<1.00.4<INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.80.2NitrationAbs/cm*ASTM D7624>2010.77.6SulfationAbs/1mm*ASTM D7415>3025.427.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/1mm*ASTM D7414>2520.722.3		Silicon	ppm	ASTM D5185m	>25	8	<b>1</b> 70	
Fuel%ASTM D3524>3.0<1.00.4INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.80.2NitrationAbs/cm*ASTM D7624>2010.77.6SulfationAbs/.1mm*ASTM D7415>3025.427.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2520.722.3		Sodium	ppm	ASTM D5185m		6	<1	
Fuel%ASTM D3524>3.0<1.00.4INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.80.2NitrationAbs/cm*ASTM D7624>2010.77.6SulfationAbs/1mm*ASTM D7415>3025.427.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/1mm*ASTM D7414>2520.722.3		Potassium			>20	8	5	
Soot %     %     *ASTM D7844     >4     0.8     0.2        Nitration     Abs/cm     *ASTM D7624     >20     10.7     7.6        Sulfation     Abs/.1mm     *ASTM D7415     >30     25.4     27.9        FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     20.7     22.3		Fuel	%	ASTM D3524	>3.0	<1.0	0.4	
Soot %     %     *ASTM D7844     >4     0.8     0.2        Nitration     Abs/cm     *ASTM D7624     >20     10.7     7.6        Sulfation     Abs/.1mm     *ASTM D7415     >30     25.4     27.9        FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     20.7     22.3		INFRA-RED		method	limit/base	current	history1	history2
NitrationAbs/cm*ASTM D7624>2010.77.6SulfationAbs/.1mm*ASTM D7415>3025.427.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2520.722.3			%					
SulfationAbs/.1mm*ASTM D7415>3025.427.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2520.722.3								
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2520.722.3								
Oxidation     Abs/.1mm     *ASTM D7414     >25     20.7     22.3								
		FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN)     mg KOH/g     ASTM D2896     9.8     6.5     10.9		Oxidation	Abs/.1mm	*ASTM D7414	>25	20.7	22.3	
		Base Number (BN)	mg KOH/g	ASTM D2896	9.8	6.5	10.9	



# **OIL ANALYSIS REPORT**





	VISUAL		method	limit/base	)	current	history1	history2
	White Metal	scalar	*Visual	NONE		NONE	NONE	
	Yellow Metal	scalar	*Visual	NONE		NONE	NONE	
	Precipitate	scalar	*Visual	NONE		NONE	NONE	
-	Silt	scalar	*Visual	NONE		NONE	NONE	
	Debris	scalar	*Visual	NONE		NONE	NONE	
	Sand/Dirt	scalar	*Visual	NONE		NONE	NONE	
/22	Appearance	scalar	*Visual	NORML		NORML	NORML	
Dec15/22	Odor	scalar	*Visual	NORML		NORML	NORML	
	Emulsified Water	scalar	*Visual	>0.2		NEG	NEG	
	Free Water	scalar	*Visual			NEG	NEG	
	FLUID PROPE	RTIES	method	limit/base	)	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445			12.3	▲ 9.5	
	GRAPHS			-		-		
	Ferrous Alloys							
	35 iron							
	30 - chromium							
	25 - nickel							
1	20							
	20 - 15 -							
	10-							
	5							
	0							
	0ec15/22 .			Jul6/23 .				
	Dec1			Jul				
	Non-ferrous Meta	s						
	45 copper							
	and lead							
	35 annual tin							
ſ								
	25							
	15-							
	10-							
				Jul6/23 -				
	Dec15/22			lul				
	Viscosity @ 100°C	2			E	Base Number		
				1	2.0			
	18 - Abnormal				0.0	Base		
ć	16 Base			Base Number (mg KOH/g)	8.0-			
	£ 14 -			er (mç	6.0 -			
t,	3 Abnormal			, dunb				
	12			Base	4.0-			
	10-				2.0-			
	8				0.0 L			
	Dec15/22			Jul6/23	Der15/23	77/6122		Jul6/23
aboratory Sample No. ab Number Inique Number	: WearCheck USA - : GFL0087735 : 05899213 : 10560569	Received Diagnos Diagnost	1 : 14 . ed : 18 . ician : Dor	ry, NC 275 Jul 2023 Jul 2023 1 Baldridge			K	t Truman Road ansas City, MO US 64126
							<b>a</b> .	
est Package	: FLEET ( Additional contact Customer Serv							act: Robert Hart art@gflenv.com

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

Contact/Location: See also GFL823, 834, 837, 840 - Robert Hart - GFL836

F:

T: (580)461-1509