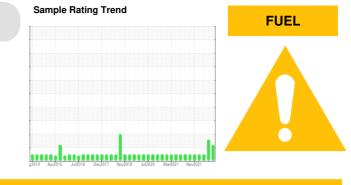


Machine Id 2296 Component Diesel Engine

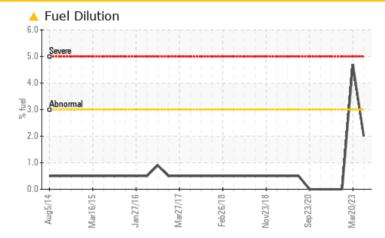
Fluid

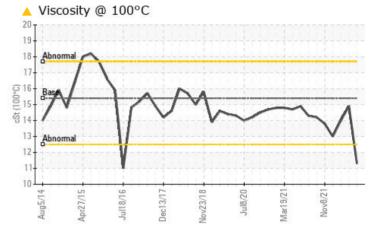
PROBLEM SUMMARY

PETRO CANADA DURON SHP 15W40 (60 QTS)



COMPONENT CONDITION SUMMARY





RECOMMENDATION

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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				MARGINAL	ABNORMAL	NORMAL		
Fuel	%	ASTM D3524	>3.0	A 2.0	4 .7	<1.0		
Visc @ 100°C	cSt	ASTM D445	15.4	11.3	14.9	14.0		

Customer Id: GFL030 Sample No.: GFL0047432 Lab Number: 05904173 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Doug Bogart +1 (800)237-1369 x4016 <u>dougb@wearcheckusa.com</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



20 Mar 2023 Diag: Doug Bogart

We advise that you check for faulty combustion, plugged air filters, or aftercoolers. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value.All component wear rates are normal. There is an abnormal amount of solids and carbon present in the oil. Light fuel dilution occurring. The oil is no longer serviceable due to the presence of contaminants.



view report

24 Feb 2022 Diag: Wes Davis



Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

22 Nov 2021 Diag: Doug Bogart





Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.







OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 2296 Component Diesel E Fluid PETRO (

Diesel Engine

PETRO CANADA DURON SHP 15W40 (60 QTS)

2014 An/2015 Ju2/016 Dec/017 Nov/018 Ju2/020 Ma/2021 Nov/2021

SAMPLE INFORMATICSample NumberSample DateMachine AgehrsOil AgehrsOil ChangedSample StatusImageCONTAMINATIONGlycolWEAR METALSIronppmChromiumppmNickelppmSilverppmAluminumppmLeadppmCopperppmTinppmAntimonyppmBoronppmBariumppmManganeseppmManganeseppmSulfurppmSilufurppmManganeseppmSodiumppmSiliconppmSiliconppmSodiumppmSodiumppmSodiumppmSoot %%NitrationAbs/c	N method Client Info Client Info Client Info Client Info Client Info Wc Method	limit/base	GFL0047432 10 Jul 2023 1790999 600 Changed MARGINAL	history1 GFL0070776 20 Mar 2023 1790692	history2 GFL003776
Sample DateImageMachine AgehrsOil AgehrsOil ChangedSample StatusCONTAMINATIONGlycolWEAR METALSIronppmChromiumppmChromiumppmNickelppmSilverppmAluminumppmLeadppmCopperppmAntimonyppmCadmiumppmBoronppmBariumppmMagnesiumppmCalciumppmMagnesiumppmSilfurppmSilfurppmMagnesiumppmCONTAMINANTSppmSiliconppmSodiumppmKortanationppmMagnesiumppmSodiumppmSodiumppmSodiumppmSodiumppmSoot %%	Client Info Client Info Client Info Client Info method	limit/base	10 Jul 2023 1790999 600 Changed	20 Mar 2023	GFL003776
Machine AgehrsOil AgehrsOil ChangedhrsSample StatusICONTAMINATIONGlycolWEAR METALSIronppmChromiumppmNickelppmNickelppmAluminumppmLeadppmCopperppmTinppmAntimonyppmCadmiumppmBoronppmBariumppmMaganeseppmMagnesiumppmCalciumppmSilfurppmSulfurppmSulfurppmSulfurppmSodiumppmSodiumppmSulfurppmSulfurppmSulfurppmSodiumppmSodiumppmSulfurppmSodiumppmSodiumppmSulfurppmSodiumppmSodiumppmSulfurppmSodiumppmSodiumppmSodiumppmSodiumppmSoot %%	Client Info Client Info Client Info method	limit/base	1790999 600 Changed		
Oil AgehrsOil ChangedSample StatusCONTAMINATIONGlycolWEAR METALSIronppmChromiumppmChromiumppmNickelppmNickelppmSilverppmAluminumppmLeadppmCopperppmCopperppmCadmiumppmCadmiumppmBoronppmBariumppmMalganeseppmMagnesiumppmCalciumppmSulfurppmSulfurppmSodiumppmSodiumppmSodiumppmFuel%INFRA-RED%	Client Info Client Info method	limit/base	600 Changed	1/90692	24 Feb 2022
Oil Changed Sample StatusCONTAMINATIONGlycolWEAR METALSIronppmChromiumppmChromiumppmNickelppmSilverppmAluminumppmLeadppmCopperppmAntimonyppmCadmiumppmBoronppmBariumppmManganeseppmMagnesiumppmCalciumppmZincppmSulfurppmSulfurppmSodiumppmSodiumppmKontimonyppmManganeseppmManganeseppmMagnesiumppmZincppmSulfurppmSulfurppmSodiumppmSodiumppmSodiumppmSodiumppmSulfurppmSodiumppmSodiumppmSodiumppmSodiumppmSodiumppmSodiumppmSoot %%	Client Info method	limit/base	Changed		39069
Sample Status CONTAMINATION Glycol WEAR METALS Iron ppm Chromium ppm Nickel ppm Nickel ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Antimony ppm Cadmium ppm Cadmium ppm Barium ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Calcium ppm Silver ppm Silver ppm Silver ppm Silver ppm Calcium ppm ContAMINANTS Silicon ppm Sodium ppm Fuel %	method	limit/base	-	600	269
CONTAMINATION Glycol WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Antimony ppm Vanadium ppm Boron ppm Manganese ppm Magnesium ppm Calcium ppm Zinc ppm Sulfur ppm Sulfur ppm Sodium ppm Sulfur ppm Sulfur ppm Sulfur ppm Sulfur ppm Sodium ppm Sulfur ppm Sulfur ppm Sulfur ppm Sodium ppm Sodium ppm Sodium ppm Sulfur % INFRA-RED % <td></td> <td>limit/base</td> <td>MARGINAL</td> <td>Changed</td> <td>Not Changd</td>		limit/base	MARGINAL	Changed	Not Changd
Glycol WEAR METALS Iron ppm Chromium ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Antimony ppm Vanadium ppm Antimony ppm Manganese ppm Magnesium ppm Magnesium ppm Zinc ppm Sulfur ppm Sulfur ppm Sodium ppm Sodium ppm Sulfur ppm Sulfur ppm Sulfur ppm Sodium ppm Sulfur ppm Sulfur ppm Sodium ppm Sodium ppm Sulfur ppm Sodium ppm Sulfur ppm Sodium ppm <td></td> <td>limit/base</td> <td>MANGINAL</td> <td>ABNORMAL</td> <td>NORMAL</td>		limit/base	MANGINAL	ABNORMAL	NORMAL
WEAR METALSIronppmChromiumppmNickelppmNickelppmSilverppmSilverppmAluminumppmLeadppmCopperppmTinppmAntimonyppmCadmiumppmCadmiumppmBoronppmBariumppmMalganeseppmMagnesiumppmCalciumppmSulfurppmSulfurppmSodiumppmPotassiumppmSodiumppmFuel%INFRA-RED%	WC Method		current	history1	history2
Iron ppm Chromium ppm Nickel ppm Nickel ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Antimony ppm Cadmium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Barium ppm Manganese ppm Manganese ppm Manganese ppm Calcium ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm Sulfur ppm Sulfur ppm Sulfur ppm Sulfur ppm Fue ppm Sodium ppm			NEG	NEG	NEG
Chromium ppm Nickel ppm Nickel ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Antimony ppm Cadmium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Calcium ppm Sulfur ppm CONTAMINANTS Silicon ppm Fuel %	method	limit/base	current	history1	history2
NickelppmTitaniumppmSilverppmAluminumppmLeadppmCopperppmTinppmAntimonyppmCadmiumppmCadmiumppmADDITIVESBoronppmManganeseppmMagnesiumppmCalciumppmZincppmSulfurppmSodiumppmSodiumppmFuel%INFRA-RED%	ASTM D5185m	>120	9	72	3
Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Antimony ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Magnesium ppm Magnesium ppm Calcium ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm Sulfur ppm Sulfur ppm Fuel %	ASTM D5185m	>20	<1	2	<1
Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Antimony ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Manganese ppm Manganese ppm Manganese ppm Calcium ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm Sulfur ppm Sulfur ppm Fue ppm Sodium ppm Fue %	ASTM D5185m	>5	0	0	<1
Aluminum ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Antimony ppm Antimony ppm Antimony ppm Cadmium ppm Cadmium ppm ADDITIVES Boron Boron ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm Sodium ppm Fuel % INFRA-RED %	ASTM D5185m	>2	0	0	0
AluminumppmLeadppmCopperppmTinppmAntimonyppmVanadiumppmCadmiumppmCadmiumppmCadmiumppmBoronppmBariumppmMalybdenumppmMagnesiumppmCalciumppmZincppmSulfurppmSodiumppmSodiumppmFuel%INFRA-RED%	ASTM D5185m		0	0	0
LeadppmCopperppmTinppmAntimonyppmVanadiumppmCadmiumppmCadmiumppmADDITIVESBoronppmBariumppmMolybdenumppmMagnesiumppmCalciumppmPhosphorusppmSulfurppmSodiumppmSodiumppmFuel%INFRA-RED%	ASTM D5185m	>20	<1	4	2
CopperppmTinppmAntimonyppmAntimonyppmVanadiumppmCadmiumppmCadmiumppmADDITIVESBoronppmMalphariumppmManganeseppmMagnesiumppmCalciumppmPhosphorusppmSulfurppmSolifurppmSodiumppmFuel%INFRA-RED%	ASTM D5185m		0	13	<1
TinppmAntimonyppmAntimonyppmVanadiumppmCadmiumppmADDITIVESppmBoronppmBariumppmMalganeseppmMagnesiumppmCalciumppmCalciumppmZincppmSulfurppmSulfurppmSodiumppmFuel%INFRA-RED%	ASTM D5185m		1	7	0
Antimony ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Zinc ppm Sulfur ppm Sulfur ppm Sulfur ppm Fuel %	ASTM D5185m		0	<1	<1
VanadiumppmCadmiumppmCadmiumppmADDITIVESppmBoronppmBariumppmMolybdenumppmMagnesieppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmFuel%INFRA-RED%	ASTM D5185m	210			<1
CadmiumppmADDITIVESBoronppmBariumppmMolybdenumppmMaganeseppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmFuel%INFRA-RED%	ASTM D5185m		0	0	0
ADDITIVESBoronppmBariumppmMolybdenumppmMaganeseppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppmFuel%INFRA-RED%	ASTM D5185m		0	0	0
Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Fuel % INFRA-RED			-		-
Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Fotassium ppm Fuel %	method	limit/base	current	history1	history2
MolybdenumppmManganeseppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppmFuel%INFRA-RED%	ASTM D5185m		150	4	169
ManganeseppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppmFuel%INFRA-RED%	ASTM D5185m	0	0	0	0
MagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppmFuel%INFRA-REDSoot %%	ASTM D5185m	60	17	65	86
CalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppmFuel%INFRA-REDSoot %%	ASTM D5185m	0	0	1	<1
Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Fuel % INFRA-RED Soot % %	ASTM D5185m	1010	151	1006	840
Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm Fuel % INFRA-RED Soot % %	AOTHORIS		131		1382
Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm Fuel % INFRA-RED Soot % %	ASTM D5185m	1070	2043	1161	
CONTAMINANTSSiliconppmSodiumppmPotassiumppmFuel%INFRA-REDSoot %%	ASTM D5185m ASTM D5185m	1070 1150	-	1161 1046	919
Silicon ppm Sodium ppm Potassium ppm Fuel % INFRA-RED Soot % %			2043		919 1039
SodiumppmPotassiumppmFuel%INFRA-REDSoot %%	ASTM D5185m	1150 1270	2043 951	1046	
Potassium ppm Fuel % INFRA-RED Soot % %	ASTM D5185m ASTM D5185m	1150 1270	2043 951 1157	1046 1287	1039
Fuel % INFRA-RED Soot % %	ASTM D5185m ASTM D5185m ASTM D5185m	1150 1270 2060 limit/base	2043 951 1157 4002	1046 1287 3263	1039 2700
INFRA-RED Soot % %	ASTM D5185m ASTM D5185m ASTM D5185m method	1150 1270 2060 limit/base	2043 951 1157 4002 current	1046 1287 3263 history1	1039 2700 history2
Soot % %	ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	1150 1270 2060 limit/base >25	2043 951 1157 4002 current 2	1046 1287 3263 history1 7	1039 2700 history2 5
	ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m	1150 1270 2060 limit/base >25 >20	2043 951 1157 4002 <u>current</u> 2 1	1046 1287 3263 history1 7 4	1039 2700 history2 5 1
	ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m	1150 1270 2060 limit/base >25 >20	2043 951 1157 4002 <u>current</u> 2 1 4	1046 1287 3263 history1 7 4 2	1039 2700 history2 5 1 <1
	ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1150 1270 2060 limit/base >25 >20 >3.0 limit/base	2043 951 1157 4002 <u>current</u> 2 1 4 4 2.0	1046 1287 3263 history1 7 4 2 2 ▲ 4.7	1039 2700 history2 5 1 <1 <1 <1.0
Sulfation Abs/.1m	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844	1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4	2043 951 1157 4002 current 2 1 4 2 2.0 2.0 current 0.5	1046 1287 3263 history1 7 4 2 ↓ 4.7 ↓ 4.7 ↓ 5.7	1039 2700 history2 5 1 <1 <1 <1.0 history2 0.1
FLUID DEGRADATIC	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 *ASTM D7844 *ASTM D7844	1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4 >20	2043 951 1157 4002 current 2 1 4 2 2.0 2.0 current	1046 1287 3263 history1 7 4 2 2 ▲ 4.7 history1	1039 2700 history2 5 1 <1 <1 <1.0 history2
Oxidation Abs/.1m	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 *ASTM D7844 *ASTM D7844 *ASTM D7844	1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4 >20	2043 951 1157 4002 current 2 1 4 2.0 current 0.5 5.9	1046 1287 3263 history1 7 4 2 ▲ 4.7 history1 history1 ↓ 5.7 14.4	1039 2700 history2 5 1 <1 <1 <1.0 history2 0.1 4.6
Base Number (BN) mg KOF	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7624	1150 1270 2060 >25 >20 >3.0 limit/base >4 >20 >30 limit/base	2043 951 1157 4002 current 2 1 4 2.0 current 0.5 5.9 19.3	1046 1287 3263 history1 7 4 2 ▲ 4.7 history1 ▲ 5.7 14.4 31.7	1039 2700 history2 5 1 <1 <1 <1.0 history2 0.1 4.6 19.8

DIAGNOSIS

Recommendation

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

Wear

All component wear rates are normal.

Contamination

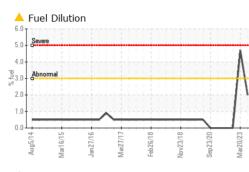
Light fuel dilution occurring. No other contaminants were detected in the oil.

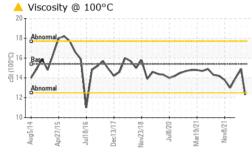
Fluid Condition

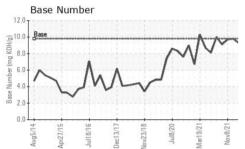
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil.



OIL ANALYSIS REPORT

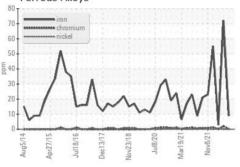


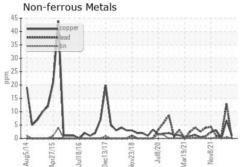


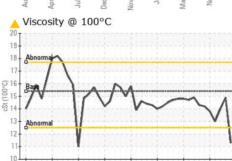


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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	11.3	14.9	14.0
GRAPHS						





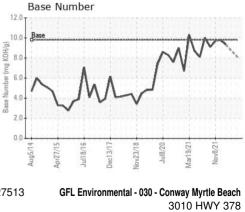




Aug5/14

Apr27/15

Jul18/16 Dec13/17



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. : GFL0047432 Received : 21 Jul 2023 Lab Number : 05904173 Diagnosed : 01 Aug 2023 Conway, SC Unique Number : 10565529 Diagnostician : Doug Bogart US 29527 Test Package : FLEET (Additional Tests: PercentFuel) Contact: CHET STROSCHINE Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. cstroschine@gflenv.com * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Т: Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F:

Jov23/18

Nov8/21-

Mar19/21

Submitted By: CHET STROSCHINE