

### **PROBLEM SUMMARY**



WEAR



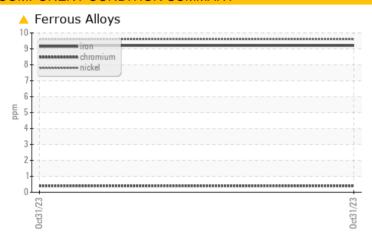


Machine Id **929136** Component

Diesel Engine

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

### **COMPONENT CONDITION SUMMARY**



#### RECOMMENDATION

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

# PROBLEMATIC TEST RESULTS sample Status ABNORMAL --- ---

 Sample Status
 ABNORMAL
 -- -- 

 Nickel
 ppm
 ASTM D5185m
 >5
 ▲ 10
 -- --

Customer Id: GFL996 Sample No.: GFL0091095 Lab Number: 06037261 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Sean Felton +1 919-379-4092 sfelton@wearcheckusa.com

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

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



### **OIL ANALYSIS REPORT**

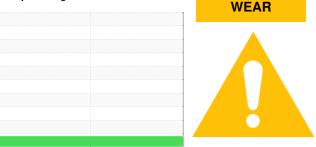
Sample Rating Trend





Machine Id 929136 Component **Diesel Engine** 

**PETRO CANADA DURO**I



#### **DIAGNOSIS**

#### Recommendation

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

### Wear

Exhaust valve wear is indicated. All other component wear rates are normal.

#### Contamination

There is no indication of any contamination in the

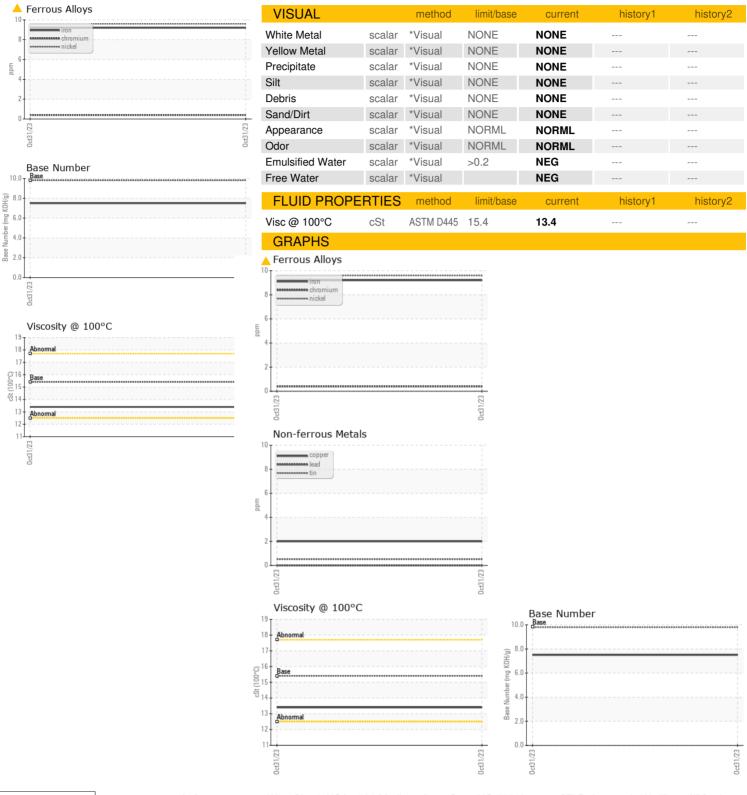
#### **Fluid Condition**

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

SAMPLE INFORMATION   method   limit/base   current   history1   history2	N SHP 15W40 (-	GAL)			Oct2023		
Sample Date         Client Info         31 Oct 2023             Machine Age         hrs         Client Info         8158             Oil Age         hrs         Client Info         600             Oil Changed         Client Info         Changed             Sample Status         Mc Method          ABNORMAL             CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0             Water         WC Method         >0.2         NEG             Glycol         WC Method         NEG             Nickel         ppm         ASTM D5185m         >20         \$1            Iron         ppm         ASTM D5185m         >2         0             Nickel         ppm         ASTM D5185m         >2         0             Titanium         ppm         ASTM D5185m         >2         0	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Sample Date         Client Info         31 Oct 2023             Machine Age         hrs         Client Info         8158             Oil Age         hrs         Client Info         600             Oil Changed         Client Info         Changed             Sample Status         Mc Method          ABNORMAL             CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0	Sample Number		Client Info		GFL0091095		
Machine Age         hrs         Client Info         8158             Oil Age         hrs         Client Info         600             Oil Changed         Client Info         Changed             Sample Status         Image: Client Info         Changed             CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0	•						
Oil Age         hrs         Client Info         600	•	hrs					
Oil Changed Sample Status         Client Info         Changed ABNORMAL             CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0             Water         WC Method         >0.2         NEG             Glycol         WC Method         >0.2         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         9             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         <1             Chromium         ppm         ASTM D5185m         >20         <1             Irical ppm         ASTM D5185m         >2         1             Silver         ppm         ASTM D5185m         >40         0            Capper <t< td=""><td></td><td>hrs</td><td>Client Info</td><td></td><td>600</td><td></td><td></td></t<>		hrs	Client Info		600		
CONTAMINATION   method   limit/base   current   history1   history2	-		Client Info		Changed		
Fuel   WC Method   S3.0   C1.0   C							
Water         WC Method         >0.2         NEG             Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         9             Chromium         ppm         ASTM D5185m         >20         <1	CONTAMINAT	ΓΙΟΝ	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         9             Chromium         ppm         ASTM D5185m         >20         <1	Fuel		WC Method	>3.0	<1.0		
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >12         9             Chromium         ppm         ASTM D5185m         >20         <1	Water		WC Method	>0.2	NEG		
Iron	Glycol		WC Method		NEG		
Chromium         ppm         ASTM D5185m         >20         <1             Nickel         ppm         ASTM D5185m         >5         ▲ 10             Titanium         ppm         ASTM D5185m         >2         0             Silver         ppm         ASTM D5185m         >2         <1	WEAR METAL	_S	method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185m         >20         <1             Nickel         ppm         ASTM D5185m         >5         ▲ 10             Titanium         ppm         ASTM D5185m         >2         0             Silver         ppm         ASTM D5185m         >2         <1	Iron	mqq	ASTM D5185m	>120	9		
Nickel	Chromium		ASTM D5185m	>20			
Titanium         ppm         ASTM D5185m         >2         <1             Aluminum         ppm         ASTM D5185m         >20         1             Aluminum         ppm         ASTM D5185m         >20         1             Lead         ppm         ASTM D5185m         >30         2             Copper         ppm         ASTM D5185m         >15         <1	Nickel		ASTM D5185m	>5	<u> 10</u>		
Silver         ppm         ASTM D5185m         >2         <1             Aluminum         ppm         ASTM D5185m         >20         1             Lead         ppm         ASTM D5185m         >40         0             Copper         ppm         ASTM D5185m         >330         2             Tin         ppm         ASTM D5185m         0              Vanadium         ppm         ASTM D5185m         0              Cadmium         ppm         ASTM D5185m         0              ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0             ADDITIVES         method         limit/base         current <td< td=""><td>Titanium</td><td></td><td>ASTM D5185m</td><td>&gt;2</td><td>0</td><td></td><td></td></td<>	Titanium		ASTM D5185m	>2	0		
Lead	Silver		ASTM D5185m	>2	<1		
Copper         ppm         ASTM D5185m         >330         2             Tin         ppm         ASTM D5185m         >15         <1	Aluminum		ASTM D5185m	>20	1		
Tin	Lead	ppm	ASTM D5185m	>40	0		
Vanadium         ppm         ASTM D5185m         0             Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2             Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         0         54             Manganese         ppm         ASTM D5185m         1010         902             Magnesium         ppm         ASTM D5185m         1070         988             Phosphorus         ppm         ASTM D5185m         1070         988             Phosphorus         ppm         ASTM D5185m         1270         1200             Sulfur         ppm         ASTM D5185m         226         2584             CONTAMINANTS         method         limit/base         current         hi	Copper	ppm	ASTM D5185m	>330	2		
Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2             Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         0         54             Manganese         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>15	<1		
Mathematical Part	Vanadium	ppm	ASTM D5185m		0		
Boron	Cadmium	ppm	ASTM D5185m		0		
Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         60         54             Manganese         ppm         ASTM D5185m         0         <1             Magnesium         ppm         ASTM D5185m         1010         902             Calcium         ppm         ASTM D5185m         1070         988             Phosphorus         ppm         ASTM D5185m         1150         900             Zinc         ppm         ASTM D5185m         1270         1200             Sulfur         ppm         ASTM D5185m         2060         2584             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         >20         2             Potassium         ppm         ASTM D5185m	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         54             Manganese         ppm         ASTM D5185m         0         <1             Magnesium         ppm         ASTM D5185m         1010         902             Calcium         ppm         ASTM D5185m         1070         988             Phosphorus         ppm         ASTM D5185m         1150         900             Zinc         ppm         ASTM D5185m         1270         1200             Sulfur         ppm         ASTM D5185m         2060         2584             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         >20         2             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base<	Boron	ppm	ASTM D5185m	0	2		
Manganese         ppm         ASTM D5185m         0         <1             Magnesium         ppm         ASTM D5185m         1010         902             Calcium         ppm         ASTM D5185m         1070         988             Phosphorus         ppm         ASTM D5185m         1150         900             Zinc         ppm         ASTM D5185m         1270         1200             Sulfur         ppm         ASTM D5185m         2060         2584             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         >20         2             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624	Barium	ppm	ASTM D5185m	0	0		
Magnesium         ppm         ASTM D5185m         1010         902             Calcium         ppm         ASTM D5185m         1070         988             Phosphorus         ppm         ASTM D5185m         1150         900             Zinc         ppm         ASTM D5185m         1270         1200             Sulfur         ppm         ASTM D5185m         2060         2584             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         3             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         % ASTM D7844         >4         0.9             Nitration         Abs/.1mm         *ASTM D7415         >30         19.8<	Molybdenum	ppm	ASTM D5185m	60	54		
Calcium         ppm         ASTM D5185m         1070         988             Phosphorus         ppm         ASTM D5185m         1150         900             Zinc         ppm         ASTM D5185m         1270         1200             Sulfur         ppm         ASTM D5185m         2060         2584             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         >20         2             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.0             Nitration         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         "*ASTM D7414 <t< td=""><td>Manganese</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td>&lt;1</td><td></td><td></td></t<>	Manganese	ppm	ASTM D5185m	0	<1		
Phosphorus         ppm         ASTM D5185m         1150         900             Zinc         ppm         ASTM D5185m         1270         1200             Sulfur         ppm         ASTM D5185m         2060         2584             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         >20         2             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.9             Nitration         Abs/.mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7	Magnesium	ppm	ASTM D5185m	1010	902		
Zinc         ppm         ASTM D5185m         1270         1200             Sulfur         ppm         ASTM D5185m         2060         2584             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         >20         2             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.9             Nitration         Abs/cm         *ASTM D7624         >20         8.0             Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM	Calcium	ppm	ASTM D5185m	1070	988		
Sulfur         ppm         ASTM D5185m         2060         2584             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         3             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.9             Nitration         Abs/cm         *ASTM D7624         >20         8.0             Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8	Phosphorus	ppm	ASTM D5185m	1150	900		
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         3             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.9             Nitration         Abs/cm         *ASTM D7624         >20         8.0             Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8	Zinc	ppm	ASTM D5185m	1270	1200		
Silicon         ppm         ASTM D5185m         >25         3             Sodium         ppm         ASTM D5185m         3             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.9             Nitration         Abs/cm         *ASTM D7624         >20         8.0             Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8			ASTM D5185m	2060	2584		
Sodium         ppm         ASTM D5185m         3             Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.9             Nitration         Abs/cm         *ASTM D7624         >20         8.0             Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8	CONTAMINAN	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         2             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.9             Nitration         Abs/cm         *ASTM D7624         >20         8.0             Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8	Silicon	ppm		>25			
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.9             Nitration         Abs/cm         *ASTM D7624         >20         8.0             Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8		ppm					
Soot %         %         *ASTM D7844         >4         0.9             Nitration         Abs/cm         *ASTM D7624         >20         8.0             Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8	Potassium	ppm	ASTM D5185m	>20	2		
Nitration         Abs/cm         *ASTM D7624         >20         8.0             Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.8             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8	Soot %	%		>4	0.9		
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 14.8	Nitration	Abs/cm	*ASTM D7624	>20	8.0		
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.8		
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN)   mg KOH/g   ASTM D2896   9.8   7.5	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.8		
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	7.5		



### **OIL ANALYSIS REPORT**







Laboratory Sample No. Lab Number Unique Number

: 06037261 : 10792490 Test Package : FLEET

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

: GFL0091095 Recieved

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 18 Dec 2023 : 20 Dec 2023 Diagnosed : Sean Felton Diagnostician

GFL Environmental - 996 - Viroqua WI Southwest 950 Nelson Parkway

Viroqua, WI US 54665

Contact: Shawn Burke sburke@gflenv.com

> T: F:

\* - 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)