

# **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 913072 Component

Diesel Engine

## PETRO CANADA DURON SHP 15W40 (36 QTS)

# DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

### Wear

Metal levels are typical for a components first oil change.

### Contamination

There is no indication of any contamination in the oil.

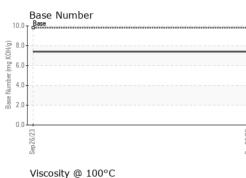
### Fluid Condition

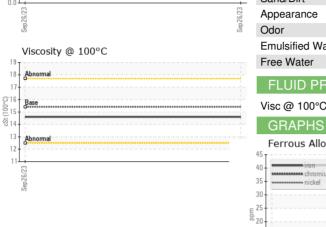
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

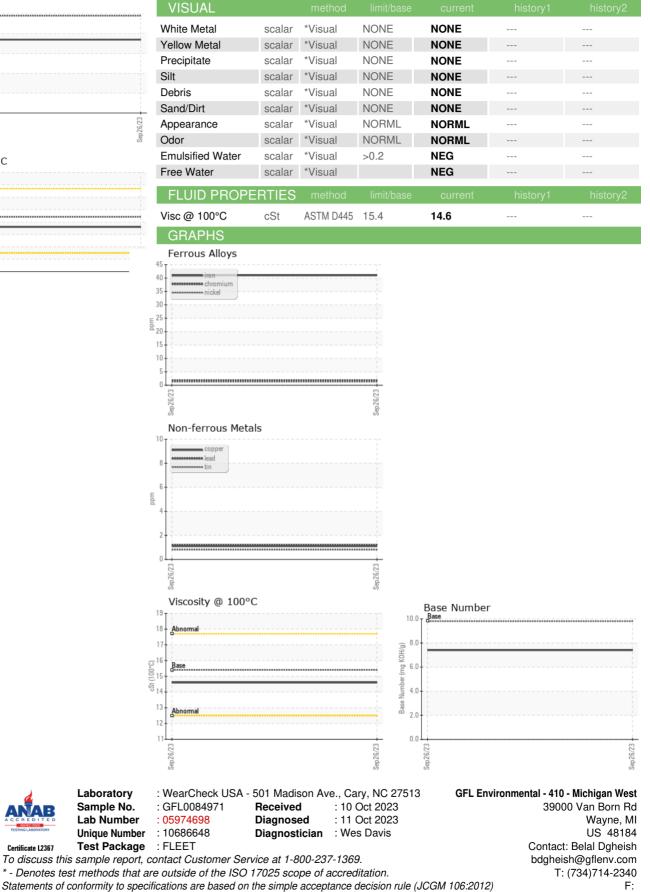
Fuel         WC Method         >3.0         <1.0	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         2630             Oil Age         hrs         Client Info         NORMAL             Sample Status         I         NORMAL              CONTAMINATION         method         imit/base         current         history1         history1           Glycol         WC Method         >3.0<	Sample Number		Client Info		GFL0084971		
Oil Age         hrs         Client Info         2630             Oil Changed         Client Info         N/A             Sample Status         Imit/base         current         history1         history1           CONTAMINATION         method         imit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	Sample Date		Client Info		26 Sep 2023		
Oil Changed         Client Info         N/A             Sample Status         Image Imag	Machine Age	hrs	Client Info		2630		
Sample Status         NORMAL             CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	Oil Age	hrs	Client Info		2630		
CONTAMINATION         method         limit/base         current         history1         histor           Fuel         WC Method         >3.0         <1.0	Oil Changed		Client Info		N/A		
Fuel         WC Method         >3.0         <1.0             Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history1            WEAR METALS         method         limit/base         current         history1             Chromium         ppm         ASTM D5185m         >20         2             Nickel         ppm         ASTM D5185m         >20         6             Aluminum         ppm         ASTM D5185m         >20         6             Aduminum         ppm         ASTM D5185m         >20         6             Aduminum         ppm         ASTM D5185m         >20         6             Copper         ppm         ASTM D5185m         >20         6             Cadmium         ppm         ASTM D5185m         0         3             ADDITVES         method         limit/base         cu	Sample Status				NORMAL		
Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >120         41             Othromium         ppm         ASTM D5185m         >20         2             Nickel         ppm         ASTM D5185m         >2         <1             Silver         ppm         ASTM D5185m         >2         0             Aluminum         ppm         ASTM D5185m         >20         6             Aluminum         ppm         ASTM D5185m         >20         6             Aluminum         ppm         ASTM D5185m         >20         1             Adadium         ppm         ASTM D5185m         >20         1             Vanadium         ppm         ASTM D5185m         0         3             Addmium         ppm         ASTM D5185m         0         3	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >120         41             Ohromium         ppm         ASTM D5185m         >20         2             Nickel         ppm         ASTM D5185m         >2         <1	Fuel		WC Method	>3.0	<1.0		
Iron         ppm         ASTM D5185m         >120         41             Chromium         ppm         ASTM D5185m         >20         2             Nickel         ppm         ASTM D5185m         >2         <1							
Iron         ppm         ASTM D5185m         >120         41             Chromium         ppm         ASTM D5185m         >20         2             Nickel         ppm         ASTM D5185m         >2         <1             Silver         ppm         ASTM D5185m         >2         <1             Aluminum         ppm         ASTM D5185m         >20         6             Copper         ppm         ASTM D5185m         >300         1             Copper         ppm         ASTM D5185m         >300         1             Cadmium         ppm         ASTM D5185m         >15         <1             ADDITIVES         method         limit/base         current         history1         histor           Boron         ppm         ASTM D5185m         0         0             Magnese         ppm         ASTM D5185m         0         <1             Magnesium         ppm         ASTM D5185m <t< th=""><th>WEAR METAL</th><th>S</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	WEAR METAL	S	method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185m         >20         2             Nickel         ppm         ASTM D5185m         >5         1             Silver         ppm         ASTM D5185m         >2         <1			ASTM D5185m		41		
Nickel         ppm         ASTM D5185m         >5         1             Titanium         ppm         ASTM D5185m         >2         <1	-						
Titanium         ppm         ASTM D5185m         >2         <1             Silver         ppm         ASTM D5185m         >2         0             Aluminum         ppm         ASTM D5185m         >20         6             Lead         ppm         ASTM D5185m         >330         1             Copper         ppm         ASTM D5185m         >330         1             Yanadium         ppm         ASTM D5185m         >15         <1							
Silver         ppm         ASTM D5185m         >2         0             Aluminum         ppm         ASTM D5185m         >20         6             Lead         ppm         ASTM D5185m         >40         1             Copper         ppm         ASTM D5185m         >330         1             Tin         ppm         ASTM D5185m         >15         <1					-		
Aluminum         ppm         ASTM D5185m         >20         6             Lead         ppm         ASTM D5185m         >40         1             Copper         ppm         ASTM D5185m         >330         1             Tin         ppm         ASTM D5185m         >15         <1							
Lead         ppm         ASTM D5185m         >40         1             Copper         ppm         ASTM D5185m         >330         1             Tin         ppm         ASTM D5185m         >15         <1					-		
Copper         ppm         ASTM D5185m         >330         1             Tin         ppm         ASTM D5185m         >15         <1					-		
Tin         ppm         ASTM D5185m         >15         <1             Vanadium         ppm         ASTM D5185m         >15         <1							
Vanadium         ppm         ASTM D5185m         <1             Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         3             Barium         ppm         ASTM D5185m         0         0             Malgaese         ppm         ASTM D5185m         0         60         62             Magnesium         ppm         ASTM D5185m         0         <1					-		
Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history           Boron         ppm         ASTM D5185m         0         3             Barium         ppm         ASTM D5185m         0         0             Malybdenum         ppm         ASTM D5185m         0         62             Manganese         ppm         ASTM D5185m         0         <-1				>10			
ADDITIVES         method         limit/base         current         history1         history           Boron         ppm         ASTM D5185m         0         3             Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         60         62             Manganese         ppm         ASTM D5185m         0         <1							
Boron         ppm         ASTM D5185m         0         3             Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         60         62             Manganese         ppm         ASTM D5185m         0         <1	Cadmium	ppm	ASTM D5185m		U		
Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         60         62             Manganese         ppm         ASTM D5185m         0         <1             Magnesium         ppm         ASTM D5185m         1010         939             Calcium         ppm         ASTM D5185m         1070         1083             Calcium         ppm         ASTM D5185m         1070         1083             Zinc         ppm         ASTM D5185m         1270         1287             Sulfur         ppm         ASTM D5185m         2060         2990             Solicon         ppm         ASTM D5185m         225         12             Sodium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         62             Manganese         ppm         ASTM D5185m         0         <1	Boron	ppm	ASTM D5185m	0	3		
Manganese         ppm         ASTM D5185m         0         <1             Magnesium         ppm         ASTM D5185m         1010         939             Calcium         ppm         ASTM D5185m         1010         939             Calcium         ppm         ASTM D5185m         1070         1083             Phosphorus         ppm         ASTM D5185m         1270         1287             Zinc         ppm         ASTM D5185m         2060         2990             Sulfur         ppm         ASTM D5185m         2060         2990             Solicon         ppm         ASTM D5185m         2060         2990             Sodium         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         <	Barium	ppm	ASTM D5185m	0	0		
Magnesium         ppm         ASTM D5185m         1010         939             Calcium         ppm         ASTM D5185m         1070         1083             Phosphorus         ppm         ASTM D5185m         1070         1083             Zinc         ppm         ASTM D5185m         1150         1046             Sulfur         ppm         ASTM D5185m         1270         1287             Sulfur         ppm         ASTM D5185m         2060         2990             CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm	Molybdenum	ppm			62		
Calcium         ppm         ASTM D5185m         1070         1083             Phosphorus         ppm         ASTM D5185m         1150         1046             Zinc         ppm         ASTM D5185m         1270         1287             Sulfur         ppm         ASTM D5185m         2060         2990             CONTAMINANTS         method         limit/base         current         history1         histor           Silicon         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >25         12             Potassium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         histor           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm< *ASTM D741	Manganese	ppm	ASTM D5185m	0	<1		
Phosphorus         ppm         ASTM D5185m         1150         1046             Zinc         ppm         ASTM D5185m         1270         1287             Sulfur         ppm         ASTM D5185m         2060         2990             CONTAMINANTS         method         limit/base         current         history1         histor           Silicon         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Magnesium	ppm	ASTM D5185m	1010	939		
Zinc         ppm         ASTM D5185m         1270         1287             Sulfur         ppm         ASTM D5185m         2060         2990             CONTAMINANTS         method         limit/base         current         history1         histor           Silicon         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Calcium	ppm	ASTM D5185m	1070	1000		
Sulfur         ppm         ASTM D5185m         2060         2990             CONTAMINANTS         method         limit/base         current         history1         histor           Silicon         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         histor           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Phosphorus			1070	1083		
CONTAMINANTS         method         limit/base         current         history1         histor           Silicon         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >25         12             Potassium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         histor           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3		ppm	ASTM D5185m				
Silicon         ppm         ASTM D5185m         >25         12             Sodium         ppm         ASTM D5185m         >25         31             Potassium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Zinc			1150	1046 1287		
Sodium         ppm         ASTM D5185m         31            Potassium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         histor           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Sulfur	ppm ppm	ASTM D5185m	1150 1270	1046 1287		
Potassium         ppm         ASTM D5185m         >20         16             INFRA-RED         method         limit/base         current         history1         histor           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Sulfur	ppm ppm	ASTM D5185m ASTM D5185m	1150 1270 2060	1046 1287 2990		
INFRA-RED         method         limit/base         current         history1         histor           Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Sulfur CONTAMINAN	ppm ppm TS	ASTM D5185m ASTM D5185m method	1150 1270 2060 limit/base	1046 1287 2990 current	  history1	  history2
Soot %         %         *ASTM D7844         >4         1.7             Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Sulfur CONTAMINAN Silicon	ppm ppm TS ppm	ASTM D5185m ASTM D5185m method ASTM D5185m	1150 1270 2060 limit/base	1046 1287 2990 current 12	  history1	  history2 
Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Sulfur CONTAMINAN Silicon Sodium	ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m	1150 1270 2060 limit/base >25	1046 1287 2990 current 12 31	  history1	  history2 
Nitration         Abs/cm         *ASTM D7624         >20         12.9             Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m ASTM D5185m ASTM D5185m	1150 1270 2060 <i>limit/base</i> >25 >20	1046 1287 2990 current 12 31 16	  history1  	  history2 
Sulfation         Abs/.1mm         *ASTM D7415         >30         24.3	Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m method	1150 1270 2060 imit/base >25 >20 imit/base	1046 1287 2990 current 12 31 16 current	  history1   history1	  history2   history2
FLUID DEGRADATION method limit/base current history1 histor	Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844	1150 1270 2060 imit/base >25 >20 imit/base >4	1046 1287 2990 current 12 31 16 current 1.7	  history1   history1 	  history2   history2 
	Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm TS ppm ppm ppm % Abs/cm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> *ASTM D7844 *ASTM D7624	1150 1270 2060 imit/base >25 >20 imit/base >4 >20	1046 1287 2990 current 12 31 16 current 1.7 1.7 12.9	  history1   history1 	  history2   history2 
Oxidation Abs/.1mm *ASTM D7414 >25 21.2	Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7844	1150 1270 2060 imit/base >25 >20 imit/base >4 >20 >30	1046 1287 2990 current 12 31 16 current 1.7 12.9 24.3	  history1   history1  	  history2   history2 
Base Number (BN) mg KOH/g ASTM D2896 9.8 7.4	Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm TS ppm ppm ppm ppm % Abs/cm Abs/cm Abs/1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415	1150 1270 2060 <b>limit/base</b> >25 >20 <b>limit/base</b> >20 >20 >30	1046 1287 2990 current 12 31 16 current 1.7 12.9 24.3 current	  history1  history1  history1  	  history2  history2  history2   history2



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Certificate L2367