

# **OIL ANALYSIS REPORT**

Oxidation

FLUID DEGRADATION method

Abs/.1mm ASTM D7414\*

>25

14.1

# SHARP BUS LINES **INTERNATIONAL 1138** Component

**Diesel Engine** 

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

## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

## Fluid Condition

The condition of the oil is acceptable for the time in service.

SAMPLE INFORMATION         method         imit/base         current         history1         history2           Sample Number         Client Info         01 Sep 2023             Sample Date         Client Info         01 Sep 2023             Dil Age         kms         Client Info         1014             Dil Changed         Client Info         Changed             Sample Status         Imit/base         current         history1         history2           CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             Contamin ppm         ASTM 05156m         >2.0         <1             Noreal         ppm         ASTM 05156m         >3         0             Noreal         ppm         ASTM 05156m         >3							
SAMPLE INFORMATION         method         imit/base         current         history1         history2           Sample Number         Client Info         01 Sep 2023             Sample Date         Client Info         01 Sep 2023             Dil Age         kms         Client Info         1014             Dil Changed         Client Info         Changed             Sample Status         NORMAL              CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             Silvor         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1              Normium         ppm         ASTM 05156m         >3							
SAMPLE INFORMATION         method         imit/base         current         history1         history2           Sample Number         Client Info         01 Sep 2023             Sample Date         Client Info         01 Sep 2023             Dil Age         kms         Client Info         1014             Dil Changed         Client Info         Changed             Sample Status         NORMAL              CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             Silvor         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1              Normium         ppm         ASTM 05156m         >3							
SAMPLE INFORMATION         method         imit/base         current         history1         history2           Sample Number         Client Info         01 Sep 2023             Sample Date         Client Info         01 Sep 2023             Dil Age         kms         Client Info         1014             Dil Changed         Client Info         Changed             Sample Status         NORMAL              CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             Silvor         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1              Normium         ppm         ASTM 05156m         >3							
SAMPLE INFORMATION         method         imit/base         current         history1         history2           Sample Number         Client Info         01 Sep 2023             Sample Date         Client Info         01 Sep 2023             Dil Age         kms         Client Info         1014             Dil Changed         Client Info         Changed             Sample Status         NORMAL              CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             Silvor         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1              Normium         ppm         ASTM 05156m         >3							
SAMPLE INFORMATION         method         limit/base         current         history1         history2           Sample Date         Client Info         01 Sep 2023             Sample Date         Client Info         01 Sep 2023             Dil Age         kms         Client Info         1014             Dil Changed         Client Info         Changed             Dil Changed         Client Info         Changed             Sample Status         method         limit/base         current         history1         history2           GONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0             Optomium         ppm         ASTID5185(m)         >0             Silver         ppm         ASTID5185(m)         >4         0             Silver         ppm         ASTID5185(m)         >3         0             Silver         ppm         ASTID5185(m)         >3	L)				Sep 2023		
Sample Number         Client Info         PC0081289             Sample Date         Client Info         01 Sep 2023             Sample Date         Client Info         239010             Dil Age         kms         Client Info         1014             Dil Changed         Client Info         Changed             Dil Changed         Client Info         Changed             Sample Status         Imit/base         current         history1         history2           CONTAMINATION         method         Imit/base         current         history1            Silver         ppm         ASTM 05156m         >100         15             Chromium         ppm         ASTM 05156m         >4         0             Silver         ppm         ASTM 05156m         >4         0             Silver         ppm         ASTM 05156m         >3         0             Silver         ppm         ASTM 05156m         >3         0         <	SAMPLE INFORM	ΛΑΤΙΟΝ	method	limit/base		history1	history2
Sample Date         Client Info         01 Sep 2023             Vachine Age         kms         Client Info         1014             Dil Age         kms         Client Info         1014             Sample Status         Client Info         Changed             CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0							
Machine Age         kms         Client Info         239010             Dil Age         kms         Client Info         1014             Sample Status         Client Info         Changed             CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0							
Dil Age         Kms         Client Info         1014             Sample Status         Client Info         Changed             Sample Status         Imit/base         current         history1            CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0		kms			-		
Dil Changed         Client Info         Changed             Sample Status         Image Status	-						
Sample Status         NORMAL             CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0	-						
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >2.0         <1.0	Sample Status				•		
Fuel         WC Method         >2.0         <1.0             Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5185(m)         >20         <1             Chromium         ppm         ASTM D5185(m)         >20         <1             Nickel         ppm         ASTM D5185(m)         >20         <1             Mathom         ppm         ASTM D5185(m)         >20         2             Automium         ppm         ASTM D5185(m)         >33         0         <1             Lead         ppm         ASTM D5185(m)         >330         <1             Automony         ppm         ASTM D5185(m)         0             Automony         ppm         ASTM D5185(m)         0             Automony         ppm         ASTM D5185(m)         0 <th< td=""><td>-</td><td>ON</td><td>method</td><td>limit/base</td><td>current</td><td>historv1</td><td>historv2</td></th<>	-	ON	method	limit/base	current	historv1	historv2
Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5185(m)         >20         <1							
WEAR METALS         method         limit/base         current         history1         history2           iron         ppm         ASTM D5185(m)         >100         15             Chromium         ppm         ASTM D5185(m)         >20         <1				>2.0			
ron         ppm         ASTM D5185(m)         >100         15             Chromium         ppm         ASTM D5185(m)         >20         <1	-	_					
Chromium         ppm         ASTM 05185(m)         >20         <1             Nickel         ppm         ASTM 05185(m)         >4         0             Titanium         ppm         ASTM 05185(m)         >3         0             Silver         ppm         ASTM 05185(m)         >3         0             Aluminum         ppm         ASTM 05185(m)         >20         2             Aluminum         ppm         ASTM 05185(m)         >20         2             Copper         ppm         ASTM 05185(m)         >20         2             Antimony         ppm         ASTM 05185(m)         >15         0             Antimony         ppm         ASTM 05185(m)         0              Antimony         ppm         ASTM 05185(m)         0              Copper         ppm         ASTM 05185(m)         0         3             Copper         ppm         ASTM 05185(m)	WEAR METALS	S	method	limit/base		history1	history2
Nickel         ppm         ASTM D5185(m)         >4         0             Titanium         ppm         ASTM D5185(m)         >3         0             Silver         ppm         ASTM D5185(m)         >20         2             Aluminum         ppm         ASTM D5185(m)         >20         2             Lead         ppm         ASTM D5185(m)         >330         <1	Iron	ppm	. ,				
Titanium         ppm         ASTM D5185(m)         0             Silver         ppm         ASTM D5185(m)         >3         0             Aluminum         ppm         ASTM D5185(m)         >20         2             Lead         ppm         ASTM D5185(m)         >40         <1	Chromium	ppm		>20			
Silver         ppm         ASTM D5185(m)         >3         0             Aluminum         ppm         ASTM D5185(m)         >20         2             Lead         ppm         ASTM D5185(m)         >40         <1				>4			
Aluminum         ppm         ASTM D5185(m)         >20         2             Lead         ppm         ASTM D5185(m)         >40         <1		ppm			-		
Lead         ppm         ASTM D5185(m)         >40         <1             Copper         ppm         ASTM D5185(m)         >330         <1			. ,		-		
Copper         ppm         ASTM D5185(m)         >330         <1             Tin         ppm         ASTM D5185(m)         >15         0             Antimony         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Beryllium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         3             Molybdenum         ppm         ASTM D5185(m)         0         0             Maganese         ppm         ASTM D5185(m)         0         <-1					_		
Tin         ppm         ASTM D5186(m)         >15         0             Antimony         ppm         ASTM D5185(m)         0              Antimony         ppm         ASTM D5185(m)         0              Beryllium         ppm         ASTM D5185(m)         0              Cadmium         ppm         ASTM D5185(m)         0              ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         3             Molybdenum         ppm         ASTM D5185(m)         0         0             Maganesium         ppm         ASTM D5185(m)         0         <1							
Antimony         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Beryllium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         3             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         3             Molybdenum         ppm         ASTM D5185(m)         0              Manganese         ppm         ASTM D5185(m)         1010         931             Calcium         ppm         ASTM D5185(m)         1070         990             Sulfur         ppm         ASTM D5185(m)         1270         1129 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
VanadiumppmASTM D5185(m)0BerylliumppmASTM D5185(m)0CadmiumppmASTM D5185(m)0ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185(m)03BariumppmASTM D5185(m)00MolybdenumppmASTM D5185(m)00MaganeseppmASTM D5185(m)0<1				>15			
Beryllium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         3             Barium         ppm         ASTM D5185(m)         0         0             Maganesium         ppm         ASTM D5185(m)         0         <1	•				-		
Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         3             Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         0         0             Maganese         ppm         ASTM D5185(m)         0         <1             Magnesium         ppm         ASTM D5185(m)         1010         931             Calcium         ppm         ASTM D5185(m)         1070         990             Calcium         ppm         ASTM D5185(m)         1270         1129             Sulfur         ppm         ASTM D5185(m)         2060         2558             Sulfur         ppm         ASTM D5185(m)         >25         3             Sodium         ppm         ASTM D5185(m)         20 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         3             Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         60         56             Manganese         ppm         ASTM D5185(m)         0         <1							
Boron         ppm         ASTM D5185(m)         0         3             Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         60         56             Manganese         ppm         ASTM D5185(m)         0         <1		ррп					
Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         60         56             Manganese         ppm         ASTM D5185(m)         0         <1	ADDITIVES			limit/base		history1	history2
Molybdenum         ppm         ASTM D5185(m)         60         56             Manganese         ppm         ASTM D5185(m)         0         <1		ppm					
Manganese         ppm         ASTM D5185(m)         0         <1             Magnesium         ppm         ASTM D5185(m)         1010         931             Calcium         ppm         ASTM D5185(m)         1070         990             Phosphorus         ppm         ASTM D5185(m)         1070         990             Phosphorus         ppm         ASTM D5185(m)         1070         1019             Zinc         ppm         ASTM D5185(m)         1270         1129             Sulfur         ppm         ASTM D5185(m)         2060         2558             Lithium         ppm         ASTM D5185(m)         2060         2558             CONTAMINANTS         method         limit/base         current         history1         history2           Solicon         ppm         ASTM D5185(m)         >20         0             Potassium         ppm         ASTM D5185(m)         >20         0             INFRA-RED <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td>					-		
Magnesium         ppm         ASTM D5185(m)         1010         931             Calcium         ppm         ASTM D5185(m)         1070         990             Phosphorus         ppm         ASTM D5185(m)         1150         1019             Zinc         ppm         ASTM D5185(m)         1270         1129             Sulfur         ppm         ASTM D5185(m)         2060         2558             Sulfur         ppm         ASTM D5185(m)         2060         2558             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3             Sodium         ppm         ASTM D5185(m)         >20         0             Potassium         ppm         ASTM D5185(m)         >20         0             INFRA-RED         method         limit/base         current         history1         history2           Soot %         % </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
Calcium         ppm         ASTM D5185(m)         1070         990             Phosphorus         ppm         ASTM D5185(m)         1150         1019             Zinc         ppm         ASTM D5185(m)         1270         1129             Sulfur         ppm         ASTM D5185(m)         2060         2558             Lithium         ppm         ASTM D5185(m)         2060         2558             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3             Sodium         ppm         ASTM D5185(m)         >20         0             Potassium         ppm         ASTM D5185(m)         >20         0             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.3             Nitration         Abs/cm </td <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	-						
Phosphorus         ppm         ASTM D5185(m)         1150         1019             Zinc         ppm         ASTM D5185(m)         1270         1129             Sulfur         ppm         ASTM D5185(m)         2060         2558             Lithium         ppm         ASTM D5185(m)         2060         2558             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3             Sodium         ppm         ASTM D5185(m)         >20         0             Potassium         ppm         ASTM D5185(m)         >20         0             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.3             Nitration         Abs/cm         ASTM D7624*         >20         6.6	0						
Zinc         ppm         ASTM D5185(m)         1270         1129             Sulfur         ppm         ASTM D5185(m)         2060         2558             Lithium         ppm         ASTM D5185(m)         2060         2558             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3             Sodium         ppm         ASTM D5185(m)         >25         3             Sodium         ppm         ASTM D5185(m)         >20         0             Potassium         ppm         ASTM D5185(m)         >20         0             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.3             Nitration         Abs/cm         ASTM D7624*         >20         6.6							
Sulfur         ppm         ASTM D5185(m)         2060         2558             Lithium         ppm         ASTM D5185(m)         2060         <1	•						
LithiumppmASTM D5185(m)<1CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185(m)>253SodiumppmASTM D5185(m)2PotassiumppmASTM D5185(m)>200INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%ASTM D7844*>30.3NitrationAbs/cmASTM D7624*>206.6							
CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185(m)       >25       3           Sodium       ppm       ASTM D5185(m)       2           Potassium       ppm       ASTM D5185(m)       >20       0           INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       ASTM D7844*       >3       0.3           Nitration       Abs/cm       ASTM D7624*       >20       6.6				2000			
Silicon         ppm         ASTM D5185(m)         >25         3             Sodium         ppm         ASTM D5185(m)         2             Potassium         ppm         ASTM D5185(m)         >20         0             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.3             Nitration         Abs/cm         ASTM D7624*         >20         6.6							
Sodium         ppm         ASTM D5185(m)         2             Potassium         ppm         ASTM D5185(m)         >20         0             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.3             Nitration         Abs/cm         ASTM D7624*         >20         6.6							
Potassium         ppm         ASTM D5185(m)         >20         0             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.3             Nitration         Abs/cm         ASTM D7624*         >20         6.6				>25			
INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     ASTM D7844*     >3     0.3         Nitration     Abs/cm     ASTM D7624*     >20     6.6				00			
Soot %         %         ASTM D7844*         >3         0.3             Nitration         Abs/cm         ASTM D7624*         >20         6.6	Potassium	ppm	ASTM D5185(m)	>20	0		
Nitration         Abs/cm         ASTM D7624*         >20         6.6	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>3	0.3		
Sulfation         Abs/.1mm         ASTM D7415*         >30         18.8	Nitration	Abs/cm	ASTM D7624*	>20	6.6		
	Sulfation	Abs/.1mm	ASTM D7415*	>30	18.8		

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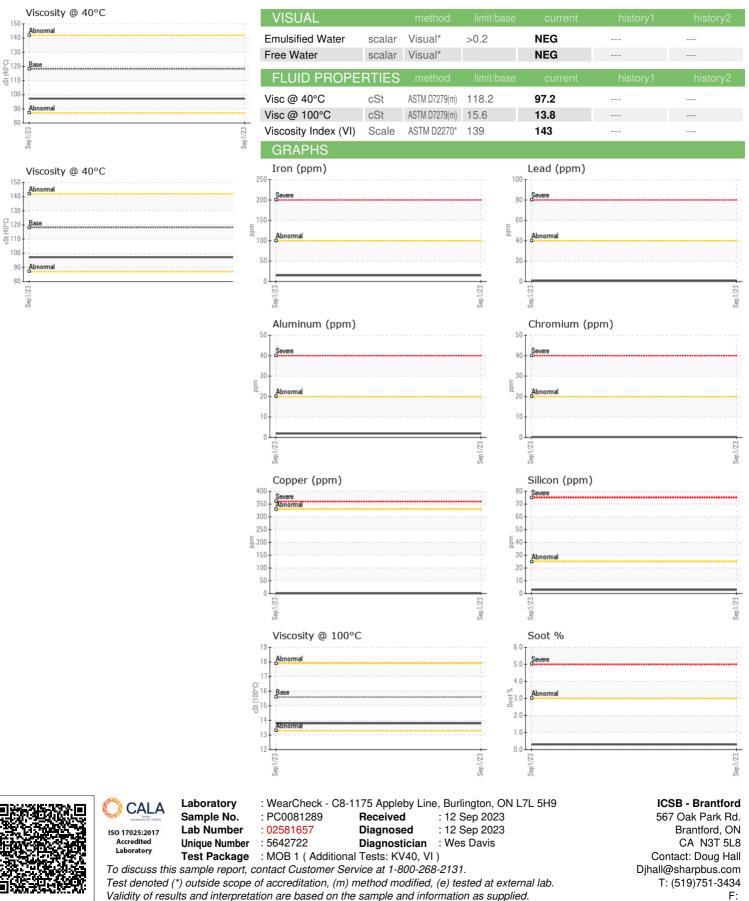
Contact/Location: Doug Hall - ICSB902

#### Sample Rating Trend





# **OIL ANALYSIS REPORT**



25

Contact/Location: Doug Hall - ICSB902