

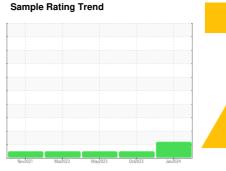
# **OIL ANALYSIS REPORT**



N.E.R./Off-Road **E-34** 

Component **Diesel Engine** 

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





### **DIAGNOSIS**

#### Recommendation

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

#### Wear

All component wear rates are normal.

#### Contamination

There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

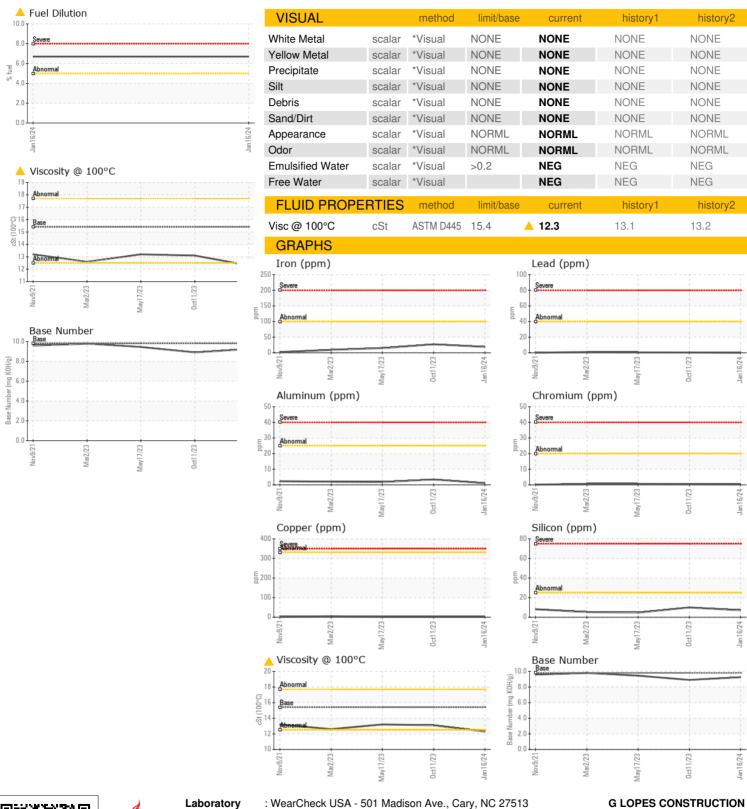
#### ▲ Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

SAMPLE INFORMATION         method         limit/base         current         history1         history2           Sample Number         Client Info         PCA0109736         PCA01045889         PCA00098560           Sample Date         Client Info         16 Jan 2024         11 Oct 2023         17 May 2023           Machine Age         hrs         Client Info         8403         7847         7847           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Bander Status         ABNORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >10.0         19         2.7         15           Chromium         ppm         ASTM D5185m         >20         <1         <1         1           Nickel         ppm         ASTM D5185m         >2         0         <1         <1           <	N SHP 15W40 (	G.712)	Nov2021	Mar2023	May2023 Oct2023	Jan 2024	
Sample Date	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         8403         7847         7847           Oil Age         hrs         Client Info         8403         7847         7847           Oil Age         hrs         Client Info         N/A         N/A         N/A           Sample Status         NEG         NEG         NRG         NRG           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         20.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         19         27         15           Chromium         ppm         ASTM D5185m         >20         <1	Sample Number		Client Info		PCA0109746	PCA0104589	PCA0098560
Oil Age         hrs         Client Info         8403         7847         7847           Oil Changed         Client Info         N/A         N/A         N/A         N/A         N/A           Sample Status         Client Info         N/A         N/A         N/A         N/A         N/A         N/A           Sample Status         Client Info         N/A         ANA         N/A         N/A         N/A         N/A           Water         Med         Imitity         Inistory2         Med         NEG         NEG         NEG           Wear         MEATM DEFilem         Selection         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM DEFIlem         >20         <1         <1         <1           Chromium         ppm         ASTM DEFIlem         >20         <1         <1         <1           Chromium         ppm         ASTM DEFIlem         >20         <1         <1         <1           Chromium         ppm         ASTM DEFIlem         >20         <1         <1         <1         <1         <1 <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <td>16 Jan 2024</td> <td>11 Oct 2023</td> <td>17 May 2023</td>	Sample Date		Client Info		16 Jan 2024	11 Oct 2023	17 May 2023
Coli   Changed   Client Info   N/A   ABNORMAL   NORMAL   NORMAL   NORMAL   NORMAL   NORMAL	Machine Age	hrs	Client Info		8403	7847	7847
ABNORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	Oil Age	hrs	Client Info		8403	7847	7847
Water	Oil Changed		Client Info		N/A	N/A	N/A
Water         WC Method         >0.2         NEG         Netorya         NEG         NEG         Netorya         NEG           ASTM DATM <td>Sample Status</td> <td></td> <td></td> <td></td> <td>ABNORMAL</td> <td>NORMAL</td> <td>NORMAL</td>	Sample Status				ABNORMAL	NORMAL	NORMAL
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         19         27         15           Chromium         ppm         ASTM D5185m         >20         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         19         27         15           Chromium         ppm         ASTM D5185m         >20         <1	Water		WC Method	>0.2	NEG	NEG	NEG
Port   Port	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185m	>100	19	27	15
Still pm	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>2	0	<1	0
Aluminum ppm ASTM D5185m >25 1 3 2 Lead ppm ASTM D5185m >40 0 <1 <1 Copper ppm ASTM D5185m >330 2 2 2 2  Tin ppm ASTM D5185m >15 <1 <1 <1 <1 O	Titanium	ppm	ASTM D5185m	>2	0	<1	<1
Lead         ppm         ASTM D5185m         >40         0         <1         <1           Copper         ppm         ASTM D5185m         >330         2         2         2           Tin         ppm         ASTM D5185m         >15         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0           Magnesium         ppm         ASTM D5185m         1010         779         397         609           Calcium         ppm         ASTM D5185m         1270         1295         1340	Silver	ppm	ASTM D5185m	>2	0	0	<1
Copper         ppm         ASTM D5185m         >330         2         2         2           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>25	1	3	2
Tin	_ead	ppm	ASTM D5185m	>40	0	<1	<1
Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         157         396         242           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         <1         <1           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         779         397         609           Calcium         ppm         ASTM D5185m         1070         1295         1340         1469           Phosphorus         ppm         ASTM D5185m         1270         1296         1250         1246           Sulfur         ppm         ASTM D5185m         200         3199         3668         3579           CONTAMINANTS         method         limit/base         current         history1	Copper	ppm	ASTM D5185m	>330	2	2	2
Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         157         396         242           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         75         89         76           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         779         397         609           Calcium         ppm         ASTM D5185m         1070         1295         1340         1469           Phosphorus         ppm         ASTM D5185m         1270         1296         1250         1246           Sulfur         ppm         ASTM D5185m         1270         1296         1250         1246           Sulfur         ppm         ASTM D5185m         20         3199         3668	Γin	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES	Vanadium		ASTM D5185m		<1	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         75         89         76           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         779         397         609           Calcium         ppm         ASTM D5185m         1070         1295         1340         1469           Phosphorus         ppm         ASTM D5185m         1150         1066         1037         1044           Zinc         ppm         ASTM D5185m         1270         1296         1250         1246           Sulfur         ppm         ASTM D5185m         2060         3199         3668         3579           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         25         7         10         5           Sodium         ppm         ASTM D5185m         20         0         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D7844 <th< td=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td>157</td><td>396</td><td>242</td></th<>	Boron	ppm	ASTM D5185m	0	157	396	242
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         779         397         609           Calcium         ppm         ASTM D5185m         1070         1295         1340         1469           Phosphorus         ppm         ASTM D5185m         1150         1066         1037         1044           Zinc         ppm         ASTM D5185m         1270         1296         1250         1246           Sulfur         ppm         ASTM D5185m         2060         3199         3668         3579           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         2         2         2           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         25         7         10         5           Sodium         ppm         ASTM D5185m         20         0         2         0           Fuel         %         ASTM D5185m         >20 <td< td=""><td>Barium</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td>0</td><td>0</td><td>0</td></td<>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         779         397         609           Calcium         ppm         ASTM D5185m         1070         1295         1340         1469           Phosphorus         ppm         ASTM D5185m         1150         1066         1037         1044           Zinc         ppm         ASTM D5185m         1270         1296         1250         1246           Sulfur         ppm         ASTM D5185m         2060         3199         3668         3579           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         7         10         5           Sodium         ppm         ASTM D5185m         >20         0         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D3524         >5         6.7         <1.0	Molybdenum	ppm	ASTM D5185m	60	75	89	76
Calcium         ppm         ASTM D5185m         1070         1295         1340         1469           Phosphorus         ppm         ASTM D5185m         1150         1066         1037         1044           Zinc         ppm         ASTM D5185m         1270         1296         1250         1246           Sulfur         ppm         ASTM D5185m         2060         3199         3668         3579           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         7         10         5           Sodium         ppm         ASTM D5185m         >20         0         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D3524         >5         ▲6.7         <1.0	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         1066         1037         1044           Zinc         ppm         ASTM D5185m         1270         1296         1250         1246           Sulfur         ppm         ASTM D5185m         2060         3199         3668         3579           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         7         10         5           Sodium         ppm         ASTM D5185m         2         2         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Soot %         %         *ASTM D7844         >3         0.4	Magnesium	ppm	ASTM D5185m	1010	779	397	609
Zinc         ppm         ASTM D5185m         1270         1296         1250         1246           Sulfur         ppm         ASTM D5185m         2060         3199         3668         3579           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         7         10         5           Sodium         ppm         ASTM D5185m         2         2         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Soot %         %         *ASTM D7844         >3         0.4         1.1         1.6           Nitration         Abs/cm         *ASTM D7415         >30         18.4	Calcium	ppm	ASTM D5185m	1070	1295	1340	1469
Sulfur         ppm         ASTM D5185m         2060         3199         3668         3579           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         7         10         5           Sodium         ppm         ASTM D5185m         2         2         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Soot %         %         ASTM D3524         >5         ^3         0.4         1.1         1.6           Nitration         Abs/cm         *ASTM D7624         >20         7.7         5.7         6.7           Sulfation         Abs/.1mm         *ASTM D7415         >30	Phosphorus	ppm	ASTM D5185m	1150	1066	1037	1044
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         7         10         5           Sodium         ppm         ASTM D5185m         2         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D3524         >5         ▲ 6.7         <1.0	Zinc	ppm	ASTM D5185m	1270	1296	1250	1246
Silicon         ppm         ASTM D5185m         >25         7         10         5           Sodium         ppm         ASTM D5185m         2         2         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D3524         >5         ▲ 6.7         <1.0         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         1.1         1.6           Nitration         Abs/cm         *ASTM D7624         >20         7.7         5.7         6.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.4         21.2         22.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.4         13.6         14.5	Sulfur	ppm	ASTM D5185m	2060	3199	3668	3579
Sodium         ppm         ASTM D5185m         2         2         2         2         2         Potassium         ppm         ASTM D5185m         >20         0         2         0         0         2         0         0         2         0         0         2         0         0         2         0         4         1.0          1.0           4.0 </td <td>CONTAMINAN</td> <td>TS</td> <td>method</td> <td>limit/base</td> <td>current</td> <td>history1</td> <td>history2</td>	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D3524         >5         ▲ 6.7         <1.0         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         1.1         1.6           Nitration         Abs/cm         *ASTM D7624         >20         7.7         5.7         6.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.4         21.2         22.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.4         13.6         14.5	Silicon	ppm	ASTM D5185m	>25	7	10	5
Fuel % ASTM D3524 >5	Sodium	ppm	ASTM D5185m		2	2	2
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         1.1         1.6           Nitration         Abs/cm         *ASTM D7624         >20         7.7         5.7         6.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.4         21.2         22.2           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.4         13.6         14.5	Potassium	ppm	ASTM D5185m	>20	0	2	0
Soot %         %         *ASTM D7844 >3         0.4         1.1         1.6           Nitration         Abs/cm         *ASTM D7624 >20         7.7         5.7         6.7           Sulfation         Abs/.1mm         *ASTM D7415 >30         18.4         21.2         22.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         15.4         13.6         14.5	Fuel	%	ASTM D3524	>5	<b>△</b> 6.7	<1.0	<1.0
Nitration         Abs/cm         *ASTM D7624         >20         7.7         5.7         6.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.4         21.2         22.2           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.4         13.6         14.5	INFRA-RED		method	limit/base	current	history1	history2
Nitration         Abs/cm         *ASTM D7624         >20         7.7         5.7         6.7           Sulfation         Abs/.1mm         *ASTM D7615         >30         18.4         21.2         22.2           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.4         13.6         14.5	Soot %	%	*ASTM D7844	>3	0.4	1.1	1.6
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.4         21.2         22.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.4         13.6         14.5	Vitration	Abs/cm	*ASTM D7624	>20	7.7	5.7	6.7
Oxidation							
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.4	13.6	14.5



## **OIL ANALYSIS REPORT**







Laboratory Sample No. Lab Number **Unique Number** 

: 06065848

: PCA0109746 : 10842525

: 19 Jan 2024 Recieved Diagnosed : 23 Jan 2024 Diagnostician : Wes Davis

Test Package : MOB 2 (Additional Tests: FuelDilution, PercentFuel) 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)

565 WINTHROP ST TAUNTON, MA US 02780

Contact: BUTCH MCGRATH

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