

## **OIL ANALYSIS REPORT**

Sample Rating Trend



933040 Component Natural Gas Engine Fluid

PETRO CANADA DURON SHP 15W40 (21 QTS)

## DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Machine Id

### Wear

All component wear rates are normal.

#### 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.

Sample Number         Client Info         ZF May 2024         GFL0103429         GFL0103429         GFL0102429           Sample Date         Client Info         27 May 2024         12 Mar 2024         30 Nov 2023           Machine Age         hrs         Client Info         1023         563         1201           Oil Age         hrs         Client Info         1023         563         1201           Oil Changed         Client Info         1023         563         1201           Sample Status         imit/base         current         History1         History1           Water         WC Method         >0.1         NEG         NEG         NEG           Wetar         WC Method         >0.1         NEG         NEG         NEG           Irin<         ppm         ASTM D5185m         >50         40         40         106           Chromium         ppm         ASTM D5185m         >55         3         2         3           Iria         ppm         ASTM D5185m         >5         3         2         3           Iria         ppm         ASTM D5185m         >4         2         0         2           Iria         ppm         ASTM D5185m <th>SAMPLE INFORM</th> <th>MATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         2224         1764         1201           Oil Age         irs         Client Info         1023         563         1201           Oil Changed         Client Info         1023         563         1201           Oil Changed         Client Info         1023         563         1201           Sample Status         Imit/base         current         NoRMAL         ABNORMAL           Vetar         WC Method         >0.1         NEG         NEG         NEG           Water         WC Method         >0.1         NEG         Method         106           Chromium         ppm         ASTM D5185m         >55         3         2         3           Nickel         ppm         ASTM D5185m         >5         0         0         <1           Silver         ppm         ASTM D5185m         >5         13         7         23           Lead         ppm         ASTM D5185m         >5         13         7         23           Lead         ppm         ASTM D5185m         >4         2         0         2           Copper         ppm         ASTM D5185m         9         0	Sample Number		Client Info		GFL0122642	GFL0103429	GFL0074629
Oil Age         hrs         Client Info         1023         563         1201           Oil Changed         Client Info         Changed         NorRMAL         NorRMAL         ABNORMAL           Sample Status         Imit/base         ourrent         history1         ABNORMAL           CONTAMINATION         method         limit/base         ourrent         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           Wear         WC Method         >0.1         NEG         NEG         NEG           Iron         ppm         ASTM D5185m         >50         40         40         106           Chromium         ppm         ASTM D5185m         >5         3         2         3           Nickel         ppm         ASTM D5185m         >4         2         <1         3           Aluminum         ppm         ASTM D5185m         >40         2         <1         2           Copper         ppm         ASTM D5185m         >40         0         0         0           Cadamium         ppm         ASTM D5185m         0         0         0         0           Cadamium	Sample Date		Client Info		27 May 2024	12 Mar 2024	30 Nov 2023
Oil Changed Sample Status     Client Info     Changed NORMAL     Not Changed ABNORMAL     Changed ABNORMAL       CONTAMINATION     method     limit/base     current     history1     ABNORMAL       Water     WC Method     >0.1     NEG     NEG     NEG       Water     WC Method     >0.1     NEG     NEG     NEG       VEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >5.0     40     40     106       Chromium     ppm     ASTM D5185m     >5.0     40     40     106       Silver     ppm     ASTM D5185m     >5.0     0     0     <1       Silver     ppm     ASTM D5185m     >3     <1     0     <1       Lead     ppm     ASTM D5185m     >4     2     0     2       Copper     ppm     ASTM D5185m     >4     2     0     2       Vanadium     ppm     ASTM D5185m     >4     2     0     2       Copper     ppm     ASTM D5185m     0     0     0     0       Cadmium     ppm     ASTM D5185m     0     3     2     15    Mandauese     ppm     ASTM D5185m <th>Machine Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>2224</th> <th>1764</th> <th>1201</th>	Machine Age	hrs	Client Info		2224	1764	1201
Sample Status         NORMAL         NORMAL         NORMAL         ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           Wear         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >5         3         2         3           Nickel         ppm         ASTM D5185m         >5         0         0         <1	Oil Age	hrs	Client Info		1023	563	1201
CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           Wear METALS         method         limit/base         ourrent         history1         history2           Iron         ppm         ASTM D5185m         >50         40         40         ▲ 106           Chromium         ppm         ASTM D5185m         >5         0         0         <1           Nickel         ppm         ASTM D5185m         >5         0         0         <1           Silver         ppm         ASTM D5185m         >25         13         7         23         Lead         ppm         ASTM D5185m         >40         0 <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>Changed</th> <th>Not Changd</th> <th>Changed</th>	Oil Changed		Client Info		Changed	Not Changd	Changed
Water         WC Method         >0.1         NEG         NEG         NEG           Wear         ppm         ASTM 05185m         >5.0         40         40         ▲ 106           Chromium         ppm         ASTM 05185m         >5.0         3         2         3           Nickel         ppm         ASTM 05185m         >4         2         <1         3           Titanium         ppm         ASTM 05185m         >5         0         0         <1           Silver         ppm         ASTM 05185m         >3         <1         0         <1           Aluminum         ppm         ASTM 05185m         >3         <1         0         <1           Lead         ppm         ASTM 05185m         >4         2         0         2           Copper         ppm         ASTM 05185m         0         0         0         0           Cadmium         ppm         ASTM 05185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM 05185m         0         6         <1         3 <th>Sample Status</th> <th></th> <th></th> <th></th> <th>NORMAL</th> <th>NORMAL</th> <th>ABNORMAL</th>	Sample Status				NORMAL	NORMAL	ABNORMAL
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         40         40         ▲         106           Chromium         ppm         ASTM D5185m         >50         40         40         ▲         106           Chromium         ppm         ASTM D5185m         >5         0         0         <1         3           Titanium         ppm         ASTM D5185m         >5         0         0         <1         3           Silver         ppm         ASTM D5185m         >25         13         7         23         Lead         177         23           Lead         ppm         ASTM D5185m         >150         4         3         177         23           Lead         ppm         ASTM D5185m         0         0         0         0         0           Capper         ppm         ASTM D5185m         0         0         0         0         0           Cademium         ppm         ASTM D5185m         0         6         <1         3         3           Boron         ppm         ASTM D5185m         0	CONTAMINAT	ION	method	limit/base	current	history1	history2
Iron         ppm         ASTM D5185m         >50         40         40         A         106           Chromium         ppm         ASTM D5185m         >5         3         2         3           Nickel         ppm         ASTM D5185m         >5         0         0         <1           Silver         ppm         ASTM D5185m         >5         0         0         <1           Silver         ppm         ASTM D5185m         >3         <1         0         <1           Aluminum         ppm         ASTM D5185m         >25         13         7         23           Lead         ppm         ASTM D5185m         >40         2         <1         2           Copper         ppm         ASTM D5185m         >4         2         0         2           Vanadium         ppm         ASTM D5185m         0         6         <1         3           Boron         ppm         ASTM D5185m         0         6         <1         3           Barium         ppm         ASTM D5185m         0         3         2         15           Magnaese         ppm         ASTM D5185m         0         100         0 </th <th>Water</th> <th></th> <th>WC Method</th> <th>&gt;0.1</th> <th>NEG</th> <th>NEG</th> <th>NEG</th>	Water		WC Method	>0.1	NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >5         3         2         3           Nickel         ppm         ASTM D5185m         >4         2         <1         3           Titanium         ppm         ASTM D5185m         >5         0         0         <1           Silver         ppm         ASTM D5185m         >3         <1         0         <1           Silver         ppm         ASTM D5185m         >25         13         7         23           Lead         ppm         ASTM D5185m         >40         2         <1         2           Copper         ppm         ASTM D5185m         >4         2         0         2           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         6         <1         3           Boron         ppm         ASTM D5185m         0         6         <1         3           Barium         ppm         ASTM D5185m         0         3         2         15           Magnaese         ppm         ASTM D5185m         0         100         0         4	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >4         2         <1	Iron	ppm	ASTM D5185m	>50	40	40	<b>1</b> 06
Titanium         ppm         ASTM D5185m         >5         0         0         <1	Chromium	ppm	ASTM D5185m	>5	3	2	3
Silver         ppm         ASTM D5185m         >3         <1	Nickel	ppm	ASTM D5185m	>4	2	<1	3
Aluminum         ppm         ASTM D5185m         >25         13         7         23           Lead         ppm         ASTM D5185m         >40         2         <1         2           Copper         ppm         ASTM D5185m         >150         4         3         17           Tin         ppm         ASTM D5185m         >4         2         0         2           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         6         <1         3           Boron         ppm         ASTM D5185m         0         6         <1         3           Barium         ppm         ASTM D5185m         0         0         0         4           Molybdenum         ppm         ASTM D5185m         0         3         2         15           Magnaese         ppm         ASTM D5185m         010         1039         965         820           Calcium         ppm         ASTM D5185m         1010         1037         1037         1037           Sulfur         ppm         ASTM D5185m         1270         1397         1307	Titanium	ppm	ASTM D5185m	>5	0	0	<1
Lead         ppm         ASTM D5185m         >40         2         <1	Silver	ppm	ASTM D5185m	>3	<1	0	<1
Copper         ppm         ASTM D5185m         >150         4         3         17           Tin         ppm         ASTM D5185m         >4         2         0         2           Vanadium         ppm         ASTM D5185m         >4         2         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ACDDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         <1         3           Barium         ppm         ASTM D5185m         0         0         0         4           Molybdenum         ppm         ASTM D5185m         0         3         2         15           Magnesium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1070         1290         1262         1132           Phosphorus         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         220         3097	Aluminum	ppm	ASTM D5185m	>25	13	7	23
Tin         ppm         ASTM D5185m         >4         2         0         2           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         <1	Lead	ppm	ASTM D5185m	>40	2	<1	2
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         <1	Copper	ppm	ASTM D5185m	>150	4	3	17
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         <1         3           Barium         ppm         ASTM D5185m         0         0         0         4           Molybdenum         ppm         ASTM D5185m         0         3         2         15           Magnesium         ppm         ASTM D5185m         0         3         2         15           Magnesium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1070         1290         1262         1132           Phosphorus         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         2060         3097         3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Solicon         ppm         ASTM D5185m         >20         26	Tin	ppm	ASTM D5185m	>4	2	0	2
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         <1         3           Barium         ppm         ASTM D5185m         0         0         0         4           Molybdenum         ppm         ASTM D5185m         60         80         71         65           Manganese         ppm         ASTM D5185m         0         3         2         15           Magnesium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1070         1290         1262         1132           Phosphorus         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         2060         3097         3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         <	Vanadium	ppm	ASTM D5185m		0	0	0
Boron         ppm         ASTM D5185m         0         6         <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         pm         ASTM D5185m         0         0         0         0         4           Molybdenum         ppm         ASTM D5185m         60         80         71         65           Manganese         ppm         ASTM D5185m         0         3         2         15           Magnesium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1070         1290         1262         1132           Phosphorus         ppm         ASTM D5185m         1070         1397         1307         1037           Zinc         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         2060         3097         3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method			mothod	limit/baco	ourropt	history(1	history2
Molybdenum         ppm         ASTM D5185m         60         80         71         65           Manganese         ppm         ASTM D5185m         0         3         2         15           Magnesium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1070         1290         1262         1132           Phosphorus         ppm         ASTM D5185m         1150         1127         973         791           Zinc         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         2060         3097         3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         26         10         68           Potassium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit	ADDITIVES		methou	iiiiii/base	Current	nistory i	matory
Manganese         ppm         ASTM D5185m         0         3         2         15           Magnesium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1070         1290         1262         1132           Phosphorus         ppm         ASTM D5185m         1150         1127         973         791           Zinc         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         2060         3097         3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0         0           Nitration         Abs/.tmm         *ASTM D7624		ppm					
Magnesium         ppm         ASTM D5185m         1010         1039         965         820           Calcium         ppm         ASTM D5185m         1070         1290         1262         1132           Phosphorus         ppm         ASTM D5185m         1150         1127         973         791           Zinc         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         2060         3097         3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0         0           Nitration         Abs/.mm         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.lmm         *ASTM D7	Boron Barium		ASTM D5185m	0	6	<1	3
Calcium         ppm         ASTM D5185m         1070         1290         1262         1132           Phosphorus         ppm         ASTM D5185m         1150         1127         973         791           Zinc         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         2060         3097         3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.4         12.2           Soot %         %         *ASTM D7624         >20         10.4         12.2           Sulfation         Abs/.mm         *ASTM D7415         >30         25.4	Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	6 0	<1 0	3 4
Phosphorus         ppm         ASTM D5185m         1150         1127         973         791           Zinc         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         2060         3097         3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	6 0 80	<1 0 71	3 4 65
Zinc         ppm         ASTM D5185m         1270         1397         1307         1037           Sulfur         ppm         ASTM D5185m         2060         3097         3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.2         10.4         12.2           Soot %         %         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.tmm         *ASTM D741	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	6 0 80 3	<1 0 71 2	3 4 65 15
Sulfur         ppm         ASTM D5185m         2060 <b>3097</b> 3239         3320           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >20         26         10         68           Potassium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.2         10.4         12.2           Soot %         %         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D741	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	6 0 80 3 1039	<1 0 71 2 965	3 4 65 15 820
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         9         6         5           Potassium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.5         16.0         22.2	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	6 0 80 3 1039 1290	<1 0 71 2 965 1262	3 4 65 15 820 1132
Silicon         ppm         ASTM D5185m         >25         10         8         22           Sodium         ppm         ASTM D5185m         9         6         5           Potassium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.2         10.4         12.2           Soot %         %         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.mm         *ASTM D7615         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.tmm         *ASTM D7614         >25         18.5         16.0         22.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	6 0 80 3 1039 1290 1127	<1 0 71 2 965 1262 973	3 4 65 15 820 1132 791
Sodium         ppm         ASTM D5185m         9         6         5           Potassium         ppm         ASTM D5185m<>20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.5         16.0         22.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	6 0 80 3 1039 1290 1127 1397	<1 0 71 2 965 1262 973 1307	3 4 65 15 820 1132 791 1037
Potassium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.5         16.0         22.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	6 0 80 3 1039 1290 1127 1397 3097	<1 0 71 2 965 1262 973 1307 3239	3 4 65 15 820 1132 791 1037 3320
Potassium         ppm         ASTM D5185m         >20         26         10         68           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.tmm         *ASTM D7414         >25         18.5         16.0         22.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	6 0 80 3 1039 1290 1127 1397 3097 current	<1 0 71 2 965 1262 973 1307 3239 history1	3 4 65 15 820 1132 791 1037 3320 history2
Soot %         %         *ASTM D7844         0         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.5         16.0         22.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b>	0 00 00 1010 1070 1150 1270 2060	6 0 80 3 1039 1290 1127 1397 3097 current 10	<1 0 71 2 965 1262 973 1307 3239 history1 8	3 4 65 15 820 1132 791 1037 3320 history2 22
Nitration         Abs/cm         *ASTM D7624         >20         10.2         10.4         12.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.5         16.0         22.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 kimit/base >25	6 0 80 3 1039 1290 1127 1397 3097 current 10 9	<1 0 71 2 965 1262 973 1307 3239 history1 8 6	3 4 65 15 820 1132 791 1037 3320 history2 22 5
Sulfation         Abs/.1mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.5         16.0         22.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25	6 0 80 3 1039 1290 1127 1397 3097 current 10 9 26	<1 0 71 2 965 1262 973 1307 3239 history1 8 6 10	3 4 65 15 820 1132 791 1037 3320 history2 22 5 68
Sulfation         Abs/.1mm         *ASTM D7415         >30         25.4         21.5         24.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.5         16.0         22.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25	6 0 80 3 1039 1290 1127 1397 3097 current 10 9 26 current	<1 0 71 2 965 1262 973 1307 3239 history1 8 6 10 history1	3 4 65 15 820 1132 791 1037 3320 history2 22 5 68 history2
Oxidation Abs/.1mm *ASTM D7414 >25 18.5 16.0 22.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>Imit/base</b> >25 >20	6 0 80 3 1039 1290 1127 1397 3097 <i>current</i> 10 9 26 <i>current</i> 0	<1 0 71 2 965 1262 973 1307 3239 history1 8 6 10 10 history1 0	3 4 65 15 820 1132 791 1037 3320 <b>history2</b> 22 5 68 <b>history2</b> 0
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	6 0 80 3 1039 1290 1127 1397 3097 <i>current</i> 10 9 26 <i>current</i> 0 10.2	<1 0 71 2 965 1262 973 1307 3239 history1 8 6 10 history1 0 10.4	3 4 65 15 820 1132 791 1037 3320 history2 22 5 68 history2 0 12.2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         4.4         3.9         3.8	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >20	6 0 80 3 1039 1290 1127 1397 3097 <i>current</i> 10 9 26 <i>current</i> 0 10.2 25.4	<1 0 71 2 965 1262 973 1307 3239 history1 8 6 10 history1 0 10.4 21.5	3 4 65 15 820 1132 791 1037 3320 <b>history2</b> 22 5 68 <b>history2</b> 0 12.2 24.8
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 2060 225 220 220 imit/base >20 >30 imit/base	6 0 80 3 1039 1290 1127 1397 3097 <i>current</i> 10 9 26 <i>current</i> 0 10.2 25.4	<1 0 71 2 965 1262 973 1307 3239 history1 8 6 10 history1 0 10.4 21.5 history1	3 4 65 15 820 1132 791 1037 3320 history2 22 5 68 history2 0 12.2 24.8 history2

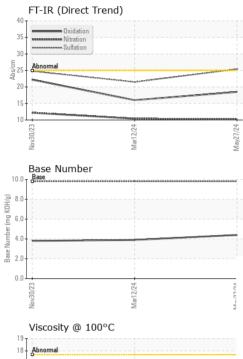


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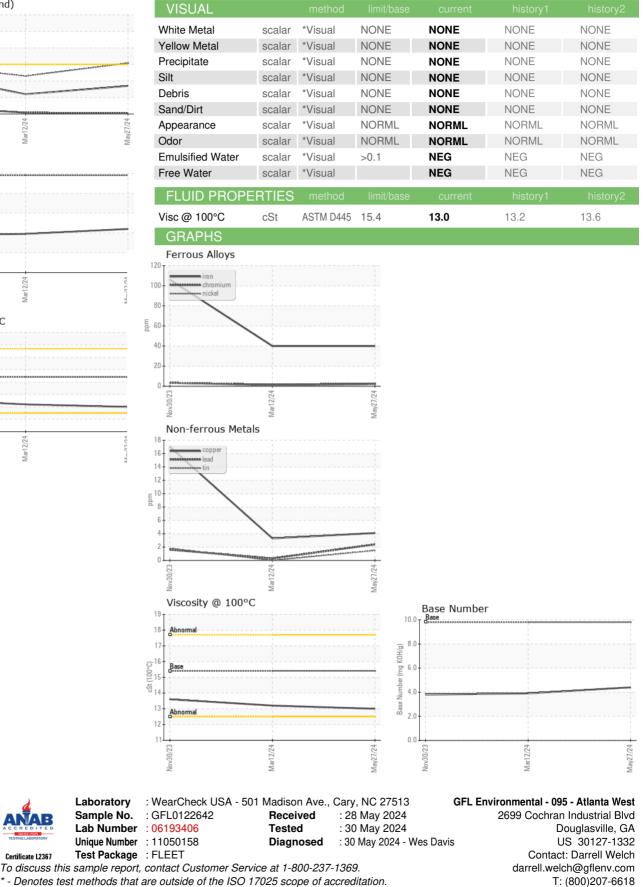
Base

Nov30/23

# **OIL ANALYSIS REPORT**



Mar12/24



Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Report Id: GFL095 [WUSCAR] 06193406 (Generated: 05/30/2024 08:48:08) Rev: 1

Certificate 12367

Submitted By: Darrell Welch

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