



### COMPONENT CONDITION SUMMARY Particle Trend 40k 4µm 35k 6µm 4µm (Im 1) 30k 25k 20k 20k 15k 10k 5k 0k 0ct27/22 -Aug3/20

Jan22/15

Sep15/16

Dec12/18

### RECOMMENDATION

Mar8/1

Mav31/12

**EA** 

**Hydraulic System** 

Area TC02

TC02 Component

We recommend you service the filters on this component. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

Aug21/13

TRIBOL HYDRAULIC 943AW-68 (--- LTR)

PROBLEMATIC TEST RESULTS							
Sample Status			ABNORMAL	ABNORMAL	SEVERE		
Particles >4µm	ASTM D7647	>5000	🔺 18641	<b>1</b> 9557	▲ 5668		
Particles >6µm	ASTM D7647	>1300	<u> </u>	🔺 2657	1055		
Oil Cleanliness	ISO 4406 (c)	>19/17/14	<u> </u>	<b>1</b> 21/19/13	<b>2</b> 0/17/13		

Customer Id: GOONAP Sample No.: WC0873617 Lab Number: 02602299 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data: Kevin Marson +1 (289)291-4644 x4644 Kevin.Marson@wearcheck.com

To change component or sample information: Gloria Gonzalez +1 (289)291-4643 x4643 gloria.gonzalez@wearcheck.com

RECOMMENDED AC				
Action	Status	Date	Done By	Description
Change Filter			?	We recommend you service the filters on this component.
Resample			?	We recommend an early resample to monitor this condition.
Information Required			?	NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

### HISTORICAL DIAGNOSIS



### 25 Aug 2023 Diag: Kevin Marson

We recommend you service the filters on this component. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.All component wear rates are normal. There is a moderate amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.





# WEAR

### 25 Apr 2023 Diag: Kevin Marson

Due to this condition we recommend the following action... We advise an early resample to confirm this situation. NOTE: The current sample results do not match this units historical trend, indicating the sample may not be from this component/unit.Copper ppm levels are severe. Iron and lead ppm levels are abnormal. Bearing wear is indicated. Oil cooler core leaching or motor piston wear is indicated. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion. There is a light amount of silt (particulates < 14 microns in size) present in the oil. Additive levels indicate the addition of a different brand, or type of oil. The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear. NOTE: The color of the oil is darker then previous samples.





### 05 Feb 2023 Diag: Kevin Marson

Resample at the next service interval to monitor. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.All component wear rates are normal. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.





### **OIL ANALYSIS REPORT**





### DIAGNOSIS

#### Recommendation

We recommend you service the filters on this component. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

### Wear

All component wear rates are normal.

### Contamination

There is a moderate amount of silt (particulates < 14 microns in size) present in the oil.

### Fluid Condition

The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.



SAMPLE INFORMATION         method         limit/base         current         history1         history2           Sample Number         Client Info         05 Nov 2023         25 Aug 2023         25 Apr 2023           Machine Age         hrs         Client Info         0         0         0           Oil Age         hrs         Client Info         0         0         0         0           Sample Status         Client Info         N/A         N/A         N/A         N/A           Sample Status         method         Imit/base         current         history1         history2           Water         WC Method         >0.05         NEG         NEG         NEG           Nickel         ppm         ASTM 05/68/m         >20         0         <1         Aisor           Nickel         ppm         ASTM 05/68/m         >20         0         <1         16         16         16           Nickel         ppm         ASTM 05/68/m         >20         0         <1         16         16         16         16         16         16         16         16         16         16         16         16         16         16         16         16         16 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>							
Sample Number         Client Info         WC0873617         WC0841283         WC22128057           Sample Date         Client Info         0         0         0         0           Machine Age         hrs         Client Info         0         0         0         0           Oll Age         hrs         Client Info         N/A         N/A         N/A         N/A           Sample Status         Imathone         Imathone         Current         history1         history2           Water         WC Method         >0.05         NEG         NEG         NEG           WeAR METALS         method         Imathone         pm         ASIN DISE(m)         >20         0         <1         ASIN DISE(m)           Iron         ppm         ASIN DISE(m)         >20         0         <1         ASIN DISE(m)           Iron         ppm         ASIN DISE(m)         >20         0         <1         ASIN DISE(m)           Iron         ppm         ASIN DISE(m)         >20         0         <1         ASIN DISE(m)           Iron         ppm         ASIN DISE(m)         >20         0         <1         ASIN DISE(m)           Iron         ppm         ASIN DISE(m)<	SAMPLE INFORM	<b>IATION</b>	method	limit/base	current	history1	history2
Sample Date         Client Info         05 Nov 2023         25 Aug 2023         25 Apr 2023           Machine Age         hrs         Client Info         0         0         0           Oil Age         hrs         Client Info         0         0         0           Oil Age         hrs         Client Info         0         N/A         N/A         N/A           Sample Status         method         limit/base         current         history1         history2           Water         WC Method         >0.05         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Konn         ppm         ASTM D51500         >20         0         1         3           Konn         ppm         ASTM D51500         >20         -1         0         2           Konn         ppm         ASTM D51500         >20         -1         1         1           Konn         ppm         ASTM D51500         >20         -1         1         1           Kon         ppm         ASTM D51500         Q         Q         -1         1         1	Sample Number		Client Info		WC0873617	WC0841283	WC22128057
Machine Age Oil Age Oil Age Oil Changed ImageClient Info000Oil Changed Sample StatusClient InfoN/AN/AN/ASample StatusImage CONTAMINATIONmethodimit/base CurrentNEGNEGCONTAMINATIONWC Method>0.05NEGNEGNEGWEAR METALSmethodimit/base Currentnistory1history2IronppmASTM DEISS SATM DEISSS200<1ANickelppmASTM DEISS SATM DEISSS200<1ANickelppmASTM DEISS SATM DEISSS200<1ANickelppmASTM DEISS SATM DEISSS200<1ADianumppmASTM DEISS SATM DEISSS200<1A122CopperppmASTM DEISS SATM DEISSS200<1A122Tin <nom< td="">ppmASTM DEISS SATM DEISSS200&lt;1A122ApartinomyppmASTM DEISS SATM DEISSS20C&lt;1&lt;1122CopperppmASTM DEISS SATM DEISSS20C&lt;1&lt;1122CadmiumppmASTM DEISS ASTM DEISSC0&lt;1&lt;12ApartinomyppmASTM DEISSC0&lt;1&lt;1ApartinomyppmASTM DEISSC0&lt;1&lt;1ApartinomyppmASTM DEISSC</nom<>	Sample Date		Client Info		05 Nov 2023	25 Aug 2023	25 Apr 2023
Oil Age     hrs     Client Info     0     0     0       Oil Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     Client Info     N/A     ABNORMAL     ABNORMAL     SEVERE       CONTAMINATION     method     limitbase     current     history1     history2       Water     WC Method     >0.05     NEG     NEG     NEG       WEAR METALS     method     limitbase     current     history1     history2       Iron     ppm     ASTMD51600     >20     0     <1     36       Chromium     ppm     ASTMD51600     >20     0     <1     36       Silver     ppm     ASTMD51600     >20     0     <1     8       Silver     ppm     ASTMD51600     >20     0     <1     8       Lead     ppm     ASTMD51600     >20     0     <1     17       Copper     ppm     ASTMD51600     >20     0     <1     17       Vanadium     ppm     ASTMD51600     >20     0     <1     17       Vanadium     ppm     ASTMD51600     >20     0     <1     17       Barium     ppm     ASTMD51600     0     0 </th <th>Machine Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>0</th> <th>0</th> <th>0</th>	Machine Age	hrs	Client Info		0	0	0
Oil Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     I     Imit/base     ABNORMAL     SEVERE       CONTAMINATION     We Method     >0.05     NEG     NEG     NEG       Water     WC Method     >0.05     NEG     NEG     NEG       WEAR METALS     method     Imit/base     current     History1     history2       Kron     ppm     ASTM0515611     >20     0     <1     \$1       Kron     ppm     ASTM0515611     >20     <1     0     <1       Nickel     ppm     ASTM0515611     >20     <1     0     <1       Naminum     ppm     ASTM0515611     >20     <1     <10     0       Aduminum     ppm     ASTM0515611     >20     <1     <10     <1132       Aduminum     ppm     ASTM0515611     >20     <1     <10     <1132       Adminum     ppm     ASTM0515611     >20     0     <1     <132       Adminum     ppm     ASTM0515611     <0     0     <1     <132       Adminum     ppm     ASTM0515611     <0     0     <1     <132       Adminum     ppm     ASTM0515611     <0	Oil Age	hrs	Client Info		0	0	0
Sample Status         Image         ABNORMAL         ABNORMAL         SEVERE           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.05         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM05185(m)         >20         0         <1         \$36           Chromium         ppm         ASTM05185(m)         >20         o1         0         <1           Nickel         ppm         ASTM05185(m)         >20         o1         0         0           Stiver         ppm         ASTM05185(m)         >20         c1         <1         0         0           Lead         ppm         ASTM05185(m)         >20         o1         <1         132           Tinaium         ppm         ASTM05185(m)         >20         o1         <1         132           Vanadum         ppm         ASTM05185(m)         0         0         <1         132           Astm05185(m)          0         0         <1         132	Oil Changed		Client Info		N/A	N/A	N/A
CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.05         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM 05185(m)         >20         0         <1         ASTM           Nickel         ppm         ASTM 05185(m)         >20         <1         0         2           Silver         ppm         ASTM 05185(m)         >20         <1         0         0           Aluminum         ppm         ASTM 05185(m)         >20         <1         <1         A           Copper         ppm         ASTM 05185(m)         >20         <1         <1         <122           Tin         ppm         ASTM 05185(m)         >20         <1         <1         <122           Tin         ppm         ASTM 05185(m)         >20         <1         <1         <122           Tin         ppm         ASTM 05185(m)         0         0         <1         <1           Antimony         ppm         ASTM 05185(m)         0	Sample Status				ABNORMAL	ABNORMAL	SEVERE
Water         WC Method         >0.05         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM 05185(m)         >20         0         <1         ▲         36           Chromium         ppm         ASTM 05185(m)         >20         0         <1         ▲         36           Nickel         ppm         ASTM 05185(m)         >20         <1         0         2           Nickel         ppm         ASTM 05185(m)         >20         <1         0         0           Aluminum         ppm         ASTM 05185(m)         >20         <1         <1         0         <1           Copper         ppm         ASTM 05185(m)         >20         <1         <1         0         <1           Antimony         ppm         ASTM 05185(m)         >20         0         <1         <1          132           Astm b5185(m)         >20         <1         <1         <1         <1         <1          14           Astm b5185(m)         <20         0         <1         <1          14<	CONTAMINATION	N	method	limit/base	current	historv1	historv2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5165(m)         >20         0         -1         36           Chromium         ppm         ASTM D5165(m)         >20         -1         0         2           Nickel         ppm         ASTM D5165(m)         >20         -1         0         2           Silver         ppm         ASTM D5165(m)         >20         -1         0         0           Aluminum         ppm         ASTM D5165(m)         >20         -1         -1         4           Copper         ppm         ASTM D5165(m)         >20         -1         -1         1           Copper         ppm         ASTM D5165(m)         >20         0         0         -1           Antimony         ppm         ASTM D5165(m)         20         0         0         -1           Cadmium         ppm         ASTM D5165(m)         0         0         0         -1           ADDITVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5165(m)         -1         0 <th>Water</th> <th>•</th> <th>WC Method</th> <th>&gt;0.05</th> <th>NEG</th> <th>NEG</th> <th>NEG</th>	Water	•	WC Method	>0.05	NEG	NEG	NEG
IronppmASTM D5185(m)>200<1	WEAR METALS		method	limit/base	current	history1	history2
Dromium         ppm         ASTM D5185(m)         >20         0         0         <1	Iron	ppm	ASTM D5185(m)	>20	0	<1	<b>4</b> 36
Nickel         ppm         ASTM D5185(m)         >20         <1         0         2           Titanium         ppm         ASTM D5185(m)          <1	Chromium	mag	ASTM D5185(m)	>20	0	0	<1
Titanium         ppm         ASTM D5185(m)         0         0         <1	Nickel	ppm	ASTM D5185(m)	>20	<1	0	2
SilverpmASTM D5185(m)<100AluminumppmASTM D5185(m)>20<1	Titanium	ppm	ASTM D5185(m)		0	0	<1
Aluminum         ppm         ASTM D5185(m)         >20         0         <1	Silver	ppm	ASTM D5185(m)		<1	0	0
Lead         ppm         ASTM D5185(m)         >20         <1	Aluminum	ppm	ASTM D5185(m)	>20	0	<1	8
Copper         prm         ASTM D5185(m)         >20         <1	Lead	ppm	ASTM D5185(m)	>20	<1	<1	<b>1</b> 7
Tin         ppm         ASTM D5185(m)         >20         0         0         <1	Copper	ppm	ASTM D5185(m)	>20	<1	<1	132
Antimony         ppm         ASTM D5185(m)         0         0         <1	Tin	ppm	ASTM D5185(m)	>20	0	0	<1
Vanadium         ppm         ASTM D5185(m)         0         0         <1	Antimony	ppm	ASTM D5185(m)		0	0	<1
Beryllium         ppm         ASTM D5185(m)         0         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         0         <1	Vanadium	ppm	ASTM D5185(m)		0	0	<1
Cadmium         ppm         ASTM D5185(m)         0         0         <1	Beryllium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         <1         0         <1           Barium         ppm         ASTM D5185(m)         0         0         <1           Molybdenum         ppm         ASTM D5185(m)         0         0         0         <1           Magnese         ppm         ASTM D5185(m)         0         0         <1         36           Calcium         ppm         ASTM D5185(m)         <1         <1         <1         36           Calcium         ppm         ASTM D5185(m)         <43         44         74           Phosphorus         ppm         ASTM D5185(m)         <55         65         793           Zinc         ppm         ASTM D5185(m)         <239         313         2363           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >20         0         <14         <1           Sodium         ppm<	Cadmium	ppm	ASTM D5185(m)		0	0	<1
BoronppmASTM D5185(m)<1							
Barium         ppm         ASTM D5185(m)         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185(m)         0         0         0           Manganese         ppm         ASTM D5185(m)         I         0         0         <1           Magnesium         ppm         ASTM D5185(m)         I         43         44         74           Phosphorus         ppm         ASTM D5185(m)         I         43         44         74           Phosphorus         ppm         ASTM D5185(m)         I         66         8         601           Sulfur         ppm         ASTM D5185(m)         I         239         313         2363           Lithium         ppm         ASTM D5185(m)         Imit/base         current         history1         history2           Solium         ppm         ASTM D5185(m)         >15         0         0         14           Sodium         ppm         ASTM D5185(m)         >20         0         <1         1           PtUID CLEANLINESS         method         Imit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000         18641         19557         5668           Particles >6µm         ASTM D7647         >100 <td< th=""><th>ADDITIVES Boron</th><th>ppm</th><th>method ASTM D5185(m)</th><th>limit/base</th><th>current &lt;1</th><th>history1 0</th><th>history2 &lt;1</th></td<>	ADDITIVES Boron	ppm	method ASTM D5185(m)	limit/base	current <1	history1 0	history2 <1
Manganese         ppm         ASTM D5185(m)         0         0         <1	ADDITIVES Boron Barium	ppm ppm	method ASTM D5185(m) ASTM D5185(m)	limit/base	current <1 <1	history1 0 0	history2 <1 <1
Magnesium         ppm         ASTM D5185(m)         <1	ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base	current <1 <1 0	history1 0 0 0	history2 <1 <1 0
Calcium         ppm         ASTM D5185(m)         43         44         ▲ 74           Phosphorus         ppm         ASTM D5185(m)         55         65         793           Zinc         ppm         ASTM D5185(m)         6         8         601           Sulfur         ppm         ASTM D5185(m)         239         313         2363           Lithium         ppm         ASTM D5185(m)          <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >15         0         0         14           Sodium         ppm         ASTM D5185(m)         >20         0         <1         <1           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000         18641         19557         5668           Particles >6µm         ASTM D7647         >1300         3837         2657         1055           Particles >1µm         ASTM D7647         >10         1         1         1           Particles >21µm	ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method           ASTM D5185(m)           ASTM D5185(m)           ASTM D5185(m)           ASTM D5185(m)           ASTM D5185(m)	limit/base	<pre>current &lt;1 &lt;1 0 0 0</pre>	history1 0 0 0 0	history2 <1 <1 0 <1
Phosphorus         ppm         ASTM D5185(m)         55         65         ▲ 793           Zinc         ppm         ASTM D5185(m)         Q39         313         ▲ 2363           Sulfur         ppm         ASTM D5185(m)         Q39         313         ▲ 2363           Lithium         ppm         ASTM D5185(m)         Q39         313         ▲ 2363           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >15         0         0         14           Sodium         ppm         ASTM D5185(m)         >20         0         <11	ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base	<pre>current &lt;1 &lt;1 0 0 &lt;1 </pre>	history1 0 0 0 0 <1	history2 <1 <1 0 <1 <1 ▲ 36
Zinc         ppm         ASTM D5185(m)         6         8         ▲ 601           Sulfur         ppm         ASTM D5185(m)         239         313         ▲ 2363           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >15         0         0         14           Sodium         ppm         ASTM D5185(m)         >15         0         0         14           Sodium         ppm         ASTM D5185(m)         >20         0         <1         <1           Potassium         ppm         ASTM D5185(m)         >20         0         <1         <1           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000         18641         19557         5668           Particles >6µm         ASTM D7647         >1300         3837         2657         1055           Particles >14µm         ASTM D7647         >10         1         1         1	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base	<pre>current &lt;1 &lt;1 0 0 &lt;1 &lt;1 43</pre>	history1 0 0 0 <1 44	history2 <1 <1 0 <1 ▲ 36 ▲ 74
SulfurppmASTM D5185(m)239313▲ 2363LithiumppmASTM D5185(m)<1	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base	<pre>current &lt;1 &lt;1 0 0 &lt;1 &lt;1 43 55</pre>	history1 0 0 0 0 <1 44 65	history2 <1 <1 0 <1 ▲ 36 ▲ 74 ▲ 793
LithiumppmASTM D5185(m)<1	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base	<pre>current &lt;1 &lt;1 0 0 &lt;1 43 55 6</pre>	history1 0 0 0 0 <1 44 65 8	history2 <1 <1 0 <1 ▲ 36 ▲ 74 ▲ 793 ▲ 601
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185(m)>150014SodiumppmASTM D5185(m)>150014PotassiumppmASTM D5185(m)>200<1<1FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>500018641195575668Particles >6µmASTM D7647>1300383726571055Particles >14µmASTM D7647>160626257Particles >21µmASTM D7647>4061713Particles >38µmASTM D7647>3000Oil CleanlinessISO 4406 (c)>19/17/1421/19/1321/19/1320/17/13	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base	<pre>current &lt;1 &lt;1 0 0 &lt;1 43 55 6 239</pre>	history1 0 0 0 0 <1 44 65 8 313	history2 <1 <1 0 <1 ▲ 36 ▲ 74 ▲ 793 ▲ 601 ▲ 2363
Silicon         ppm         ASTM D5185(m)         >15         0         0         14           Sodium         ppm         ASTM D5185(m)         <1	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base	<1         <1         0         0         <1         43         55         6         239         <1	history1 0 0 0 <1 44 65 8 313 <1	history2 <1 <1 0 <1 36 ▲ 74 ▲ 793 ▲ 601 ▲ 2363 <1
Sodium         ppm         ASTM D5185(m)         <1	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base	<1         <1         0         0         <1         43         55         6         239         <1         current	history1         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         <1         history1	<1         <1         0         <1         36         74         793         601         2363         <1
Potassium         ppm         ASTM D5185(m)         >20         0         <1	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base	<1         <1         0         0         <1         43         55         6         239         <1         current	history1         0         0         0         0         0         0         0         0         0         0         0         0         0         <1         history1         0	history2 <1 <1 0 <1 36 <74 <793 <601 <2363 <1
FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4µm       ASTM D7647       >5000       ▲ 18641       ▲ 19557       ▲ 5668         Particles >6µm       ASTM D7647       >1300       ▲ 3837       ▲ 2657       1055         Particles >14µm       ASTM D7647       >160       62       62       57         Particles >21µm       ASTM D7647       >40       6       17       13         Particles >38µm       ASTM D7647       >10       1       1       1         Particles >71µm       ASTM D7647       >3       0       0       0         Oil Cleanliness       ISO 4406 (c)       >19/17/14       21/19/13       ▲ 21/19/13       ▲ 20/17/13	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base	<1         <1         0         0         <1         43         55         6         239         <1         current         0         <1	history1         0         0         0         0         0         -         44         65         8         313         <1         history1         0         0         0         0         0         0         0         0	history2 <li>&lt;1 <ul> <li>&lt;1</li> <li>0</li> <li>&lt;1</li> <li>36</li> <li>74</li> <li>793</li> <li>601</li> <li>2363</li> <li>&lt;1</li> </ul> </li> <li>history2 <ul> <li>14</li> <li>2</li> </ul></li>
Particles >4μm       ASTM D7647       >5000       ▲ 18641       ▲ 19557       ▲ 5668         Particles >6μm       ASTM D7647       >1300       ▲ 3837       ▲ 2657       1055         Particles >14μm       ASTM D7647       >160       62       62       57         Particles >21μm       ASTM D7647       >40       6       17       13         Particles >38μm       ASTM D7647       >10       1       1       1         Particles >38μm       ASTM D7647       >3       0       0       0         Oli Cleanliness       ISO 4406 (c)       >19/17/14       21/19/13       ▲ 21/19/13       ▲ 20/17/13	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base	<1         <1         0         0         <1         43         55         6         239         <1         current         0         <1         0	history1         0         0         0         0         0         0         0         0         0         44         65         8         313         <1         history1         0         0         1	history2 1 </1 0 </1 36 </1 36 </1 36 </1 50 </1 50 </1 50 </1 50 </1 50 </1 50 </1 50 </1 50 </1 50 </1 50 </1 50 </1 50 </td
Particles >6μm         ASTM D7647         >1300         ▲ 3837         ▲ 2657         1055           Particles >14μm         ASTM D7647         >160         62         62         57           Particles >21μm         ASTM D7647         >40         6         17         13           Particles >21μm         ASTM D7647         >10         1         1         1           Particles >38μm         ASTM D7647         >3         0         0         0           Particles >71μm         ASTM D7647         >3         0         0         21/19/13         20/17/13	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base >15 >20 limit/base	<1         <1         0         0         <1         43         55         6         239         <1         current         0         <1         0         <10         current         0         <1         0         <10         current	history1         0         0         0         0         0         <1         44         65         8         313         <1         history1         0         0         1         history1         0         1         history1	history2 <li>&lt;1 <ul> <li>&lt;1</li> <li>0</li> <li>&lt;1</li> <li>36</li> <li>74</li> <li>793</li> <li>601</li> <li>2363</li> <li>&lt;1</li> </ul> </li> <li>history2</li> <ul> <li>14</li> <li>2</li> <ul> <li>&lt;1</li> </ul> <ul> <li>history2</li> <ul> <li>history2</li> </ul> </ul></ul>
Particles >14μm         ASTM D7647         >160         62         62         57           Particles >21μm         ASTM D7647         >40         6         17         13           Particles >38μm         ASTM D7647         >10         1         1         1           Particles >37µm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         21/19/13         21/19/13         20/17/13	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base >15 >20 limit/base >5000	<1         <1         0         0         <1         43         55         6         239         <1         current         0         <1         0         current         0         <1         0         <1         0         <18641	history1         0         0         0         0         0         44         65         8         313         <1	history2 <1 0 <1 36 74 793 601 2363 <1 history2 14 2 <1 history2 ∧ 5668
Particles >21μm         ASTM D7647         >40         6         17         13           Particles >38μm         ASTM D7647         >10         1         1         1           Particles >37μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         ▲ 21/19/13         ▲ 21/19/13         ▲ 20/17/13	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >6µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base >15 >20 limit/base >5000 >1300	<1         <1         0         0         <1         43         55         6         239         <1         0         current         0         <1         0         current         0         current         18641         3837	history1         0         0         0         0         0         44         65         8         313         <1         history1         0         0         0         0         0         0         0         0         1         history1         history1         2         19557         2657	history2 <ul> <li>&lt;1</li> <li>&lt;1</li> <li>0</li> <li>&lt;1</li> <li>36</li> <li>74</li> <li>793</li> <li>601</li> <li>2363</li> <li>&lt;1</li> </ul> History2 <ul> <li>14</li> <li>2</li> <li>&lt;1</li> <li>history2</li> <li>668</li> <li>1055</li> </ul>
Particles >38μm         ASTM D7647         >10         1         1         1           Particles >71μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         21/19/13         21/19/13         20/17/13	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >6µm Particles >14µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base >15 >20 limit/base >5000 >1300 >160	<1         <1         0         0         <1         43         55         6         239         <1         0         current         0         <11         0         current         62	history1         0         0         0         0         0         44         65         8         313         <1         history1         0         0         0         0         0         0         0         19557         62	history2 <ul> <li>&lt;1</li> <li>&lt;1</li> <li>0</li> <li>&lt;1</li> <li>36</li> <li>74</li> <li>793</li> <li>601</li> <li>2363</li> <li>&lt;1</li> </ul> 14 <ul> <li>2</li> <li>&lt;1</li> <li>history2</li> <li>history2</li> <li>&lt;1</li> <li>5668</li> <li>1055</li> <li>57</li> </ul>
Particles >71μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         ▲ 21/19/13         ▲ 21/19/13         ▲ 20/17/13	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >14µm Particles >21µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)           ASTM D7647           ASTM D7647           ASTM D7647	limit/base limit/base >15 >20 limit/base >5000 >1300 >160 >40	<1         <1         0         0         <1         43         55         6         239         <1         0         <10         0         <10         0         <11         0         <11         0         <11         0         <11         0         <1239         <13837         62         6	history1         0         0         0         0         44         65         8         313         <1         history1         0         0         0         0         0         0         0         19557         62         17	history2 <1 0 <1 36 74 793 601 €2363 <1 Nistory2 14 2 <1 14 2 <1 history2 0 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 2 <1 14 14 2 <1 14 14 2 <1 14 14 14 14 14 14 14 14 14 1
Oil Cleanliness ISO 4406 (c) >19/17/14 🔺 21/19/13 🔺 21/19/13 🔺 20/17/13	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >6µm Particles >14µm Particles >21µm Particles >38µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)           ASTM D7647           ASTM D7647           ASTM D7647           ASTM D7647           ASTM D7647           ASTM D7647	limit/base >15 >20 limit/base >5000 >1300 >160 >40 >10	<1         <1         0         0         <1         43         55         6         239         <1         0         <1         0         <1         0         <1         0         <1         0         <11         0         <11         0         <239         <10         0         <11         0         <18641         3837         62         6         1	history1         0         0         0         0         0         44         65         8         313         <1         history1         0         0         0         0         0         1         history1         ▲         19557         ▲         62         17         1	history2    <1   0   <1   36   74   793   601   2363   <1   history2   14   2   14   2   <1   history2   14   2   <1   5668   1055   57   13   1
	ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >6µm Particles >14µm Particles >21µm Particles >38µm Particles >71µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)           ASTM D7647           ASTM D7647           ASTM D7647           ASTM D7647	limit/base >15 >20 limit/base >5000 >1300 >160 >40 >10 >3	<1         <1         0         <1         43         55         6         239         <1         0         <10         0         <10         0         <10         0         <11         0         <11         0         <11         0         <11         0         <11         0         <18641         3837         62         6         1         0	history1         0         0         0         0         0         44         65         8         313         <1         bistory1         0         0         0         0         1         1         bistory1         1         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         19557         62         17         1         0	history2 <ul> <li>&lt;1</li> <li>&lt;1</li> <li>0</li> <li>&lt;1</li> <li>36</li> <li>74</li> <li>793</li> <li>601</li> <li>2363</li> <li>&lt;1</li> </ul> history2 <ul> <li>14</li> <li>2</li> <li>&lt;1</li> <li>bistory2</li> </ul> 14 <ul> <li>5668</li> <li>1055</li> <li>57</li> <li>13</li> <li>1</li> <li>0</li> </ul>



## **OIL ANALYSIS REPORT**







FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*		0.10	0.10	0.93
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Precipitate	scalar	Visual*	NONE	NONE	NONE	NONE
Silt	scalar	Visual*	NONE	NONE	NONE	NONE
Debris	scalar	Visual*	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	NONE	NONE	NONE
Appearance	scalar	Visual*	NORML	NORML	NORML	NORML
Odor	scalar	Visual*	NORML	NORML	NORML	NORML
Emulsified Water	scalar	Visual*	>0.05	NEG	NEG	NEG
Free Water	scalar	Visual*		NEG	NEG	NEG
FI UID PROPERTIES		method	limit/base	current	historv1	historv2
	cSt	ASTM D7279(m)	68	66.2	66.0	64.3
	COL	AOTIN DI LI S(III)	00	00.2	00.0	04.0
SAMPLE IMAGES		method	limit/base	current	history1	history2





Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab. Validity of results and interpretation are based on the sample and information as supplied.



Color

CALA

ISO 17025:2017 Accredited Laboratory

F: (613)354-9377 Submitted By: ?