

# **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id CATERPILLAR 299D SKIDSTEER 040-0019 (S/N CAT0299DAFD204356) Component Diesel Engine Fluid SCHAEFFER SUPREME 7000 (3 GAL)

### 



### DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. ( Customer Sample Comment: Engine oil sample @ 12216 hours )

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

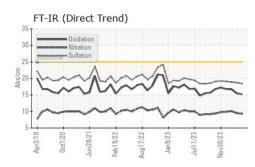
#### Fluid Condition

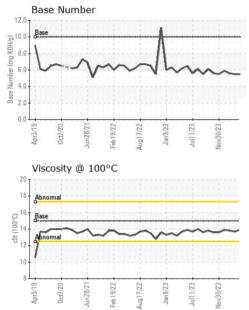
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

Sample Number         Client Info         WC0868282         WC0903927         WC0903927           Sample Date         Client Info         12 Jun 2024         Of May 2024         12 Mar 2024           Machine Age         hrs         Client Info         11951         11644         0           Oil Age         hrs         Client Info         11951         11644         0           Oil Changed         Client Info         Changed	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         12216         11951         11644           Oil Age         hrs         Client Info         11951         11644         0           Oil Changed         Client Info         11951         11644         0           Oil Changed         Client Info         11951         11644         0           Sample Status         Imit/base         Current         NORMAL         NORMAL           VCOMINATION         method         Imit/base         current         History1         History2           Fuel         WC Method         >5         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Clycol         WC Method         NEG         0         <1         1164/4           Nickel         ppm         ASTM DS185m         >20         0         0         <1           Nickel         ppm         ASTM DS185m         >20         0         0         <1           Nickel         ppm         ASTM DS185m         >20         0         0         <1           Nickel         ppm         ASTM DS185m         >20         0	Sample Number		Client Info		WC0868282	WC0903927	WC0903957
Oil Age         Ins         Client Info         11951         11644         0           Oil Changed         Client Info         Changed         NEG         NEG <t< th=""><th>Sample Date</th><th></th><th>Client Info</th><th></th><th>12 Jun 2024</th><th>01 May 2024</th><th>12 Mar 2024</th></t<>	Sample Date		Client Info		12 Jun 2024	01 May 2024	12 Mar 2024
Oil Changed Sample Status         Client Info         Changed NORMAL         Changed NORMAL         Changed NORMAL         Changed NORMAL           CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >5         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >20         0         0         0           Silver         ppm         ASTM D5185m         >20         0         0         0           Gopper         ppm         ASTM D5185m         >20         0         0         <1           Copper         ppm         ASTM D5185m         >30         0         <1         0           Copper         ppm         ASTM D5185m         S0         72         3         <	Machine Age	hrs	Client Info		12216	11951	11644
Sample Status         NORMAL         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         Imit/base         current         history1         history2           Fuel         WC Method         >5         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         <1         2         3           Chromium         ppm         ASTM D5185m         >2         0         0         <1           Nickel         ppm         ASTM D5185m         >2         0         0         <1           Numinum         ppm         ASTM D5185m         >2         0         0         <1           Aluminum         ppm         ASTM D5185m         >30         <1         0         <1           Cadadium         ppm         ASTM D5185m         >30         <1         0         <1           Vanadium         <	Oil Age	hrs	Client Info		11951	11644	0
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >2         0         0         <1           Nickel         ppm         ASTM D5185m         >2         0         0         <1           Lead         ppm         ASTM D5185m         >30         <1         0         <1           Lead         ppm         ASTM D5185m         >15         0         0         0           Cadmium         ppm         ASTM D5185m         63         60         75           Baron         ppm         ASTM D5185m         0         0         0           Manganees         ppm </th <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>Changed</th> <th>Changed</th> <th>Changed</th>	Oil Changed		Client Info		Changed	Changed	Changed
Fuel         WC Method         >5         <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5165m         >20         0         0         <1           Nickel         ppm         ASTM D5165m         >2         0         0         0           Silver         ppm         ASTM D5165m         >2         0         0         0           Silver         ppm         ASTM D5165m         >2         0         0         0           Copper         ppm         ASTM D5165m         >25         3         2         2           Lead         ppm         ASTM D5165m         >25         0         0         0           Copper         ppm         ASTM D5165m         >20         0         0         0           Vanadium         ppm         ASTM D5165m         >15         0         0         0           Copper         ppm         ASTM D5165m         0         0         0         1      <	CONTAMINATION	٧	method	limit/base	current	history1	history2
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >2         0         0         <1           Nickel         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Autminum         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >15         0         0         0           Vanadium         ppm         ASTM D5185m         15         0         0         0           Vanadium         ppm         ASTM D5185m         50         72         73         71           Molybdenum         ppm         ASTM D5185m         100         0         0         11         14           Calcium         ppm         ASTM D5185m         100         22         11         14	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         <1         2         3           Chromium         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >2         0         0         <1           Titanium         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Lead         ppm         ASTM D5185m         >2         0         0         <1         0           Copper         ppm         ASTM D5185m         >15         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0         0           ASTM D5185m         0         0         0         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         72         73         71           Marease         ppm         ASTM D5185m	Water		WC Method	>0.2	NEG	NEG	NEG
Iron         ppm         ASTM D5185m         >100         <1	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         0         0         <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >2         0         0         <1	Iron	ppm	ASTM D5185m	>100	<1	2	3
Titanium         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >25         3         2         2           Lead         ppm         ASTM D5185m         >30         <1         0         <1           Copper         ppm         ASTM D5185m         >330         <1         0         <1           Tin         ppm         ASTM D5185m         >15         0         0         0           Vanadium         ppm         ASTM D5185m         >15         0         0         0           Cadmium         ppm         ASTM D5185m          0         0         0           ADDTIVES         method         Imit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0           Molydeenum         ppm         ASTM D5185m         1000         22         11         14           Calcium         ppm         ASTM D5185m         1400         2175         2302	Chromium	ppm	ASTM D5185m	>20	0	0	<1
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >25         3         2         2           Lead         ppm         ASTM D5185m         >30         <1         0         <1           Copper         ppm         ASTM D5185m         >15         0         0         <1           Tin         ppm         ASTM D5185m         >15         0         0         0           Cadmium         ppm         ASTM D5185m         >15         0         0         0           Cadmium         ppm         ASTM D5185m          63         60         75           Baron         ppm         ASTM D5185m         50         72         73         71           Manganese         ppm         ASTM D5185m         1000         22         11         14           Calcium         ppm         ASTM D5185m         1000         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         25         4	Nickel	ppm	ASTM D5185m	>2	0	0	<1
Aluminum         ppm         ASTM D5185m         >25         3         2         2           Lead         ppm         ASTM D5185m         >40         0         <1         0           Copper         ppm         ASTM D5185m         >330         <1         0         <1           Tin         ppm         ASTM D5185m         >15         0         0         0           Cadmium         ppm         ASTM D5185m         <1         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         63         60         75           Barium         ppm         ASTM D5185m         0         0         <1         0           Molybdenum         ppm         ASTM D5185m         1000         22         11         14           Calcium         ppm         ASTM D5185m         1000         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         1000         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         1000         111         14 <th>Titanium</th> <th>ppm</th> <th>ASTM D5185m</th> <th>&gt;2</th> <th>0</th> <th>0</th> <th>0</th>	Titanium	ppm	ASTM D5185m	>2	0	0	0
Lead         ppm         ASTM D5185m         >40         0         <1	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >330         <1	Aluminum	ppm	ASTM D5185m	>25	3	2	2
Tin         ppm         ASTM D5185m<>15         0         0         0           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         63         60         75           Barium         ppm         ASTM D5185m         50         72         73         71           Manganese         ppm         ASTM D5185m         100         22         11         14           Calcium         ppm         ASTM D5185m         1000         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         1000         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         985         1019         1046         1100           Zinc         ppm         ASTM D5185m         >20         5713         6179         5346	Lead	ppm	ASTM D5185m	>40	0	<1	0
Vanadium         ppm         ASTM D5185m         <1	Copper	ppm	ASTM D5185m	>330	<1	0	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         63         60         75           Barium         ppm         ASTM D5185m         0         0         0         <10	Tin	ppm	ASTM D5185m	>15	0	0	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         63         60         75           Barium         ppm         ASTM D5185m         0         0         <1           Molybdenum         ppm         ASTM D5185m         50         72         73         71           Manganese         ppm         ASTM D5185m         1000         22         11         14           Calcium         ppm         ASTM D5185m         1400         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         1000         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         985         1019         1046         1100           Zinc         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         3	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron         ppm         ASTM D5185m         63         60         75           Barium         ppm         ASTM D5185m         0         0         <1           Molybdenum         ppm         ASTM D5185m         50         72         73         71           Manganese         ppm         ASTM D5185m         1000         22         11         14           Calcium         ppm         ASTM D5185m         1000         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         1400         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         20         57         4         3         4           Sodium         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         3         0         1           INFRA-RED         method         limit/base         current	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         <1							
Molybdenum         ppm         ASTM D5185m         50         72         73         71           Manganese         ppm         ASTM D5185m          <1         0         0           Magnesium         ppm         ASTM D5185m         1000         22         11         14           Calcium         ppm         ASTM D5185m         1400         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         985         1019         1046         1100           Zinc         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         1060         5713         6179         5346           CONTAMINANTS         method         imit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         3         0         1           Potassium         ppm         ASTM D5185m         >20         3         0.1         0.1           Nitration         Abs/cm         'ASTM D7644	ADDITIVES		method	limit/base	current	history1	history2
Manganese         ppm         ASTM D5185m         <		ppm		limit/base			
Magnesium         ppm         ASTM D5185m         1000         22         11         14           Calcium         ppm         ASTM D5185m         1400         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         985         1019         1046         1100           Zinc         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         1060         5713         6179         5346           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         3         0         1           Potassium         ppm         ASTM D5185m         >20         3         0.1         0.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/.1mm         *ASTM D7415	Boron		ASTM D5185m	limit/base	63	60	75
Calcium         ppm         ASTM D5185m         1400         2175         2302         2163           Phosphorus         ppm         ASTM D5185m         985         1019         1046         1100           Zinc         ppm         ASTM D5185m         985         1019         1046         1100           Zinc         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         4000         5713         6179         5346           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         3         0         1           Potassium         ppm         ASTM D7844         >3         0.1         0.1         0.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/.tmm<*ASTM D7415         >30 <th>Boron Barium</th> <th>ppm</th> <th>ASTM D5185m ASTM D5185m</th> <th></th> <th>63 0</th> <th>60 0</th> <th>75 &lt;1</th>	Boron Barium	ppm	ASTM D5185m ASTM D5185m		63 0	60 0	75 <1
Phosphorus         ppm         ASTM D5185m         985         1019         1046         1100           Zinc         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         1060         5713         6179         5346           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         3         0         1           Potassium         ppm         ASTM D5185m         >20         3         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         9.3         9.5         10.1           Sulfation         Abs/tm         *ASTM D7415	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		63 0 72	60 0 73	75 <1 71
Zinc         ppm         ASTM D5185m         1060         1181         1249         1214           Sulfur         ppm         ASTM D5185m         4000         5713         6179         5346           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         3         0         1           Potassium         ppm         ASTM D5185m         >20         3         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         9.3         9.5         10.1           Sulfation         Abs/1mm         *ASTM D7415         >30         18.4         18.7         18.9           FLUID DEGRADATION         method         limit/base	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50	63 0 72 <1	60 0 73 0	75 <1 71 0
Sulfur         ppm         ASTM D5185m         4000         5713         6179         5346           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         3         0         1           Potassium         ppm         ASTM D5185m         >20         3         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         9.3         9.5         10.1           Sulfation         Abs/tm         *ASTM D7415         >30         18.4         18.7         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/tm         *ASTM D7414	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 1000	63 0 72 <1 22	60 0 73 0 11	75 <1 71 0 14
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25434SodiumppmASTM D5185m2<11PotassiumppmASTM D5185m>20301INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.10.10.1NitrationAbs/cm*ASTM D7624>209.39.510.1SulfationAbs/imm*ASTM D7415>3018.418.718.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2515.215.516.7	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 1000 1400	63 0 72 <1 22 2175	60 0 73 0 11 2302	75 <1 71 0 14 2163
Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         20         2         <1	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	50 1000 1400 985	63 0 72 <1 22 2175 1019	60 0 73 0 11 2302 1046	75 <1 71 0 14 2163 1100
Sodium         ppm         ASTM D5185m         2         <1	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	50 1000 1400 985 1060	63 0 72 <1 22 2175 1019 1181	60 0 73 0 11 2302 1046 1249	75 <1 71 0 14 2163 1100 1214
Potassium         ppm         ASTM D5185m         >20         3         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         9.3         9.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.4         18.7         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.2         15.5         16.7	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	50 1000 1400 985 1060 4000	63 0 72 <1 22 2175 1019 1181 5713	60 0 73 0 11 2302 1046 1249 6179	75 <1 71 0 14 2163 1100 1214 5346
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         9.3         9.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.4         18.7         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.2         15.5         16.7	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 1000 1400 985 1060 4000	63 0 72 <1 22 2175 1019 1181 5713 current	60 0 73 0 11 2302 1046 1249 6179 history1	75 <1 71 0 14 2163 1100 1214 5346 history2
Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         9.3         9.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.4         18.7         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.2         15.5         16.7	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b>	50 1000 1400 985 1060 4000	63 0 72 <1 22 2175 1019 1181 5713 current 4	60 0 73 0 11 2302 1046 1249 6179 history1 3	75 <1 71 0 14 2163 1100 1214 5346 history2 4
Nitration         Abs/cm         *ASTM D7624         >20         9.3         9.5         10.1           Sulfation         Abs/.tmm         *ASTM D7415         >30         18.4         18.7         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.tmm         *ASTM D7414         >25         15.2         15.5         16.7	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	50 1000 1400 985 1060 4000 limit/base >25	63 0 72 <1 22 2175 1019 1181 5713 <u>current</u> 4 2	60 0 73 0 11 2302 1046 1249 6179 history1 3 < 1	75 <1 71 0 14 2163 1100 1214 5346 <b>history2</b> 4 1
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.4         18.7         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.2         15.5         16.7	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	50 1000 1400 985 1060 4000 limit/base >25 >20	63 0 72 <1 22 2175 1019 1181 5713 current 4 2 3	60 0 73 0 11 2302 1046 1249 6179 history1 3 <1 0 history1	75 <1 71 0 14 2163 1100 1214 5346 history2 4 1 1 history2
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.2     15.5     16.7	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm	ASTM D5185m ASTM D5185m	50 50 1000 1400 985 1060 4000 <b>limit/base</b> >25 >20 <b>limit/base</b> >3	63 0 72 <1 22 2175 1019 1181 5713 current 4 2 3 3	60 0 73 0 11 2302 1046 1249 6179 history1 3 <1 0 history1 0.1	75 <1 71 0 14 2163 1100 1214 5346 history2 4 1 1 history2 0.1
Oxidation Abs/.1mm *ASTM D7414 >25 15.2 15.5 16.7	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm	ASTM D5185m ASTM D5185m	50 50 1000 1400 985 1060 4000 <b>limit/base</b> >25 >20 <b>limit/base</b> >3	63 0 72 <1 22 2175 1019 1181 5713 <i>current</i> 4 2 3 <i>current</i> 0.1	60 0 73 0 11 2302 1046 1249 6179 history1 3 <1 0 history1 0.1	75 <1 71 0 14 2163 1100 1214 5346 history2 4 1 1 history2 0.1
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	50 50 1400 985 1060 4000 <b>Iimit/base</b> >25 >20 <b>Iimit/base</b> >3 >20	63 0 72 <1 22 2175 1019 1181 5713 <i>current</i> 4 2 3 <i>current</i> 0.1 9.3	60 0 73 0 11 2302 1046 1249 6179 history1 3 < 1249 6179 history1 0 0 history1 0.1 9.5	75 <1 71 0 14 2163 1100 1214 5346 history2 4 1 1 history2 0.1 10.1
Base Number (BN)         mg KOH/g         ASTM D2896         10         5.5         5.6	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	50 50 1000 1400 985 1060 4000 <b>imit/base</b> >25 20 <b>imit/base</b> >3 >20 >3	63 0 72 <1 22 2175 1019 1181 5713 <u>current</u> 4 2 3 <u>current</u> 0.1 9.3 18.4	60 0 73 0 11 2302 1046 1249 6179 history1 3 <100 history1 0.1 9.5 18.7	75 <1 71 0 14 2163 1100 1214 5346 history2 4 1 1 history2 0.1 10.1 18.9
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	50 50 1400 985 1060 4000 <b>imit/base</b> >25 20 <b>imit/base</b> >3 >20 >30	63 0 72 <1 22 2175 1019 1181 5713 Current 4 2 3 Current 0.1 9.3 18.4 Current	60 0 73 0 11 2302 1046 1249 6179 history1 3 c1 0 history1 0.1 9.5 18.7 history1	75 <1 71 0 14 2163 1100 1214 5346 history2 4 1 1 history2 0.1 10.1 18.9 history2



## **OIL ANALYSIS REPORT**



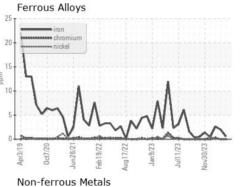


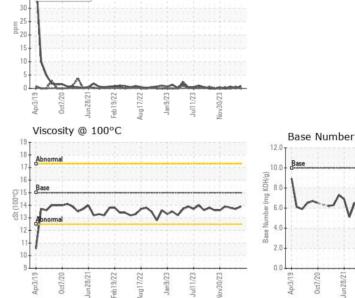
Jan 9/23

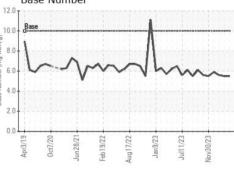
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15	13.9	13.7	13.8
GRAPHS						

45

40 35







Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 SHIMMICK CONSTRUCTION Sample No. : WC0868282 Received : 17 Jun 2024 5535 TRAILHEAD DRIVE Lab Number : 06211389 Tested : 19 Jun 2024 CHATTANOOGA, TN Unique Number : 11084253 Diagnosed : 19 Jun 2024 - Don Baldridge US 37415 Test Package : CONST (Additional Tests: TBN) Contact: DANIEL LISELLA Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. daniel.lisella@shimmick.com \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F:

Report Id: AECCHATN [WUSCAR] 06211389 (Generated: 06/22/2024 03:06:19) Rev: 1

Submitted By: TECH TECHNICIAN

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