

# **OIL ANALYSIS REPORT**

# **JOHN F SECREST** [JOHN F SECREST] 003 565425-3

**Starboard Main Engine** 

**CHEVRON DELO 710 LS (250 GAL)** 

Sample Rating Trend



### DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

### Contamination

Light fuel dilution occurring.

### Fluid Condition

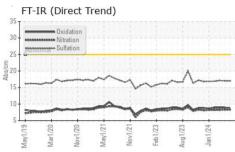
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The condition of the oil is suitable for further service.

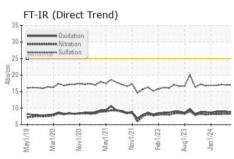
Sample Number         Client Info         MW0068750         MW0065923         MW0065912         01 May 2024         01 Apr 2024         2024         02 Apr 2024	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         13813         13093         12350           Oil Age         hrs         Client Info         0         13093         12350           Oil Changed         Client Info         N/A         N/A         N/A         Not Changed           Sample Status         Client Info         N/A         N/A         N/A         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM DS185m         >75         12         20         14           Chromium         ppm         ASTM DS185m         >2         0         1         0           Nickel         ppm         ASTM DS185m         >2         0         0         0         0           Aluminum         ppm         ASTM DS185m         >18         4         8	Sample Number		Client Info		MW0068750	MW0065923	MW0065916
Oil Age         hrs         Client Info         NA         13093         12350           Oil Changed Sample Status         Client Info         N/A         N/A         N/A         Not Changd           Sample Status         Client Info         N/A         N/A         N/A         Not Changd           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         O.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         75         12         20         14           Chromium         ppm         ASTM D5185m         >8         2         4         2           Nickel         ppm         ASTM D5185m         >8         2         4         2           Silver         ppm         ASTM D5185m         >15         1         4         1           Lead         ppm         ASTM D5185m         >15         1         4         1           Copper         ppm         ASTM D5185m         80         13         24         1 <th>Sample Date</th> <th></th> <th>Client Info</th> <th></th> <th>01 May 2024</th> <th>01 Apr 2024</th> <th>01 Mar 2024</th>	Sample Date		Client Info		01 May 2024	01 Apr 2024	01 Mar 2024
Oil Changed Sample Status         Client Info         N/A         N/A         Not Changed ABNORMAL         NoRMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG         NEG           Glycol         WC Method         Image: Neg         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >75         12         20         14           Chromium         ppm         ASTM D5185m         >22         0         1         0           Chromium         ppm         ASTM D5185m         >22         0         1         0           Chromium         ppm         ASTM D5185m         >22         0         1         0           Silver         ppm         ASTM D5185m         >15         1         4         1           Lead         ppm         ASTM D5185m         >15         1         4         1         4           Copper         ppm	Machine Age	hrs	Client Info		13813	13093	12350
Sample Status	Oil Age	hrs	Client Info		0	13093	12350
CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >75         12         20         14           Chromium         ppm         ASTM D5185m         >2         0         1         0           Nickel         ppm         ASTM D5185m         >2         0         1         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         1         4         1           Lead         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         >18         4         8         5           Copper	Oil Changed		Client Info		N/A	N/A	Not Changd
CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >75         12         20         14           Chromium         ppm         ASTM D5185m         >8         2         4         2           Nickel         ppm         ASTM D5185m         >2         0         1         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         1         4         1           Lead         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         >14         7         11         6           Vanadium <th>Sample Status</th> <th></th> <th></th> <th></th> <th>ABNORMAL</th> <th>NORMAL</th> <th>NORMAL</th>	Sample Status				ABNORMAL	NORMAL	NORMAL
Water Glycol         WC Method Polycol         >0.1         NEG NEG         NEG NEG         NEG           WEAR METALS         method         limit/bass         current         history1         history2           Iron         ppm         ASTM D5185m         >75         12         20         14           Chromium         ppm         ASTM D5185m         >8         2         4         2           Nickel         ppm         ASTM D5185m         >2         0         1         0           Sliver         ppm         ASTM D5185m         >2         0         1         0           Sliver         ppm         ASTM D5185m         >2         0         0         0           Sliver         ppm         ASTM D5185m         >15         1         4         1           Lead         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         0         13         24         14         14           Tin         ppm         ASTM D5185m         0 <t< th=""><th>CONTAMINATION</th><th>V</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	CONTAMINATION	V	method	limit/base	current	history1	history2
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >75         12         20         14           Chromium         ppm         ASTM D5185m         >8         2         4         2           Nickel         ppm         ASTM D5185m         >3         0         <1	Water		WC Method	>0.1	NEG	NEG	NEG
Iron							
Iron	WEAR METALS		method	limit/base	current	history1	history2
Chromium	Iron	nnm	ΔSTM D5185m	<b>\</b> 75	12		
Nickel         ppm         ASTM D5185m         >2         0         1         0           Titanium         ppm         ASTM D5185m         >3         0         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         1         4         1           Lead         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         >80         13         24         14           Tin         ppm         ASTM D5185m         >80         13         24         14           Tin         ppm         ASTM D5185m         80         13         24         14           Tin         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         <1         0           ADDTTVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         <1         <1         <1         0           Molybde	-						
Titanium         ppm         ASTM D5185m         >3         0         <1							
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         1         4         1           Lead         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         >80         13         24         14           Tin         ppm         ASTM D5185m         >14         7         11         6           Vanadium         ppm         ASTM D5185m         0         -1         0           Cadmium         ppm         ASTM D5185m         0         1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         49         62         38           Barium         ppm         ASTM D5185m         41         -1         -1         0           Molybdenum         ppm         ASTM D5185m         47         67         46		• • • • • • • • • • • • • • • • • • • •			-		
Aluminum         ppm         ASTM D5185m         >15         1         4         1           Lead         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         >80         13         24         14           Tin         ppm         ASTM D5185m         >14         7         11         6           Vanadium         ppm         ASTM D5185m         0         -1         0           Cadmium         ppm         ASTM D5185m         0         1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         49         62         38           Barium         ppm         ASTM D5185m         <1         <1         0           Molybdenum         ppm         ASTM D5185m         47         67         46           Magnesium         ppm         ASTM D5185m         17         20         17           Calcium         ppm         ASTM D5185m         17         20         17           Calcium         ppm         ASTM D5185m         11							
Lead         ppm         ASTM D5185m         >18         4         8         5           Copper         ppm         ASTM D5185m         >80         13         24         14           Tin         ppm         ASTM D5185m         >14         7         11         6           Vanadium         ppm         ASTM D5185m         0         <1					-		
Copper         ppm         ASTM D5185m         >80         13         24         14           Tin         ppm         ASTM D5185m         >14         7         11         6           Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         49         62         38           Barium         ppm         ASTM D5185m         47         67         46           Manganese         ppm         ASTM D5185m         2         3         1           Magnesium         ppm         ASTM D5185m         17         20         17           Calcium         ppm         ASTM D5185m         3636         4914         3675           Phosphorus         ppm         ASTM D5185m         11         17         5           Sulfur         ppm         ASTM D5185m         2813         3488         2600           CONTAMINANTS         method         limit/base         current         hist							
Tin         ppm         ASTM D5185m         >14         7         11         6           Vanadium         ppm         ASTM D5185m         0         <1		• • • • • • • • • • • • • • • • • • • •			-		
Vanadium         ppm         ASTM D5185m         0         <1					_		
Cadmium         ppm         ASTM D5185m         0         1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         49         62         38           Barium         ppm         ASTM D5185m         -1         <1		• • • • • • • • • • • • • • • • • • • •		>1 <del>1</del>			
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         49         62         38           Barium         ppm         ASTM D5185m         <1         <1         0           Molybdenum         ppm         ASTM D5185m         47         67         46           Manganese         ppm         ASTM D5185m         2         3         1           Magnesium         ppm         ASTM D5185m         17         20         17           Calcium         ppm         ASTM D5185m         3636         4914         3675           Phosphorus         ppm         ASTM D5185m         11         21         9           Zinc         ppm         ASTM D5185m         11         17         5           Sulfur         ppm         ASTM D5185m         2813         3488         2600           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         4         7         4           Sodium         ppm         ASTM D5185m         >20         0	7 311 10131101111				-		
Boron         ppm         ASTM D5185m         49         62         38           Barium         ppm         ASTM D5185m         <1	Oddiniani	ррпп	AOTIVI DOTOOIII		Ū	1	· ·
Barium         ppm         ASTM D5185m         <1	A D D I TIVEO		and a Albandal	Discould find a second		for the description of	Indiana and O
Molybdenum         ppm         ASTM D5185m         47         67         46           Manganese         ppm         ASTM D5185m         2         3         1           Magnesium         ppm         ASTM D5185m         17         20         17           Calcium         ppm         ASTM D5185m         3636         4914         3675           Phosphorus         ppm         ASTM D5185m         11         21         9           Zinc         ppm         ASTM D5185m         11         17         5           Sulfur         ppm         ASTM D5185m         2813         3488         2600           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         4         7         4           Sodium         ppm         ASTM D5185m         >75         2         3         1           Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D5185m         >20         0         3         0           INFRA-RED         method         limit/base				limit/base			
Manganese         ppm         ASTM D5185m         2         3         1           Magnesium         ppm         ASTM D5185m         17         20         17           Calcium         ppm         ASTM D5185m         3636         4914         3675           Phosphorus         ppm         ASTM D5185m         11         21         9           Zinc         ppm         ASTM D5185m         11         17         5           Sulfur         ppm         ASTM D5185m         2813         3488         2600           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         4         7         4           Sodium         ppm         ASTM D5185m         >75         2         3         1           Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D5185m         >20         0         3         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         % </th <th>Boron</th> <th>• • • • • • • • • • • • • • • • • • • •</th> <th>ASTM D5185m</th> <th>limit/base</th> <th>49</th> <th>62</th> <th>38</th>	Boron	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m	limit/base	49	62	38
Magnesium         ppm         ASTM D5185m         17         20         17           Calcium         ppm         ASTM D5185m         3636         4914         3675           Phosphorus         ppm         ASTM D5185m         11         21         9           Zinc         ppm         ASTM D5185m         11         17         5           Sulfur         ppm         ASTM D5185m         2813         3488         2600           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         4         7         4           Sodium         ppm         ASTM D5185m         >75         2         3         1           Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D3524         >4.0         2.7         <1.0         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.3         8.3         8.2           Sulfation	Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	49 <1	62 <1	38
Calcium         ppm         ASTM D5185m         3636         4914         3675           Phosphorus         ppm         ASTM D5185m         11         21         9           Zinc         ppm         ASTM D5185m         11         17         5           Sulfur         ppm         ASTM D5185m         2813         3488         2600           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         4         7         4           Sodium         ppm         ASTM D5185m         >75         2         3         1           Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D5185m         >20         0         3         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.5           Nitration         Abs/.1mm         *ASTM D7415         >30         17.0         17.0         17.1     <	Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	49 <1 47	62 <1 67	38 0 46
Phosphorus         ppm         ASTM D5185m         11         21         9           Zinc         ppm         ASTM D5185m         11         17         5           Sulfur         ppm         ASTM D5185m         2813         3488         2600           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         4         7         4           Sodium         ppm         ASTM D5185m         >75         2         3         1           Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D5185m         >20         0         3         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.5           Nitration         Abs/:nm         *ASTM D7415         >30         17.0         17.0         17.1           FLUID DEGRADATION         method         limit/base         current         history1         history2<	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	49 <1 47 2	62 <1 67 3	38 0 46 1
Zinc         ppm         ASTM D5185m         11         17         5           Sulfur         ppm         ASTM D5185m         2813         3488         2600           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         4         7         4           Sodium         ppm         ASTM D5185m         >75         2         3         1           Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D5185m         >20         0         3         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.5           Nitration         Abs/:nm         *ASTM D7415         >30         17.0         17.0         17.1           FLUID DEGRADATION         method         limit/base         current         history1 <th>Boron Barium Molybdenum Manganese Magnesium</th> <th>ppm ppm ppm</th> <th>ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m</th> <th>limit/base</th> <th>49 &lt;1 47 2 17</th> <th>62 &lt;1 67 3 20</th> <th>38 0 46 1 17</th>	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	49 <1 47 2 17	62 <1 67 3 20	38 0 46 1 17
Sulfur         ppm         ASTM D5185m         2813         3488         2600           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         4         7         4           Sodium         ppm         ASTM D5185m         >75         2         3         1           Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D3524         >4.0         ▲ 2.7         <1.0         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.3         8.3         8.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.0         17.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25 <th>Boron Barium Molybdenum Manganese Magnesium Calcium</th> <th>ppm ppm ppm ppm</th> <th>ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m</th> <th>limit/base</th> <th>49 &lt;1 47 2 17 3636</th> <th>62 &lt;1 67 3 20 4914</th> <th>38 0 46 1 17 3675</th>	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	49 <1 47 2 17 3636	62 <1 67 3 20 4914	38 0 46 1 17 3675
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         4         7         4           Sodium         ppm         ASTM D5185m         >75         2         3         1           Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D3524         >4.0         2.7         <1.0	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 ASTM D5185m	limit/base	49 <1 47 2 17 3636 11	62 <1 67 3 20 4914 21	38 0 46 1 17 3675 9
Silicon       ppm       ASTM D5185m       >20       4       7       4         Sodium       ppm       ASTM D5185m       >75       2       3       1         Potassium       ppm       ASTM D5185m       >20       0       3       0         Fuel       %       ASTM D3524       >4.0       2.7       <1.0	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 ASTM D5185m	limit/base	49 <1 47 2 17 3636 11	62 <1 67 3 20 4914 21	38 0 46 1 17 3675 9
Sodium         ppm         ASTM D5185m         >75         2         3         1           Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D3524         >4.0         ≥2.7         <1.0         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.3         8.3         8.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.0         17.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         8.8         8.9         8.9	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 ASTM D5185m	limit/base	49 <1 47 2 17 3636 11	62 <1 67 3 20 4914 21	38 0 46 1 17 3675 9
Potassium         ppm         ASTM D5185m         >20         0         3         0           Fuel         %         ASTM D3524         >4.0         ▲ 2.7         <1.0	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 ASTM D5185m		49 <1 47 2 17 3636 11 11 2813	62 <1 67 3 20 4914 21 17 3488	38 0 46 1 17 3675 9 5 2600
Fuel         %         ASTM D3524         >4.0         ▲ 2.7         <1.0	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 ASTM D5185m	limit/base	49 <1 47 2 17 3636 11 11 2813  current	62 <1 67 3 20 4914 21 17 3488 history1	38 0 46 1 17 3675 9 5 2600 history2
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.3         8.3         8.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.0         17.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         8.8         8.9         8.9	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20	49 <1 47 2 17 3636 11 11 2813 current 4	62 <1 67 3 20 4914 21 17 3488 history1	38 0 46 1 17 3675 9 5 2600 history2
Soot %         %         *ASTM D7844         >3         0.5         0.5         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.3         8.3         8.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.0         17.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         8.8         8.9         8.9	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >75	49 <1 47 2 17 3636 11 11 2813 current 4	62 <1 67 3 20 4914 21 17 3488 history1 7	38 0 46 1 17 3675 9 5 2600 history2 4
Nitration         Abs/cm         *ASTM D7624         >20         8.3         8.3         8.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.0         17.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         8.8         8.9         8.9	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >75 >20	49 <1 47 2 17 3636 11 11 2813 current 4 2 0	62 <1 67 3 20 4914 21 17 3488 history1 7 3 3 3	38 0 46 1 17 3675 9 5 2600 history2 4 1
Nitration         Abs/cm         *ASTM D7624         >20         8.3         8.3         8.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.0         17.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         8.8         8.9         8.9	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >75 >20 >4.0	49 <1 47 2 17 3636 11 11 2813 current 4 2 0 2.7	62 <1 67 3 20 4914 21 17 3488 history1 7 3 3 <1.0	38 0 46 1 17 3675 9 5 2600 history2 4 1 0 <1.0
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.0         17.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         8.8         8.9         8.9	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	49 <1 47 2 17 3636 11 11 2813	62 <1 67 3 20 4914 21 17 3488 history1 7 3 3 <1.0 history1	38 0 46 1 17 3675 9 5 2600 history2 4 1 0 <1.0 history2
Oxidation         Abs/.1mm         *ASTM D7414         >25         8.8         8.9         8.9	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >75 >20 >4.0 limit/base >3	49 <1 47 2 17 3636 11 11 2813	62 <1 67 3 20 4914 21 17 3488 history1 7 3 3 <1.0 history1 0.5	38 0 46 1 17 3675 9 5 2600 history2 4 1 0 <1.0 history2 0.5
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	limit/base >20 >75 >20 >4.0 limit/base >3 >20	49 <1 47 2 17 3636 11 11 2813	62 <1 67 3 20 4914 21 17 3488 history1 7 3 3 <1.0 history1 0.5 8.3	38 0 46 1 17 3675 9 5 2600 history2 4 1 0 <1.0 history2 0.5 8.2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7624	limit/base >20 >75 >20 >4.0 limit/base >3 >20 >3	49 <1 47 2 17 3636 11 11 2813	62 <1 67 3 20 4914 21 17 3488 history1 7 3 3 <1.0 history1 0.5 8.3 17.0	38 0 46 1 17 3675 9 5 2600 history2 4 1 0 <1.0 history2 0.5 8.2 17.1
PAGE 174111POLITE 110 10 10 10 10 10 10 10 10 10 10 10 10	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D78185m ASTM D7844 *ASTM D7624 *ASTM D7624 *ASTM D7415 method	limit/base >20 >75 >20 >4.0 limit/base >3 >20 >30 limit/base	49 <1 47 2 17 3636 11 11 2813	62 <1 67 3 20 4914 21 17 3488 history1 7 3 <1.0 history1 0.5 8.3 17.0 history1	38 0 46 1 17 3675 9 5 2600 history2 4 1 0 <1.0 history2 0.5 8.2 17.1 history2

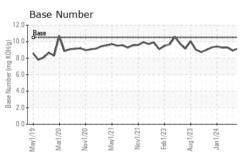


## **OIL ANALYSIS REPORT**





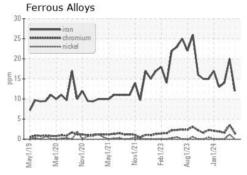


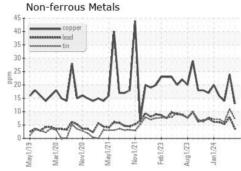


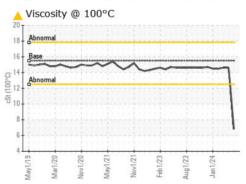
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

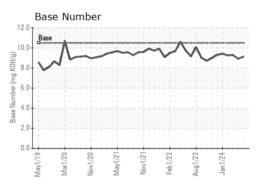
I LOID I NOI LITTILO		memou	IIIIII/Dase	Current	HISTORY	HISTORY
Visc @ 100°C	cSt	ASTM D445	15.5	<b>▲</b> 6.8	14.6	14.6

### **GRAPHS**













Certificate 12367

Laboratory Sample No.

: MW0068750 Lab Number : 06176238 Unique Number : 11022291

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 10 May 2024 **Tested** Diagnosed

: 15 May 2024 : 15 May 2024 - Wes Davis

900 S 3RD ST PADUCAH, KY Contact: ANTHONY VAN CURA

Test Package : MAR 2 ( Additional Tests: FuelDilution, PercentFuel ) To discuss this sample report, contact Customer Service at 1-800-237-1369. \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

anthony.vancura@ingrambarge.com T: (270)415-4467

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) Report Id: INGPAD [WUSCAR] 06176238 (Generated: 05/15/2024 12:07:50) Rev: 1

Contact/Location: ANTHONY VAN CURA - INGPAD

US 42003

**INGRAM BARGE** 

F: (615)695-3697