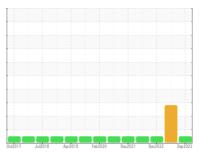


# **OIL ANALYSIS REPORT**





Sample Rating Trend



## DIAGNOSIS

### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

All component wear rates are normal.

## Contamination

Fuel content negligible. There is no indication of any contamination in the oil.

### **Fluid Condition**

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

	N SHP 15W40 (	- GAL)	0ct2017	Jul2018 Apr2019	Feb2020 Dec2021 Dec2022	Sep 2023	
Sample Date         Client Info         20 Sep 2023         15 Aug 2023         21 Dec 2022           Machine Age         hrs         Client Info         7892         7892         7192           Oil Age         hrs         Client Info         5726         6426         5767           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Image: Client Info         N/A         N/A         N/A         N/A           CONTAMINATION         method         Image: Client Info         NEG         NEG         NEG           WEAR METALS         method         Imit base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         0         <1         1           Nickel         ppm         ASTM D5185m         >20         0         <1         1           Nickel         ppm         ASTM D5185m         >2         0         <1         <1           Aluminum         ppm         ASTM D5185m         >2         0         <1         <1           Aluminum         ppm         ASTM D5185m         >2         0         <1         <1	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         7892         7892         7192           Oil Age         hrs         Client Info         5726         6426         5767           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Image: Control of the property of	Sample Number		Client Info		PCA0090497	PCA0090817	PCA0078346
Oil Age         hrs         Client Info         5726         6426         5767           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         NoRMAL         SEVERE         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         3         21         14           Chromium         ppm         ASTM D5185m         >20         0         <1	Sample Date		Client Info		20 Sep 2023	15 Aug 2023	21 Dec 2022
Oil Changed Sample Status         Client Info         N/A         N/A         N/A         N/A           CONTAMINATION         method         Imilibase         current         history1         history2           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         Imilibase         current         history1         history2           Iron         ppm         ASTM D5185m         >20         0         <1         1           Okchel         ppm         ASTM D5185m         >20         0         <1         1           Nickel         ppm         ASTM D5185m         >20         0         <1         1           Nickel         ppm         ASTM D5185m         >20         <1         <1           Silver         ppm         ASTM D5185m         >20         0         <1         <1           Lead         ppm         ASTM D5185m         >25         1         3         2           Lead         ppm         ASTM D5185m         >330         <1         34         2           Tin         ppm         ASTM D5185m         >30         <1         3         2           Capper <td>Machine Age</td> <td>hrs</td> <td>Client Info</td> <td></td> <th>7892</th> <td>7892</td> <td>7192</td>	Machine Age	hrs	Client Info		7892	7892	7192
CONTAMINATION	Oil Age	hrs	Client Info		5726	6426	5767
CONTAMINATION	Oil Changed		Client Info		N/A	N/A	N/A
WEAR METALS	Sample Status				NORMAL	SEVERE	NORMAL
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         3         21         14           Chromium         ppm         ASTM D5185m         >20         0         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         0         <1         1           Nickel         ppm         ASTM D5185m         >2         0         0         0           Titanium         ppm         ASTM D5185m         >2         0         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	3	21	14
Titanium         ppm         ASTM D5185m         >2         0         -1         -1           Silver         ppm         ASTM D5185m         >2         0         <1	Chromium	ppm	ASTM D5185m	>20	0	<1	1
Stiver         ppm         ASTM D5185m         >2         0         <1         0           Aluminum         ppm         ASTM D5185m         >25         1         3         2           Lead         ppm         ASTM D5185m         >40         0         1         3           Copper         ppm         ASTM D5185m         >330         <1         34         2           Tin         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         9         36         13           Boron         ppm         ASTM D5185m         0         0         0         0           Boron         ppm         ASTM D5185m         0         9         36         13           Barium         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         1010         873         67         1052	Nickel	ppm	ASTM D5185m	>2	0	0	0
Aluminum         ppm         ASTM D5185m         >25         1         3         2           Lead         ppm         ASTM D5185m         >40         0         1         3           Copper         ppm         ASTM D5185m         >330         <1	Titanium	ppm	ASTM D5185m	>2	0	<1	<1
Lead         ppm         ASTM D5185m         >40         0         1         3           Copper         ppm         ASTM D5185m         >330         <1         34         2           Tin         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         9         36         13           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         0         <1         <1         1           Calcium         ppm         ASTM D5185m         1010         873         67         1052           Calcium         ppm         ASTM D5185m         1150	Silver	ppm	ASTM D5185m	>2	0	<1	0
Copper         ppm         ASTM D5185m         >330         <1         34         2           Tin         ppm         ASTM D5185m         >15         0         <1	Aluminum	ppm	ASTM D5185m	>25	1	3	2
Tin         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         9         36         13           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Manganese         ppm         ASTM D5185m         0         0         -1         -1           Magnesium         ppm         ASTM D5185m         1010         873         67         1052           Calcium         ppm         ASTM D5185m         1070         1247         1987         1215           Phosphorus         ppm         ASTM D5185m         1270         1273         998         1376           Sulfur         ppm         ASTM D5185m         2060         3888 </td <td>Lead</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;40</td> <th>0</th> <td>1</td> <td>3</td>	Lead	ppm	ASTM D5185m	>40	0	1	3
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         9         36         13           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Mangaese         ppm         ASTM D5185m         01010         873         67         1052           Calcium         ppm         ASTM D5185m         1070         1247         1987         1215           Phosphorus         ppm         ASTM D5185m         1150         1021         795         1175           Zinc         ppm         ASTM D5185m         1270         1273         998         1376           Sulfur         ppm         ASTM D5185m         2060         3888         3808         3785           CONTAMINANTS         method         limit/base         current         history1	Copper	ppm	ASTM D5185m	>330	<1	34	2
Cadmium         ppm         ASTM D5185m         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         9         36         13           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         59         34         69           Manganese         ppm         ASTM D5185m         1010         873         67         1052           Calcium         ppm         ASTM D5185m         1070         1247         1987         1215           Phosphorus         ppm         ASTM D5185m         1150         1021         795         1175           Zinc         ppm         ASTM D5185m         1270         1273         998         1376           Sulfur         ppm         ASTM D5185m         2060         3888         3808         3785           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25 <td< td=""><td>Tin</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;15</td><th>0</th><td>&lt;1</td><td>&lt;1</td></td<>	Tin	ppm	ASTM D5185m	>15	0	<1	<1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         9         36         13           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 9 36 13  Barium ppm ASTM D5185m 0 0 0  Molybdenum ppm ASTM D5185m 60 59 34 69  Manganese ppm ASTM D5185m 1010 873 67 1052  Calcium ppm ASTM D5185m 1070 1247 1987 1215  Phosphorus ppm ASTM D5185m 1150 1021 795 1175  Zinc ppm ASTM D5185m 1270 1273 998 1376  Sulfur ppm ASTM D5185m 2060 3888 3808 3785  CONTAMINANTS method limit/base current history1 history2  Silicon ppm ASTM D5185m >25 4 7 17  Sodium ppm ASTM D5185m >20 3 0 0  Fuel % ASTM D5185m >20 3 0 0  Fuel % ASTM D5185m >20 5.4 5.9 7.5  Sulfation Abs/tmm *ASTM D7415 >30 17.3 17.4 20.2  FLUID DEGRADATION method limit/base current history1 history2  Nitration Abs/tmm *ASTM D7414 >25 13.1 10.0 15.7	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         59         34         69           Manganese         ppm         ASTM D5185m         0         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         59         34         69           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         873         67         1052           Calcium         ppm         ASTM D5185m         1070         1247         1987         1215           Phosphorus         ppm         ASTM D5185m         1070         1247         1987         1215           Phosphorus         ppm         ASTM D5185m         1270         1273         998         1376           Zinc         ppm         ASTM D5185m         2060         3888         3808         3785           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7         17           Sodium         ppm         ASTM D5185m         20         3         0         0           Fuel         %         ASTM D5185m         >20         3         0         0           INFRA-RED         method         limit/base	Boron	ppm	ASTM D5185m	0	9	36	13
Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         873         67         1052           Calcium         ppm         ASTM D5185m         1070         1247         1987         1215           Phosphorus         ppm         ASTM D5185m         1150         1021         795         1175           Zinc         ppm         ASTM D5185m         1270         1273         998         1376           Sulfur         ppm         ASTM D5185m         2060         3888         3808         3785           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         225         4         7         17           Sodium         ppm         ASTM D5185m         20         3         0         0           Fuel         %         ASTM D5185m         >20         3         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7624         >20         5.4 </td <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>0</th> <td>0</td> <td>0</td>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         873         67         1052           Calcium         ppm         ASTM D5185m         1070         1247         1987         1215           Phosphorus         ppm         ASTM D5185m         1150         1021         795         1175           Zinc         ppm         ASTM D5185m         1270         1273         998         1376           Sulfur         ppm         ASTM D5185m         2060         3888         3808         3785           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7         17           Sodium         ppm         ASTM D5185m         >20         3         0         0           Fuel         %         ASTM D5185m         >20         3         0         0           Fuel         %         ASTM D5185m         >20         3         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >	Molybdenum	ppm	ASTM D5185m	60	59	34	69
Calcium         ppm         ASTM D5185m         1070         1247         1987         1215           Phosphorus         ppm         ASTM D5185m         1150         1021         795         1175           Zinc         ppm         ASTM D5185m         1270         1273         998         1376           Sulfur         ppm         ASTM D5185m         2060         3888         3808         3785           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         25         4         7         17           Sodium         ppm         ASTM D5185m         20         3         0         0           Fuel         %         ASTM D5185m         >20         3         0         0           Fuel         %         ASTM D3524         >5         0.6         17.9         <1.0	Manganese	ppm	ASTM D5185m	0	0	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         1021         795         1175           Zinc         ppm         ASTM D5185m         1270         1273         998         1376           Sulfur         ppm         ASTM D5185m         2060         3888         3808         3785           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7         17           Sodium         ppm         ASTM D5185m         >20         3         0         0           Fuel         %         ASTM D5185m         >20         3         0         0           Fuel         %         ASTM D5185m         >20         3         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.1         0.4           Nitration         Abs/.mm         *ASTM D7624         >20         5.4         5.9         7.5           Sulfation         Abs/.mm         *ASTM D7415         <	Magnesium	ppm	ASTM D5185m	1010	873	67	1052
Zinc         ppm         ASTM D5185m         1270         1273         998         1376           Sulfur         ppm         ASTM D5185m         2060         3888         3808         3785           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7         17           Sodium         ppm         ASTM D5185m         2         1         <1	Calcium	ppm	ASTM D5185m	1070	1247	1987	1215
Sulfur         ppm         ASTM D5185m         2060         3888         3808         3785           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7         17           Sodium         ppm         ASTM D5185m         2         1         <1	Phosphorus	ppm	ASTM D5185m	1150	1021	795	1175
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7         17           Sodium         ppm         ASTM D5185m         2         1         <1	Zinc	ppm	ASTM D5185m	1270	1273	998	1376
Silicon         ppm         ASTM D5185m         >25         4         7         17           Sodium         ppm         ASTM D5185m         2         1         <1           Potassium         ppm         ASTM D5185m         >20         3         0         0           Fuel         %         ASTM D3524         >5         0.6         17.9         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.1         0.4           Nitration         Abs/cm         *ASTM D7624         >20         5.4         5.9         7.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         17.4         20.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.1         10.0         15.7	Sulfur	ppm	ASTM D5185m	2060	3888	3808	3785
Sodium         ppm         ASTM D5185m         2         1         <1           Potassium         ppm         ASTM D5185m         >20         3         0         0           Fuel         %         ASTM D3524         >5         0.6         17.9         <1.0	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3         0         0           Fuel         %         ASTM D3524         >5         0.6         17.9         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.1         0.4           Nitration         Abs/cm         *ASTM D7624         >20         5.4         5.9         7.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         17.4         20.2           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.1         10.0         15.7	Silicon	ppm	ASTM D5185m	>25	4	7	17
Fuel         %         ASTM D3524         >5         0.6         17.9         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.1         0.4           Nitration         Abs/cm         *ASTM D7624         >20         5.4         5.9         7.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         17.4         20.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.1         10.0         15.7	Sodium	ppm	ASTM D5185m		2	1	<1
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.1         0.4           Nitration         Abs/cm         *ASTM D7624         >20         5.4         5.9         7.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         17.4         20.2           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.1         10.0         15.7	Potassium	ppm	ASTM D5185m	>20	3	0	0
Soot %         %         *ASTM D7844 >3         0.2         0.1         0.4           Nitration         Abs/cm         *ASTM D7624 >20         5.4         5.9         7.5           Sulfation         Abs/.1mm         *ASTM D7415 >30         17.3         17.4         20.2           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         13.1         10.0         15.7	Fuel	%	ASTM D3524	>5	0.6	17.9	<1.0
Nitration         Abs/cm         *ASTM D7624         >20         5.4         5.9         7.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         17.4         20.2           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.1         10.0         15.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         17.4         20.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.1         10.0         15.7	Soot %	%	*ASTM D7844	>3	0.2	0.1	0.4
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 13.1 10.0 15.7	Nitration	Abs/cm	*ASTM D7624	>20	5.4	5.9	7.5
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.1</b> 10.0 15.7	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.3	17.4	20.2
	FLUID DEGRAD	OITAC	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         10.06         8.63         9.84	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.1	10.0	15.7
	Rasa Number (RN)	ma KOH/a	ASTM D2896	9.8	10.06	8.63	9.84



# **OIL ANALYSIS REPORT**





Certificate L2367

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

: PCA0090497

: 05958734 : 10659947

Received : 22 Sep 2023 Diagnosed

: 26 Sep 2023 Diagnostician : Wes Davis

Test Package : MOB 2 ( Additional Tests: PercentFuel ) To discuss this sample report, contact Customer Service at 1-800-237-1369.

\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

WIN Waste Innovations - Shop # - Taunton

565 WINTHROP ST TAUNTON, MA US 02780

Contact: Dave Wilson dwilson@win-waste.com

T:

F:

Report Id: WINTAU [WUSCAR] 05958734 (Generated: 09/30/2023 08:24:02) Rev: 1

Submitted By: MATT MANOLI