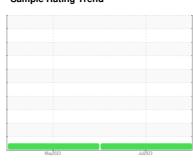


# **OIL ANALYSIS REPORT**

Sample Rating Trend







Machine Id
E-178
Component
Diesel Engine
Fluid

PHILLIPS 66 15W40 (--- GAL)

#### DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

#### Wear

All component wear rates are normal.

## Contamination

There is no indication of any contamination in the oil.

### **Fluid Condition**

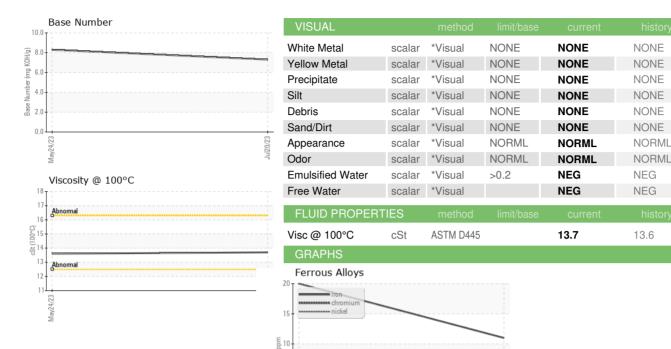
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

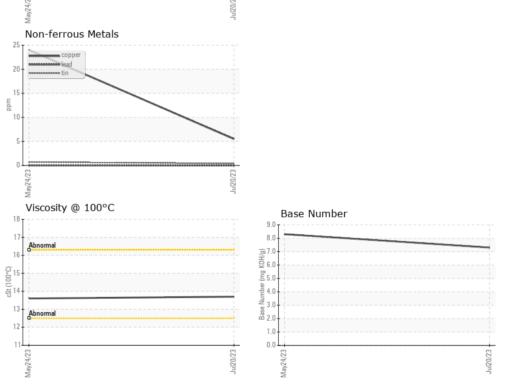
SAMPLE INFORMATION   method   limit/base   current   history1   history2   Sample Number   Client Info   20 Jul 2023   24 May 2023     Machine Age   hrs   Client Info   1382   1096     Oil Age   hrs   Client Info   299   596     Oil Changed   Client Info   Changed   Chang							
Sample Number   Client Info   WC0780326   WC0780342			,	May2023	Jul2023		
Sample Date   Client Info   20 Jul 2023   24 May 2023	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         1382         1096	Sample Number		Client Info		WC0780326	WC0780342	
Machine Age         hrs         Client Info         1382         1096			Client Info		20 Jul 2023	24 May 2023	
Oil Age         hrs         Client Info         299         596	•	hrs	Client Info		1382		
Client Info   Changed   NORMAL   NORM		hrs	Client Info		299	596	
CONTAMINATION			Client Info		Changed	Changed	
Fuel	Sample Status				NORMAL	NORMAL	
WEAR METALS         method         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         11         20	CONTAMINATION	N	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         11         20            Chromium         ppm         ASTM D5185m         20         <1	Fuel		WC Method	>5	<1.0	<1.0	
Iron	Glycol		WC Method		NEG	NEG	
Chromium	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	11	20	
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	
Titanium	Nickel		ASTM D5185m	>4	2	4	
Silver	Titanium		ASTM D5185m		2	<1	
Aluminum	Silver		ASTM D5185m	>3	0	0	
Lead	Aluminum		ASTM D5185m	>20	3	2	
Copper         ppm         ASTM D5185m         >330         6         24            Tin         ppm         ASTM D5185m         >15         <1	Lead		ASTM D5185m	>40	0	0	
Tin	Copper		ASTM D5185m	>330	6	24	
Vanadium         ppm         ASTM D5185m         <1         0            Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         62         191            Barium         ppm         ASTM D5185m         0         0            Molybdenum         ppm         ASTM D5185m         116         272            Manganese         ppm         ASTM D5185m         156         832            Magnesium         ppm         ASTM D5185m         12342         1533            Phosphorus         ppm          ASTM D5185m         1276         1103            Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         25         4         7            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m <th< td=""><td>• •</td><td></td><td>ASTM D5185m</td><td>&gt;15</td><td>&lt;1</td><td>&lt;1</td><td></td></th<>	• •		ASTM D5185m	>15	<1	<1	
Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         62         191            Barium         ppm         ASTM D5185m         0         0            Molybdenum         ppm         ASTM D5185m         116         272            Manganese         ppm         ASTM D5185m         116         272            Magnesium         ppm         ASTM D5185m         156         832            Calcium         ppm         ASTM D5185m         2342         1533            Phosphorus         ppm         ASTM D5185m         1065         906            Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Solium         ppm         ASTM D5185m         3         <1 <td>Vanadium</td> <td></td> <td>ASTM D5185m</td> <td></td> <td>&lt;1</td> <td>0</td> <td></td>	Vanadium		ASTM D5185m		<1	0	
Boron	Cadmium		ASTM D5185m		0	0	
Barium         ppm         ASTM D5185m         0         0            Molybdenum         ppm         ASTM D5185m         116         272            Manganese         ppm         ASTM D5185m         <1         <1            Magnesium         ppm         ASTM D5185m         156         832            Calcium         ppm         ASTM D5185m         2342         1533            Phosphorus         ppm         ASTM D5185m         1065         906            Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         116         272            Manganese         ppm         ASTM D5185m         <1         <1            Magnesium         ppm         ASTM D5185m         156         832            Calcium         ppm         ASTM D5185m         2342         1533            Phosphorus         ppm         ASTM D5185m         1065         906            Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         3         <1            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >3 </td <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <td>62</td> <td>191</td> <td></td>	Boron	ppm	ASTM D5185m		62	191	
Manganese         ppm         ASTM D5185m         <1         <1            Magnesium         ppm         ASTM D5185m         156         832            Calcium         ppm         ASTM D5185m         2342         1533            Phosphorus         ppm         ASTM D5185m         1065         906            Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         >20         0         2            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.3            Sulfation	Barium	ppm	ASTM D5185m		0	0	
Magnesium         ppm         ASTM D5185m         156         832            Calcium         ppm         ASTM D5185m         2342         1533            Phosphorus         ppm         ASTM D5185m         1065         906            Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         3         <1	Molybdenum	ppm	ASTM D5185m		116	272	
Magnesium         ppm         ASTM D5185m         156         832            Calcium         ppm         ASTM D5185m         2342         1533            Phosphorus         ppm         ASTM D5185m         1065         906            Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         >20         0         2            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.3            Nitration         Abs/.1mm         *ASTM D7415         >30         19.4         23.5	-		ASTM D5185m		<1	<1	
Phosphorus         ppm         ASTM D5185m         1065         906            Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         3         <1	Magnesium		ASTM D5185m		156	832	
Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         3         <1            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.3            Nitration         Abs/cm         *ASTM D7624         >20         9.2         9.1            Sulfation         Abs/.1mm         *ASTM D7415         >30         19.4         23.5            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         1	Calcium	ppm	ASTM D5185m		2342	1533	
Zinc         ppm         ASTM D5185m         1276         1103            Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         3         <1            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.3            Nitration         Abs/cm         *ASTM D7624         >20         9.2         9.1            Sulfation         Abs/.1mm         *ASTM D7415         >30         19.4         23.5            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         1	Phosphorus	ppm	ASTM D5185m		1065	906	
Sulfur         ppm         ASTM D5185m         4439         3225            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         3         <1			ASTM D5185m		1276	1103	
Silicon         ppm         ASTM D5185m         >25         4         7            Sodium         ppm         ASTM D5185m         3         <1            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.3            Nitration         Abs/cm         *ASTM D7624         >20         9.2         9.1            Sulfation         Abs/.1mm         *ASTM D7415         >30         19.4         23.5            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         18.5	Sulfur		ASTM D5185m		4439	3225	
Sodium         ppm         ASTM D5185m         3         <1            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.3            Nitration         Abs/cm         *ASTM D7624         >20         9.2         9.1            Sulfation         Abs/.1mm         *ASTM D7415         >30         19.4         23.5            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         18.5	CONTAMINANTS	;	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3            Nitration         Abs/cm         *ASTM D7624         >20         9.2         9.1            Sulfation         Abs/.1mm         *ASTM D7415         >30         19.4         23.5            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         18.5	Silicon	ppm	ASTM D5185m	>25	4	7	
INFRA-RED	Sodium	ppm	ASTM D5185m		3	<1	
Soot %         %         *ASTM D7844         >3         0.3         0.3            Nitration         Abs/cm         *ASTM D7624         >20         9.2         9.1            Sulfation         Abs/.1mm         *ASTM D7415         >30         19.4         23.5            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         18.5	Potassium	ppm	ASTM D5185m	>20	0	2	
Nitration         Abs/cm         *ASTM D7624         >20         9.2         9.1            Sulfation         Abs/.1mm         *ASTM D7415         >30         19.4         23.5            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         18.5	INFRA-RED		method	limit/base	current	history1	history2
Nitration         Abs/cm         *ASTM D7624         >20         9.2         9.1            Sulfation         Abs/.1mm         *ASTM D7615         >30         19.4         23.5            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         18.5	Soot %	%	*ASTM D7844	>3	0.3	0.3	
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.4         23.5            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         18.5			*ASTM D7624				
Oxidation							
	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.8	18.5	
	Base Number (BN)	mg KOH/g	ASTM D2896		7.3	8.3	

Contact/Location: NICK DIXON - DUKRAL



# **OIL ANALYSIS REPORT**









Laboratory Sample No. Lab Number

Unique Number

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 05905102

: WC0780326 : 10566458

Received Diagnosed

: 24 Jul 2023 : 24 Jul 2023 Diagnostician : Wes Davis

**DUKE LAZZARA** 4201 FAYETTEVILLE RD RALEIGH, NC US 27603

Contact: NICK DIXON NICK.DIXON@DUKELAZZAM.COM

Test Package : CONST ( Additional Tests: TBN ) Certificate L2367 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)

Report Id: DUKRAL [WUSCAR] 05905102 (Generated: 07/24/2023 18:27:11) Rev: 1

Contact/Location: NICK DIXON - DUKRAL

F:

T: (919)760-7797