

## **OIL ANALYSIS REPORT**

Area {UNASSIGNED} 2023 Peterbilt

**Case Drain Diesel Engine** Fluid {not provided} (--- GAL)

### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. ( Customer Sample Comment: Truck is new to our shop, has not been used at the shop it came from. Truck sat for a long time, oil change due date came up.)

#### 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         restructure         Listory         Nistory         Nistory           Sample Date         Client Info         CFL0096972             Machine Age         hrs         Client Info         25             Oil Apage         hrs         Client Info         25             Oil Apage         hrs         Client Info         Changed             CONTAMINATION         method         Imit/base         current         History1         History2           Fuel         WC Method         >5         -1.0             Water         WC Method         >0.02         NEG             WEAR METALS         method         Imit/base         current         History1         History2           Kran         ppm         ASTM 05185         >10         34             Wear         ppm         ASTM 05185         >2         1             Kine         ppm         ASTM 05185         >2         1             Kineta         ppm         ASTM 05185							
SAMPLE INFORMATION         method         linit/base         current         history1         history2           Sample Date         Client Info         12 Apr 2024             Machine Age         hrs         Client Info         25             Oil Age         hrs         Client Info         25             Oil Ohanged         rs         Client Info         25             CONTAMINATION         method         Imit/base         current         History1         History2           Fuel         WC Method         >5         <1.0             WEAR METALS         method         Imit/base         current         History1         History2           for         ppm         ASTM 05185m<>1/10         34             WEAR METALS         method         Imit/base         current         History1         History2           for         ppm         ASTM 05185m<>2         <1             Kind         ppm         ASTM 05185m         2         1             Nickel         ppm         ASTM							
SAMPLE INFORMATION         method         linit/base         current         history1         history2           Sample Date         Client Info         12 Apr 2024             Machine Age         hrs         Client Info         25             Oil Age         hrs         Client Info         25             Oil Ohanged         rs         Client Info         25             CONTAMINATION         method         Imit/base         current         History1         History2           Fuel         WC Method         >5         <1.0             WEAR METALS         method         Imit/base         current         History1         History2           for         ppm         ASTM 05185m<>1/10         34             WEAR METALS         method         Imit/base         current         History1         History2           for         ppm         ASTM 05185m<>2         <1             Kind         ppm         ASTM 05185m         2         1             Nickel         ppm         ASTM							
SAMPLE INFORMATION         method         linit/base         current         history1         history2           Sample Date         Client Info         12 Apr 2024             Machine Age         hrs         Client Info         25             Oil Age         hrs         Client Info         25             Oil Ohanged         rs         Client Info         25             CONTAMINATION         method         Imit/base         current         History1         History2           Fuel         WC Method         >5         <1.0             WEAR METALS         method         Imit/base         current         History1         History2           for         ppm         ASTM 05185m<>1/10         34             WEAR METALS         method         Imit/base         current         History1         History2           for         ppm         ASTM 05185m<>2         <1             Kind         ppm         ASTM 05185m         2         1             Nickel         ppm         ASTM							
Sample Number         Client Info         GFL0096972             Sample Date         Client Info         25             Machine Age         hrs         Client Info         25             Oil Age         Client Info         25              Oil Changed         Client Info         25              Oil Changed         Client Info         Changed              Sample Status         Imitebase         current         history1         History2           Fuel         WC Method         >0.2         NEG             Water         WC Method         >0.2         NEG             Nedel         ppm         ASTM 051555         >2         1.0             Nickel         ppm         ASTM 051555         >2         1             Silver         ppm         ASTM 051555         >2         1             Silver         ppm         ASTM 051555         >45         1					Apr2U24		
Sample Date         Client Info         12 Apr 2024             Machine Age         hrs         Client Info         25             Oil Age         hrs         Client Info         25             Sample Status         Client Info         25             CONTAMINATION         method         Imit/base         current         history1         history2           Fuel         WC Method         >5         <1.0             Glycol         WC Method         >5         <1.0             WEAR METALS         method         Imit/base         current         history1         history2           for         ppm         ASTM D5155m         >110         34             Nickel         ppm         ASTM D5155m         >2         <1             Sliver         ppm         ASTM D5155m         >2         <1             Aluminum         ppm         ASTM D5155m         >2         <1             Sliver         ppm         ASTM D5155m<	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date         Client Info         12 Apr 2024             Machine Age         hrs         Client Info         25             Oil Age         hrs         Client Info         25             Sample Status         Client Info         25             CONTAMINATION         method         Imit/base         current         history1         history2           Fuel         WC Method         >5         <1.0					GFL0096972		
Machine Age Dil AgehrsClient Info25Dil Age AgehrsClient Info25Sample StatusClient InfoNORMALSample StatusVCInit/basecurrenthistory1WaterWC Method>5<1.0							
Oil Age         hrs         Client Info         25             Sample Status         Client Info         Changed             CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0		hrs			-		
Chier Info         Changed             Sample Status         Image         Image          Image            CONTAMINATION         method         Iimit/base         current         history1         history2           Fuel         WC Method         >5         <1.0	-				-		
Sample Status         NORMAL             CONTAMINATION         method         imit/base         current         history1         history2           Fuel         WC Method         >5         <1.0	-		Client Info		Changed		
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5.         <1.0	-						
Fuel         WC Method         >5         <1.0             Water         WC Method         >0.2         NEG             Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >110         34             Nickel         ppm         ASTM D5185m         >2         2             Silver         ppm         ASTM D5185m         >2         2             Lead         ppm         ASTM D5185m         >2         1             Copper         ppm         ASTM D5185m         >4         1             Adamium         ppm         ASTM D5185m         >4         1             Cadmium         ppm         ASTM D5185m         S         14             ADDITVES         method         imit/base         current         history1         history2           Barium <td>-</td> <td></td> <td>mathad</td> <td>limit/booo</td> <td>ourropt</td> <td>history1</td> <td>history?</td>	-		mathad	limit/booo	ourropt	history1	history?
Water         WC Method         >0.2         NEG             Silycol         WC Method         Imit/base         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           tron         ppm         ASTM D5185m         >4         1             Silver         ppm         ASTM D5185m         >2         2             Aluminum         ppm         ASTM D5185m         >2         2             Aluminum         ppm         ASTM D5185m         >2         1             Aluminum         ppm         ASTM D5185m         >25         12             Aluminum         ppm         ASTM D5185m         >45         1             Aluminum         ppm         ASTM D5185m         >45         1             Aluminum         ppm         ASTM D5185m         <14						TIIStOLA	TIIStoryz
Silycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5185m         >110         34             Chromium         ppm         ASTM D5185m         >2         2             Silver         ppm         ASTM D5185m         >2         2             Aluminum         ppm         ASTM D5185m         >2         1             Aluminum         ppm         ASTM D5185m         >2         1             Copper         ppm         ASTM D5185m         >45         1             Admaium         ppm         ASTM D5185m         1              Admaium         ppm         ASTM D5185m         1              Admaium         ppm         ASTM D5185m         342              ADDITIVES         method         imit/base         current         history1							
WEAR METALS         method         limit/base         current         history1         history2           iron         ppm         ASTM D5185m         >110         34             Chromium         ppm         ASTM D5185m         >4         1             Nickel         ppm         ASTM D5185m         >2         2             Titanium         ppm         ASTM D5185m         >2             Silver         ppm         ASTM D5185m         >2             Auminum         ppm         ASTM D5185m         >25         12             Copper         ppm         ASTM D5185m         >25         14             Cadmium         ppm         ASTM D5185m         >4         1             ADDITIVES         method         limit/base         current         history1         history2           Barium         ppm         ASTM D5185m         342             Magnesium         ppm         ASTM D5185m         342				>0.2			
ron         ppm         ASTM D5185m         >110         34             Chromium         ppm         ASTM D5185m         >4         1             Nickel         ppm         ASTM D5185m         >2         2             Silver         ppm         ASTM D5185m         >2         <1	lycol		WC Method		NEG		
Chromium         ppm         ASTM D5185m         >4         1             Nickel         ppm         ASTM D5185m         >2         2             Titanium         ppm         ASTM D5185m         >2         2             Silver         ppm         ASTM D5185m         >2              Aluminum         ppm         ASTM D5185m         >2         1             Aluminum         ppm         ASTM D5185m         >2         1             cad         ppm         ASTM D5185m         >2         1             Copper         ppm         ASTM D5185m         >4         1             Cadmium         ppm         ASTM D5185m         1             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         342              Magnaese         ppm         ASTM D5185m         111	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >2         2             Titanium         ppm         ASTM D5185m         <	Iron	ppm	ASTM D5185m	>110	34		
Nickel         ppm         ASTM D5185m         >2         2             Titanium         ppm         ASTM D5185m         <	Chromium	ppm	ASTM D5185m	>4	1		
Silver         ppm         ASTM D5185m         >2         <1             Aluminum         ppm         ASTM D5185m         >25         12             Lead         ppm         ASTM D5185m         >45         1             Copper         ppm         ASTM D5185m         >45         1             Vanadium         ppm         ASTM D5185m         >4         1             Vanadium         ppm         ASTM D5185m         >4         1             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         342             Molybdenum         ppm         ASTM D5185m         1111             Maganesium         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         775             Sulfur         ppm         ASTM D5185m         30         21        <	Nickel	ppm	ASTM D5185m	>2	2		
Aluminum         ppm         ASTM D5185m         >25         12             Lead         ppm         ASTM D5185m         >45         1             Copper         ppm         ASTM D5185m         >85         14             Tin         ppm         ASTM D5185m         >4         1             Vanadium         ppm         ASTM D5185m         >4         1             Cadmium         ppm         ASTM D5185m         <1	Titanium	ppm	ASTM D5185m		<1		
Lead         ppm         ASTM D5185m         >45         1             Copper         ppm         ASTM D5185m         >85         14             Tin         ppm         ASTM D5185m         >4         1             Vanadium         ppm         ASTM D5185m         >4         1             Cadmium         ppm         ASTM D5185m         >4         1             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         342             Molybdenum         ppm         ASTM D5185m         342             Maganese         ppm         ASTM D5185m         342             Magnesium         ppm         ASTM D5185m         5             Calcium         ppm         ASTM D5185m         679             Sulfur         ppm         ASTM D5185m         2838             Sulfur	Silver	ppm	ASTM D5185m	>2	<1		
Copper         ppm         ASTM D5185m         >85         14            Tin         ppm         ASTM D5185m         >4         1             Vanadium         ppm         ASTM D5185m         <1	Aluminum	ppm	ASTM D5185m	>25	12		
Tin         ppm         ASTM D5185m         >4         1             Vanadium         ppm         ASTM D5185m         <1	Lead	ppm	ASTM D5185m	>45	1		
Vanadium         ppm         ASTM D5185m         <1            Cadmium         ppm         ASTM D5185m         1             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         342             Barium         ppm         ASTM D5185m         5             Molybdenum         ppm         ASTM D5185m         5             Manganese         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         854             Sulfur         ppm         ASTM D5185m         2838             Sulfur         ppm         ASTM D5185m         5             Solicon         ppm         ASTM D5185m         20         5             Solicon         ppm         ASTM D5185m         20         5	Copper	ppm	ASTM D5185m	>85	14		
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ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m342BariumppmASTM D5185m5MolybdenumppmASTM D5185m111ManganeseppmASTM D5185m679MagnesiumppmASTM D5185m679CalciumppmASTM D5185m775CalciumppmASTM D5185m775PhosphorusppmASTM D5185m854SulfurppmASTM D5185m2838SulfurppmASTM D5185m2838SoliconppmASTM D5185m>3021INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7624>205.4SulfationAbs/tmm*ASTM D7415>3021.6FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/tmm*ASTM D7414>2515.7	Vanadium	ppm	ASTM D5185m		<1		
Boron         ppm         ASTM D5185m         342             Barium         ppm         ASTM D5185m         5             Molybdenum         ppm         ASTM D5185m         111             Manganese         ppm         ASTM D5185m         8             Magnesium         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         775             Zinc         ppm         ASTM D5185m         775             Sulfur         ppm         ASTM D5185m         2838             Sulfur         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current <t< td=""><td>Cadmium</td><td>ppm</td><td>ASTM D5185m</td><td></td><td>1</td><td></td><td></td></t<>	Cadmium	ppm	ASTM D5185m		1		
Barium         ppm         ASTM D5185m         5             Molybdenum         ppm         ASTM D5185m         111             Manganese         ppm         ASTM D5185m         8             Magnesium         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         775             Zinc         ppm         ASTM D5185m         854             Sulfur         ppm         ASTM D5185m         2838             Solicon         ppm         ASTM D5185m         >30         21             Solicon         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base <t< th=""><th>ADDITIVES</th><th></th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	ADDITIVES		method	limit/base	current	history1	history2
Barium         ppm         ASTM D5185m         5             Molybdenum         ppm         ASTM D5185m         111             Magnesium         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         1459             Calcium         ppm         ASTM D5185m         775             Phosphorus         ppm         ASTM D5185m         854             Sulfur         ppm         ASTM D5185m         2838             Sulfur         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %	Boron	ppm	ASTM D5185m		342		
Manganese         ppm         ASTM D5185m         8             Magnesium         ppm         ASTM D5185m         679	Barium		ASTM D5185m		5		
Manganese         ppm         ASTM D5185m         8             Magnesium         ppm         ASTM D5185m         679             Calcium         ppm         ASTM D5185m         1459             Phosphorus         ppm         ASTM D5185m         775             Zinc         ppm         ASTM D5185m         854             Sulfur         ppm         ASTM D5185m         2838             Sulfur         ppm         ASTM D5185m         2838             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Sulfation	Molybdenum	ppm	ASTM D5185m		111		
Calcium         ppm         ASTM D5185m         1459             Phosphorus         ppm         ASTM D5185m         775             Zinc         ppm         ASTM D5185m         854             Sulfur         ppm         ASTM D5185m         2838             Sulfur         ppm         ASTM D5185m         2838             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         5.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         21.6	Manganese	ppm	ASTM D5185m		8		
Phosphorus         ppm         ASTM D5185m         775             Zinc         ppm         ASTM D5185m         854             Sulfur         ppm         ASTM D5185m         2838             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >30         5             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Sulfation         Abs/cm         *ASTM D7624         >20         5.4             Sulfation         Abs/.1mm         *ASTM D7615         >30         21.6	Magnesium	ppm	ASTM D5185m		679		
Zinc         ppm         ASTM D5185m         854             Sulfur         ppm         ASTM D5185m         2838             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >20         5             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >3         0.1             Sulfation         Abs/cm         *ASTM D7624         >20         5.4             FLUID DEGRADATION         method         limit/base         current         histor	Calcium	ppm	ASTM D5185m		1459		
SulfurppmASTM D5185m2838CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>3021SodiumppmASTM D5185m>3021SodiumppmASTM D5185m>205PotassiumppmASTM D5185m>205INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.1NitrationAbs/cm*ASTM D7624>205.4SulfationAbs/1mm*ASTM D7415>3021.6FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2515.7	Phosphorus	ppm	ASTM D5185m		775		
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>3021SodiumppmASTM D5185m5PotassiumppmASTM D5185m>205INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.1NitrationAbs/cm*ASTM D7624>205.4SulfationAbs/ltm*ASTM D7624>3021.6FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1tm*ASTM D7414>2515.7	Zinc	ppm	ASTM D5185m		854		
Silicon         ppm         ASTM D5185m         >30         21             Sodium         ppm         ASTM D5185m         >30         5             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         5.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         21.6             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.7	Sulfur	ppm	ASTM D5185m		2838		
Sodium         ppm         ASTM D5185m         5             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         5.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         21.6             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.7	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         5.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         21.6             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.7	Silicon	ppm	ASTM D5185m	>30	21		
INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >3       0.1           Nitration       Abs/cm       *ASTM D7624       >20       5.4           Sulfation       Abs/.1mm       *ASTM D7415       >30       21.6           FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       15.7	Sodium	ppm	ASTM D5185m		5		
Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         5.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         21.6             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.7	Potassium	ppm	ASTM D5185m	>20	5		
Nitration         Abs/cm         *ASTM D7624         >20         5.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         21.6             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.7	INFRA-RED		method	limit/base	current	history1	history2
Nitration         Abs/cm         *ASTM D7624         >20         5.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         21.6             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.7	Soot %	%	*ASTM D7844	>3	0.1		
Sulfation       Abs/.1mm       *ASTM D7415       >30       21.6           FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       15.7							
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.7							
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.7</b>						history	-biotom (2
						riistory I	nistory2
Base Number (BN)         mg KOH/g         ASTM D2896         9.9				>25			
	Base Number (BN)	mg KOH/g	ASTM D2896		9.9		

Sample Rating Trend



NORMAL



# **OIL ANALYSIS REPORT**



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