

PROBLEM SUMMARY



911051 PETERBILT 320 Component

1 Diesel Engine **TIER ONE 15W40 (--- GAL)**

COMPONENT CONDITION SUMMARY



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	00.					

PROBLEMATIC	C TEST	RESULT	S		
Sample Status			ATTENTION	ATTENTION	
Visc @ 100°C	cSt	ASTM D445	🔺 12.3	11.1	

Customer Id: GFL642 Sample No.: GFL0061454 Lab Number: 05924075 Test Package: FLEET



To discuss the diagnosis or test data:

Sean Felton +1 919-379-4092 sfelton@wearcheckusa.com

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

There are no recommended actions for this sample.

HISTORICAL DIAGNOSIS

30 Nov 2022 Diag: Don Baldridge

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. Fuel content negligible. Elevated aluminum (AI) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.





OIL ANALYSIS REPORT

Sample Rating Trend

VISCOSITY

911051 PETERBILT 320

Component 1 Diesel Engine Fluid TIER ONE 15W40 (--- GAL)

DIAGNOSIS

			NUVEDEE	AU\$2023		
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0061454	GFL0061452	
Sample Date		Client Info		09 Aug 2023	30 Nov 2022	
Machine Age	hrs	Client Info		2490	737	
Oil Age	hrs	Client Info		94	711	
Oil Changed		Client Info		Not Changd	Changed	
Sample Status				ATTENTION	ATTENTION	
CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol		WC Method		NEG	NEG	
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	12	49	
Chromium	ppm	ASTM D5185m	>20	<1	4	
Nickel	ppm	ASTM D5185m	>4	0	0	
Titanium	ppm	ASTM D5185m		<1	<1	
Silver	ppm	ASTM D5185m	>3	0	<1	
Aluminum	ppm	ASTM D5185m	>20	6	24	
Lead	ppm	ASTM D5185m	>40	<1	<1	
Copper	ppm	ASTM D5185m	>330	3	83	
Tin	ppm	ASTM D5185m	>15	<1	1	
Vanadium	ppm	ASTM D5185m		0	<1	
Cadmium	ppm	ASTM D5185m		0	0	
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 4	history1 39	history2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	limit/base	current 4 0	history1 39 1	history2
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 4 0 59	history1 39 1 7	history2
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 4 0 59 <1	history1 39 1 7 2	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 4 0 59 <1 985	history1 39 1 7 2 741	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	Current 4 0 59 <1 985 1299	history1 39 1 7 2 741 1421	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	Current 4 0 59 <1 985 1299 1099	history1 39 1 7 2 741 1421 747	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	Current 4 0 59 <1 985 1299 1099 1405	history1 39 1 7 2 741 1421 747 852	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	Current 4 0 59 <1 985 1299 1099 1405 4114	history1 39 1 7 2 741 1421 747 852 3429	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	Current 4 0 59 <1 985 1299 1099 1405 4114 Current	history1 39 1 7 2 741 1421 747 852 3429 history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base limit/base >25	current 4 0 59 <1 985 1299 1099 1405 4114 current 3	history1 39 1 7 2 741 1421 747 852 3429 history1 13	history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base limit/base >25	current 4 0 59 <1 985 1299 1099 1405 4114 current 3 1	history1 39 1 7 2 741 1421 747 852 3429 history1 13 5	history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm	method ASTM D5185m	limit/base limit/base >25 >20	current 4 0 59 <1 985 1299 1099 1405 4114 current 3 1 10	history1 39 1 7 2 741 1421 747 852 3429 history1 13 5 62	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 	current 4 0 59 <1 985 1299 1099 1405 4114 current 3 1 10 <1.0	history1 39 1 7 2 741 1421 747 852 3429 history1 13 5 62 0.6	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	method ASTM D5185m	limit/base limit/base >25 >20 >5	current 4 0 59 <1 985 1299 1099 1405 4114 current 3 1 10 <1.0 current	history1 39 1 7 2 741 1421 747 852 3429 history1 13 5 62 0.6 history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base	current 4 0 59 <1 985 1299 1099 1405 4114 current 3 1 10 <1.0 current 0.3	history1 39 1 7 2 741 1421 747 852 3429 history1 13 5 62 0.6 history1 0.3	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base >25 >20 >5 limit/base >3 >20	current 4 0 59 <1 985 1299 1099 1405 4114 current 3 1 10 <1.0 current 0.3 8.4	history1 39 1 7 2 741 1421 747 852 3429 history1 13 5 62 0.6 history1 0.3 10.0	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D7848 *ASTM D7844 *ASTM D7624 *ASTM D7415	limit/base 	current 4 0 59 <1 985 1299 1099 1405 4114 current 3 1 00 <10 <1.0 0.3 8.4 19.1	history1 39 1 7 2 741 1421 747 852 3429 history1 13 5 62 0.6 history1 0.3 10.0 22.6	history2 history2 history2 history2 history2 </th
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base >25 >20 >5 limit/base >3 >20 >3 >20 >30	current 4 0 59 <1 985 1299 1099 1405 4114 current 3 1 00 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	history1 39 1 7 2 741 1421 747 852 3429 history1 13 5 62 0.6 history1 0.3 10.0 22.6	history2 history2 history2 history2 history2 history2 history2 history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D7844 *ASTM D7415 *ASTM D7414	limit/base >25 >20 >5 limit/base >3 >20 >30 limit/base >25	current 4 0 59 <1 985 1299 1099 1405 4114 current 3 1 00 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <0.3 <0.3 <0.4 <0.5 <0.5	history1 39 1 7 2 741 1421 747 852 3429 history1 13 5 62 0.6 history1 0.3 10.0 22.6 history1 17.4	history2



OIL ANALYSIS REPORT





			mounou	iiiiii/basc	Current		· · · · · · · · · · · · · · · · · · ·
	White Metal	scalar	*Visual	NONE	NONE	NONE	
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
	Precipitate	scalar	*Visual	NONE	NONE	NONE	
	Silt	scalar	*Visual	NONE	NONE	NONE	
	Debris	scalar	*Visual	NONE	NONE	NONE	
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
5	Appearance	scalar	*Visual	NORMI	NORMI	NORMI	
00.1	Odor	scalar	*Visual	NORMI	NORMI	NORMI	
	Emulsified Water	scalar	*\/isual	>0.2	NEG	NEG	
	Eree Water	scalar	*\/ieual	20.L	NEG	NEG	
	Tiee Water	Scala	VISUAI		NEG	NEG	
	FLUID PROPI	ERTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445		12.3	▲ 11.1	
	GRAPHS						
	Ferrous Alloys						
	iron						
	40 - newsease chromium						
	30						
	20						
	10-						
	0/22			9/23			
	Nov3			Aug			
	Non-ferrous Meta	als					
	90 Copper 1						
	80 - Incommentation lead						
	60						
	= 50-						
	50 40						
	50 50 40 30						
	50 50 30 20						
	50 40 30 20			/			
				123			
	50 50 20 10 0 20 50 50 50 50 50 50 50 50 50 50 50 50 50			EZIG ^B NY			
	50 50 30 20 10 0 52 50 50 20 50 50 20 50 50 20 50 50 50 20 50 50 50 50 50 50 50 50 50 50 50 50 50	c		Aug9/23	Baco Numb		
	S0 50 50 30 20 10 0 CC00000 Viscosity @ 100° 18	c		Vn03/23	Base Numbe	9r	
	S0 50 50 20 10 0 Viscosity @ 100° 17 Abnomal	c		4003/23 1.6	Base Numbe	21.	
	S0 50 20 10 0 Viscosity @ 100° 18 17 Abnormal	c		9.9 8.1 100 100 100 100 100 100 100 100 100 1	Base Numbe	2r	
	S0 50 40 30 20 10 0 Viscosity @ 100° 18 17 Abnomal	c		9. (B)(10) (B)	Base Numbe	er	
	S0 40 30 20 10 0 20 10 0 20 10 0 20 20 10 0 20 20 20 20 20 20 20 20 20	c		9. 8. (0)(0) 9. (0)(0) 9. (0)(0) 9. (0)(0) 9. (0)(0) 9. (0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(Base Numbe	er	
	S0 40 30 20 10 0 20 10 0 20 10 0 20 20 10 0 20 20 20 20 20 20 20 20 20	c		1.6 Mundae (mg (K0H(d) 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6	Base Numbe	er	
	S0 S0 S0 S0 S0 S0 S0 S0 S0 S0	c		16 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19	Base Numbe	er	
	S0 S0 S0 S0 S0 S0 S0 S0 S0 S0	c		9.9 8.8 1.6 1.9 1.1 1.1 1.1 1.1	Base Numbe	2r	
	S0 S0 S0 S0 S0 S0 S0 S0 S0 S0	c		9.0 8.8 (0,0)(0,0) 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0	Base Numbe	2r	
	So So So So So So So So So So	c		9.13 8.8 (0,17) 9.15 9.15 9.15 1.1 1.1 1.1 0.1 22 1.1	Base Number	2r	19223
	S0 40 30 20 10 0 CCCCCC 0 Viscosity @ 100° Abnormal 10 CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	c		9.1 8.1 9.1 9.1 9.1 9.1 9.1 9.1 9.1 9.1 9.1 9	Base Number	er	2260nA
Laboratory	Solution Soluti	C 501 Madia	son Ave., Ca	99 88 (0,HO) 00 99 81 (0,HO) 00 99 81 90 90 90 90 90 90 90 90 90 90 90 90 90	Base Number	≥r	sind Rapids Hauling
Laboratory Sample No.	Viscosity @ 100°	C 501 Madia Received	son Ave., Ca	99. 88. (h)HOX 00. 99. 81. (h)HOX 00. 99. 81. (h)HOX 00. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 81. 99. 99. 99. 99. 99. 99. 99. 99. 99. 9	Base Number	2r vironmental - 642- Gra 5826 Alde	Ind Rapids Hauling
Laboratory Sample No. Lab Number	WearCheck USA - GFL0061454 : 05924075	C 501 Madia Received Diagnos	son Ave., Ca 1 : 14 / ed : 15 /	ry, NC 2751: Aug 2023 Aug 2023	Base Number	er vironmental - 642- Gra 5826 Alder	Ind Rapids Hauling In Nash Ave SE Lowell, M
Laboratory Sample No. Lab Number Unique Number	WearCheck USA - GFL0061454 : 05924075 : 10604022 : 05924075	501 Madia Received Diagnos	son Ave., Ca i : 14 / ed : 15 / ician : Sea	Public Provide August 2023 ry, NC 2751: Aug 2023 Aug 2023 an Felton	Base Number	er vironmental - 642- Gra 5826 Alder	Ind Rapids Hauling In Nash Ave SE Lowell, M US 49331

Report Id: GFL642 [WUSCAR] 05924075 (Generated: 08/15/2023 15:48:13) Rev: 1

* - 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)

Submitted By: BRITTANY FLINN

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