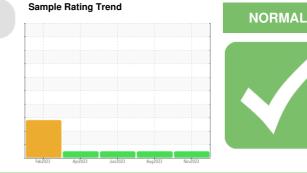


## **OIL ANALYSIS REPORT**







**413030 MACK GRANITE** Component **Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (--- GAL)

SAMPLE INFORMATION method limit/base

DIAG	NOSIS	

### Recommendation

Resample at the next service interval to monitor.

#### 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.

SAMIFLE INFURI		method	iiiiii/base	current	Thistory I	Thstoryz
Sample Number		Client Info		GFL0094665	GFL0089365	GFL0087118
Sample Date		Client Info		02 Nov 2023	19 Aug 2023	28 Jun 2023
Machine Age	hrs	Client Info		2751	2224	1885
Oil Age	hrs	Client Info		200	0	1127
Oil Changed		Client Info	Changed		Not Changd	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	s	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	8	6	15
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>5	<1	0	<1
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>2	<1	<1	<1
Aluminum	ppm	ASTM D5185m	>20	2	2	2
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	3	6	44
Tin	ppm		>15	<1	<1	1
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	<1	1	3
Barium	ppm	ASTM D5185m	0	4	0	0
Molybdenum	ppm	ASTM D5185m	60	57	60	75
Manganese	ppm	ASTM D5185m	0	0	<1	<1
Magnesium						
Magnoolann	ppm	ASTM D5185m	1010	859	979	1043
Calcium	ppm ppm	ASTM D5185m ASTM D5185m	1010 1070	859 1016	979 1117	1043 1244
0						
Calcium	ppm	ASTM D5185m	1070	1016	1117	1244
Calcium Phosphorus	ppm ppm	ASTM D5185m ASTM D5185m	1070 1150	1016 839	1117 1006	1244 1143
Calcium Phosphorus Zinc	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	1070 1150 1270	1016 839 1159	1117 1006 1228	1244 1143 1405
Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	1070 1150 1270 2060	1016 839 1159 2830	1117 1006 1228 3541	1244 1143 1405 3424
Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	1070 1150 1270 2060 limit/base	1016 839 1159 2830 current	1117 1006 1228 3541 history1	1244 1143 1405 3424 history2
Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm TS ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m	1070 1150 1270 2060 limit/base >25	1016 839 1159 2830 current 4	1117 1006 1228 3541 history1 4	1244 1143 1405 3424 history2 7
Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1070 1150 1270 2060 limit/base >25	1016 839 1159 2830 current 4 <1	1117 1006 1228 3541 history1 4 3	1244 1143 1405 3424 history2 7 3
Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1070 1150 1270 2060 <i>limit/base</i> >25 >20	1016 839 1159 2830 current 4 <1 6	1117 1006 1228 3541 history1 4 3 5	1244 1143 1405 3424 history2 7 3 14
Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1070 1150 1270 2060 limit/base >25 >20 limit/base	1016 839 1159 2830 current 4 <1 6 current	1117 1006 1228 3541 history1 4 3 5 5 history1	1244 1143 1405 3424 history2 7 3 14 history2
Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >4	1016 839 1159 2830 current 4 <1 6 current 0.3	1117 1006 1228 3541 history1 4 3 5 5 history1 0.3	1244 1143 1405 3424 history2 7 3 14 history2 0.4
Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm TS ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7624	1070 1150 1270 2060 imit/base >25 >20 imit/base >4 >20	1016 839 1159 2830 current 4 <1 6 current 0.3 7.4	1117 1006 1228 3541 history1 4 3 5 history1 0.3 6.7	1244 1143 1405 3424 history2 7 3 14 history2 0.4 8.0
Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm TS ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	1070 1150 1270 2060 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >4 >20 >30	1016 839 1159 2830 current 4 <1 6 current 0.3 7.4 19.2	1117 1006 1228 3541 history1 4 3 5 history1 0.3 6.7 19.0	1244 1143 1405 3424 history2 7 3 14 history2 0.4 8.0 20.6
Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm TS ppm ppm ppm ppm % Abs/cm Abs/cm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415	1070 1150 1270 2060 <b>limit/base</b> >25 >20 <b>limit/base</b> >4 >20 >30 <b>limit/base</b>	1016 839 1159 2830 current 4 <1 6 current 0.3 7.4 19.2 current	1117 1006 1228 3541 4 3 5 history1 0.3 6.7 19.0 history1	1244 1143 1405 3424 history2 7 3 14 history2 0.4 8.0 20.6 history2

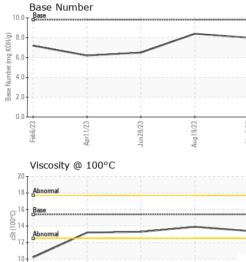


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Feb6/23

Apr11/23

# **OIL ANALYSIS REPORT**



		VISUAL White Metal	opelar	method *Visual	limit/base	current	history1 NONE	history2 NONE
-		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Precipitate	scalar 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
/23	/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jun28/23	Aug 19/23 Nov2/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual	20.2	NEG	NEG	NEG
		FLUID PROP	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	13.4	13.9	13.3
		GRAPHS						
		Ferrous Alloys						
		40 iron		1				
Jun 28/23	Aug19/23	35 - chromium						
μĻ	Aur	30 25						
		Ē_20						
		15	-					
		10						
		5-		<u> </u>				
		C. C						
		Feb 6/23 Aprl 1/23	Jun28/23	Aug19/23	Nov2/23			
		4	-	Aug	2			
		Non-ferrous Met	als					
		copper						
		200 - tin						
		150		   				
		100-						
		50-	$\lambda$					
		Feb6/23	un28/23	ug19/23	Nov2/23			
		Feb Apr1	Jun2	Aug1	Nov			
		Viscosity @ 100°	С			Base Number		
		18 - Abnormal			10.0	- Base		
		17-		   	₽ <sup>8.0</sup>	)		
	1	Dase			B 6.0			
		5 15 00 14 33 13 Abnormal			.6.0 0.0 Base Number (mg KOH/0) 4.0			
		0			4.0	)		
		12			2.0			
		10						
		94	33	2	0.0		5	53
		Feb 6/23 Aprl 1/23	Jun 28/23	Aug19/23	Nov2/23	Feb6/23 Apr11/23	Jun28/23	Aug 19/23
		As As	Ju	Au	~	A	лL	Au
d	Laboratory	: WearCheck USA -						
NAB	Sample No.	: GFL0094665	Receive	d :031	lov 2023		3741	Conquest Driv
	Sample No. Lab Number	: GFL0094665 : 05997638	Receive Diagnos	d : 03 M ed : 06 M	Nov 2023 Nov 2023		3741	Conquest Driv Garner, N
	Sample No.	: GFL0094665	Receive	d : 03 M ed : 06 M	lov 2023			Conquest Dri

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)