

### **OIL ANALYSIS REPORT**

Sample Rating Trend





### Machine Id MACK 32 Component Diesel Engine

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

### DIAGNOSIS

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.

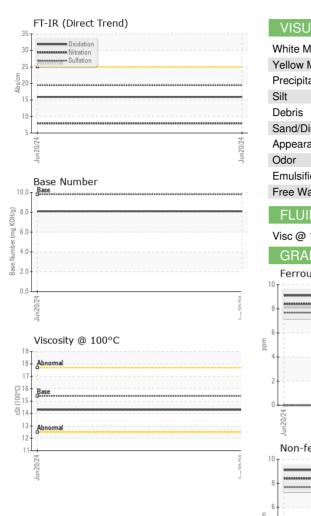
#### Fluid Condition

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

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0115725		
Sample Date		Client Info		20 Jun 2024		
Machine Age	hrs	Client Info		6490		
Oil Age	hrs	Client Info		400		
Oil Changed		Client Info		Not Changd		
Sample Status				NORMAL		
CONTAMINATI	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0		
Water		WC Method	>0.2	NEG		
Glycol		WC Method		NEG		
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	8		
Chromium	ppm	ASTM D5185m	>20	0		
Nickel	ppm	ASTM D5185m	>5	0		
Titanium	ppm	ASTM D5185m	>2	0		
Silver	ppm	ASTM D5185m	>2	0		
Aluminum	ppm	ASTM D5185m	>20	4		
Lead	ppm	ASTM D5185m	>40	0		
Copper	ppm	ASTM D5185m	>330	2		
Tin	ppm	ASTM D5185m	>15	<1		
Vanadium	ppm	ASTM D5185m		0		
Cadmium				-		
Caumum	ppm	ASTM D5185m		0		
ADDITIVES	ppm	method	limit/base	0 current	history1	history2
	ppm		limit/base			
ADDITIVES		method		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 4	history1	history2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0	current 4 0	history1 	history2 
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 4 0 61	history1  	history2  
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 4 0 61 0	history1  	history2   
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	current 4 0 61 0 928	history1   	history2    
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	current 4 0 61 0 928 1120	history1   	history2     
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	Current 4 0 61 0 928 1120 1079	history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	Current 4 0 61 0 928 1120 1079 1288	history1	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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	Current 4 0 61 0 928 1120 1079 1288 3555	history1	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 ASTM D5185m	0 00 00 1010 1070 1150 1270 2060	Current 4 0 61 0 928 1120 1079 1288 3555 Current	history1 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	0 00 00 1010 1070 1150 1270 2060	current           4           0           61           0           928           1120           1079           1288           3555           current           5	history1 history1	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	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b>	current           4           0           61           0           928           1120           1079           1288           3555           current           5           1	history1  history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20	current         4         0         61         0         928         1120         1079         1288         3555         current         5         1         7	history1 history1	history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25	current         4         0         61         0         928         1120         1079         1288         3555         current         5         1         7         current	history1                        history1            history1            history1               history1                     history1	history2 history2 history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20 <b>limit/base</b>	current         4         0         61         0         928         1120         1079         1288         3555         current         5         1         7         current         0.4	history1                        history1                           history1  history1	history2 history2 history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method         ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20 <b>imit/base</b> >20	current         4         0         61         0         928         1120         1079         1288         3555         current         5         1         7         current         0.4         7.9	history1   history1                           history1	history2 <tr tr=""></tr>
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20 <b>imit/base</b> >4 >20	current         4         0         61         0         928         1120         1079         1288         3555         current         5         1         7         current         0.4         7.9         19.4	history1  history1            history1	history2                                    history2               history2



## **OIL ANALYSIS REPORT**



	VISUAL		method			history1	history
	White Metal	scalar	*Visual	NONE	NONE		
	Yellow Metal	scalar	*Visual	NONE	NONE		
	Precipitate	scalar	*Visual	NONE	NONE		
	Silt	scalar	*Visual	NONE	NONE		
	Debris	scalar	*Visual	NONE	NONE		
	Sand/Dirt	scalar	*Visual	NONE	NONE		
	Appearance	scalar	*Visual	NORML	NORML		
	Odor	scalar	*Visual	NORML	NORML		
	Emulsified Water	scalar	*Visual	>0.2	NEG		
	Free Water	scalar	*Visual		NEG		
	FLUID PROPE	ERTIES	method	limit/base	current	history1	history
	Visc @ 100°C	cSt	ASTM D445	15.4	14.3		
	GRAPHS						
	Ferrous Alloys						
	10 iron ]						
	8 - nickel						
	6						
	udd						
	4						
	2						
	0						
		******		0/24			
	Jun20/24		*****	Jun20/24			
		ls	*****	Jun20/24			
	Jun20/24	ls		Jun20/24			
	Non-ferrous Meta	ls		Jun20/24			
	Non-ferrous Meta	ls	*********************	Jun20/24			
	Non-ferrous Meta	ls	******	Jun20/24			
	Non-ferrous Meta	ls		Jun20024			
	Non-ferrous Meta	ls		Jun20024			
	Non-ferrous Meta	ls		Jun20/24			
	Non-ferrous Meta	ls		Jun20/24			
	Non-ferrous Meta						
	Non-ferrous Meta						
	Non-ferrous Meta						
	Non-ferrous Meta				Base Numbe	21	
	Non-ferrous Meta					54	
	Non-ferrous Meta			10.0		21	
	Non-ferrous Meta			10.0		21	
	Non-ferrous Meta			10.0		۲ <b>۲</b>	
	Non-ferrous Meta			10.0		2 <b>r</b>	
	Non-ferrous Meta			10.0		9 <b>r</b>	
	Non-ferrous Meta			10.0 8.0 906 June Kunner (Jun Kolle) 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.		51.	
	Non-ferrous Meta			10.0		51.	
	Non-ferrous Meta			10.0 Base Mumber (n) Base Mumb	Base	21.	
	Non-ferrous Meta			10.0 Base Mumber (n) Base Mumb	Base	51.	
	Non-ferrous Meta			10.0 4.0 Base Munber (mg K0H/0) 4.0 2.0		51.	
	Non-ferrous Meta	C		10.0 10.0	Base		
	Non-ferrous Meta Non-ferrous Meta Copper Viscosity @ 100° Abnormal Abnormal Copper Viscosity @ 100° Second	C D1 Madiso	n Ave., Car	10.0 400 4000 4	Base	LE	
	Non-ferrous Meta Non-ferrous Meta Copper Viscosity @ 100° Abnomal Copper Viscosity @ 100° Copper Viscosity @ 100° Copper Copper Viscosity @ 100° Copper C	C D1 Madiso Recei	n Ave., Car ived : 0	10.0 10.0	Base		RSITY AVE
r	Non-ferrous Meta Non-ferrous Meta Copper Viscosity @ 100° Abnomal Copper Viscosity @ 100° Base Copper Viscosity @ 100° Copper Copper Viscosity @ 100° Copper Cop	)1 Madiso Recei Teste	n Ave., Car ived : 0 sd : 0	10.0 10.0	Base + + + - + - - - - - - - - - - - - -	LE	RSITY AVE BETHEL,
	Non-ferrous Meta Non-ferrous Meta Copper Viscosity @ 100° Abnomal Copper Viscosity @ 100° Copper Viscosity @ 100° Copper Copper Viscosity @ 100° Copper C	C D1 Madiso Recei	n Ave., Car ived : 0 sd : 0	10.0 10.0	Base + + + - + - - - - - - - - - - - - -	LE 23602 UNIVER	PAGE & SC RSITY AVE BETHEL, US 55 fike Heidem

To discuss this sample repo \* - 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)

Certificate L2367

Submitted By: Mike Heidemann

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