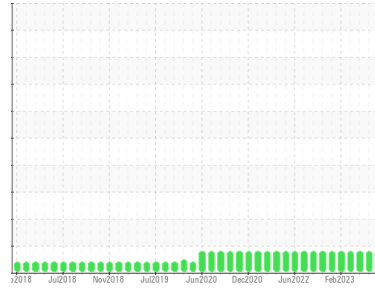


# OIL ANALYSIS REPORT

Sample Rating Trend



**FUEL**



Area  
**MARSHALL**  
 Machine Id  
**[MARSHALL] DB100101E Unit 01**  
 Component  
**Natural Gas Engine**  
 Fluid  
**PETRO CANADA DURON MONOGRADE HD 40W (250 GAL)**

## DIAGNOSIS

### ▲ Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

### Wear

All component wear rates are normal.

### ▲ Contamination

Light fuel dilution occurring.

### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

## SAMPLE INFORMATION

	method	limit/base	current	history 1	history 2
Sample Number	Client Info		<b>PCA0073209</b>	PCA0073208	PCA0073207
Sample Date	Client Info		<b>28 Jun 2023</b>	30 May 2023	26 Apr 2023
Machine Age	hrs	Client Info	<b>108602</b>	108356	108127
Oil Age	hrs	Client Info	<b>108602</b>	108356	108127
Oil Changed	Client Info		<b>Filtered</b>	Filtered	Filtered
Sample Status			<b>MARGINAL</b>	MARGINAL	MARGINAL

## WEAR METALS

	method	limit/base	current	history 1	history 2
Iron	ppm	ASTM D5185m >50	<b>5</b>	4	4
Chromium	ppm	ASTM D5185m >4	<b>0</b>	0	0
Nickel	ppm	ASTM D5185m >2	<b>0</b>	0	0
Titanium	ppm	ASTM D5185m	<b>0</b>	0	0
Silver	ppm	ASTM D5185m >3	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m >9	<b>2</b>	2	1
Lead	ppm	ASTM D5185m >30	<b>1</b>	0	0
Copper	ppm	ASTM D5185m >35	<b>2</b>	2	1
Tin	ppm	ASTM D5185m >4	<b>&lt;1</b>	0	0
Vanadium	ppm	ASTM D5185m	<b>0</b>	0	0
Cadmium	ppm	ASTM D5185m	<b>0</b>	0	0

## ADDITIVES

	method	limit/base	current	history 1	history 2
Boron	ppm	ASTM D5185m	<b>4</b>	4	4
Barium	ppm	ASTM D5185m	<b>2</b>	0	0
Molybdenum	ppm	ASTM D5185m	<b>3</b>	3	3
Manganese	ppm	ASTM D5185m	<b>&lt;1</b>	0	<1
Magnesium	ppm	ASTM D5185m	<b>908</b>	950	908
Calcium	ppm	ASTM D5185m	<b>1118</b>	1129	1082
Phosphorus	ppm	ASTM D5185m	<b>1098</b>	1061	1042
Zinc	ppm	ASTM D5185m	<b>1296</b>	1320	1255
Sulfur	ppm	ASTM D5185m	<b>3268</b>	3650	3183

## CONTAMINANTS

	method	limit/base	current	history 1	history 2
Silicon	ppm	ASTM D5185m >+100	<b>2</b>	2	2
Sodium	ppm	ASTM D5185m	<b>0</b>	1	2
Potassium	ppm	ASTM D5185m >20	<b>2</b>	1	0
Fuel	%	ASTM D3524 >4.0	▲ <b>2.4</b>	▲ 2.7	▲ 2.5

## INFRA-RED

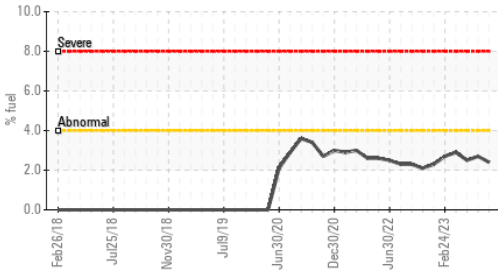
	method	limit/base	current	history 1	history 2
Soot %	%	*ASTM D7844	<b>0.1</b>	0.1	0
Nitration	Abs/cm	*ASTM D7624 >20	<b>4.7</b>	4.7	4.2
Sulfation	Abs/.1mm	*ASTM D7415 >30	<b>14.6</b>	14.3	12.3

## FLUID DEGRADATION

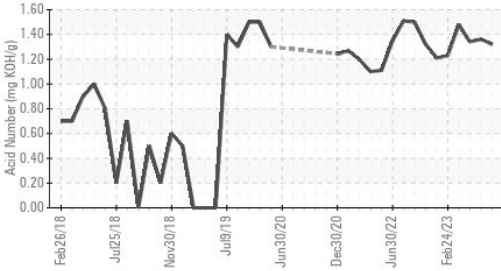
	method	limit/base	current	history 1	history 2
Oxidation	Abs/.1mm	*ASTM D7414 >25	<b>9.1</b>	7.8	7.2
Acid Number (AN)	mg KOH/g	ASTM D8045	<b>1.32</b>	1.362	1.34
Base Number (BN)	mg KOH/g	ASTM D2896 8.5	<b>10.05</b>	7.4	8.53

# OIL ANALYSIS REPORT

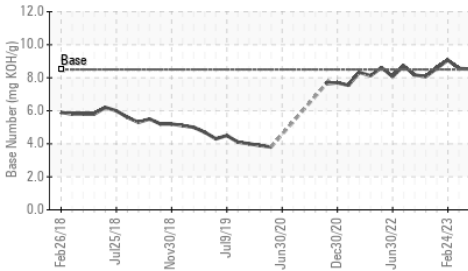
## ▲ Fuel Dilution



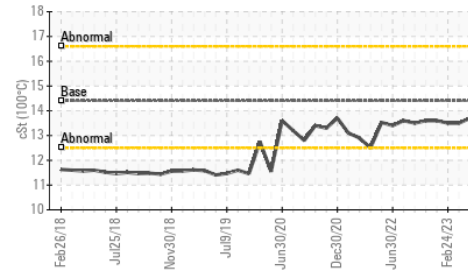
## Acid Number



## Base Number



## Viscosity @ 100°C



## VISUAL

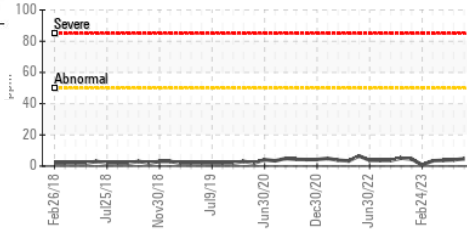
	method	limit/base	current	history 1	history 2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

## FLUID PROPERTIES

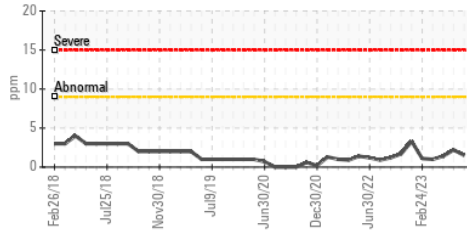
	method	limit/base	current	history 1	history 2
Visc @ 100°C	cSt	ASTM D445	14.4	13.4	13.7

## GRAPHS

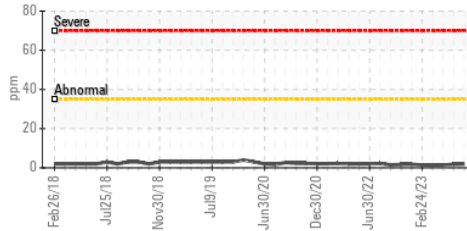
### Iron (ppm)



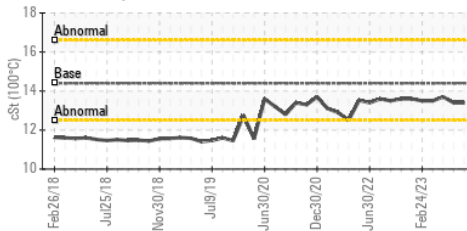
### Aluminum (ppm)



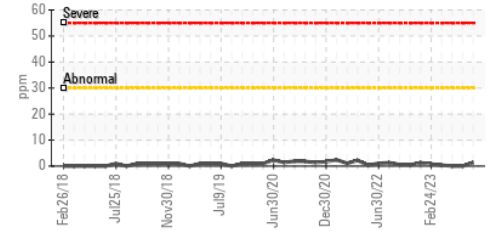
### Copper (ppm)



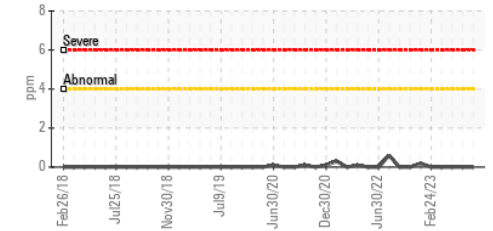
### Viscosity @ 100°C



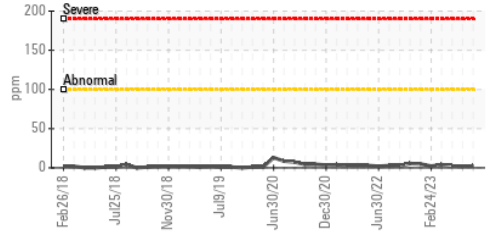
### Lead (ppm)



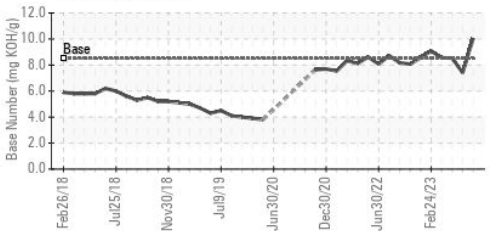
### Chromium (ppm)



### Silicon (ppm)



### Base Number



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : PCA0073209 **Received** : 06 Jul 2023  
**Lab Number** : 05891458 **Diagnosed** : 07 Jul 2023  
**Unique Number** : 10547268 **Diagnostician** : Sean Felton  
**Test Package** : MOB 2 ( Additional Tests: FuelDilution, PercentFuel )

**Magellan Midstream LP - Marshall**  
 1601 West College Drive  
 Marshall, MN  
 US 56258

Contact: Brett Erickson  
 brett.erickson@magellanlp.com  
 T: (519)822-1260

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)

F: