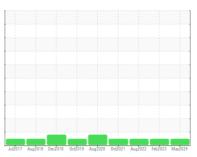


# **OIL ANALYSIS REPORT**

Sample Rating Trend



NORMAL



JOHN DEERE 600-159

**Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (30 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

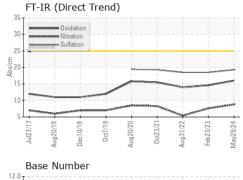
## **Fluid Condition**

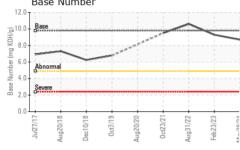
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

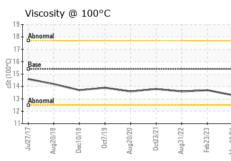
Sample Number   Client Info   PCA0106875   PCA0078559   PCA0078   Sample Date   Client Info   29 May 2024   23 Feb 2023   31 Aug 20   Aug 2024   23 Feb 2023   31 Aug 20   Aug 2024   23 Feb 2023   31 Aug 20   Aug 2024   32 Feb 2023   31 Aug 20   Aug 2024   35 Feb 2023   31 Aug 20   Aug 2024   32 Feb 2023   32 Feb 2023   31 Aug 20   Aug 2024   32 Feb 2023   32 Feb 2023   31 Aug 20   Aug 2024   32 Feb 2023   Aug 2024   Aug	āAL)		Jul2017 Aug	j2018 Dec2018 Oct2019	Aug2020 Oct2021 Aug2022 Feb203	23 May2024	
Sample Date	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Date	Sample Number		Client Info		PCA0106875	PCA0078559	PCA0070777
Machine Age         hrs         Client Info         6966         6509         550           Oil Age         hrs         Client Info         500         509         550           Oil Changed         Client Info         Changed Chang			Client Info		29 May 2024	23 Feb 2023	31 Aug 2022
Oil Changed Sample Status         Client Info         Changed NORMAL	•	hrs	Client Info			6509	_
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history1   history1   history1   water   wc Method   vo.2:1   v1.0	Oil Age	hrs	Client Info		500	509	550
CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >2.1         <1.0	Oil Changed		Client Info		Changed	Changed	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.21         NEG         NEG         NEG           Glycol         WC Method         Imilibase         current         history1         history1           WEAR METALS         method         limilibase         current         history1         history1           Iron         ppm         ASTM D5185m         >51         40         24         30           Chromium         ppm         ASTM D5185m         >51         40         24         30           Chromium         ppm         ASTM D5185m         >5         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >51         40         24         30           Chromium         ppm         ASTM D5185m         >51         40         24         30           Chromium         ppm         ASTM D5185m         >5         <1	Fuel		WC Method	>2.1	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.21	NEG	NEG	NEG
Pron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >11         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 <td>WEAR METAL</td> <td>S</td> <td>method</td> <td>limit/base</td> <th>current</th> <td>history1</td> <td>history2</td>	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>51	40	24	30
Description	Chromium	ppm	ASTM D5185m	>11	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>5	<1	<1	<1
Aluminum	Titanium	ppm	ASTM D5185m		0	0	0
Lead	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >26         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Aluminum	ppm	ASTM D5185m	>31	2	<1	1
Tin	Lead	ppm	ASTM D5185m	>26	<1	<1	<1
Trin	Copper	ppm	ASTM D5185m	>26	<1	<1	<1
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         4         3         4           Barium         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         0         0           Manganese         ppm         ASTM D5185m         0         <1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         915         934         895           Calcium         ppm         ASTM D5185m         1070         1045         1122         1159           Phosphorus         ppm         ASTM D5185m         1270         1216         1251         1203           Sulfur         ppm         ASTM D5185m         2060         3416         3131         3190           CONTAMINANTS         method         limit/base         current         hi		ppm	ASTM D5185m	>4	<1	0	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         4         3         4           Barium         ppm         ASTM D5185m         0         <1	Antimony	ppm	ASTM D5185m				
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         4         3         4           Barium         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         <1         0         0           Manganese         ppm         ASTM D5185m         0         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium		ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         60         58         62         61           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         58         62         61           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         915         934         895           Calcium         ppm         ASTM D5185m         1070         1045         1122         1159           Phosphorus         ppm         ASTM D5185m         1150         1053         1065         1004           Zinc         ppm         ASTM D5185m         1270         1216         1251         1203           Sulfur         ppm         ASTM D5185m         2060         3416         3131         3190           CONTAMINANTS         method         limit/base         current         history1         history1         history1         history1           Silicon         ppm         ASTM D5185m         >22         5         4         3           Sodium         ppm         ASTM D5185m         >31         3         0         <1	Boron	ppm	ASTM D5185m	0	4	3	4
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         915         934         895           Calcium         ppm         ASTM D5185m         1070         1045         1122         1159           Phosphorus         ppm         ASTM D5185m         1150         1053         1065         1004           Zinc         ppm         ASTM D5185m         1270         1216         1251         1203           Sulfur         ppm         ASTM D5185m         2060         3416         3131         3190           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >22         5         4         3           Sodium         ppm         ASTM D5185m         >31         3         0         <1	Barium	ppm	ASTM D5185m	0	<1	0	0
Magnesium         ppm         ASTM D5185m         1010         915         934         895           Calcium         ppm         ASTM D5185m         1070         1045         1122         1159           Phosphorus         ppm         ASTM D5185m         1150         1053         1065         1004           Zinc         ppm         ASTM D5185m         1270         1216         1251         1203           Sulfur         ppm         ASTM D5185m         2060         3416         3131         3190           CONTAMINANTS         method         limit/base         current         history1         history1         history1         history1           Silicon         ppm         ASTM D5185m         >22         5         4         3           Sodium         ppm         ASTM D5185m         >31         3         0         <1	Molybdenum	ppm	ASTM D5185m	60	58	62	61
Calcium         ppm         ASTM D5185m         1070         1045         1122         1159           Phosphorus         ppm         ASTM D5185m         1150         1053         1065         1004           Zinc         ppm         ASTM D5185m         1270         1216         1251         1203           Sulfur         ppm         ASTM D5185m         2060         3416         3131         3190           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >22         5         4         3           Sodium         ppm         ASTM D5185m         >31         3         0         <1	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         1053         1065         1004           Zinc         ppm         ASTM D5185m         1270         1216         1251         1203           Sulfur         ppm         ASTM D5185m         2060         3416         3131         3190           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >22         5         4         3           Sodium         ppm         ASTM D5185m         >31         3         0         <1	Magnesium	ppm	ASTM D5185m	1010	915	934	895
Zinc         ppm         ASTM D5185m         1270         1216         1251         1203           Sulfur         ppm         ASTM D5185m         2060         3416         3131         3190           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >22         5         4         3           Sodium         ppm         ASTM D5185m         >31         3         0         <1	Calcium	ppm	ASTM D5185m	1070	1045	1122	1159
Sulfur         ppm         ASTM D5185m         2060         3416         3131         3190           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >22         5         4         3           Sodium         ppm         ASTM D5185m         >31         3         0         <1	Phosphorus	ppm	ASTM D5185m	1150	1053	1065	1004
CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >22         5         4         3           Sodium         ppm         ASTM D5185m         >31         3         0         <1	Zinc	ppm	ASTM D5185m	1270	1216	1251	1203
Silicon         ppm         ASTM D5185m         >22         5         4         3           Sodium         ppm         ASTM D5185m         >31         3         0         <1           Potassium         ppm         ASTM D5185m         >20         2         1         0           INFRA-RED         method         limit/base         current         history1         history1         history1           Soot %         %         *ASTM D7844         >3         0.5         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         8.8         7.6         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.3         18.5         18.5           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.0         14.6         14.0	Sulfur	ppm	ASTM D5185m	2060	3416	3131	3190
Sodium         ppm         ASTM D5185m         >31         3         0         <1           Potassium         ppm         ASTM D5185m         >20         2         1         0           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >3         0.5         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         8.8         7.6         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.3         18.5         18.5           FLUID DEGRADATION         method         limit/base         current         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.0         14.6         14.0	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         2         1         0           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >3         0.5         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         8.8         7.6         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.3         18.5         18.5           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.0         14.6         14.0	Silicon	ppm	ASTM D5185m	>22	5	4	3
INFRA-RED	Sodium	ppm	ASTM D5185m	>31	3	0	<1
Soot %         %         *ASTM D7844 >3         0.5         0.4         0.1           Nitration         Abs/cm         *ASTM D7624 >20         8.8         7.6         5.4           Sulfation         Abs/.1mm         *ASTM D7415 >30         19.3         18.5         18.5           FLUID DEGRADATION method limit/base current         history1         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414 >25         16.0         14.6         14.0	Potassium	ppm	ASTM D5185m	>20	2	1	0
Nitration         Abs/cm         *ASTM D7624         >20         8.8         7.6         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.3         18.5         18.5           FLUID DEGRADATION method limit/base current         history1         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.0         14.6         14.0	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.3         18.5         18.5           FLUID DEGRADATION method limit/base current         bistory1         history1         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.0         14.6         14.0	Soot %	%	*ASTM D7844	>3	0.5	0.4	0.1
FLUID DEGRADATION method limit/base current history1 history  Oxidation Abs/.1mm *ASTM D7414 >25 16.0 14.6 14.0	Nitration	Abs/cm	*ASTM D7624	>20	8.8	7.6	5.4
Oxidation Abs/.1mm *ASTM D7414 >25 <b>16.0</b> 14.6 14.0	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.3	18.5	18.5
	FLUID DEGRAE	OATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 <b>8.7</b> 9.3 10.6	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.0	14.6	14.0
, , ,	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.7	9.3	10.6



# **OIL ANALYSIS REPORT**



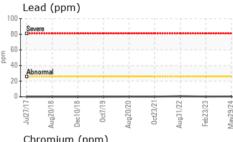


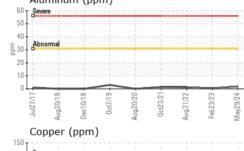


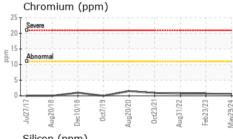
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.21	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

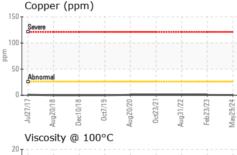
FLUID PROP	EHILO	method			riistory i	nistory∠
Visc @ 100°C	cSt	ASTM D445	15.4	13.3	13.7	13.6

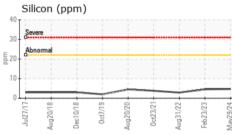
Severe								
+								
+								
Abnom	mal							
-	-							***
711/	9/18	9/18	Oct7/19 -	0/20	3/21-	1/22	3/23	9/24
Jul27/17	Aug20/18	Dec10/1	Oct	Aug20/20	Oct2	Aug31/22	Feb23/2	May29/24
Alum	ninuu	m (pį	nm)					

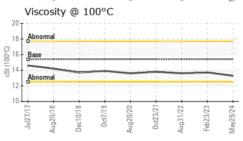


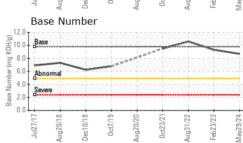
















Certificate 12367

Laboratory Sample No.

: PCA0106875 Lab Number : 06201176

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 06 Jun 2024

**Tested** Diagnosed

: 07 Jun 2024

: 07 Jun 2024 - Wes Davis Test Package : MOB 1 ( Additional Tests: TBN )

VALPARAISO, IN US 46385 Contact: MARK STEFFEL mark.steffel@gemarshall.com

**GE MARSHALL EXCAVATION** 

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)

Report Id: GEMVAL [WUSCAR] 06201176 (Generated: 06/07/2024 04:46:45) Rev: 1

Unique Number : 11063299

Contact/Location: MARK STEFFEL - GEMVAL

T:

F:

1351 JOLIET RD