

## **OIL ANALYSIS REPORT**

Sample Rating Trend





#### Component Diesel Engine Fluid

### PETRO CANADA DURON SHP 10W30 (--- QTS)

#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

#### Wear

All component wear rates are normal.

#### Contamination

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.

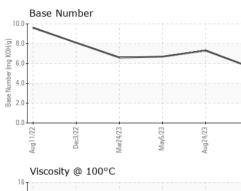
#### Fluid Condition

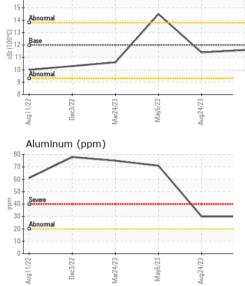
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATI         Sample Number         Sample Date       Image         Machine Age       mls         Oil Age       mls         Oil Changed       sample Status         CONTAMINATION         Fuel       Image         Water       Image         Glycol       Image         WEAR METALS         Iron       ppr         Nickel       ppr         Silver       ppr         Aluminum       ppr         Lead       ppr         Copper       ppr         Cadmium       ppr         Boron       ppr         Manganese       ppr         Manganese       ppr         Sulfur       ppr         Sulfur       ppr         Sulfur       ppr         Sulfur       ppr	Client Info Client Info Client Info Client Info Client Info Client Info Client Info WC Method WC Method WC Method WC Method MC Method MC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>0.2 limit/base >100 >20 >4 -3 >20 >40 >330	Aughors         Aughors           Current         PCA0115177           21 Dec 2023         102040           0         NA           N/A         NORMAL           <1.0         NEG           NEG         Current           63         4           0         0           0         30           0         30           0         30           0         78	Istory1           PCA0019366           24 Aug 2023           83003           0           Not Changd           NORMAL           <1.0           NEG           NEG           145           3           <1           0           <13           <1           0           <1           0           <1           0           <1           0           <1           30           0           0           <10	history2           PCA0098033           05 May 2023           63181           0           Changed           ATTENTION           history2           <1.0           NEG           NEG           95           7           2           <1           0           71           3
Sample Number Sample Date Machine Age Mls Oil Age Mls Oil Changed Sample Status CONTAMINATION Fuel Water Glycol WEAR METALS Iron Ppm Chromium ppm Chromium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Cadmium ppm Cadmium ppm Barium ppm Barium ppm Malganese ppm Alagnesium ppm Calcium ppm Calcium ppm Cinc ppm Silver ppm Calcium ppm Contation ppm Calcium ppm Contation ppm Contation ppm Contation ppm Calcium ppm Calcium ppm Calcium ppm Calcium ppm Contation ppm Calcium pp	Client Info Client Info Client Info Client Info Client Info Client Info Client Info WC Method WC Method WC Method WC Method MC Method MC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >5 >0.2 limit/base >100 >20 >4 >3 >20 >4 >3 >20 >40 >330	PCA01151777 21 Dec 2023 102040 0 N/A NORMAL 4 Current 4 Current 63 63 4 0 0 0 0 0 30 0 0	PCA0019366 24 Aug 2023 83003 0 Not Changd NORMAL 4.1.0 NEG NEG NEG history1 45 3 <1 0 <1 0 <1 30	PCA0098033 05 May 2023 63181 0 Changed ATTENTION history2 <1.0 NEG NEG NEG 95 7 2 95 7 2 <1 0 0 71
Sample DateImageMachine AgemlsOil AgemlsOil Changedsample StatusCONTAMINATIONFuelWaterGlycolWEAR METALSIronpprChromiumpprNickelpprAluminumpprLeadpprCopperpprTinpprCadmiumpprBoronpprBariumpprMaganesepprMagnesiumpprZincpprSiliconppr	Client Info Client Info Client Info Client Info Client Info WC Method WC Method WC Method WC Method MC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>5 >0.2 <b>limit/base</b> >100 >20 >4 >3 >20 >20 >40 >330	21 Dec 2023 102040 0 N/A NORMAL current <1.0 NEG NEG 63 4 63 4 0 0 0 0 0 30 0 0	24 Aug 2023 83003 0 Not Changd NORMAL 4 1.0 NEG NEG NEG 45 3 45 3 3 <1 0 0 <1 0 30	05 May 2023 63181 0 Changed ATTENTION ATTENTION ( NEG NEG NEG 95 7 2 95 7 2 4 ( 1 0 0 71
Machine AgemlsOil AgemlsOil Changedsample StatusCONTAMINATIONFuelWaterglycolWEAR METALSIronppmChromiumppmNickelppmSilverppmAluminumppmLeadppmCopperppmTinppmCadmiumppmBoronppmBariumppmMagnesiumppmCalciumppmZincppmZincppmSiliconppmSiliconppm	Client Info Client Info Client Info Client Info WC Method WC Method WC Method WC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>5 >0.2 <b>limit/base</b> >100 >20 >4 >3 >20 >20 >40 >330	102040 0 N/A NORMAL < current < 4 63 4 63 4 0 0 0 0 0 0 0 30 0 0	83003 0 Not Changd 1 NORMAL 4 1.0 NEG NEG NEG 1 45 3 45 3 45 3 (1 0 0 <1 0 (1 30)	63181 0 Changed ATTENTION 4 1.0 NEG NEG 95 7 2 2 <1 0 0 71
Oil AgemlsOil ChangedSample StatusCONTAMINATIONFuelWatergGlycolWEAR METALSIron ppmChromium ppmNickelppmSilverppmAluminumppmLeadppmCopperppmCadmiumppmBoronppmBariumppmMaganeseppmMagnesiumppmCalciumppmZincppmSiliconppmCONTAMINANTS	Client Info Client Info Client Info WC Method WC Method WC Method MC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>5 >0.2 <b>limit/base</b> >100 >20 >4 >3 >20 >20 >40 >330	0 N/A NORMAL < current <1.0 NEG NEG 0 current 63 4 0 0 0 0 0 30 0 0	0 Not Changd NORMAL 4 1.0 NEG NEG history1 45 3 <1 0 <1 0 <1 30	0 Changed ATTENTION ATTENTION ////////////////////////////////////
Oil Changed         Sample Status         CONTAMINATION         Fuel         Water         Glycol         WEAR METALS         Iron       ppm         Chromium       ppm         Nickel       ppm         Silver       ppm         Aluminum       ppm         Lead       ppm         Copper       ppm         Cadmium       ppm         Boron       ppm         Malganese       ppm         Magnesium       ppm         Zinc       ppm         Zinc       ppm         Sulfur       ppm         Silicon       ppm	Client Info method WC Method WC Method WC Method WC Method MC MC MC METhod MC MC MC METhod MC MC MC METhod MC MC MC MC MC METhod MC MC MC MC MC MC METhod MC MC M	>5 >0.2 <b>limit/base</b> >100 >20 >4 >3 >20 >20 >40 >330	N/A NORMAL Current <1.0 NEG NEG 0 Current 63 4 0 0 0 0 0 30 0 0	Not Changd           NORMAL           history1           <1.0	Changed ATTENTION history2 <1.0 NEG NEG 95 7 2 95 7 2 <1 0 0 71
Sample Status CONTAMINATION Fuel Water Glycol WEAR METALS Iron ppm Chromium ppm Nickel ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Cadmium ppm Barium ppm Barium ppm Manganese ppm Manganese ppm Calcium ppm Calcium ppm Sinc ppm Sinc ppm Sinc ppm Silver ppm Silicon ppm	method         WC Method         WC Method         WC Method         WC Method         method         ASTM D5185m	>5 >0.2 <b>limit/base</b> >100 >20 >4 >3 >20 >20 >40 >330	NORMAL current <1.0 NEG NEG current 63 4 0 0 0 0 30 0 0	NORMAL           history1           <1.0	ATTENTION history2 <1.0 NEG NEG 95 7 2 5 7 2 <1 0 7 7
CONTAMINATION         Fuel         Water         Glycol         WEAR METALS         Iron       ppr         Chromium       ppr         Chromium       ppr         Nickel       ppr         Silver       ppr         Aluminum       ppr         Lead       ppr         Copper       ppr         Tin       ppr         Cadmium       ppr         Boron       ppr         Manganese       ppr         Magnesium       ppr         Zinc       ppr         Zinc       ppr         Sulfur       ppr         Silicon       ppr	WC Method WC Method WC Method MC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>5 >0.2 <b>limit/base</b> >100 >20 >4 >3 >20 >20 >40 >330	current           <1.0	history1           <1.0	history2 <1.0 NEG NEG history2 95 7 2 <1 0 7 1
Fuel         Water         Glycol         WEAR METALS         Iron       ppr         Chromium       ppr         Nickel       ppr         Silver       ppr         Aluminum       ppr         Lead       ppr         Copper       ppr         Cadmium       ppr         Boron       ppr         Molybdenum       ppr         Magnesium       ppr         Calcium       ppr         Zinc       ppr         Sulfur       ppr         Silicon       ppr	WC Method WC Method WC Method MC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>5 >0.2 <b>limit/base</b> >100 >20 >4 >3 >20 >20 >40 >330	<1.0 NEG NEG Current 63 4 0 0 0 0 30 0 0	<1.0 NEG NEG 45 3 <1 0 <1 30	<1.0 NEG NEG 95 7 2 <1 0 71
Water       Glycol         Glycol       WEAR METALS         Iron       ppr         Chromium       ppr         Chromium       ppr         Nickel       ppr         Silver       ppr         Aluminum       ppr         Lead       ppr         Copper       ppr         Tin       ppr         Vanadium       ppr         Cadmium       ppr         Boron       ppr         Manganese       ppr         Magnesium       ppr         Calcium       ppr         Zinc       ppr         Sulfur       ppr         Silicon       ppr	WC Method WC Method MC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>0.2 limit/base >100 >20 >4 -3 >20 >40 >330	NEG NEG 63 4 0 0 0 0 30 0	NEG NEG history1 45 3 <1 0 <1 30	NEG NEG 95 7 2 <1 0 71
Glycol         WEAR METALS         Iron       ppm         Chromium       ppm         Nickel       ppm         Nickel       ppm         Silver       ppm         Aluminum       ppm         Lead       ppm         Copper       ppm         Tin       ppm         Cadmium       ppm         Boron       ppm         Manganese       ppm         Magnesium       ppm         Calcium       ppm         Zinc       ppm         Sulfur       ppm         Silicon       ppm	WC Method method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >100 >20 >4 >3 >20 >40 >330	NEG current 63 4 0 0 0 0 30 0	NEG history1 45 3 <1 0 <1 30	NEG history2 95 7 2 <1 0 71
WEAR METALS         Iron       ppm         Chromium       ppm         Nickel       ppm         Nickel       ppm         Silver       ppm         Aluminum       ppm         Lead       ppm         Copper       ppm         Cadmium       ppm         Cadmium       ppm         Boron       ppm         Molybdenum       ppm         Maganese       ppm         Calcium       ppm         Zinc       ppm         Sulfur       ppm         Silicon       ppm	method       ASTM D5185m	>100 >20 >4 >3 >20 >40 >330	current           63           4           0           0           0           30           0	history1 45 3 <1 0 <1 30	history2 95 7 2 <1 0 71
Iron ppr Chromium ppr Nickel ppr Titanium ppr Silver ppr Aluminum ppr Lead ppr Copper ppr Tin ppr Vanadium ppr Cadmium ppr Cadmium ppr Molybdenum ppr Molybdenum ppr Manganese ppr Manganese ppr Manganese ppr Calcium ppr Calcium ppr Sulfur ppr Sulfur ppr	ASTM D5185m	>100 >20 >4 >3 >20 >40 >330	63 4 0 0 0 30 0	45 3 <1 0 <1 30	95 7 2 <1 0 71
Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Manganese ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m	>20 >4 >3 >20 >40 >330	4 0 0 0 30 0	3 <1 0 <1 30	7 2 <1 0 71
Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Maganese ppm Maganesium ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>4 >3 >20 >40 >330	0 0 0 30 0	<1 0 <1 30	2 <1 0 71
Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Cadmium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Manganese ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m           ASTM D5185m           ASTM D5185m           ASTM D5185m           ASTM D5185m           ASTM D5185m	>3 >20 >40 >330	0 0 30 0	0 <1 30	<1 0 71
Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m ASTM D5185m ASTM D5185m	>20 >40 >330	0 30 0	<1 30	0 71
Aluminum     ppm       Lead     ppm       Copper     ppm       Tin     ppm       Vanadium     ppm       Cadmium     ppm       Cadmium     ppm       Cadmium     ppm       Boron     ppm       Barium     ppm       Manganese     ppm       Magnesium     ppm       Calcium     ppm       Sulfur     ppm       Sulfur     ppm       Silicon     ppm	ASTM D5185m ASTM D5185m	>20 >40 >330	30 0	30	71
Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m	>40 >330	0		
Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Sulfur ppm CONTAMINANTS Silicon ppm		>330		0	3
Tin pprr Vanadium pprr Cadmium pprr ADDITIVES Boron pprr Barium pprr Molybdenum pprr Manganese pprr Magnesium pprr Calcium pprr Calcium pprr Sulfur pprr Sulfur pprr Sulfur pprr Sulfur pprr	ASTM D5185m		78		
Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Sulfur ppm CONTAMINANTS Silicon ppm		>15		93	249
Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m		4	4	14
ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m		0	0	0
Boron ppr Barium ppr Molybdenum ppr Manganese ppr Magnesium ppr Calcium ppr Calcium ppr Zinc ppr Sulfur ppr CONTAMINANTS Silicon ppr	ASTM D5185m		0	0	0
Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm	method	limit/base	current	history1	history2
Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m	2	9	11	19
Manganese     ppm       Magnesium     ppm       Calcium     ppm       Phosphorus     ppm       Zinc     ppm       Sulfur     ppm       CONTAMINANTS     Silicon	ASTM D5185m	0	0	0	0
Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m	50	65	62	55
Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m	0	3	2	5
Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m	950	878	889	651
Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m	1050	1288	1298	1710
Sulfur ppm CONTAMINANTS Silicon ppm	ASTM D5185m	995	1001	967	780
CONTAMINANTS Silicon ppm	ASTM D5185m	1180	1207	1252	991
Silicon ppm	ASTM D5185m	2600	2018	2819	1853
	method	limit/base	current	history1	history2
o "	ASTM D5185m	>25	8	6	10
Sodium ppm			2	2	6
Potassium ppm	ASTM D5185m	>20	66	63	183
INFRA-RED		limit/base	current	history1	history2
Soot % %	ASTM D5185m method	>3	1.3	0.8	1.1
Nitration Abs/	ASTM D5185m	20	1.3		13.1
Sulfation Abs/.1	ASTM D5185m method *ASTM D7844		1.3 11.3	9.6	01 7
FLUID DEGRADATI	ASTM D5185m method *ASTM D7844 cm *ASTM D7624	>20		9.6 20.2	24.7
Oxidation Abs/.1	ASTM D5185m method *ASTM D7844 cm *ASTM D7624 mm *ASTM D7415	>20	11.3		24.7 history2
Base Number (BN) mg KC	ASTM D5185m method *ASTM D7844 cm *ASTM D7844 mm *ASTM D7624 ON method	>20 >30 limit/base	11.3 23.6	20.2	



# **OIL ANALYSIS REPORT**





		VISUAL		method	limit/base	current	history1	history2
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	$\frown$	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
Mar24/23 May5/23	Aug24/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Mar	Aug	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
С		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
-		Free Water	scalar	*Visual		NEG	NEG	NEG
$\wedge$		FLUID PROPE	RTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	12.00	11.6	11.4	<b>1</b> 4.5
		GRAPHS						
		Iron (ppm)			100	Lead (ppm)		
	~	250 200 Severe			100	Severe	1 1	· · · · · · · · · · · · · · · · · · ·
Mar24/23 May5/23	Aug24/23	200						
W N	Au	Abnormal	1	1	E 40			1
		50 -			20	T I		
		0					_	
$\langle \rangle$		Aug11/22 - Dec3/22 -	May5/23 -	Aug24/23 -	Dec21/23	Aug11/22	Mar24/23 - May5/23 -	Aug24/23 .
		Aug1 Dec	May	Aug2	Dec2	Aug <sup>1</sup> Dec	Mar2 May	Aug2
		Aluminum (ppm)				Chromium (pp	m)	
		08	-		50	Series		
		60 -			4(			
6/23	1/23	e 40 - Severe			<u>ل</u> الم	Abnormal		
Mar24/23 May5/23	Aug24/23	20 - Abnormal			10			
		0						
		Aug11/22 Dec3/22 Mar24/23	May5/23	Aug24/23	Dec21/23	Aug11/22 Dec3/22	Mar24/23 May5/23	Aug24/23
		Aug1 Dec	May	Aug2	Dec2	Dec	Mar2	Aug2
		Copper (ppm)				Silicon (ppm)		
		400 Severe			80	Severe	1 1	
		300			60			
		톱 200-			튭.40			
		100			20	Abnormal		
		0						
		ug11/22 - Dec3/22 -	May5/23 -	4/23 -	1/23 -	ug11/22	Mar24/23 - May5/23 -	4/23 -
		Aug11/22 Dec3/22	May	Aug24/23	Dec21/23	Aug11/22 Dec3/22	Mar24/23 May5/23	Aug24/23
		Viscosity @ 100°C			10.0	Base Number		
		14 Abnormal	~		(10.0 (10) HOX But Jag But Jag But HOX But Jag But See 0.0			
		(0-00) 12 - <b>Base</b>				· · · · · · · · · · · · · · · · · · ·		
						) <mark>-</mark>		
		10 Abnormal			ase 2.0	D <b>-</b>		
		3 2 8	13	23 -			23	53
		Aug 11/22 Dec3/22 Mar24/23	May5/23	Aug24/23	Dec21/23	Aug11/22 Dec3/22	Mar24/23 May5/23	Aug24/23
		A. L	2	Au	ā	Aı	2 2	Au
	Laboratory	: WearCheck USA - 5	01 Madis	on Ave., Ca	ry, NC 27513	3 <b>MIL</b>	LER TRUCK	LEASING #11
d	Sample No.	: PCA0115177	Recieved	: 05	Jan 2024			IDUSTRIAL AV
ANAB		: 06052546	Diagnose	ed : 08 .	Jan 2024		HASBROUC	CK HEIGHTS, N
	Lab Number				<b>D</b> .			110 0-0-0
	Unique Numbe	r : 10818495 I	Diagnosti		s Davis		Contact. M	US 0760
Certificate 12367	Unique Numbe Test Package	r : 10818495 I	<b>Diagnost</b> i Fests: TB	N)		mlo		US 0760 IIKE LONGETT ertransgroup.cor

Contact/Location: MIKE LONGETTE - MILRUT