

## **OIL ANALYSIS REPORT**

Sample Rating Trend

NORMAL



## **MACK 420055**

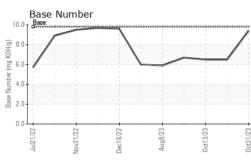
Component **Diesel Engine** Fluid

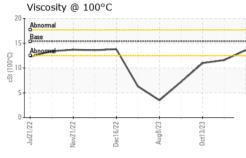
PETRO CANADA DURON SHP 15W40 (--- LTR)

Resample at the next service interval to monitor.Sample DateClient Info31 Oct 202317 Oct 202313 Oct 2023WearMachine AgehrsClient Info970996019574All component wear rates are normal.Oil AgehrsClient Info783675648ContaminationOil ChangedClient InfoNot ChangdN/ANot ChangdThere is no indication of any contamination in theSample StatusImage: Client InfoNORMALATTENTION		``````````````````````````````````````		Jul2U22	Nov2022 Dec2022	Aug2023 0ct2023	Oct2023	
Beampie Date       Client info       31 Oct 2023       17 Oct 2023       18 Oct 2023         War       Component wear rates are normal.       Oil Age       hrs       Client info       9709       9601       9574         There is no indication of any contamination in the M.       There is no indication of any contamination in the M.       Northand	DIAGNOSIS	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Ware number of wear rates are normal.       Soli Age       his       Client Info       703       6601       9574       643         Coli Age       Lis       Client Info       Not Change       Not Chang	Recommendation	Sample Number		Client Info		GFL0092418	GFL0092419	GFL0092414
Unicomponent wear rates are normal.       Oil Age       htts       Client Info       783       675       648         Contamination       Not Changed       Not Cha	Resample at the next service interval to monitor.	Sample Date		Client Info		31 Oct 2023	17 Oct 2023	13 Oct 2023
Contamination         OI Changed         Client Info         Nor Changed         N/A         Not Changed           There is no indication of any contamination in the it.         Sample Status         Intel NormAlL         ATTENTION         ATTENTION           The BO result informations that the is suitable bor further service.         WO Method         S.0         <1.0	Wear	Machine Age	hrs	Client Info		9709	9601	9574
Sample Status         NORMAL         ATTENTION         ATTENTION           Number is no infication of any contamination in the ill.         Sample Status         NORMAL         ATTENTION         ATTENTION           Shuf Condition The BN result indicates that there is suitable iil is suitable for further service.         Normal         Vince	All component wear rates are normal.	Oil Age	hrs	Client Info		783	675	648
Sample Status         NORMAL         ATTENTION         ATTENTION           "Lik Condition The BK result indicates that there is suitable kikinity remaining in the uil. The condition of the iki is suitable for further service.         CONTAMINATION         method         linkids         current         history1         history2           Fuel         WO Method         >3.0         <1.0	Contamination	Oil Changed		Client Info		Not Changd	N/A	Not Changd
Other         CONTAMINATION         method         initialization         history1         history2           Fuel         WC Method         >3.0         <1.0		Sample Status				NORMAL	ATTENTION	ATTENTION
The BM result indicates that there is suitable for further service.       Fuel       WC Method       3-3.0       <1.0	oil.	CONTAMINATI	ON	method	limit/base	current	history1	history2
Bit suitable for further service.         Glycol         WC Method         NEG         NEG         NEG           We AR METALS         method         current         history1         history2           Iran         ppm         ASTM0585m         >12.0         <1		Fuel		WC Method	>3.0	<1.0	<1.0	2.0
WEAR METALS         method         imit/base         current         history1         history2           Iron         pm         ASTIU Ditism         >120         <1		Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTIL 05185m         >20         0         <1         <1           Nickel         ppm         ASTIL 05185m         >5         <1		WEAR METALS	6	method	limit/base	current	history1	history2
Nickel       ppm       ASTL D5185m       >5       <1       <1       <1       <1         Titanium       ppm       ASTL D5185m       >2       0       0       0         Silver       ppm       ASTL D5185m       >2       1       0       0         Aluminum       ppm       ASTL D5185m       >20       2       3       4         Lead       ppm       ASTL D5185m       >40       1       <1		Iron	ppm	ASTM D5185m	>120	<1	6	7
Titanium         ppm         ASTM D5185m         >2         0         0         <1           Silver         ppm         ASTM D5185m         >20         2         3         4           Auminum         ppm         ASTM D5185m         >20         1         <1		Chromium	ppm	ASTM D5185m	>20	0	<1	<1
Titanium         ppm         ASTM D5185m         >2         0         0         <1           Silver         ppm         ASTM D5185m         >20         2         3         4           Lead         ppm         ASTM D5185m         >20         2         3         4           Lead         ppm         ASTM D5185m         >40         1         <1		Nickel	ppm			<1	<1	<1
Silver       ppm       ASTM D518m       >22       <1       0       0         Aluminum       ppm       ASTM D518m       >20       2       3       4         Lead       ppm       ASTM D518m       >20       1       <1       <1         Copper       ppm       ASTM D518m       >330       0       4       5         Tin       ppm       ASTM D518m       >15       <1       <1       <1         Cadmium       ppm       ASTM D518m       15       <1       <1       <1         Cadmium       ppm       ASTM D518m       0       0       0       <1       89         Barium       ppm       ASTM D518m       0       0       13       71       89         Barium       ppm       ASTM D518m       0       0       13       71       89         Barium       ppm       ASTM D518m       0       0       13       13       14       15         Barium       ppm       ASTM D518m       0       0       13       153       163       163       163         Barium       ppm       ASTM D518m       0       0       2       7       7		Titanium		ASTM D5185m	>2	0	0	<1
Atuminum       ppm       ASTM D5185m       >20       2       3       4         Lead       ppm       ASTM D5185m       >40       1       <1       <1         Copper       ppm       ASTM D5185m       >3300       0       4       5         Tin       ppm       ASTM D5185m       0       1       <1       <1       <1         Vanadium       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       <1       <1       <1       <1       <1       <1       <1       <1       <1       <1       <1       <1       <1       <1       <1       <1       <1       <1		Silver				<1	0	0
Cooper         ppm         ASTM D5185m         >330         0         4         5           Tin         ppm         ASTM D5185m         >15         <1		Aluminum	ppm	ASTM D5185m	>20	2	3	4
Tin       ppm       ASTM D5185m       >15       <1		Lead	ppm	ASTM D5185m	>40	1	<1	<1
Vanadium         ppm         ASTM D5185m		Copper		ASTM D5185m	>330	0	4	5
Vanadium         ppm         ASTM D5185m		Tin	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         13         71         89           Barium         ppm         ASTM D5185m         0         0         0         10           Molybdenum         ppm         ASTM D5185m         60         62         79         78           Manganese         ppm         ASTM D5185m         0         <1		Vanadium		ASTM D5185m		<1	0	<1
Boron         ppm         ASTM D5185m         0         13         71         89           Barium         ppm         ASTM D5185m         0         0         0         0         10           Molybdenum         ppm         ASTM D5185m         60         62         79         78           Manganese         ppm         ASTM D5185m         0         0         0         0           Manganese         ppm         ASTM D5185m         1010         879         304         158           Calcium         ppm         ASTM D5185m         1010         879         8955         870           Phosphorus         ppm         ASTM D5185m         1070         1095         1180         1021           Sulfur         ppm         ASTM D5185m         1270         1255         1146         1021           Sulfur         ppm         ASTM D5185m         2060         3251         3609         3395           CONTAMINANTS         method         imit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         1         2         2           Sodium         ppm </td <td></td> <td>Cadmium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>0</th> <td>0</td> <td>&lt;1</td>		Cadmium	ppm	ASTM D5185m		0	0	<1
Barium       ppm       ASTM D5185m       0       0       0       0       10         Molybdenum       ppm       ASTM D5185m       60       62       79       78         Manganese       ppm       ASTM D5185m       0       <1       0       0         Magnesium       ppm       ASTM D5185m       1010       879       304       158         Calcium       ppm       ASTM D5185m       1010       879       895       870         Phosphorus       ppm       ASTM D5185m       1070       1095       1680       1695         Zinc       ppm       ASTM D5185m       1270       1255       1146       1021         Sulfur       ppm       ASTM D5185m       2060       3251       3609       3395         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >20       1       2       2         Sodium       ppm       ASTM D5185m       >20       1       2       2         INFRA-RED       pm       ASTM D5185m       >20       1       0.1       0.1         Nitration       Abs/cm		ADDITIVES		method	limit/base	current	history1	history2
Barium       ppm       ASTM D5185m       0       0       0       0       10         Molybdenum       ppm       ASTM D5185m       60       62       79       78         Manganese       ppm       ASTM D5185m       0       <1		Boron	ppm	ASTM D5185m	0	13	71	89
Molybdenum       ppm       ASTM D5185m       60       62       79       78         Manganese       ppm       ASTM D5185m       0       <1		Barium		ASTM D5185m	0		0	10
Manganese       ppm       ASTM D5185m       0       <1       0       0         Magnesium       ppm       ASTM D5185m       1010       879       304       158         Calcium       ppm       ASTM D5185m       1070       1095       1680       1695         Phosphorus       ppm       ASTM D5185m       1150       979       895       870         Zinc       ppm       ASTM D5185m       1270       1255       1146       1021         Sulfur       ppm       ASTM D5185m       2060       3251       3609       3395         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >20       1       21       2         Silicon       ppm       ASTM D5185m       >20       1       2       2         Sodium       ppm       ASTM D5185m       >20       1       2       2         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >4       0.1       0.1       1         Nitration       Abs/cm       *ASTM D7844 </td <td></td> <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>60</td> <th>62</th> <td>79</td> <td>78</td>		Molybdenum	ppm	ASTM D5185m	60	62	79	78
Calcium       ppm       ASTM D5185m       1070       1095       1680       1695         Phosphorus       ppm       ASTM D5185m       1150       979       895       870         Zinc       ppm       ASTM D5185m       1270       1255       1146       1021         Sulfur       ppm       ASTM D5185m       2060       3251       3609       3395         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       4       7       7         Sodium       ppm       ASTM D5185m       >20       1       2       2         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >4       0.1       0.1       0.1         Nitration       Abs/nm       *ASTM D7824       >20       6.3       7.1       7.9         Sulfation       Abs/nm       *ASTM D7844       >4       0.1       0.1       0.1         Nitration       Abs/nm       *ASTM D7824       >20       6.3       7.1       7.9         Sulfation       Abs/nm*				ASTM D5185m	0	<1	0	0
Calcium       ppm       ASTM D5185m       1070       1095       1680       1695         Phosphorus       ppm       ASTM D5185m       1150       979       895       870         Zinc       ppm       ASTM D5185m       1270       1255       1146       1021         Sulfur       ppm       ASTM D5185m       2060       3251       3609       3395         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       4       7       7         Sodium       ppm       ASTM D5185m       >20       1       2       2         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >4       0.1       0.1       0.1         Nitration       Abs/nm       *ASTM D7824       >20       6.3       7.1       7.9         Sulfation       Abs/1mm       *ASTM D7845       >30       17.0       17.7       18.4         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/1		Magnesium				879	304	158
Phosphorus       ppm       ASTM D5185m       1150       979       895       870         Zinc       ppm       ASTM D5185m       1270       1255       1146       1021         Sulfur       ppm       ASTM D5185m       2060       3251       3609       3395         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       4       7       7         Sodium       ppm       ASTM D5185m       >26       1       <1		Calcium	ppm	ASTM D5185m	1070	1095	1680	1695
Zinc       ppm       ASTM D5185m       1270       1255       1146       1021         Sulfur       ppm       ASTM D5185m       2060       3251       3609       3395         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       4       7       7         Sodium       ppm       ASTM D5185m       >25       4       7       7         Sodium       ppm       ASTM D5185m       >25       4       7       7         Sodium       ppm       ASTM D5185m       >20       11       21       <11         Potassium       ppm       ASTM D5185m       >20       1       2       2         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >4       0.1       0.1       0.1         Nitration       Abs/(mm< *ASTM D7624       >20       6.3       7.1       7.9         Sulfation       Abs/(1mm       *ASTM D7415       >30       17.0       17.7       18.4         FLUID DEGRADATION       method       limit/base		Phosphorus		ASTM D5185m	1150	979	895	870
SulfurppmASTM D5185m2060325136093395CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25477SodiumppmASTM D5185m>201<1				ASTM D5185m	1270	1255	1146	1021
SiliconppmASTM D5185m>25477SodiumppmASTM D5185m<		Sulfur	ppm	ASTM D5185m	2060	3251	3609	3395
SodiumppmASTM D5185m<1			ΓS				history1	history2
PotassiumppmASTM D5185m>20122INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.10.10.1NitrationAbs/cm*ASTM D7624>206.37.17.9SulfationAbs/1mm*ASTM D7415>3017.017.718.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/1mm*ASTM D7414>2512.813.514.3					>25		7	7
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.10.10.1NitrationAbs/cm*ASTM D7624>206.37.17.9SulfationAbs/1mm*ASTM D7415>3017.017.718.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/1mm*ASTM D7414>2512.813.514.3			• •				1	
Soot %         %         *ASTM D7844         >4         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.1         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.7         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         13.5         14.3		Potassium	ppm	ASTM D5185m	>20	1	2	2
Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.1         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.7         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         13.5         14.3		INFRA-RED		method	limit/base			
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.0         17.7         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         13.5         14.3		Soot %	%	*ASTM D7844	>4			
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2512.813.514.3		Nitration	Abs/cm	*ASTM D7624	>20	6.3	7.1	7.9
Oxidation         Abs/.1mm         *ASTM D7414         >25         12.8         13.5         14.3		Sulfation	Abs/.1mm	*ASTM D7415	>30	17.0	17.7	18.4
		FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         9.4         6.5         6.5		Oxidation	Abs/.1mm	*ASTM D7414	>25	12.8	13.5	14.3
		Base Number (BN)	mg KOH/g	ASTM D2896	9.8	9.4	6.5	6.5



## **OIL ANALYSIS REPORT**





		VISUAL		method				history2
	/	White Metal	scalar	*Visual	NONE	LIGHT	NONE	NONE
$\mathbf{X}$	_ /	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		*Visual	NONE	NONE	NONE	NONE
22	23		scalar			NORML	NORML	
Dec16/22 Aug8/23	0ct13/23 0ct31/23	Appearance	scalar	*Visual	NORML	-		NORML
0 1	0 0	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
C		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
<u> </u>	_	FLUID PROPI		method	limit/base	current	history1	history2
$\backslash$		Visc @ 100°C	cSt	ASTM D445	15.4	13.6	<b>▲</b> 11.6	<b>▲</b> 11.0
		GRAPHS						
$\sim$		Ferrous Alloys						
3 5		iron						
Dec16/22 Aug8/23	0ct13/23	10 - chromium						
A	õ	8-						
		E 6						
			-					
		4	/	$\backslash /$	1			
		2-		V	-1-			
		0	Binter	and the second se	1			
			3/23 -	3/23 -	1/23 -			
		Jul21/22 Nov21/22	Dec16/22 Aug8/23	0ct13/23	0ct31/23 -			
		Non-ferrous Meta						
		<sup>10</sup> T	,					
		copper						
		8 measure lead						
		8 - Ead		~				
		8 measure lead		$\wedge$				
		8 - Ead 6 - In the second seco		$\wedge$				
		8 - Ead		$\wedge$				
		B G G G G G G G G G G G G G G G G G G G		$\sum$				
		B G G G G G G G G G G G G G G G G G G G	16/22		3123			
		8 de tin	Dec16/22	Oet1323	0et31/23			
		B CZ/IZINF Viscosity @ 100°		Oct13/23	0ct31/23	Base Numbe	21	
		Viscosity @ 100°		Oct1323		Base Numbe	212	
		R lead in in in in in in in in in in		Oct13/23	10.1	Base	217	
		R - lead 6 4 2 0 1271200 Viscosity @ 100° 20 Abnomal 16 Base		Oct13/23	10.0	Base	er	/
		B G G G G G CZ/IZ/IZ/NN Viscosity @ 100° 20 T Abnomal 16 Base 14		Oct13/2	10.0	Base	9 <b>1</b> .	
		B G G G G G CZ/IZ/IZ/NN Viscosity @ 100° 20 T Abnomal 16 Base 14		Octi 3/2	10.0	Base	21	/
		R		Oetiaza	10.0	Base	2 <b>Г</b>	/
		B G G G G G CZ/IZ/IZ/NN Viscosity @ 100° 20 T Abnomal 16 Base 14		Oct1323	10.1 8.1 06/HO KOH/0 4.1 4.4	D Rese	9 <b>Г</b>	
		8         Image: Second Se		Oct1323	10.0	D Rese	217	
		8         Image: Second Se	c	/	10.1 (b)(0) D (b)(0)	Base		
		8         Image: Second Se	c	/	10.1 (b)(0) D (b)(0)	Base		13/23
		8         Image: Second Se		/	10.1 (b)HOX Du), Jaquing Jaquing See g 2.1	D Base	Deci 6/22	0ed13/23
		B 6 6 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Dec16/22	Oct13/23	10.1 (b)HO X Du (d) Base Number (marked and a construction of the	Base Base Vov21/22 Vov21/22	Dec16/22 Aug6/23	
	Laboratory Sample No.	8         Image: Second Se	Dec16/22	EZEIPO son Ave., Ca	10.1 (b)HO X Du (d) Base Number (marked and a construction of the	Base Base Vov21/22 Vov21/22	Dec 1912 Dec	955 - Montgomery 1121 Wilbanks St
	Laboratory Sample No. Lab Number	<sup>8</sup> <sup>6</sup> <sup>6</sup> <sup>6</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup>	C 501 Madi Received Diagnos	son Ave., Ca d : 03 l ed : 06 l	10.1 (P)HOX Put Put Put Put Put Put Put Put Put Put	Base Base Vov21/22 Vov21/22	Dec 1912 Dec	9 <b>55 - Montgomery</b> 1121 Wilbanks St Montgomery, AL
	Laboratory Sample No. Lab Number Unique Number	<sup>8</sup> <sup>6</sup> <sup>6</sup> <sup>6</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup>	C E 501 Madia Received	son Ave., Ca d : 03 l ed : 06 l	10.1 (P)HO3 Put (P)HO3	Base Base Vov21/22 Vov21/22	Deci (923 Deci (923 nvironmental - 9	9 <b>55 - Montgomery</b> 1121 Wilbanks St Montgomery, AL US 36108
	Laboratory Sample No. Lab Number Unique Number Test Package	<sup>8</sup> <sup>6</sup> <sup>6</sup> <sup>6</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup>	501 Madi Received Diagnos	son Ave., Ca d : 03 l ed : 06 l tician : Wea	10.1 (0)(10)(10)(10)(10)(10)(10)(10)(10)(10)(	Base Base Vov21/22 Vov21/22	Deci (923 Deci (923 nvironmental - 9	9 <b>55 - Montgomery</b> 1121 Wilbanks St Montgomery, AL
To discuss th	Laboratory Sample No. Lab Number Unique Number Test Package <i>is sample report,</i>	<sup>8</sup> <sup>6</sup> <sup>6</sup> <sup>6</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup> <sup>7</sup>	501 Madii Received Diagnos Diagnos	son Ave., Ca d : 03 l ed : 06 l tician : Wes	10.1 (0)(10) 100 (0.1) (0)(10)	Base Base Vov21/22 Vov21/22	Deci (923 Deci (923 nvironmental - 9	9 <b>55 - Montgomery</b> 1121 Wilbanks St Montgomery, AL US 36108

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