

PROBLEM SUMMARY

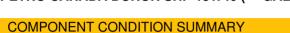
Sample Rating Trend

FUEL

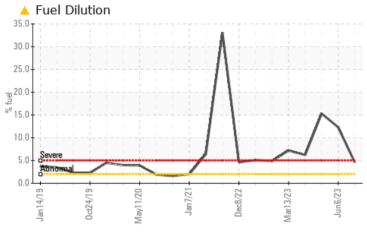
729040-361646

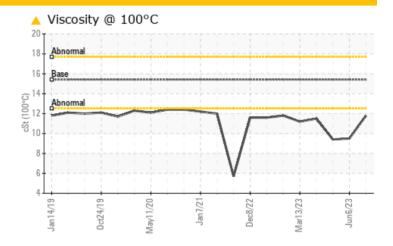
Component **Diesel Engine**

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









RECOMMENDATION

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS

Sample Status				ABNORMAL	SEVERE	SEVERE
Fuel	%	ASTM D3524	>2.0	4.6	12.3	15.3
Visc @ 100°C	cSt	ASTM D445	15.4	11.8	9.5	9.4

Customer Id: GFL837 Sample No.: GFL0098619 Lab Number: 06017115 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Wes Davis +1 905-569-8600 x223 wesd@wearcheck.ca

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Fluid			?	We recommend that you drain the oil from the component if this has not already been done.
Resample			?	We recommend an early resample to monitor this condition.

HISTORICAL DIAGNOSIS

06 Jun 2023 Diag: Wes Davis





We advise that you check the fuel injection system. We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition. All component wear rates are normal. There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.



27 Apr 2023 Diag: Wes Davis

FUEL



We advise that you check the fuel injection system. We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition. All component wear rates are normal. There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.



05 Apr 2023 Diag: Jonathan Hester

FUEL



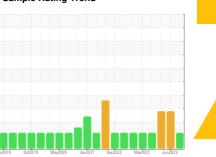
We advise that you check the fuel injection system. Resample at the next service interval to monitor. All component wear rates are normal. There is a moderate amount of fuel present in the oil. Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil.





OIL ANALYSIS REPORT

Sample Rating Trend



FUEL

729040-361646

Component

Diesel Engine

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

DIAGNOSIS

Recommendation

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

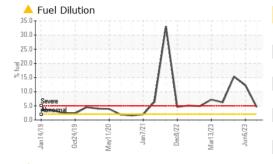
▲ Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

Sample Number Client Info GFL098619 GFL0083775 GFL007040 Sample Date Client Info 16 Nov 2023 QFL0083775 GFL007040 27 Apr 2023 28 Apr 2023 27 Apr 2023 28 Apr 2023 27 Apr 2023 28 Apr 2023 29 Apr 2023 28 Apr 2023 29 Apr 2023 20 Apr 2	iAL)		an2019 O	t2019 May2020 Ja	n2021 Dec2022 Mar2023	Jun2023	
Sample Date Client Info 16 Nov 2023 20 Jun 2023 27 Apr 2023 Machine Age hrs Client Info 29441 29072 28882 Oil Age hrs Client Info 0 0 0 0 Oil Changed Client Info N/A Not Changd Not Changd <th>SAMPLE INFOR</th> <th>MATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 29441 29072 28882 Oil Age hrs Client Info 0 0 0 0 Oil Changed Client Info NI/A Not Changd Not Changd Sample Status SEVERE SEVERE SEVERE CONTAMINATION method limit/base current history1 history2 Water WC Method NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >0 7 29 16 Chromium ppm ASTM D5185m >20 <1 2 1 Titanium ppm ASTM D5185m >4 1 2 1 Titanium ppm ASTM D5185m >0 0 0 Aluminum ppm ASTM D5185m >40 <1 2 <1 Copper ppm ASTM D5185m >40 <1 2 <1 Copper ppm ASTM D5185m >40 <1 2 <1 Cadmium ppm ASTM D5185m >0 0 0 ADDITIVES method limit/base current history1 history2 ADDITIVES method limit	Sample Number		Client Info		GFL0098619	GFL0083775	GFL0070404
Oil Age hrs Client Info N/A Not Changd	Sample Date		Client Info		16 Nov 2023	06 Jun 2023	27 Apr 2023
Oil Changed Sample Status Client Info N/A Not Changed ABNORMAL Not Changed SEVERE Not Changed SEVERE	Machine Age	hrs	Client Info		29441	29072	28882
Sample Status ABNORMAL SEVERE SEVERE CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG NEG Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05185m >10.0 7 29 16 Chromium ppm ASTM 05185m >20 <1 2 1 Nickel ppm ASTM 05185m >4 1 2 1 Silver ppm ASTM 05185m >3 0 0 0 Aluminum ppm ASTM 05185m >40 <1 2 <1 Capper ppm ASTM 05185m >30 <1 2 <1 Capper ppm ASTM 05185m >40 <1 2 <1 Capper ppm AS	Oil Age	hrs	Client Info		0	0	0
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Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1 2 1 Nickel ppm ASTM D5185m >4 1 2 1 Titanium ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >40 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	7	29	16
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	2	1
Silver	Nickel	ppm	ASTM D5185m	>4	1	2	1
Aluminum ppm ASTM D5185m >20 2 3 <1 Lead ppm ASTM D5185m >40 <1 2 <1 Copper ppm ASTM D5185m >330 <1 2 <1 Tin ppm ASTM D5185m >15 <1 <1 <1 <1 Vanadium ppm ASTM D5185m 0 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 0 Magnesium ppm ASTM D5185m 1010 768 731 793 Calcium ppm ASTM D5185m 1070 983 899 953 Phosphorus ppm ASTM D5185m 1150 982 806 895 Zinc ppm ASTM D5185m 1270 1086 989 1086 Sulfur ppm ASTM D5185m 1270 1086 989 1086 Sulfur ppm ASTM D5185m 2060 2847 2446 2449 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D5185m >20 2 18 2 Fuel % ASTM D5185m >20 0 2 0.4 0.3 INFRA-RED method limit/base current history1 history2 Soot % % "ASTM D7844 >3 0.2 0.4 0.3 INFRA-RED method limit/base current history1 history2 Soot % % "ASTM D7845 >20 6.3 10.1 8.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm "ASTM D7415 >30 18.4 23.0 18.0	Titanium	ppm	ASTM D5185m		<1	<1	<1
Lead ppm ASTM D5185m >40 <1 2 <1 Copper ppm ASTM D5185m >330 <1 2 <1 Tin ppm ASTM D5185m >15 <1 <1 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 9 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper ppm ASTM D5185m >330 <1 2 <1 Tin ppm ASTM D5185m >15 <1	Aluminum	ppm	ASTM D5185m	>20	2	3	<1
Tin ppm ASTM D5185m >15 <1 <1 <1 <1 C1	Lead	ppm	ASTM D5185m	>40	<1	2	<1
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ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 9 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 51 50 52 Manganese ppm ASTM D5185m 0 <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 9 0 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 51 50 52 Manganese ppm ASTM D5185m 0 <1 <1 <1 <1	Cadmium	ppm	ASTM D5185m		0	0	0
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Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 768 731 793 Calcium ppm ASTM D5185m 1070 983 899 953 Phosphorus ppm ASTM D5185m 1150 982 806 895 Zinc ppm ASTM D5185m 1270 1086 989 1086 Sulfur ppm ASTM D5185m 2060 2847 2446 2449 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 6 Sodium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D5185m >20 2 18 2 Fuel % ASTM D5185m >20 2 18 2 Fuel % ASTM D5185m >20 <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>0</th> <td>0</td> <td>0</td>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 768 731 793 Calcium ppm ASTM D5185m 1070 983 899 953 Phosphorus ppm ASTM D5185m 1150 982 806 895 Zinc ppm ASTM D5185m 1270 1086 989 1086 Sulfur ppm ASTM D5185m 2060 2847 2446 2449 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 6 Sodium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D544 >3 0.2 <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>60</td> <th>51</th> <td>50</td> <td>52</td>	Molybdenum	ppm	ASTM D5185m	60	51	50	52
Calcium ppm ASTM D5185m 1070 983 899 953 Phosphorus ppm ASTM D5185m 1150 982 806 895 Zinc ppm ASTM D5185m 1270 1086 989 1086 Sulfur ppm ASTM D5185m 2060 2847 2446 2449 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 6 Sodium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D5185m >20 2 18 2 Fuel % ASTM D5185m >20 2 18 2 Fuel % ASTM D5185m >20 4.6 12.3 15.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20	Manganese	ppm	ASTM D5185m	0	<1		<1
Phosphorus ppm ASTM D5185m 1150 982 806 895 Zinc ppm ASTM D5185m 1270 1086 989 1086 Sulfur ppm ASTM D5185m 2060 2847 2446 2449 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 6 Sodium ppm ASTM D5185m 23 19 6 Potassium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D3524 >2.0 4.6 12.3 15.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/.1mm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30	Magnesium	ppm	ASTM D5185m	1010	768	731	793
Zinc ppm ASTM D5185m 1270 1086 989 1086 Sulfur ppm ASTM D5185m 2060 2847 2446 2449 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 6 Sodium ppm ASTM D5185m 23 19 6 Potassium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D3524 >2.0 ▲ 4.6 12.3 15.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit	Calcium	ppm	ASTM D5185m	1070	983	899	953
Sulfur ppm ASTM D5185m 2060 2847 2446 2449 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 6 Sodium ppm ASTM D5185m 23 19 6 Potassium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D3524 >2.0 ▲ 4.6 12.3 15.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >	Phosphorus	ppm	ASTM D5185m	1150	982	806	895
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 6 Sodium ppm ASTM D5185m 23 19 6 Potassium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D3524 >2.0 ▲ 4.6 12.3 15.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	Zinc	ppm	ASTM D5185m	1270	1086	989	1086
Silicon ppm ASTM D5185m >25 5 7 6 Sodium ppm ASTM D5185m 23 19 6 Potassium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D3524 >2.0 ▲ 4.6 12.3 15.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	Sulfur	ppm	ASTM D5185m	2060	2847	2446	2449
Sodium ppm ASTM D5185m 23 19 6 Potassium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D3524 >2.0 ▲ 4.6 ■ 12.3 ■ 15.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 18 2 Fuel % ASTM D3524 >2.0 ▲ 4.6 ■ 12.3 ■ 15.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	Silicon	ppm	ASTM D5185m	>25	5	7	6
Fuel % ASTM D3524 >2.0 ▲ 4.6 ♠ 12.3 ♠ 15.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	Sodium	ppm	ASTM D5185m		23	19	6
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	Potassium	ppm	ASTM D5185m	>20	2	18	
Soot % % *ASTM D7844 >3 0.2 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	Fuel	%	ASTM D3524	>2.0	4.6	12.3	15.3
Nitration Abs/cm *ASTM D7624 >20 6.3 10.1 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.4 23.0 18.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	Soot %	%	*ASTM D7844	>3	0.2	0.4	0.3
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	Nitration	Abs/cm	*ASTM D7624	>20	6.3	10.1	8.0
Oxidation Abs/.1mm *ASTM D7414 >25 14.2 21.3 17.0	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.4	23.0	18.0
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.7 5.9 6.3	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.2	21.3	17.0
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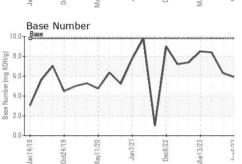
OIL ANALYSIS REPORT



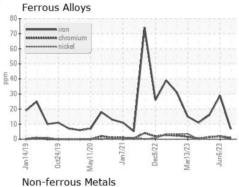
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
	DTIEO					

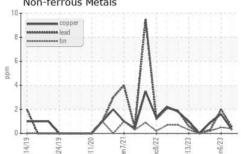
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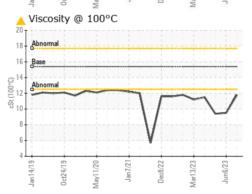


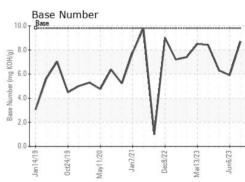


GRAPHS













Certificate L2367

Laboratory Sample No. Lab Number Unique Number

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0098619 : 06017115

: 10756259

Received : 24 Nov 2023 Diagnosed : 28 Nov 2023 Diagnostician : Wes Davis

Test Package : FLEET (Additional Tests: PercentFuel) 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)

GFL Environmental - 837 - Harrison TS

22820 S State Route 291 Harrisonville, MO US 64701

Contact: Robert Hart

T: (580)461-1509 F: