

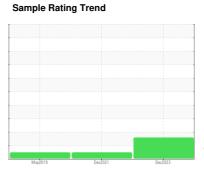
# **OIL ANALYSIS REPORT**

# GM Seattle Off Raod Shop [GM Seattle Off Raod Shop] 26-213

Component

**Transmission** 

**CHEVRON DRIVE TRAIN FLUID HD 30 (--- GAL)** 





## **DIAGNOSIS**

### Recommendation

We advise that you check for the source of water entry. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is a moderate concentration of water present in the fluid. The amount and size of particulates present in the system are acceptable.

#### **Fluid Condition**

The AN level is acceptable for this fluid. The condition of the fluid is suitable for further service.

Sample Date   Client Info   04 Dec 2023   02 Dec 2021   31 May 2019   Machine Age   hrs   Client Info   9724   8523   7641	GAL)		Ma	ny2019	Dec2021 Dec20	123	
Sample Date   Client Info   04 Dec 2023   02 Dec 2021   31 May 2019   Machine Age   hrs   Client Info   9724   8523   7641	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         9724         8523         7641           Oil Age         hrs         Client Info         9724         1823         941           Oil Changed         Client Info         9724         1823         941           Sample Status         More Changed         Not Changd         Not Changd         Not Changd           WEAR METALS         method         limit/base         current         history1         history2           PQ         ASTM D5185m         200         12         18         10           Chromium         ppm         ASTM D5185m         >200         12         18         10           Chromium         ppm         ASTM D5185m         >200         12         18         10           Chromium         ppm         ASTM D5185m         >20         1         0         0           Nickel         ppm         ASTM D5185m         >50         2	Sample Number		Client Info		PE0002177	PE12290975	PE12291953
Oil Age         hrs         Client Info         9724         1823         941           Oil Changed Sample Status         Client Info         Changed ABNORMAL         Not Changd Not Changd Not Changd Not Changd NoRMAL         Not Changd NoRMAL         Not Changd NoRMAL         NoRMAL <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <td>04 Dec 2023</td> <td>02 Dec 2021</td> <td>31 May 2019</td>	Sample Date		Client Info		04 Dec 2023	02 Dec 2021	31 May 2019
Client Info   Changed ABNORMAL   Not Changed NORMAL	Machine Age	hrs	Client Info		9724	8523	7641
WEAR METALS         method         limit/base         current         history1         history2           PQ         ASTM D8184         16             Iron         ppm         ASTM D5185m         >200         12         18         10           Chromium         ppm         ASTM D5185m         >10         1         0         0           Nickel         ppm         ASTM D5185m         0         0         0         0           Titcanium         ppm         ASTM D5185m         >50         2         2         2         2           Aluminum         ppm         ASTM D5185m         >50         2 <t< td=""><td>Oil Age</td><td>hrs</td><td>Client Info</td><td></td><td>9724</td><td>1823</td><td>941</td></t<>	Oil Age	hrs	Client Info		9724	1823	941
WEAR METALS         method         limit/base         current         history1         history2           PQ         ASTM D8184         16             Iron         ppm         ASTM D8185m         >200         12         18         10           Chromium         ppm         ASTM D8185m         >10         <1	Oil Changed		Client Info		Changed	Not Changd	Not Changd
PQ         ASTM D8184 Iron         16             Iron         ppm         ASTM D8185m         >200         12         18         10           Chromium         ppm         ASTM D8185m         >10         <1         0         0           Nickel         ppm         ASTM D8185m         0         0         0         0           Titanium         ppm         ASTM D8185m         0         <1         1         0           Silver         ppm         ASTM D8185m         50         2         2         2         2           Aluminum         ppm         ASTM D8185m         >50         <1         1         0         0           Copper         ppm         ASTM D8185m         >50         <1         1         0         0           Copper         ppm         ASTM D8185m         >50         <1         1         0         0           Tin         ppm         ASTM D8185m         >10         0         0         0         0           Calcium         ppm         ASTM D8185m         0         0         0         0         0           Barium         ppm         ASTM D8185m <td>Sample Status</td> <td></td> <td></td> <td></td> <td>ABNORMAL</td> <td>NORMAL</td> <td>NORMAL</td>	Sample Status				ABNORMAL	NORMAL	NORMAL
Iron	WEAR METALS		method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185m         >10         <1         0         0           Nickel         ppm         ASTM D5185m         0         0         0         0           Titanium         ppm         ASTM D5185m          1         0         0           Siliver         ppm         ASTM D5185m         >50         2         2         2         2           Lead         ppm         ASTM D5185m         >50         <1         1         0           Copper         ppm         ASTM D5185m         >50         <1         1         0           Copper         ppm         ASTM D5185m         >50         <1         1         0           Copper         ppm         ASTM D5185m         >10         0         0         0           Antimony         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limil/base         current         history1         history2           Barium         ppm         ASTM D5185m         0         0         0 <td>PQ</td> <td></td> <td>ASTM D8184</td> <td></td> <td>16</td> <td></td> <td></td>	PQ		ASTM D8184		16		
Nickel   ppm   ASTM D5185m   0   0   0   0   0   0   0   0   0	Iron	ppm	ASTM D5185m	>200	12	18	10
Titanium ppm ASTM D5185m	Chromium	ppm	ASTM D5185m	>10	<1	0	0
Silver	Nickel	ppm	ASTM D5185m		0	0	0
Aluminum         ppm         ASTM D5185m         >50         2         2         2         2           Lead         ppm         ASTM D5185m         >50         <1	Titanium	ppm	ASTM D5185m		<1	0	0
Lead         ppm         ASTM D5185m         >50         <1         1         0           Copper         ppm         ASTM D5185m         >200         4         8         5           Tin         ppm         ASTM D5185m         >10         0         0         0           Antimony         ppm         ASTM D5185m         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           Boron         ppm         ASTM D5185m         17         39         45         8           Barium         ppm         ASTM D5185m         0         0         0         0           Mangesium         ppm         ASTM D5185m         5         9         11         1	Silver	ppm	ASTM D5185m		0	<1	1
Copper         ppm         ASTM D5185m         >200         4         8         5           Tin         ppm         ASTM D5185m         >10         0         0         0           Antimony         ppm         ASTM D5185m          0            Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0           Barium         ppm         ASTM D5185m         5         9         11           Manganese         ppm         ASTM D5185m         32         30         41           Magnesium         ppm         ASTM D5185m         32         30         41           Phosphorus         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         937         961         924	Aluminum	ppm	ASTM D5185m	>50	2	2	2
Tin	Lead	ppm	ASTM D5185m	>50	<1	1	0
Antimony ppm ASTM D5185m	Copper	ppm	ASTM D5185m	>200	4	8	5
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         17         39         45           Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         5         9         11           Manganese         ppm         ASTM D5185m         32         30         41           Manganesium         ppm         ASTM D5185m         32         30         41           Calcium         ppm         ASTM D5185m         4208         3578         4407           Phosphorus         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         history	Tin	ppm	ASTM D5185m	>10	0	0	0
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         17         39         45           Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         5         9         11           Manganese         ppm         ASTM D5185m         0             Magnesium         ppm         ASTM D5185m         32         30         41           Calcium         ppm         ASTM D5185m         4208         3578         4407           Phosphorus         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         4986             Sulfur         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         histo	Antimony	ppm	ASTM D5185m			0	
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 17 39 45 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 5 9 11 Manganese ppm ASTM D5185m 0 0 0 0 0 Magnesium ppm ASTM D5185m 32 30 41 Calcium ppm ASTM D5185m 32 30 41 Calcium ppm ASTM D5185m 937 961 924 Zinc ppm ASTM D5185m 937 961 924 Zinc ppm ASTM D5185m 1154 1149 1118 Sulfur ppm ASTM D5185m 4986  CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 0 2 2 2 Potassium ppm ASTM D5185m 0 2 2 2 Potassium ppm ASTM D5185m 0 2 2 2 Potassium ppm ASTM D5185m >20 2 0 4 Water % ASTM D5185m >20 2 0 4 Water % ASTM D5185m >20 2 172  FLUID CLEANLINESS method limit/base current history1 history2  Particles >4μm ASTM D50304 >1000 4370 2172  FLUID CLEANLINESS method limit/base current history1 history2  Particles >6μm ASTM D7647 >2500 834 853  Particles >14μm ASTM D7647 >2500 834 853  Particles >21μm ASTM D7647 >320 142 103  Particles >21μm ASTM D7647 >20 7 6  Particles >38μm ASTM D7647 >4 1	Cadmium	ppm	ASTM D5185m		0		
Barium         ppm         ASTM D5185m         0         0         0           Molybdenum         ppm         ASTM D5185m         5         9         11           Manganese         ppm         ASTM D5185m         0             Magnesium         ppm         ASTM D5185m         32         30         41           Calcium         ppm         ASTM D5185m         4208         3578         4407           Phosphorus         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         1154         1149         1118           Sulfur         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D5185m         >20         2         0         4           Water         %         ASTM D6304         >0.1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         5         9         11           Manganese         ppm         ASTM D5185m         0             Magnesium         ppm         ASTM D5185m         32         30         41           Calcium         ppm         ASTM D5185m         4208         3578         4407           Phosphorus         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D5185m         >20         2         0         4           Water         %         ASTM D6304         >0.1         0.437             Particles > 4µm         ASTM D7647 <t< td=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td></td><td>17</td><td>39</td><td>45</td></t<>	Boron	ppm	ASTM D5185m		17	39	45
Manganese         ppm         ASTM D5185m         0             Magnesium         ppm         ASTM D5185m         32         30         41           Calcium         ppm         ASTM D5185m         4208         3578         4407           Phosphorus         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         1154         1149         1118           Sulfur         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D5185m         >20         2         0         4           Water         %         ASTM D6304         >0.1         0.437             ppm Water         ppm         ASTM D6304         >1000         4370         2172            FLUID CLEANLINESS	Barium	ppm	ASTM D5185m		0	0	0
Magnesium         ppm         ASTM D5185m         32         30         41           Calcium         ppm         ASTM D5185m         4208         3578         4407           Phosphorus         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         1154         1149         1118           Sulfur         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         >20         2         2           Potassium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D5185m         >20         2         0         4           Water         %         ASTM D6304         >0.1         0.437             ppm Water         ppm         ASTM D6304         >1000         4370         2172            FLUID CLEANLINESS	Molybdenum	ppm	ASTM D5185m		5	9	11
Calcium         ppm         ASTM D5185m         4208         3578         4407           Phosphorus         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         1154         1149         1118           Sulfur         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         >20         2         2         2           Potassium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D6304         >0.1         ▲ 0.437             ppm Water         ppm         ASTM D6304         >1000         ▲ 4370         2172            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >2500         834          853	Manganese	ppm	ASTM D5185m		0		
Phosphorus         ppm         ASTM D5185m         937         961         924           Zinc         ppm         ASTM D5185m         1154         1149         1118           Sulfur         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         >20         2         2           Potassium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D5185m         >20         2         0         4           Water         %         ASTM D6304         >0.1         ▲ 0.437             Puture         %         ASTM D6304         >1000         ▲ 4370         2172            Particles >4µm         ASTM D7647         >10000         1531          7865	Magnesium	ppm	ASTM D5185m		32	30	41
Zinc         ppm         ASTM D5185m         1154         1149         1118           Sulfur         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         0         2         2         2           Potassium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D5185m         >20         2         0         4           Water         %         ASTM D5185m         >0         2         2         2           Potassium         ppm         ASTM D6304         >0.1         ▲ 0.437             Water         %         ASTM D6304         >0.1         ▲ 0.437             ppm Water         ppm         ASTM D6304         >1000         ▲ 4370         2172            FLUID CLEANLINESS         method         limit/base         current         history1	Calcium	ppm	ASTM D5185m		4208	3578	4407
Sulfur         ppm         ASTM D5185m         4986             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         0         2         2         2           Potassium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D5185m         >20         2         0         4           Water         %         ASTM D5185m         >0         2         2         0         4           Water         %         ASTM D6304         >0.1         ▲ 0.437             ppm Water         ppm         ASTM D6304         >1000         ▲ 4370         2172            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >2500         834          853           Particles >21μm         ASTM D7647         >320         142	Phosphorus	ppm	ASTM D5185m		937	961	924
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         8         7         7           Sodium         ppm         ASTM D5185m         0         2         2           Potassium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D6304         >0.1         ▲ 0.437             ppm Water         ppm         ASTM D6304         >1000         ▲ 4370         2172            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >10000         1531          7865           Particles >6µm         ASTM D7647         >2500         834          853           Particles >1µm         ASTM D7647         >320         142          103           Particles >21µm         ASTM D7647         >80         48          6           Particles >71µm         ASTM D7647         >4         1 <td>Zinc</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <td>1154</td> <td>1149</td> <td>1118</td>	Zinc	ppm	ASTM D5185m		1154	1149	1118
Silicon       ppm       ASTM D5185m       >50       8       7       7         Sodium       ppm       ASTM D5185m       0       2       2         Potassium       ppm       ASTM D5185m       >20       2       0       4         Water       %       ASTM D6304       >0.1       0.437           ppm Water       ppm       ASTM D6304       >1000       4370       2172          FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4μm       ASTM D7647       >10000       1531        7865         Particles >6μm       ASTM D7647       >2500       834        853         Particles >14μm       ASTM D7647       >320       142        103         Particles >21μm       ASTM D7647       >20       7        6         Particles >71μm       ASTM D7647       >4       1	Sulfur	ppm	ASTM D5185m		4986		
Sodium         ppm         ASTM D5185m         0         2         2           Potassium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D6304         >0.1         ▲ 0.437             ppm Water         ppm         ASTM D6304         >1000         ▲ 4370         2172            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >10000         1531          7865           Particles >6μm         ASTM D7647         >2500         834          853           Particles >14μm         ASTM D7647         >320         142          103           Particles >21μm         ASTM D7647         >80         48          35           Particles >38μm         ASTM D7647         >20         7          6           Particles >71μm         ASTM D7647         >4         1	CONTAMINANT	S	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         2         0         4           Water         %         ASTM D6304         >0.1         ▲ 0.437             ppm         ASTM D6304         >1000         ▲ 4370         2172            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >10000         1531          7865           Particles >6μm         ASTM D7647         >2500         834          853           Particles >14μm         ASTM D7647         >320         142          103           Particles >21μm         ASTM D7647         >80         48          35           Particles >38μm         ASTM D7647         >20         7          6           Particles >71μm         ASTM D7647         >4         1		ppm				7	7
Water         %         ASTM D6304         >0.1         ▲ 0.437             ppm Water         ppm ASTM D6304         >1000         ▲ 4370         2172            FLUID CLEANLINESS method limit/base current history1         history2           Particles >4μm         ASTM D7647         >10000         1531          7865           Particles >6μm         ASTM D7647         >2500         834          853           Particles >14μm         ASTM D7647         >320         142          103           Particles >21μm         ASTM D7647         >80         48          35           Particles >38μm         ASTM D7647         >20         7          6           Particles >71μm         ASTM D7647         >4         1	Sodium	ppm	ASTM D5185m		0	2	2
ppm Water         ppm         ASTM D6304         >1000         ▲ 4370         2172            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >10000         1531          7865           Particles >6μm         ASTM D7647         >2500         834          853           Particles >14μm         ASTM D7647         >320         142          103           Particles >21μm         ASTM D7647         >80         48          35           Particles >38μm         ASTM D7647         >20         7          6           Particles >71μm         ASTM D7647         >4         1	Potassium	ppm	ASTM D5185m	>20	2	0	4
FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >10000         1531          7865           Particles >6μm         ASTM D7647         >2500         834          853           Particles >14μm         ASTM D7647         >320         142          103           Particles >21μm         ASTM D7647         >80         48          35           Particles >38μm         ASTM D7647         >20         7          6           Particles >71μm         ASTM D7647         >4         1	Water	%	ASTM D6304	>0.1	<u> </u>		
Particles >4μm         ASTM D7647         >10000         1531          7865           Particles >6μm         ASTM D7647         >2500         834          853           Particles >14μm         ASTM D7647         >320         142          103           Particles >21μm         ASTM D7647         >80         48          35           Particles >38μm         ASTM D7647         >20         7          6           Particles >71μm         ASTM D7647         >4         1	ppm Water	ppm	ASTM D6304	>1000	<b>4370</b>	2172	
Particles >6μm       ASTM D7647       >2500       834        853         Particles >14μm       ASTM D7647       >320       142        103         Particles >21μm       ASTM D7647       >80       48        35         Particles >38μm       ASTM D7647       >20       7        6         Particles >71μm       ASTM D7647       >4       1	FLUID CLEANLI	NESS	method	limit/base	current	history1	history2
Particles >14μm         ASTM D7647         >320         142          103           Particles >21μm         ASTM D7647         >80         48          35           Particles >38μm         ASTM D7647         >20         7          6           Particles >71μm         ASTM D7647         >4         1	Particles >4μm		ASTM D7647	>10000	1531		7865
Particles >21μm       ASTM D7647       >80       48        35         Particles >38μm       ASTM D7647       >20       7        6         Particles >71μm       ASTM D7647       >4       1	Particles >6µm		ASTM D7647	>2500	834		853
Particles >38μm       ASTM D7647       >20       7        6         Particles >71μm       ASTM D7647       >4       1	Particles >14µm		ASTM D7647	>320	142		103
Particles >71μm ASTM D7647 >4 1				>80	48		35
·	Particles >38µm		ASTM D7647	>20	7		6
Oil Cleanliness ISO 4406 (c) >20/18/15 <b>18/17/14</b> 21/16/13 20/17/14	Particles >71μm		ASTM D7647	>4	1		
	Oil Cleanliness		ISO 4406 (c)	>20/18/15	18/17/14	21/16/13	20/17/14



# **OIL ANALYSIS REPORT**







**Unique Number** 

Test Package

: 10831507

Diagnostician : Jonathan Hester

: CONST ( Additional Tests: ICP, KF, KV40, PQ, PrtCount, SCREEN ) 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)

US 98108

Contact: Jesse Patterson oilsamples@gmccinc.com T: 1(866)292-1303 F: