

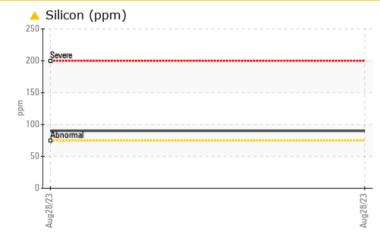
# **PROBLEM SUMMARY**

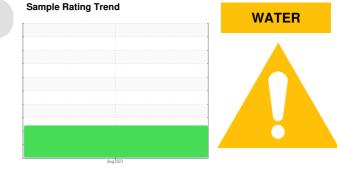
#### Area **TULSA** [19097] Machine Id **40-238** Component

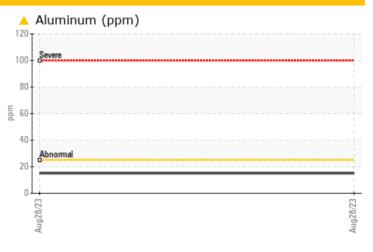
**Right Final Drive** 

CONOCO PHILLIPS GUARDOL ECT 15W40 (--- GAL)

## COMPONENT CONDITION SUMMARY







#### RECOMMENDATION

We advise that you check all areas where dirt can enter the system. The oil change at the time of sampling has been noted. Resample at the next service interval to monitor.

### PROBLEMATIC TEST RESULTS

Sample Status				ABNORMAL	 
Aluminum	ppm	ASTM D5185m	>25	🔺 15	 
Silicon	ppm	ASTM D5185m	>75	<mark>/</mark> 90	 
Emulsified Water	scalar	*Visual	>0.2	<b>6.2%</b>	 

Customer Id: MANTUL Sample No.: WC0818618 Lab Number: 05968459 Test Package: CONST



To manage this report scan the QR code

*To discuss the diagnosis or test data:* Doug Bogart +1 (800)237-1369 x4016 <u>dougb@wearcheckusa.com</u>

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

RECOMMENDED AC	RECOMMENDED ACTIONS				
Action	Status	Date	Done By	Description	
Check Dirt Access			?	We advise that you check all areas where dirt can enter the system.	

HISTORICAL DIAGNOSIS



## **OIL ANALYSIS REPORT**

## Area **TULSA** [19097] **40-238** Component

Right Final Drive

CONOCO PHILLIPS GUARDOL ECT 15W40 (--- GAL)

#### DIAGNOSIS

#### Recommendation

We advise that you check all areas where dirt can enter the system. The oil 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

Elemental levels of silicon (Si) and aluminum (AI) indicate alumina-silicate (coarse dirt) ingress.

#### Fluid Condition

The condition of the oil is acceptable for the time in service.

Machine Age      hrs      Client Info      3145          Oil Age      hrs      Client Info      3145          Sample Status      Client Info      Changed          WEAR METALS      method      Imit/base      current      history1      history2        Iron      ppm      ASTM D5185m      >500      175          Chromium      ppm      ASTM D5185m      >10      1          Silver      ppm      ASTM D5185m      >10      1          Auminum      ppm      ASTM D5185m      >25      <1          Auminum      ppm      ASTM D5185m      >25      <1          Auminum      ppm      ASTM D5185m      >10      0          Auminum      ppm      ASTM D5185m      >16           Auminum      ppm      ASTM D5185m      >10      0 <th>( GAL)</th> <th></th> <th></th> <th></th> <th>Aug2023</th> <th></th> <th></th>	( GAL)				Aug2023		
Sample Date      Client Info      28 Aug 2023          Machine Age      hrs      Client Info      3145          Oil Age      hrs      Client Info      3145          Sample Status      Client Info      Changed          WEAR METALS      method      limit/base      current      history1      history2        Iron      ppm      ASTM 05185m      >10      8          Nickel      ppm      ASTM 05185m      >10      1          Auminum      ppm      ASTM 05185m      >25      <1          Aduminum      ppm      ASTM 05185m      >25      <1          Aduminum      ppm      ASTM 05185m      >50      8          Vanadium      ppm      ASTM 05185m      >50      8          Adminum      ppm      ASTM 05185m      50      8 <td< th=""><th>SAMPLE INFORM</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<>	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Date      Client Info      28 Aug 2023          Machine Age      hrs      Client Info      3145          Oil Age      hrs      Client Info      3145          Sample Status      Client Info      Changed           WEAR METALS      method      limit/base      current      history1      ////////////////////////////////////	Sample Number		Client Info		WC0818618		
Oil Age      hrs      Client Info      3145          Oil Changed      Client Info      Changed          Sample Status      Imitbase      current      history1      history2        KeAR METALS      method      Imitbase      current      history1      history2        Chromium      ppm      ASTM 05185m      >10      8          Nickel      ppm      ASTM 05185m      >10      1          Aluminum      ppm      ASTM 05185m      >10      1          Auminum      ppm      ASTM 05185m      >25      <1	Sample Date		Client Info		28 Aug 2023		
Oil Changed      Client Info      Changed          Sample Status      Image      ABNORMAL          WEAR METALS      method      limit/base      current      history1      history2        Iron      ppm      ASTM 05165m      >500      175          Chromium      ppm      ASTM 05165m      >10      1          Nickel      ppm      ASTM 05165m      >10      1          Auminum      ppm      ASTM 05165m      >25      <1	Machine Age	hrs	Client Info		3145		
Sample Status      method      Imit/base      current      history1      history2        Iron      ppm      ASTM D5185n      >500      175          Chromium      ppm      ASTM D5185n      >10      8          Nickel      ppm      ASTM D5185n      >10      1          Silver      ppm      ASTM D5185n      >10      1          ABumium      ppm      ASTM D5185n      >25      <1	Oil Age	hrs	Client Info		3145		
Sample Status      method      Imit/base      current      history1      history2        Iron      ppm      ASTM D5185n      >500      175          Chromium      ppm      ASTM D5185n      >10      8          Nickel      ppm      ASTM D5185n      >10      1          Silver      ppm      ASTM D5185n      >10      1          ABumium      ppm      ASTM D5185n      >25      <1	Oil Changed		Client Info		Changed		
Iron      ppm      ASTM D5185n      >500      175          Chromium      ppm      ASTM D5185n      >10      8          Nickel      ppm      ASTM D5185n      >10      1          Silver      ppm      ASTM D5185n      >10      1          Aluminum      ppm      ASTM D5185n      >25      <1	-				-		
Chromium      ppm      ASTM D5185m      >10      8          Nickel      ppm      ASTM D5185m      >10      1          Silver      ppm      ASTM D5185m      >25      15          Aluminum      ppm      ASTM D5185m      >25      <15          Lead      ppm      ASTM D5185m      >25      <1          Vanadium      ppm      ASTM D5185m      >50      8          Vanadium      ppm      ASTM D5185m      >10      0          Vanadium      ppm      ASTM D5185m      <1           Vanadium      ppm      ASTM D5185m      <1           ADDITIVES      method      limit/base      current      history1      history2        Barium      ppm      ASTM D5185m      100      941          Magnesium      ppm      ASTM D5185m      10	WEAR METALS		method	limit/base	current	history1	history2
Nickel      ppm      ASTM D5185m      >10      1          Titanium      ppm      ASTM D5185m      -           Silver      ppm      ASTM D5185m      -25      ▲ 15          Aluminum      ppm      ASTM D5185m      >25      <1	Iron	ppm	ASTM D5185m	>500	175		
Titanium      ppm      ASTM D5185m      1          Silver      ppm      ASTM D5185m      >25      15          Aluminum      ppm      ASTM D5185m      >25      <15	Chromium	ppm	ASTM D5185m	>10	8		
Silver      ppm      ASTM D5185m      <1          Aluminum      ppm      ASTM D5185m      >25      ▲ 15          Lead      ppm      ASTM D5185m      >50      8          Copper      ppm      ASTM D5185m      >50      8          Tin      ppm      ASTM D5185m      >10      0          Addmium      ppm      ASTM D5185m      >10      0          ADDITIVES      method      limit/base      current      history1      history2        Boron      ppm      ASTM D5185m      85      8	Nickel	ppm	ASTM D5185m	>10	1		
Aluminum    ppm    ASTM D5185m    >25    ▲ 15        Lead    ppm    ASTM D5185m    >25    <1	Titanium	ppm	ASTM D5185m		1		
Lead      ppm      ASTM D5185m      >25      <1          Copper      ppm      ASTM D5185m      >50      8          Vanadium      ppm      ASTM D5185m      >10      0          Addium      ppm      ASTM D5185m      <1	Silver	ppm	ASTM D5185m		<1		
Lead      ppm      ASTM D5185m      >25      <1          Copper      ppm      ASTM D5185m      >50      8          Vanadium      ppm      ASTM D5185m      >10      0          Addition      ppm      ASTM D5185m      <1	Aluminum	ppm	ASTM D5185m	>25	<u> </u>		
Copper      ppm      ASTM D5185m      >50      8          Tin      ppm      ASTM D5185m      >10      0          Vanadium      ppm      ASTM D5185m      <1	Lead		ASTM D5185m	>25	<1		
Tin      ppm      ASTM D5185m      >10      0          Vanadium      ppm      ASTM D5185m      <1					8		
Vanadium      ppm      ASTM D5185m      <1          Cadmium      ppm      ASTM D5185m      <1	Tin						
CadmiumppmASTM D5185m<1ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m8BariumppmASTM D5185m0MolybdenumppmASTM D5185m4MarganeseppmASTM D5185m35026MagnesiumppmASTM D5185m18004249PhosphorusppmASTM D5185m1000941ZincppmASTM D5185m1000941SulfurppmASTM D5185m1000941SulfurppmASTM D5185m35007270CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>203VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONEVISUALmethodlimit/basecurrenthistory1history2Silitscalar*VisualNONENONEVISUALmethodlimit/basecurrenthistory1history2SodiumppmASTM D5185m>203VisualNONENONENONE<							
Boron      ppm      ASTM D5185m      85      8          Barium      ppm      ASTM D5185m      0          Molybdenum      ppm      ASTM D5185m      4          Maganese      ppm      ASTM D5185m      350      26          Calcium      ppm      ASTM D5185m      1800      4249          Calcium      ppm      ASTM D5185m      1000      941          Zinc      ppm      ASTM D5185m      1000      941          Sulfur      ppm      ASTM D5185m      1000      941          Sulfur      ppm      ASTM D5185m      3500      7270          Solium      ppm      ASTM D5185m      >20      3          Sodium      ppm      ASTM D5185m      >20      3          VISUAL      method      limit/base      current							
Barium      ppm      ASTM D5185m      0          Molybdenum      ppm      ASTM D5185m      4          Manganese      ppm      ASTM D5185m      350      26          Magnesium      ppm      ASTM D5185m      350      26          Calcium      ppm      ASTM D5185m      1800      4249          Phosphorus      ppm      ASTM D5185m      1000      941          Zinc      ppm      ASTM D5185m      1000      941          Sulfur      ppm      ASTM D5185m      3500      7270          Solicon      ppm      ASTM D5185m      >75      ●      90          Solicon      ppm      ASTM D5185m      >20      3          VISUAL      method      limit/base      current      history1      history2        White Metal      scalar      *Visual      NONE	ADDITIVES		method	limit/base	current	history1	history2
MolybdenumppmASTM D5185m4MarganeseppmASTM D5185m35026CalciumppmASTM D5185m18004249PhosphorusppmASTM D5185m1000941ZincppmASTM D5185m1000941SulfurppmASTM D5185m11001141SulfurppmASTM D5185m35007270CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>75● 90SodiumppmASTM D5185m>75● 90VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONEYellow Metalscalar*VisualNONESiltscalar*VisualNONENONESiltscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLGoorscalar*VisualNORMLNORMLAppearancescalar*VisualNORMLNORMLFree Waterscalar <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td>85</td> <td>8</td> <td></td> <td></td>	Boron	ppm	ASTM D5185m	85	8		
Molybdenum    ppm    ASTM D5185m    4        Maganese    ppm    ASTM D5185m    350    26        Magnesium    ppm    ASTM D5185m    1800    4249        Calcium    ppm    ASTM D5185m    1800    941        Phosphorus    ppm    ASTM D5185m    1000    941        Zinc    ppm    ASTM D5185m    1000    941        Sulfur    ppm    ASTM D5185m    3500    7270        CONTAMINANTS    method    limit/base    current    history1    history2      Silicon    ppm    ASTM D5185m    >75    90        Sodium    ppm    ASTM D5185m    >20    3        VISUAL    method    limit/base    current    history1    history2      White Metal    scalar    *Visual    NONE    NONE        Yellow Metal    scalar    *Vis	Barium		ASTM D5185m		0		
Manganese    ppm    ASTM D5185m    2        Magnesium    ppm    ASTM D5185m    350    26        Calcium    ppm    ASTM D5185m    1800    4249        Phosphorus    ppm    ASTM D5185m    1000    941        Zinc    ppm    ASTM D5185m    1100    1141        Sulfur    ppm    ASTM D5185m    3500    7270        Sulfur    ppm    ASTM D5185m    3500    7270        Sodium    ppm    ASTM D5185m    >75    90        Sodium    ppm    ASTM D5185m    >20    3        VISUAL    method    limit/base    current    history1    history2      White Metal    scalar    *Visual    NONE        Yellow Metal    scalar    *Visual    NONE    NONE        Silt    scalar    *Visual <td>Molybdenum</td> <td></td> <td>ASTM D5185m</td> <td></td> <td>4</td> <td></td> <td></td>	Molybdenum		ASTM D5185m		4		
MagnesiumppmASTM D5185m35026CalciumppmASTM D5185m18004249PhosphorusppmASTM D5185m1000941ZincppmASTM D5185m11001141SulfurppmASTM D5185m35007270CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>75<	-		ASTM D5185m		2		
CalciumppmASTM D5185m18004249PhosphorusppmASTM D5185m1000941ZincppmASTM D5185m11001141SulfurppmASTM D5185m35007270CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>75▲ 90SodiumppmASTM D5185m>203PotassiumppmASTM D5185m>203VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONEYellow Metalscalar*VisualNONENONESiltscalar*VisualNONENONESiltscalar*VisualNONENONESiltscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLAppearancescalar*VisualNORMLNORMLFree Waterscalar*VisualNORMLNORMLFullD PROPERTIESmethodlimit/basecurrenthistory1histo	•		ASTM D5185m	350	26		
PhosphorusppmASTM D5185m1000941ZincppmASTM D5185m11001141SulfurppmASTM D5185m35007270CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>75▲ 90SodiumppmASTM D5185m>75▲ 90PotassiumppmASTM D5185m>203VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONEYellow Metalscalar*VisualNONENONESitscalar*VisualNONENONESitscalar*VisualNONENONESitscalar*VisualNONENONESand/Dirtscalar*VisualNORENONEAppearancescalar*VisualNORMLNORMLGodrscalar*VisualNORMLNORMLAppearancescalar*VisualNORMLNORMLFree Waterscalar*Visual>0.2▲ 0.2%FullD PROPERTIESmethodlimit/basecurrenthistory1history	-		ASTM D5185m	1800	4249		
ZincppmASTM D5185m11001141SulfurppmASTM D5185m35007270CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>75<							
SulfurppmASTM D5185m35007270CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>75<					-		
SiliconppmASTM D5185m< >7590SodiumppmASTM D5185m0PotassiumppmASTM D5185m>203VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONEYellow Metalscalar*VisualNONENONEPrecipitatescalar*VisualNONENONESiltscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.20.2%Free Waterscalar*VisualNORMLNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	Sulfur						
SodiumppmASTM D5185m0PotassiumppmASTM D5185m< >203VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONEYellow Metalscalar*VisualNONENONEYellow Metalscalar*VisualNONENONEPrecipitatescalar*VisualNONENONESiltscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLFree Waterscalar*Visual>0.20.2%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	CONTAMINANTS	6	method	limit/base	current	history1	history2
PotassiumppmASTM D5185m< >203VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONEYellow Metalscalar*VisualNONENONEYellow Metalscalar*VisualNONENONEPrecipitatescalar*VisualNONENONESiltscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLFree Waterscalar*Visual>0.20.2%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	Silicon	ppm	ASTM D5185m	>75	<b>4</b> 90		
VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONENONEYellow Metalscalar*VisualNONENONEPrecipitatescalar*VisualNONENONESiltscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLFree Waterscalar*Visual>0.2▲0.2%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	Sodium		ASTM D5185m		0		
White Metal    scalar    *Visual    NONE    NONE        Yellow Metal    scalar    *Visual    NONE    NONE        Precipitate    scalar    *Visual    NONE    NONE        Silt    scalar    *Visual    NONE    NONE        Debris    scalar    *Visual    NONE    NONE        Sand/Dirt    scalar    *Visual    NONE    NONE        Appearance    scalar    *Visual    NORML    NORML        Odor    scalar    *Visual    NORML    NORML        Emulsified Water    scalar    *Visual    >0.2    0.2%        Free Water    scalar    *Visual    >0.2    NEG        FLUID PROPERTIES    method    limit/base    current    history1    history2      Visc @ 40°C    cSt    ASTM D445    115    96.1	Potassium	ppm	ASTM D5185m	>20	3		
Yellow Metalscalar*VisualNONENONEPrecipitatescalar*VisualNONENONESiltscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2▲ 0.2%Free Waterscalar*VisualImit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	VISUAL		method	limit/base	current	history1	history2
Precipitatescalar*VisualNONENONESiltscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2▲ 0.2%Free Waterscalar*VisualNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	White Metal	scalar	*Visual	NONE	NONE		
Siltscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2▲ 0.2%Free Waterscalar*VisualNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	Yellow Metal	scalar	*Visual	NONE	NONE		
Debrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2▲ 0.2%Free Waterscalar*Visual>0.2NEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	Precipitate	scalar	*Visual	NONE	NONE		
Sand/Dirt  scalar  *Visual  NONE  NONE     Appearance  scalar  *Visual  NORML  NORML      Odor  scalar  *Visual  NORML  NORML      Odor  scalar  *Visual  NORML  NORML      Emulsified Water  scalar  *Visual  >0.2  ▲ 0.2%      Free Water  scalar  *Visual  >0.2  ▲ 0.2%      FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D445  115  96.1	Silt	scalar	*Visual	NONE	NONE		
Appearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.20.2%Free Waterscalar*VisualImit/baseNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	Debris	scalar	*Visual	NONE	NONE		
Appearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2▲ 0.2%Free Waterscalar*VisualNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D44511596.1	Sand/Dirt	scalar	*Visual	NONE	NONE		
NORML  NORML  NORML      Emulsified Water  scalar  *Visual  >0.2  0.2%      Free Water  scalar  *Visual  NEG      FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D445  115  96.1	Appearance	scalar					
Emulsified Water    scalar    *Visual    >0.2    0.2%        Free Water    scalar    *Visual    MEG        FLUID PROPERTIES    method    limit/base    current    history1    history2      Visc @ 40°C    cSt    ASTM D445    115    96.1	Odor		*Visual		NORML		
Free Water  scalar  *Visual  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D445  115  96.1	Emulsified Water						
Visc @ 40°C cSt ASTM D445 115 96.1	Free Water	scalar					
-	FLUID PROPERT	TIES	method	limit/base	current	history1	history2
	-	cSt	ASTM D445	115	96.1		

Sample Rating Trend

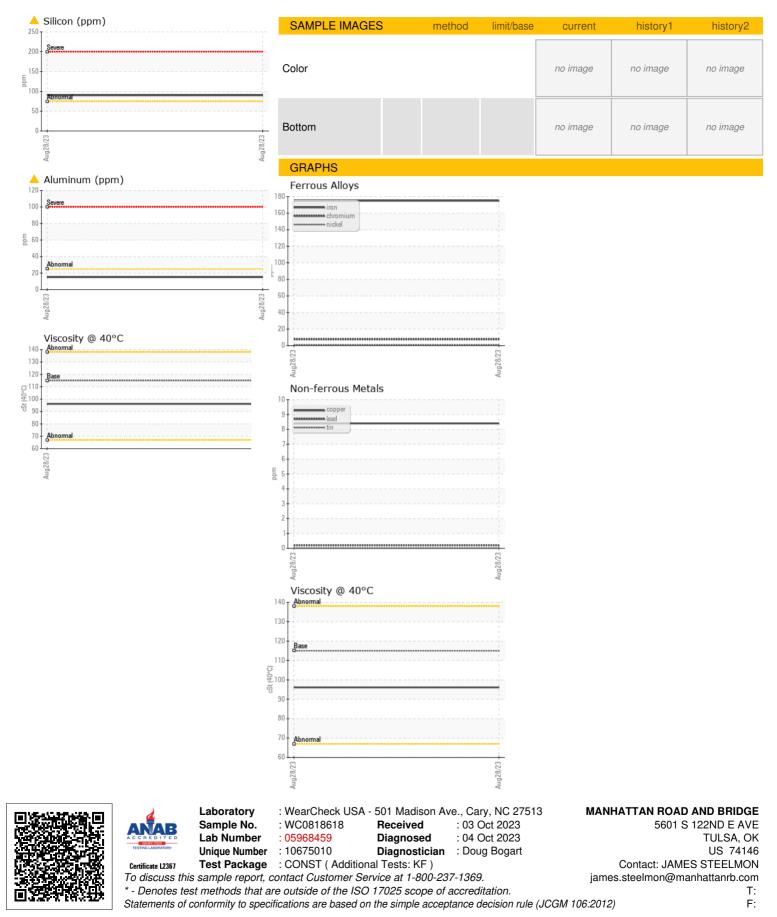
WATER

Report Id: MANTUL [WUSCAR] 05968459 (Generated: 10/05/2023 05:44:51) Rev: 1

Submitted By: JAMES STEELMON



# **OIL ANALYSIS REPORT**



Submitted By: JAMES STEELMON