

OIL ANALYSIS REPORT

Sample Rating Trend



Area MINING ME-032 CATERPILLAR 980M KRS03126 Hydraulic System

SHELL Spirax S4 CX 10W (--- GAL)



commendation sorretive action is recommendate this time, ample at the next service interval to monitor. In component wear rates are normal. Sample Date Client Info TO Warp 2024 component wear rates are normal. component wear rates are normal. Client Info NA	DIAGNOSIS	SAMPLE INFORMATIC	ON method	limit/base	current	history1	history2
corrective action is recommended at this time, ample at the next service interval to monitor. Sample Date Client Info 17 May 2020 omponent wear rates are normal. Onl Ape Hirs Client Info NA on so is using present in the oil. Sample Status Imathinable Current NI absorp? on is noise present in the oil. Sample Status Imathinable Current Nistory? Nistory? on is noise present in the oil. Sample Status Imathinable Current Nistory? Nistory? on oil is acceptable for this fluid. The fluid The METALS Imathinable Current Nistory? Nistory? Torn ppm ASTM DSISton 10	Recommendation	Sample Number	Client Info		WC0928526		
ample at the next service interval to monitor. Machine Age hrs Client Info 11535 onto ponent wear rates are normal. Oil Changed Client Info NA NA onto minitor res high apple duckets < 10	corrective action is recommended at this time.	Sample Date	Client Info		17 May 2024		
nonponent water and is any on the is in the image of the is any of the is an	ample at the next service interval to monitor.	Machine Age hrs	Client Info		11535		
omponent wear rates are normal. Oil Changed Cilent Info NABORMAL sa high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates < 14 or is a high amount of sit (particulates <	ar	Oil Age hrs	Client Info		0		
Sample Status Image ADNORMAL Image Image <td>component wear rates are normal.</td> <td>Oil Changed</td> <td>Client Info</td> <td></td> <td>N/A</td> <td></td> <td></td>	component wear rates are normal.	Oil Changed	Client Info		N/A		
re is a high amount of sill (particulates < 14 ons in size) present in the oil. d Condition AN level is acceptable for this fluid. The isition of the oil is suitable for further service. WEAR METALS without of the oil is suitable for further service. WEAR METALS without of the oil is suitable for further service. WEAR METALS without of the oil is suitable for further service. WEAR METALS without of the oil is suitable for further service. WEAR METALS without of the oil is suitable for further service. WEAR METALS without of the oil is suitable for further service. WEAR METALS without of the oil is suitable for further service. WEAR METALS without of the oil is suitable for further service. WEAR METALS without of the oil is suitable for further service. Nokel ppm ASTN 0518m >10 0 Silver ppm ASTN 0518m >10 0 Silver ppm ASTN 0518m >10 0 Copper ppm ASTN 0518m >10 0 Copper ppm ASTN 0518m >10 0 Commum ppm ASTN 0518m >10 0 Commum ppm ASTN 0518m >10 0 ADDITIVES with 0518m >10 0 ADDITIVES with 0518m >10 0 Magnesium ppm ASTN 0518m -0 Magnesium ppm ASTN 0518m -0 Magnesium ppm ASTN 0518m -0 Note of the oil instituates current history 1 Note of the oil of the oil of Note of the oil of Note of the oil of Magnesium ppm ASTN 0518m -0 Note of the oil of Silver ppm ASTN 0518m -0 Note of the oil of Note of	Contamination	Sample Status			ABNORMAL		
d Condition Weater WC Method >0.1 NEG AN level is acceptable for further service. Image and the oil is suitable for further service. MERA METALS method imit/base current history2 Image and the oil is suitable for further service. Image and the oil is suitable for further service. MERA METALS method imit/base current history2 Image and the oil is suitable for further service. Image and the oil is suitable for further service. MERA METALS method Silver and the oil is suitable for further service. Image and the oil is suitable for further service. Image and the oil is suitable for further service. MERA METALS method Image and the oil is suitable for further service. Image and the oil is suitable for further service. MERA METALS MERA METALS Image and the oil is suitable for further service. Image and the oil is suitable for further service. Image and the oil is suitable for further service. Image and the oil is suitable for further service. Image and the oil is suitable for further service. Image and the oil is suitable for further service. Image and the oil is suitable for further service. Image and the oil is suitable for further service. Image and the oil	ere is a high amount of silt (particulates < 14 crons in size) present in the oil.	CONTAMINATION	method	limit/base	current	history1	history2
M Iver AIM Immethod Immethods current History1 History2 Iron ppm ASTM D385m >20 8	id Condition	Water	WC Method	>0.1	NEG		
Iron ppm ASTM D5185m >20 8 C+	The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.	WEAR METALS	method	limit/base	current	history1	history2
Chromium ppm ASTM D5185m >10 Q1 Nickel ppm ASTM D5185m 0 Silver ppm ASTM D5185m 10 Q2 Aluminum ppm ASTM D5185m >10 Q Lead ppm ASTM D5185m >10 Q Copper ppm ASTM D5185m >10 Q		Iron ppm	ASTM D5185m	>20	8		
Nickel prm ASTM D515m - 0 Titanium ppm ASTM D515m 0 0 Aluminum ppm ASTM D515m 10 0 Lead ppm ASTM D515m >10 0 Copper ppm ASTM D515m >10 0 Vanadium ppm ASTM D515m >10 0 ADDITIVES method limit/base current historyl ADDITIVES method limit/base current historyl ADDITIVES method limit/base current historyl Manganese ppm ASTM D515m 1 4 Manganese ppm ASTM D515m 21 Sultar ppm ASTM D515m 20 10<		Chromium ppm	ASTM D5185m	>10	<1		
Titanium ppm ASTM D5185m 0 0		Nickel ppm	ASTM D5185m	>10	0		
Silver ppm ASTM D5185n >10 2 Aluminum ppm ASTM D5185n >10 0 Lead ppm ASTM D5185n >10 0 Copper ppm ASTM D5185n >10 0 Vanadium ppm ASTM D5185n >10 0 Cadmium ppm ASTM D5185n 0 ADDITIVES method Imit/base current history1 history2 Barino ppm ASTM D5185n 3 Manganese ppm ASTM D5185n 4 Manganese ppm ASTM D5185n 21 Calcium ppm ASTM D5185n 21 Sultur ppm ASTM D5185n >20 10 Sultur ppm ASTM D5185n		Titanium ppm	ASTM D5185m		0		
Aluminum ppm ASTM 05186n >1.0 2 Lead ppm ASTM 05185n >7.5 3 Copper prm ASTM 05185n >7.5 3 Tin ppm ASTM 05185n >10 0 Cadmium ppm ASTM 05185n >10 0 Cadmium ppm ASTM 05185n 0 ADDITIVES method Imit/base current history1 history2 Barium ppm ASTM 05185n 1 3 Marganese ppm ASTM 05185n 1 602 Marganese ppm ASTM 05185n 2 1 Zinc ppm ASTM 05185n 2 1 Suffur ppm ASTM 05185n 2 1 Suffur ppm ASTM 05185n 2 <t< td=""><td>Silver ppm</td><td>ASTM D5185m</td><td></td><td>0</td><td></td><td></td></t<>		Silver ppm	ASTM D5185m		0		
Lead ppm ASTM D5185m >10 0 Copper ppm ASTM D5185m >10 0 Tin ppm ASTM D5185m >10 0 Vanadium ppm ASTM D5185m C 1 ADDITIVES method limit/base current history1 ////////////////////////////////////		Aluminum ppm	ASTM D5185m	>10	2		
Copper ppm ASTM D5185m >70 0 Vanadium ppm ASTM D5185m >10 0 Cadmium ppm ASTM D5185m Imit/base current history1 history2 ADDITIVES method Imit/base current history1 history2 Boron ppm ASTM D5185m 3 Barium ppm ASTM D5185m 4 Molybdenum ppm ASTM D5185m 21 Magnesum ppm ASTM D5185m 21 Calcium ppm ASTM D5185m 20 10 Sulfur ppm ASTM D5185m 20 10		Lead ppm	ASTM D5185m	>10	0		
Tin ppm ASTM D5185m >10 0 Vanadium ppm ASTM D5185m <1		Copper ppm	ASTM D5185m	>75	3		
Vanadium CadmiumprmASTM D5185m $<$ $<$ 1 $$ $$ CadmiumprmASTM D5185m0 $$ $-$		Tin ppm	ASTM D5185m	>10	0		
Cadmium pm ASTM D5185m 0 ADDITIVES method limit/base current history1 history2 Boron pm ASTM D5185m 3 Barium ppm ASTM D5185m 3 Magnese ppm ASTM D5185m 4 Magneseium ppm ASTM D5185m 21 Calcium ppm ASTM D5185m 602 Posphorus ppm ASTM D5185m 602 Zinc ppm ASTM D5185m 602 Sulfur ppm ASTM D5185m 2237 Sulfur ppm ASTM D5185m >20 10 Sodium ppm ASTM D5185m >20 10 Sodium ppm ASTM D5185m >20 10 Particles >4µm ASTM D5185m >20		Vanadium ppm	ASTM D5185m		<1		
ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m3BariumppmASTM D5185m00MolydodenumppmASTM D5185m4ManganeseppmASTM D5185m00MagnesiumppmASTM D5185m21CalciumppmASTM D5185m602PhosphorusppmASTM D5185m602SulfurppmASTM D5185m22377SulfurppmASTM D5185m>2010SodiumppmASTM D5185m>2010PotassiumppmASTM D5185m>2010PotassiumppmASTM D5185m>2010PotassiumppmASTM D5185m>2010PotassiumppmASTM D5185m>2010Particles >4µmASTM D7647>100191Particles >6µmASTM D7647>16025Particles >1µmASTM D7647>1600Particles >21µmISM M07647>130Particles >38µmXSTM D7647>10<		Cadmium ppm	ASTM D5185m		0		
Boron ppm ASTM D5185m 3 Barium ppm ASTM D5185m C 0 Molybdenum ppm ASTM D5185m C 4 Manganese ppm ASTM D5185m C 0 Magnesium ppm ASTM D5185m C 314 Calcium ppm ASTM D5185m GO2 Calcium ppm ASTM D5185m CO2		ADDITIVES	method	limit/base	current	history1	history2
BariumppmASTM D5185m0MolybdenumppmASTM D5185m4MagneseeppmASTM D5185m21MagnesiumppmASTM D5185m21CalciumppmASTM D5185mI314PhosphorusppmASTM D5185mI602ZincppmASTM D5185mI602SulfurppmASTM D5185mI2237SolfurppmASTM D5185m>2010SodiumppmASTM D5185m>2010PotassiumppmASTM D5185m>2010Particles >4µmASTM D5185m>2010Particles >4µmASTM D7647>100191Particles >2µmASTM D7647>16025Particles >2µmASTM D7647>100Particles >3µmASTM D7647>100Particles >2µmASTM D7647>100Particles >3µmASTM D7647>100Particles >3µmASTM D7647>100Particles >2µmASTM D7647>100Particles >3µm		Boron ppm	ASTM D5185m		3		
Molybdenum ppm ASTM D5185m 4 Manganese ppm ASTM D5185m 0 Magnesium ppm ASTM D5185m 21 Calcium ppm ASTM D5185m 314 Phosphorus ppm ASTM D5185m 602 Zinc ppm ASTM D5185m 602 Sulfur ppm ASTM D5185m 602 Sulfur ppm ASTM D5185m 2237 Sulfur ppm ASTM D5185m >20 10 Sodium ppm ASTM D5185m >20 10 Potassium ppm ASTM D5185m >20 10 FLUID CLEANLINES method imit/base current history1 history2 Particles >4µm ASTM D7647 >1300 191 <		Barium ppm	ASTM D5185m		0		
Manganese ppm ASTM D5185m 0 Magnesium ppm ASTM D5185m 21 Calcium ppm ASTM D5185m 314 Phosphorus ppm ASTM D5185m 602 Zinc ppm ASTM D5185m 602 Sulfur ppm ASTM D5185m 713 Sulfur ppm ASTM D5185m 2237 Soliton ppm ASTM D5185m >20 10 Soliton ppm ASTM D5185m >20 10 Potassium ppm ASTM D5185m >20 1 Potassium pm ASTM D5185m >20 1 Patricles >4µm ASTM D5185m >20 1 Patricles >4µm ASTM D7647 >1300 191 Patricles >5µm		Molybdenum ppm	ASTM D5185m		4		
MagnesiumppmASTM D5185m21CalciumppmASTM D5185m602PhosphorusppmASTM D5185m602ZincppmASTM D5185m2237SulfurppmASTM D5185m2237CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>2010SodiumppmASTM D5185m>2010PotassiumppmASTM D5185m>201FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>500010286Particles >6µm4STM D7647>100191Particles >1µmASTM D7647>4009Particles >38µmASTM D7647>30Particles >71µmASTM D7647>30FLUID DEGRADATIONiso 4406 (c)j:j:j:j:j:l:2FLUID DEGRADATIONiso 4406 (c)j:j:j:j:j:l:2FLUID DEGRADATIONiso 4406 (c)j:j:j:j:j:l:2iso 4502FLUID DEGRADATIONiso 4406 (c)iso 1/2/15/12iso 4502iso 4502iso 4502FLUID DEGRADATIONiso 4406		Manganese ppm	ASTM D5185m		0		
CalciumppmASTM D5185m314PhosphorusppmASTM D5185m602ZincppmASTM D5185m713SulfurppmASTM D5185m2237CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>2010SodiumppmASTM D5185m>2010PotassiumppmASTM D5185m>201FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>500010286Particles >51µmASTM D7647>16025Particles >21µmASTM D7647>100Particles >71µmASTM D7647>30Particles >71µmASTM D7647>30Particles >71µmASTM D7647>30Particles >71µmASTM D7647>30COU CleanlinessSIO 406 (c)>19/17/14421/15/12FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2		Magnesium ppm	ASTM D5185m		21		
PhosphorusppmASTM D5185m602ZincppmASTM D5185mZ13SulfurppmASTM D5185mZ237CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>2010SodiumppmASTM D5185m>2010SodiumppmASTM D5185m>201PotassiumppmASTM D5185m>201FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmXASTM D7647>5000101Particles >6µm4ASTM D7647>16025Particles >21µmASTM D7647>100Particles >38µmASTM D7647>100Particles >71µmASTM D7647>30FLUID DEGRADLTIONmethodlimit/basecurrenthistory1history2		Calcium ppm	ASTM D5185m		314		
ZincppmASTM D5185m713SulfurppmASTM D5185m2237CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>2010SodiumppmASTM D5185m>2010PotassiumppmASTM D5185m>201FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>50001Particles >6µmASTM D7647>100191Particles >14µmASTM D7647>16025Particles >21µmASTM D7647>100Particles >38µmASTM D7647>30Particles >71µmASTM D7647>30FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2		Phosphorus ppm	ASTM D5185m		602		
SulfurppmASTM D5185m2237CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>2010SodiumppmASTM D5185m>2010SodiumppmASTM D5185m>201PotassiumppmASTM D5185m>201FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>5000110286Particles >6µmASTM D7647>1300191Particles >14µmASTM D7647>16025Particles >38µmASTM D7647>100Particles >71µmASTM D7647>30Particles >71µmISO 4406 (c)>19/17/1421/15/12FLUID DEGRADATIONmethodlimit/basecurrenthistory1history1		Zinc ppm	ASTM D5185m		713		
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>2010SodiumppmASTM D5185m210PotassiumppmASTM D5185m>201FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>5000▲ 10286Particles >6µmIASTM D7647>1300191Particles >6µmASTM D7647>16025Particles >14µmASTM D7647>409Particles >38µmASTM D7647>100Particles >71µmASTM D7647>30Oil CleanlinessISO 4406 (c)>19/17/14421/15/12FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2		Sulfur ppm	ASTM D5185m		2237		
SiliconppmASTM D5185m>2010SodiumppmASTM D5185m22PotassiumppmASTM D5185m>201FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>500010286Particles >6µmIASTM D7647>1300191IIParticles >14µmASTM D7647>16025IParticles >21µmIASTM D7647>100IIParticles >38µmASTM D7647>300IIParticles >71µmISO 4406 (c)>19/17/14115/12IIFLUID DEGRADATIONmethodlimit/basecurrenthistory1history2		CONTAMINANTS	method	limit/base	current	history1	history2
SodiumppmASTM D5185m201PotassiumppmASTM D5185m>201FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>500010286Particles >6µmIASTM D7647>1300191IIIIIParticles >6µmASTM D7647>16025IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		Silicon ppm	ASTM D5185m	>20	10		
PotassiumppmASTM D5185m>201FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>500010286Particles >6µmGASTM D7647>1300191Particles >6µmASTM D7647>16025Particles >14µmASTM D7647>1609Particles >21µmASTM D7647>409Particles >38µmASTM D7647>100Particles >71µmASTM D7647>30Oil CleanlinessISO 4406 (c)>19/17/1421/15/12FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2		Sodium ppm	ASTM D5185m		2		
FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>500010286Particles >6µmASTM D7647>1300191Particles >14µmASTM D7647>16025Particles >21µmASTM D7647>409Particles >38µmASTM D7647>100Particles >71µmASTM D7647>30Oil CleanlinessISO 4406 (c)>19/17/1421/15/12FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2		Potassium ppm	ASTM D5185m	>20	1		
Particles >4µm ASTM D7647 >5000 ▲ 10286 Particles >6µm ASTM D7647 >1300 191 Particles >14µm ASTM D7647 >160 25 Particles >14µm ASTM D7647 >40 9 Particles >21µm ASTM D7647 >10 0 Particles >38µm ASTM D7647 >10 0 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >19/17/14 21/15/12 FLUID DEGRADATION method limit/base current history1 history2		FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >6μm ASTM D7647 >1300 191 Particles >14μm ASTM D7647 >160 25 Particles >21μm ASTM D7647 >40 9 Particles >21μm ASTM D7647 >10 0 Particles >38μm ASTM D7647 >10 0 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >19/17/14 21/15/12 FLUID DEGRADATION method limit/base current history1 history2		Particles >4µm	ASTM D7647	>5000	<u> </u>		
Particles >14μm ASTM D7647 >160 25 Particles >21μm ASTM D7647 >40 9 Particles >38μm ASTM D7647 >10 0 Particles >38μm ASTM D7647 >10 0 Particles >37μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >19/17/14 21/15/12 FLUID DEGRADATION method limit/base current history1 history2		Particles >6µm	ASTM D7647	>1300	191		
Particles >21µm ASTM D7647 >40 9 Particles >38µm ASTM D7647 >10 0 Particles >38µm ASTM D7647 >3 0 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >19/17/14 21/15/12 FLUID DEGRADATION method limit/base current history1 history2		Particles >14µm	ASTM D7647	>160	25		
Particles >38μm ASTM D7647 >10 0 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >19/17/14 21/15/12 FLUID DEGRADATION method limit/base current history1 history2		Particles >21µm	ASTM D7647	>40	9		
Particles >71µmASTM D7647>30Oil CleanlinessISO 4406 (c)>19/17/14 21/15/12 FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2		Particles >38µm	ASTM D7647	>10	0		
Oil Cleanliness ISO 4406 (c) >19/17/14 21/15/12 FLUID DEGRADATION method limit/base current history1 history2		Particles >71µm	ASTM D7647	>3	0		
FLUID DEGRADATION method limit/base current history1 history2		Oil Cleanliness	ISO 4406 (c)	>19/17/14	<u> </u>		
		FLUID DEGRADATION	method	limit/base	current	history1	history2

Acid Number (AN) mg KOH/g ASTM D8045 0.70

Report Id: CONPEV [WUSCAR] 06201996 (Generated: 06/09/2024 17:27:21) Rev: 1

Contact/Location: Steve Bell - CONPEV Page 1 of 2



OIL ANALYSIS REPORT



Contact/Location: Steve Bell - CONPEV

E:

history2

history

history2

no image

no imade

4406

:1999 Cle

14

7/24

Mav1