

COMPANY NAME: FLUID ANALYSIS LAB
 CUSTOMER EQUIP NUM: 3039
 COMPARTMENT NAME: ENGINE
 SERIAL NUMBER: JRP02826
 MANUFACTURER: CATERPILLAR
 MODEL: 777F
 JOB SITE:
 EXT WARR NUMBER: CX544
 SHOP JOB NUM:
 COMP SERIAL NUM:
 COMPARTMENT MODEL:
 COMP MANUFACTURER:
 SAMPLE LABEL NUM:
 FLUID BRAND/WEIGHT:
 FLUID TYPE:
 EXT WARR EXPIRE DATE: 14-May-18
 FUEL CONSUMED:



Fluids Analysis Laboratory
 1330 Lynchburg Turnpike
 Salem, VA 24153-5457
 540-387-1111
 www.catermachinery.com

SAMPLE TYPE: **OIL**
 SAMPLE SHIP TIME (days): 8
 LAB CONTROL NUMBER: D100-48324-0220
 SAMPLE DATE: 12-Nov-2018
 PROCESS DATE: 20-Nov-2018
 EQUIPMENT METER: 0
 METER ON FLUID: 0
 FLUID CHANGED: No
 MAKE UP FLUID: MAKE UP FLUID UNITS: FILTER CHANGED:

D100-48324-0220
 No Action Required
 NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

D480-47180-0054
 No Action Required
 NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

D480-47052-0039
 No Action Required
 NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

D480-47051-0004
 No Action Required
 NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

Wear Metals (ppm)	Cu	Fe	Cr	Al	Pb	Sn	Si	Na	K	B	Mn	Ni	Ag	Ti	V	Ca	Mg	Zn	P
D100-48324-0220	51	36	1	5	1	1	8	0	0	27	1	0	0	2	1	1345	567	1128	878
D480-47180-0054	4	18	0	1	0	0	2	3	0	2	0	0	0	0	0	2188	31	1055	834
D480-47051-0004	1	1	0	0	0	1	1	2	1	2	0	0	0	0	0	2019	39	1008	888
D480-47052-0039	1	2	0	1	0	0	1	2	2	2	0	0	0	0	0	2036	40	1020	921

Oil Condition / Particle Count (ctm)	ST	OXI	NIT	SUL	W	A	F	PFC	VI00	POI
D100-48324-0220	30	15	12	29	N	N	N		12.1	36
D480-47180-0054	28	14	7	21	N	N	N	0.89	11.7	
D480-47051-0004	1	14	5	19	N	N	N		13.5	
D480-47052-0039	1	14	5	19	N	N	N	0.89	12.4	

Ag = Silver, Al = Aluminum, B = Boron, Ca = Calcium, Cr = Chromium, Cu = Copper, Fe = Iron, P = Phosphorus, K = Potassium, Li = Lithium, Mg = Magnesium, Mo = Molybdenum, Na = Sodium, Ni = Nickel, Pb = Lead, Si = Silicon, Sn = Tin, S = Sulfur, V = Vanadium, Zn = Zinc, A = Antifreeze, F = Fuel, W = Water, P = Positive, N = Negative, T = Trace, E = Excessive, NIT = Nitration, OXI = Oxidation, ST = Soot, SUL = Sulfation, ISO = ISO Rating, PFC = Percent Fuel Content, POI = Particle Quantifying Index, NaW = Salt Water, FL Pt = Flash Point, TAN = Total Acid Number, TBN = Total Base Number, H2O = Karl Fisher result, VI00 = Viscosity@100C, VA0 = Viscosity@40C, PVI = Particle Volume Indicator

Notice: This analysis is intended as an aid in predicting mechanical wear. No guarantees, expressed or implied, is made against failure of this piece of equipment or a component thereof.

RITCHIE EQUIPMENT, INC.
PAUL BARNETTE
P.O. BOX 1588
PRINCETON, WV 24740

FAX: 304-325-5525
 PHONE: 304-325-5525
 SAMPLE TYPE: **COOLANT - RADI_MET**
 SAMPLE SHIP TIME (days): 2

COMPANY NAME: RITCHIE EQUIPMENT, INC.
 CUSTOMER EQUIP NUM: 3039
 COMPARTMENT NAME: RADIATOR
 SERIAL NUMBER: JRP02826
 MANUFACTURER: CATERPILLAR
 MODEL: 777E
 JOB SITE:
 EXT WARR NUMBER: CYS44

SHOP JOB NUM:
 COMP SERIAL NUM:
 COMPARTMENT MODEL:
 COMP MANUFACTURER:
 SAMPLE LABEL NUM:
 FLUID BRAND/WEIGHT:
 FLUID TYPE:
 EXT WARR EXPIRE DATE: 14-May-18
 FUEL CONSUMED:

Carter
 Fluids Analysis Laboratory
 1330 Lynchburg Turnpike
 Salem, VA 24153-5457
 540-387-1111
 www.catermachinery.com

LAB CONTROL NUMBER	SAMPLE DATE	PROCESS DATE	EQUIPMENT METER	METER ON FLUID	FLUID CHANGED	MAKE UP FLUID	MAKE UP FLUID UNITS
D100-48002-1018	31-Dec-2018	02-Jan-2019	0	0	Unknown		

No Action Required
 ALL TESTS APPEAR NORMAL FOR THIS COOLANT. SAMPLE AGAIN AT REGULAR INTERVAL TO MONITOR THE COOLING SYSTEM.

D100-48324-1022	12-Nov-2018	20-Nov-2018	0	0	No		
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No Action Required
 UNKNOWN EQUIPMENT OR FLUID HOURS. UNKNOWN FLUID TYPE. ALL TESTS APPEAR NORMAL FOR THIS COOLANT. SAMPLE AGAIN AT REGULAR INTERVAL TO MONITOR THE COOLING SYSTEM.

D470-45182-9104	09-Jun-2015	11-Jun-2015	10593 HR	10593 HR	No		
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No Action Required
 NO ACTION REQUIRED, CONTINUE TO SAMPLE.

Date	Al	Cu	Fe	Pb	K	Na	Sn	Zn	CaC	MgC	TH	MnO4	SiO3	BO3	PO4	BP	FP	GL	pH	CON
D100-48002-1018	0	1	0	0	840	2417	0	1	0	4	4	890	45	880	549	107	-34	48	7.8	3564
D100-48324-1022	0	1	0	0	861	2463	0	0	0	5	6	637	88	599	508	107	-38	49	8.0	3588
D470-45182-9104																107	-37	50	8.0	3751

Date	NO2	Odor	Color	App	Foam	Oil	Paint
D100-48002-1018	988	norm	magenta	clear	norm	none	none
D100-48324-1022	1174	norm	magenta	clear	norm	none	none
D470-45182-9104	410	norm	orange	clear	norm	none	light

A = Aluminum, Cu = Copper, Fe = Iron, K = Potassium, Na = Sodium, Pb = Tin, V = Vanadium, Zn = Zinc, BO3 = Borate, CaC = Ca as CaCO3, MgC = Mg as CaCO3, MnO4 = Molybdate, PO4 = Phosphate, SiO3 = Silicate, TH = Total Hardness, Cl = Chloride, CO3 = Carbonate, GLO = Glycolate, NO2 = Nitrite, NO3 = Nitrate, PO4 = Phosphate, SAC = Sulfuric Acid, SO4 = Sulfate, TT = Toluene, BP = Boil Point(C), FP = Freeze Point(C), GL = Glycol, CON = Conductivity, App = Appearance, Paint = Precipitate Appearance, PCol = Precipitate Color, PProp = Precipitate Property, CType = Coolant Type

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COMPANY NAME : FLUID ANALYSIS LAB
 CUSTOMER EQUIP NUM : 3039
 COMPARTMENT NAME : TRANSMISSION POWER SHIFT
 SERIAL NUMBER : JRP02826
 MANUFACTURER : CATERPILLAR
 MODEL : 777F
 JOB SITE :
 EXT WARR NUMBER : CK544
 SHOP JOB NUM :
 COMP SERIAL NUM :
 COMPARTMENT MODEL :
 COMP MANUFACTURER :
 SAMPLE LABEL NUM :
 FLUID BRAND/WEIGHT :
 FLUID TYPE :
 EXT WARR EXPIRE DATE : 14-May-18
 FUEL CONSUMED :



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LAB CONTROL NUMBER	SAMPLE DATE	PROCESS DATE	EQUIPMENT METER	METER ON FLUID	FLUID CHANGED	MAKE UP FLUID	MAKE UP FLUID UNITS	FILTER CHANGED
D100-48324-0213	05-Nov-2018	20-Nov-2018	0	0	Unknown			
Monitor Compartment	ISO PARTICLE COUNT READING EXCEEDS RECOMMENDED CLEANLINESS LEVEL. SILICON (TYPICALLY DIRTY) LEVEL APPEARS HIGH. OTHER READINGS APPEAR TO BE NORMAL. INSPECT FOR SOURCE OF DIRT ENTRY INTO THE SYSTEM. CHECK POSSIBLE SOURCES OF CONTAMINATION. RESAMPLE IN 125 HOURS TO MONITOR.							
D480-46019-0203	15-Jan-2016	19-Jan-2016	12528 HR	500 HR	No			Yes
No Action Required	NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.							
D470-45162-3010	09-Jun-2015	11-Jun-2015	10693 HR	3663 HR	No			Yes
Monitor Compartment	HOURS ON OIL ARE COMPUTER GENERATED BUT THERE APPEARS TO BE LESS HOURS ON OIL THAN INDICATED. HAVING NO RECENT HISTORY ON THIS COMPARTMENT, SODIUM IS ELEVATED. ISO IS 2220/4. CONTINUE TO MONITOR. RESAMPLE IN 250 HOURS.							
D480-43238-0217	19-Aug-2013	26-Aug-2013	6830 HR	6830 HR	Yes			Yes
No Action Required	NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.							

When Made (pmm)	Cu	Fe	Cr	Al	Pb	Sn	Si	Na	K	B	Mo	Ni	Ag	Ti	V	Ca	Mg	Zn	P
D100-48324-0213	3	10	0	11	0	0	28	5	1	24	1	1	0	2	0	2373	180	1225	813
D480-46019-0203	1	4	0	2	0	0	7	3	1	0	0	0	0	0	0	2404	9	1058	840
D470-45162-3010	11	15	0	1	0	0	5	11	0	0	1	1	1	1	1	1780	88	881	732
D480-43238-0217	48	21	0	2	0	1	7	5	2	1	1	4				2282	27	858	780

Oil Condition / Particle Count (cc/ml)	ST	OXI	NIT	SUL	W	A	V100	POI	180	4µ	6µ	10µ	14µ	18µ	21µ	38µ	50µ
D100-48324-0213	0	6	8	19	N	N	9.3	35	23/23/21	46310	42080	31808	17815	10553	7724	787	138
D480-46019-0203	0	4	5	15	N	N	10.0		DEBRIS								
D470-45162-3010	0	8	5	17	N	N	8.8		22/20/14	23287	6302				28		11
D480-43238-0217	0	8	8	21	N	N	10.0		22/20/16	38530	7251				121		6

Ag = Silver, Al = Aluminum, B = Boron, Ca = Calcium, Cr = Chromium, Cu = Copper, Fe = Iron, P = Phosphorus, K = Potassium, Li = Lithium, Mg = Magnesium, Mo = Molybdenum, Na = Sodium, Ni = Nickel, Pb = Lead, Si = Silicon, Sn = Tin, S = Sulphur, V = Vanadium, Zn = Zinc, A = Antifreeze, F = Fuel, W = Water, P = Positive, N = Negative, T = Trace, E = Excessive, NIT = Nitration, OXI = Oxidation, ST = Soot, SUL = Sulfation, ISO = ISO Rating, PFC = Percent Fuel Content, POI = Particle Quantifying Index, NAW = Salt Water, FI, PI = Flash Point, TAN = Total Acid Number, TBN = Total Base Number, H2O = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, PVI = Particle Volume Indicator

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COMPANY NAME : FLUID ANALYSIS LAB
 CUSTOMER EQUIP NUM : 3039
 COMPARTMENT NAME : HYDRAULIC SYSTEM
 SERIAL NUMBER : JRP02826
 MANUFACTURER : CATERPILLAR
 MODEL : 777F
 JOB SITE :
 EXT WARR NUMBER : CK544
 SHOP JOB NUM :
 COMP SERIAL NUM :
 COMPARTMENT MODEL :
 COMP MANUFACTURER :
 SAMPLE LABEL NUM :
 FLUID BRAND/WEIGHT :
 FLUID TYPE :
 EXT WARR EXPIRE DATE : 14-May-18
 FUEL CONSUMED :

Carter

CAT

Fluids Analysis Laboratory
 1330 Lynchburg Turnpike
 Salem, VA 24153-5457
 540-387-1111
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LAB CONTROL NUMBER	SAMPLE DATE	PROCESS DATE	EQUIPMENT METER	METER ON FLUID	FLUID CHANGED	MAKE UP FLUID	MAKE UP FLUID UNITS	FILTER CHANGED											
D100-48324-0203	05-Nov-2018	20-Nov-2018	0	0	Unknown														
Monitor Compartment	ISO PARTICLE COUNT READING EXCEEDS RECOMMENDED CLEANLINESS LEVEL. OTHER READINGS APPEAR TO BE NORMAL. CHECK POSSIBLE SOURCES OF CONTAMINATION. CONTINUE NORMALLY SCHEDULED SAMPLING.																		
D480-48018-0202	15-Jan-2016	19-Jan-2016	12528 HR	500 HR	No			Yes											
No Action Required	NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.																		
D470-45182-5013	09-Jun-2015	11-Jun-2015	10693 HR		No			Yes											
Monitor Compartment	ZINC IS BELOW CATERPILLAR'S RECOMMENDED TARGET LEVEL OF 900. RECOMMEND CHANGING AND ADDING A HYDRAULIC OIL WITH A MINIMUM OF 900 ZINC TO PROTECT AGAINST SCUFFING AND WEAR. DEBRIS IS VISIBLE IN OIL. INSPECT FILTER FOR DEBRIS. RESAMPLE IN 250 HOURS.																		
D480-43238-0216	19-Aug-2013	26-Aug-2013	6830 HR	1000 HR	Yes			Yes											
Monitor Compartment	DEBRIS FOUND IN OIL BOTTLE, BUT WEAR IS NORMAL. RESAMPLE IN 50 HOURS TO MONITOR.																		
Wear Metals (ppm)	Cu	Fe	Cr	Al	Pb	Sn	Si	Na	K	B	Mo	Ni	Ag	Ti	V	Ca	Mg	Zn	P
D100-48324-0203	3	7	0	4	0	1	15	5	0	24	1	1	0	1	0	2330	173	1203	897
D480-48018-0202	38	7	1	4	1	0	11	2	2	2	4					2082	38	952	772
D470-45182-5013	58	8	1	3	0	0	18	0	0	0	0	6				1859	31	867	707
D480-43238-0216	122	9	2	5	0	0	17	2	2	1	9					2280	87	1088	897
Oil Contention / Particle Count (cf/ml)	ST	OXI	NIT	SUL	W	A	V100	POI	ISO	4µ	6µ	10µ	14µ	18µ	21µ	38µ	50µ		
D100-48324-0203	0	6	0	19	N	N	9.5	34	2221/13	39559	14287	683	73	38	30	8	5		
D480-48018-0202	0	6	5	16	N	N	7.8		1818/14	4346	1381		145		41	3			
D470-45182-5013	0	4	4	13	N	N	7.4												
D480-43238-0216					N	N	7.3												

Ag = Silver, Al = Aluminum, B = Boron, Ca = Calcium, Cr = Chromium, Cu = Copper, Fe = Iron, P = Phosphorus, K = Potassium, Li = Lithium, Mg = Magnesium, Mo = Molybdenum, Na = Sodium, Ni = Nickel, Pb = Lead, Si = Silicon, Sn = Tin, S = Sulfur, V = Vanadium, Zn = Zinc, A = Antifreeze, F = Fuel, W = Water, P = Positive, N = Negative, T = Trace, E = Excessive, NIT = Nitration, OXI = Oxidation, ST = Soot, SUL = Sulfation, ISO = ISO Rating, PFC = Percent Fuel Content, POI = Particle Quantifying Index, MAW = Salt Water, FL Pt = Flash Point, TAN = Total Acid Number, TBN = Total Base Number, H2O = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, PVI = Particle Volume Indicator

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RITCH PRESERVATI
P O BOX 1085
PRINCETON, WVA

FAX:
 PHONE: 304-325-8195
 SAMPLE TYPE: **OIL**
 SAMPLE SHIP TIME (days): **2**

COMPANY NAME: RITCHEE EQUIPMENT, INC.
 CUSTOMER EQUIP NUM: 3039
 COMPARTMENT NAME: STEERING SYSTEM
 SERIAL NUMBER: JRP02826
 MANUFACTURER: CATERPILLAR
 MODEL: 777E
 JOB SITE:
 EXT WARR NUMBER: CX544
 SHOP JOB NUM
 COMP SERIAL NUM
 COMPARTMENT MODEL
 COMP MANUFACTURER
 SAMPLE LABEL NUM
 FLUID BRAND/WEIGHT
 FLUID TYPE
 EXT WARR EXPIRE DATE: 14-May-18
 FUEL CONSUMED:

Fluids Analysis Laboratory
1330 Lynchburg Turnpike
Salem, VA 24153-5457
540-387-1111
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LAB CONTROL NUMBER	SAMPLE DATE	PROCESS DATE	EQUIPMENT METER	METER ON FLUID	FLUID CHANGED	MAKE UP FLUID	MAKE UP FLUID UNITS	FILTER CHANGED
D100-49002-0502	31-Dec-2018	02-Jan-2019	0	0	No			

Monitor Compartment
 SILICON (TYPICALLY DIRTY) LEVEL APPEARS HIGH. OTHER READINGS APPEAR TO BE NORMAL. INSPECT FOR SOURCE OF DIRT ENTRY INTO THE SYSTEM. CHECK POSSIBLE SOURCES OF CONTAMINATION. RESAMPLE IN 125 HOURS TO MONITOR.

D480-46019-0201 15-Jan-2016 19-Jan-2016 12528 HR 500 HR No Yes
 NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

Action Required
 D470-45162-5017 09-Jun-2015 11-Jun-2015 10693 HR 10693 HR No Yes
 SILICON (TYPICALLY DIRTY) LEVEL APPEARS HIGH. DEBRIS IS VISIBLE IN OIL. CHANGE OIL. CHECK FOR LEAKS WHERE DIRT COULD ENTER. RESAMPLE IN 50 HOURS TO MONITOR.

Monitor Compartment
 D480-43214-0192 03-Aug-2013 02-Aug-2013 6238 HR Unknown
 SILICON (TYPICALLY DIRTY) LEVEL APPEARS HIGH. RESAMPLE IN 50 HOURS TO MONITOR.

Wear Metals (ppm)	Cu											Fe											Cr											Al											Pb											Sn											Si											Na											K											B											Mo											Ni											Ag											Ti											V											Ca											Mg											Zn											P										
	14	27	5	30	1	0	49	4	7	20	2	0	4	0	2401	164	1160	976	3	5	0	7	1	0	11	2	3	3	0	1922	33	912	725	9	15	0	29	0	0	47	0	7	0	0	0	0	1748	81	856	689	16	21	1	41	1	0	58	1	12	1	1	1	1334	273	1002	804																																																																																																																																															
D100-49002-0502	14	27	5	30	1	0	49	4	7	20	2	0	4	0	2401	164	1160	976	3	5	0	7	1	0	11	2	3	3	0	1922	33	912	725	9	15	0	29	0 <td>0<td>47</td><td>0<td>7</td><td>0<td>0<td>0<td>1748</td><td>81</td><td>856</td><td>689</td> <td>16</td><td>21</td><td>1</td><td>41</td><td>1</td><td>0<td>58</td><td>1</td><td>12</td><td>1</td><td>1</td><td>1</td><td>1334</td><td>273</td><td>1002</td><td>804</td> </td></td></td></td></td></td>	0 <td>47</td> <td>0<td>7</td><td>0<td>0<td>0<td>1748</td><td>81</td><td>856</td><td>689</td> <td>16</td><td>21</td><td>1</td><td>41</td><td>1</td><td>0<td>58</td><td>1</td><td>12</td><td>1</td><td>1</td><td>1</td><td>1334</td><td>273</td><td>1002</td><td>804</td> </td></td></td></td></td>	47	0 <td>7</td> <td>0<td>0<td>0<td>1748</td><td>81</td><td>856</td><td>689</td> <td>16</td><td>21</td><td>1</td><td>41</td><td>1</td><td>0<td>58</td><td>1</td><td>12</td><td>1</td><td>1</td><td>1</td><td>1334</td><td>273</td><td>1002</td><td>804</td> </td></td></td></td>	7	0 <td>0<td>0<td>1748</td><td>81</td><td>856</td><td>689</td> <td>16</td><td>21</td><td>1</td><td>41</td><td>1</td><td>0<td>58</td><td>1</td><td>12</td><td>1</td><td>1</td><td>1</td><td>1334</td><td>273</td><td>1002</td><td>804</td> </td></td></td>	0 <td>0<td>1748</td><td>81</td><td>856</td><td>689</td> <td>16</td><td>21</td><td>1</td><td>41</td><td>1</td><td>0<td>58</td><td>1</td><td>12</td><td>1</td><td>1</td><td>1</td><td>1334</td><td>273</td><td>1002</td><td>804</td> </td></td>	0 <td>1748</td> <td>81</td> <td>856</td> <td>689</td> <td>16</td> <td>21</td> <td>1</td> <td>41</td> <td>1</td> <td>0<td>58</td><td>1</td><td>12</td><td>1</td><td>1</td><td>1</td><td>1334</td><td>273</td><td>1002</td><td>804</td> </td>	1748	81	856	689	16	21	1	41	1	0 <td>58</td> <td>1</td> <td>12</td> <td>1</td> <td>1</td> <td>1</td> <td>1334</td> <td>273</td> <td>1002</td> <td>804</td>	58	1	12	1	1	1	1334	273	1002	804																																																																																																																																																

Oil Condition / Particle Count (cells/ml)	ST		OXII		NIT		SUL		W		A		Y100		POI		ISO		4µ		6µ		10µ		14µ		18µ		21µ		38µ		50µ							
	0	7	7	6	19	N	N	8.3	4	22/19/12	29818	3955	171	35	22	19	8	4	0	4	4	4	12	N	N	7.1	DEBRIS	0	7	6	18	N	N	7.6	22/17/12	22787	847	40	9	1
D100-49002-0502	0	7	7	6	19	N	N	8.3	4	22/19/12	29818	3955	171	35	22	19	8	4	0	4	4	4	12	N	N	7.1	DEBRIS	0	7	6	18	N	N	7.6	22/17/12	22787	847	40	9	1

Ag = Silver, Al = Aluminum, B = Boron, Ca = Calcium, Cr = Chromium, Cu = Copper, Fe = Iron, P = Phosphorus, K = Potassium, Li = Lithium, Mg = Magnesium, Mo = Molybdenum, Na = Sodium, Ni = Nickel, Pb = Lead, Si = Silicon, Sn = Tin, S = Sulfur, V = Vanadium, Zn = Zinc, A = Antifreeze, F = Fuel, W = Water, P = Positive, N = Negative, T = Trace, E = Excessive, NIT = Nitration, OXI = Oxidation, ST = Seal, SUL = Sulfation, ISO = ISO Rating, PFC = Percent Fuel Content, POI = Particle Quantifying Index, NAW = Sulf Water, FLPI = Flash Point, TAN = Total Acid Number, TBN = Total Base Number, H2O = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, PVI = Particle Volume Indicator

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COMPANY NAME: FLUID ANALYSIS LAB
 CUSTOMER EQUIP NUM: 3039
 COMPARTMENT NAME: FINAL DRIVE REAR RIGHT
 SERIAL NUMBER: JRP02826
 MANUFACTURER: CATERPILLAR
 MODEL: 777F
 JOB SITE:
 EXT WARR NUMBER: C544
 FUEL CONSUMED:
 SHOP JOB NUM:
 COMP SERIAL NUM:
 COMPARTMENT MODEL:
 COMP MANUFACTURER:
 SAMPLE LABEL NUM:
 FLUID BRAND/WEIGHT:
 FLUID TYPE:
 EXT WARR EXPIRE DATE: 14-May-18
 PHONE: OIL
 SAMPLE TYPE: OIL
 SAMPLE SHIP TIME (days): 13



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 Salem, VA 24153-5457
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LAB CONTROL NUMBER	SAMPLE DATE	PROCESS DATE	EQUIPMENT METER	METER ON FLUID	FLUID CHANGED	MAKE UP FLUID	MAKE UP FLUID UNITS	FILTER CHANGED
D100-48324-0234	05-Nov-2018	20-Nov-2018	0	0	No			
No Action Required NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.								
D100-48324-0238	05-Nov-2018	20-Nov-2018	0	0	Unknown			
No Action Required NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.								
D480-46019-0282	15-Jan-2016	19-Jan-2016	12528 HR	500 HR	No			
No Action Required NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.								
D470-45162-4030	09-Jun-2015	11-Jun-2015	10693 HR		No			No
Monitor Compartment HAVING NO RECENT HISTORY ON THIS COMPARTMENT. UNKNOWN UNITS ON OIL. COPPER AND IRON ARE ELEVATED. DEBRIS IS VISIBLE IN OIL. CHANGE OIL. INSPECT DRAIN PLUG FOR DEBRIS. CHECK FOR LEAKS WHERE DIRT COULD ENTER. RESAMPLE IN 150 HOURS. MORE SAMPLE HISTORY NEEDED TO ESTABLISH A NORMAL WEAR TREND.								

Wear Metals (ppm)	Cu	Fe	Cr	Al	Pb	Sn	Si	Na	K	B	Mn	Ni	Ag	Ti	V	Ca	Mg	Zn	P
D100-48324-0234	5	36	0	4	0	0	15	6	0	22	1	1	0	1	0	2164	182	1148	840
D100-48324-0238	11	108	1	3	2	2	7	6	0	5	1	0	0	0	0	2388	13	1010	749
D480-46019-0282	30	148	1	1	1	3	4	18	2	1	1	1	1	1	1	1814	8	791	675
D470-45162-4030	30	131	0	1	2	2	17	1	1	0	0	0	0	0	0	1777	5	765	648

Oil Condition / Particle Count (c/ml)	ST	OXI	NIT	SUL	W	V100	PdI	ISO
D100-48324-0234					N	10.0		80
D100-48324-0238					N	18.8		111
D480-46019-0282					N			
D470-45162-4030					0	5	6	18
					N	18.8		DEBRIS

Ag = Silver, Al = Aluminum, B = Boron, Ca = Calcium, Cr = Chromium, Cu = Copper, Fe = Iron, P = Phosphorus, K = Potassium, Li = Lithium, Mg = Magnesium, Mo = Molybdenum, Na = Sodium, Ni = Nickel, Pb = Lead, Si = Silicon, Sn = Tin, S = Sulfur, V = Vanadium, Zn = Zinc, A = Antifreeze, F = Fuel, W = Water, P = Positive, N = Negative, T = Trace, E = Excessive, NIT = Nitration, OXI = Oxidation, ST = Soot, SUL = Sulfation, ISO = ISO Rating, PFC = Percent Fuel Content, PdI = Particle Quantifying Index, NaW = Sulf Water, FL Pt = Flash Point, TAN = Total Acid Number, TBN = Total Base Number, H2O = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, PVI = Particle Volume Indicator

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RITCHEE EQUIPMENT, INC.
PAUL BARNETTE
P.O. BOX 1588
PRINCETON, WV 24740

FAX: 304-325-6525
 PHONE: 304-325-6525
 SAMPLE TYPE: **OIL**
 SAMPLE SHIP TIME (days): 2

COMPANY NAME: RITCHEE EQUIPMENT, INC.
 CUSTOMER EQUIP NUM: 3039
 COMPARTMENT NAME: COMPARTMENT NAME: FINAL DRIVE REAR LEFT
 SERIAL NUMBER: JRP02826
 MANUFACTURER: CATERPILLAR
 MODEL: 777F
 JOB SITE:
 EXT WARR NUMBER: CX544
 EXT WARR EXPIRE DATE: 14-May-18
 FUEL CONSUMED:



Carter
 Fluids Analysis Laboratory
 1330 Lynchburg Turnpike
 Salem, VA 24153-5457
 540-387-1111
 www.cartermachinery.com

LAB CONTROL NUMBER	SAMPLE DATE	PROCESS DATE	EQUIPMENT METER	METER ON FLUID	FLUID CHANGED	MAKE UP FLUID	MAKE UP FLUID UNITS	FILTER CHANGED
D100-49002-0546	31-Dec-2018	02-Jan-2019	0	0	No			
No Action Required NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.								
D480-46019-0291	15-Jan-2016	19-Jan-2016	12528 HR	500 HR	No			
No Action Required NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.								
D470-45162-4031	09-Jun-2015	11-Jun-2015	10693 HR	No	No			No
Monitor Compartment UNKNOWN UNITS ON OIL. COPPER AND IRON ARE ELVATED. DEBRIS IS VISIBLE IN OIL. CONTINUE TO MONITOR. INSPECT DRAIN PLUG FOR DEBRIS. CHECK FOR LEAKS WHERE DIRT COULD ENTER. RESAMPLE IN 250 HOURS. MORE SAMPLE HISTORY NEEDED TO ESTABLISH A NORMAL WEAR TREND.								

Wear Metals (ppm)	Cu	Fe	Cr	Al	Pb	Sn	Si	Na	K	B	Mo	Ni	Ag	Ti	V	Ca	Mg	Zn	P
D100-49002-0546	27	142	1	2	4	2	15	3	0	20	0	1	0	0	0	1607	11	696	630
D480-46019-0291	30	144	1	1	3	4	17	2	1	1	1	1			1788	6	784	647	
D470-45162-4031	30	130	0	1	2	2	17	0	1	1	0	1			1710	5	736	616	

Oil Condition/ Particle Count (ct/ml)	ST	OXI	NIT	SUL	W	V100	PQI	ISO
D100-49002-0546					N	18.1	77	
D480-46019-0291					N			
D470-45162-4031	0	5	6	16	N	18.9		DEBRIS

Ag = Silver, Al = Aluminum, B = Boron, Ca = Calcium, Cr = Chromium, Cu = Copper, Fe = Iron, P = Phosphorus, K = Potassium, Li = Lithium, Mg = Magnesium, Mo = Molybdenum, Na = Sodium, Ni = Nickel, Pb = Lead, Si = Silicon, Sn = Tin, S = Sulfur, V = Vanadium, Zn = Zinc, A = Antifreeze, F = Fuel, W = Water, P = Positive, N = Negative, T = Trace, E = Excessive, NT = Nitration, OXI = Oxidation, ST = ISO Rating, ISO = ISO Rating, PFC = Percent Fuel Content, PQI = Particle Quantifying Index, NaW = Salt Water, FL P = Flash Point, TAN = Total Acid Number, TEN = Total Base Number, H2O = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, PVI = Particle Volume Indicator

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COMPANY NAME : FLUID ANALYSIS LAB
 CUSTOMER EQUIP NUM : 3039
 COMPARTMENT NAME : DIFFERENTIAL
 SERIAL NUMBER : JRP02826
 MANUFACTURER : CATERPILLAR
 MODEL : 777F
 JOB SITE :
 EXT WARR NUMBER : C5544
 SHOP JOB NUM :
 COMP SERIAL NUM :
 COMPARTMENT MODEL :
 COMP MANUFACTURER :
 SAMPLE LABEL NUM :
 FLUID BRAND/WEIGHT :
 FLUID TYPE :
 EXT WARR EXPIRE DATE : 14-May-18
 FUEL CONSUMED :

Carter
 Fluids Analysis Laboratory
 1330 Lynchburg Turnpike
 Salem, VA 24153-5457
 540-387-1111
 www.catermachinery.com



LAB CONTROL NUMBER	SAMPLE DATE	PROCESS DATE	EQUIPMENT METER	METER ON FLUID	FLUID CHANGED	MAKE UP FLUID	MAKE UP FLUID UNITS	FILTER CHANGED
D100-48324-0237	05-Nov-2018	20-Nov-2018	0	0	No			

NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

No Action Required

Wear Metals (ppm)	Cu	Fe	Cr	Al	Pb	Sn	Si	Na	K	B	Mo	Ni	Ag	Ti	V	Ca	Mg	Zn	P
D100-48324-0237	27	138	1	2	3	2	15	5	0	15	1	1	0	0	0	1494	5	664	508

Oil Condition / Particle Count (each)	W	V100	PQI	IBO
D100-48324-0237	N	18.4	89	NORMAL

Ag = Silver, Al = Aluminum, B = Boron, Ca = Calcium, Cr = Chromium, Cu = Copper, Fe = Iron, P = Phosphorus, K = Potassium, Li = Lithium, Mg = Magnesium, Mo = Molybdenum, Na = Sodium, Ni = Nickel, Pb = Lead, Si = Silicon, Sn = Tin, S = Sulfur, V = Vanadium, Zn = Zinc, A = Antifreeze, F = Fuel, W = Water, P = Positive, N = Negative, T = Trace, E = Excessive, NIT = Nitration, OXI = Oxidation, ST = Soot, SUL = Sulfation, ISO = ISO Rating, PFC = Percent Fuel Content, PQI = Particle Quantifying Index, NAV = Salt Water, FL Pt = Flash Point, TAN = Total Acid Number, TEN = Total Base Number, HZO = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, PVI = Particle Volume Indicator

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COMPANY NAME : FLUID ANALYSIS LAB
 CUSTOMER EQUIP NUM : 3039
 COMPARTMENT NAME : WHEEL BEARINGS FRONT RIGHT
 SERIAL NUMBER : JRP02826
 MANUFACTURER : CATERPILLAR
 MODEL : 777F
 JOB SITE :
 EXT WARR NUMBER : CYS44
 SHOP JOB NUM :
 COMP SERIAL NUM :
 COMPARTMENT MODEL :
 COMP MANUFACTURER :
 SAMPLE LABEL NUM :
 FLUID BRAND/WEIGHT :
 FLUID TYPE :
 EXT WARR EXPIRE DATE : 14-May-18
 FUEL CONSUMED :



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LAB CONTROL NUMBER	SAMPLE DATE	PROCESS DATE	EQUIPMENT METER	METER ON FLUID	FLUID CHANGED	MAKE UP FLUID	MAKE UP FLUID UNITS	FILTER CHANGED
D100-48324-0235	05-Nov-2018	20-Nov-2018	0	0	Unknown			
No Action Required NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.								
D480-48019-0280	15-Jan-2016	19-Jan-2016	12528 HR	500 HR	No			
No Action Required NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.								
D470-45162-4028	09-Jun-2015	11-Jun-2015	10639 HR	3809 HR	No			No
Monitor Compartment HAVING NO RECENT HISTORY ON THIS COMPARTMENT, ELEMENTS HAVE COME DOWN FROM PREVIOUS SAMPLE. DEBRIS IS VISIBLE IN OIL. CONTINUE TO MONITOR. INSPECT DRAIN PLUG FOR DEBRIS. CHECK FOR LEAKS WHERE DIRT COULD ENTER. RESAMPLE IN 150 HOURS.								
D480-43238-0274	19-Aug-2013	26-Aug-2013	6830 HR	1000 HR	Yes			Yes
No Action Required NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.								

Wear Metals (ppm)	Cu	Fe	Cr	Al	Pb	Sn	Si	Na	K	B	Mo	Ni	Ag	Ti	V	Ca	Mg	Zn	P
D100-48324-0235	33	162	1	3	4	2	18	8	0	18	1	1	0	0	0	1731	7	773	595
D480-48019-0280	51	61	1	4	1	0	19	2	0	0	1	5				2072	39	854	767
D470-45162-4028	70	71	1	5	0	0	28	0	2	0	0	8				2089	39	838	765
D480-43238-0274	116	118	2	10	1	1	48	2	2	0	8					1854	93	887	796
Oil Contention / Particle Count (ct/ml)																			
D100-48324-0235	ST	OXI	NIT	SUL	W	V100	POL	ISO											
D480-48019-0280					N	18.1	101												
D470-45162-4028	0	5	5	17	N	8.8	DEBRIS												
D480-43238-0274					N														

Ag = Silver, Al = Aluminum, B = Boron, Ca = Calcium, Cr = Chromium, Cu = Copper, Fe = Iron, P = Phosphorus, K = Potassium, Li = Lithium, Mg = Magnesium, Mo = Molybdenum, Na = Sodium, Ni = Nickel, Pb = Lead, Si = Silicon, Sn = Tin, S = Sulfur, V = Vanadium, Zn = Zinc, A = Antifreeze, F = Fuel, W = Water, P = Positive, N = Negative, T = Trace, E = Excessive, NIT = Nitration, OXI = Oxidation, ST = Soot, SUL = Sulfation, ISO = ISO Rating, PFC = Percent Fuel Content, POL = Particle Quantifying Index, NAW = Salt Water, FL Pt = Flash Point, TAN = Total Acid Number, TBN = Total Base Number, H2O = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, PVI = Particle Volume Indicator

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COMPANY NAME : FLUID ANALYSIS LAB
 CUSTOMER EQUIP NUM : 3039
 COMPARTMENT NAME : WHEEL BEARINGS FRONT LEFT
 SERIAL NUMBER : JRP02826
 MANUFACTURER : CATERPILLAR
 MODEL : 777F
 JOB SITE :
 EXT WARR NUMBER : CX544
 SHOP JOB NUM :
 COMP SERIAL NUM :
 COMPARTMENT MODEL :
 COMP MANUFACTURER :
 SAMPLE LABEL NUM :
 FLUID BRAND/WEIGHT :
 FLUID TYPE :
 EXT WARR EXPIRE DATE : 14-May-18
 FUEL CONSUMED :



Fluids Analysis Laboratory
 1330 Lynchburg Turnpike
 Salem, VA 24153-5457
 540-387-1111
 www.cartermachinery.com

FAX: PHONE: SAMPLE TYPE: OIL SAMPLE SHIP TIME (day): 15 LAB CONTROL NUMBER: SAMPLE DATE: PROCESS DATE: EQUIPMENT METER: METER ON FLUID: FLUID CHANGED: MAKE UP FLUID: MAKE UP FLUID UNITS: FILTER CHANGED:

D100-48324-0233 05-Nov-2018 20-Nov-2018 0 0 No No

No Action Required ELEVATED SILICON APPEARS TO BE RESIDUAL FROM A COMPOUND USED IN ASSEMBLY OR REPAIRS. OTHER READINGS APPEAR TO BE NORMAL. CONTINUE NORMALLY SCHEDULED SAMPLING

D100-48324-0236 05-Nov-2018 20-Nov-2018 0 0 Unknown

No Action Required ELEVATED SILICON APPEARS TO BE RESIDUAL FROM A COMPOUND USED IN ASSEMBLY OR REPAIRS. OTHER READINGS APPEAR TO BE NORMAL. CONTINUE NORMALLY SCHEDULED SAMPLING

D480-48019-0294 15-Jan-2016 19-Jan-2016 12528 HR 500 HR No

No Action Required NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

D470-45182-4029 08-Jun-2015 11-Jun-2015 10693 HR 3863 HR No

Monitor Compartment HAVING NO RECENT HISTORY ON THIS COMPARTMENT, IRON IS ELEVATED, OTHER ELEMENTS HAVE COME DOWN. CONTINUE TO MONITOR. INSPECT DRAIN PLUG FOR DEBRIS. CHECK FOR LEAKS WHERE DIRT COULD ENTER. RESAMPLE IN 150 HOURS.

Wear Metals (ppm)	Oil Position / Particle Count (total)																		
	Cu	Fe	Cr	Al	Pb	Sn	Si	Ni	K	B	Mo	NI	Ag	Ti	V	Ca	Mg	Zn	P
D100-48324-0233	5	283	2	3	0	0	28	7	0	33	12	1	0	0	0	1103	8	510	487
D100-48324-0238	10	211	2	9	0	0	73	6	0	11	1	2	0	3	0	1970	16	677	678
D480-48019-0294	6	294	2	2	1	1	37	5	2	19	1	1452	10	609	623				
D470-45182-4029	6	295	1	3	0	0	45	4	3	16	0	1359	9	548	559				
D100-48324-0233	ST	OXI	NIT	SUL	W	V100	PQI	ISO	4μ	6μ	14μ	21μ	36μ						
D100-48324-0238					N	18.9	106												
D480-48019-0294					N	12.4	50												
D470-45182-4029	0	8	6	18	N	18.8	2322718	61044	38688	2271	187	8							

Ag = Silver, Al = Aluminum, B = Boron, Ca = Calcium, Cr = Chromium, Cu = Copper, Fe = Iron, P = Phosphorus, K = Potassium, Li = Lithium, Mg = Magnesium, Mo = Molybdenum, Na = Sodium, Ni = Nickel, Pb = Lead, Si = Silicon, Sn = Tin, S = Sulfur, V = Vanadium, Zn = Zinc, A = Antifreeze, F = Fuel, W = Water, P = Positive, N = Negative, T = Trace, E = Excessive, NIT = Nitration, OXI = Oxidation, ST = Soot, SUL = Sulfation, ISO = ISO Rating, PFC = Percent Fuel Content, PQI = Particle Quantifying Index, NtW = Salt Water, FL = Flash Point, TAN = Total Acid Number, TBN = Total Base Number, H2O = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, PVI = Particle Volume Indicator

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