

COMPANY NAME: EMPIRE POWER SYSTEMS
 CUSTOMER EQUIP NUM: DWB02704
 COMPARTMENT NAME: ENGINE
 SERIAL NUMBER: DWB02704
 MANUFACTURER: CATERPILLAR
 MODEL: C27
 JOB SITE:
 CSA ACTIVE: False

SHOP JOB NUM: 3032719
 COMP SERIAL NUM:
 COMPARTMENT MODEL:
 COMP MANUFACTURER:
 SAMPLE LABEL NUM: 278747
 FLUID BRAND/WEIGHT: CAT/15W-40
 FLUID TYPE:
 CSA EXPIRATION: 0



1725 S. Country Club Drive
 Mesa, AZ 85210
 Telephone, (480) 633-4835
<http://empire.cat.com>
 ISO 9001:2008 Registered

FAX:
 PHONE:
SAMPLE TYPE: OIL
 SAMPLE SHIP TIME (days): 3

FILTER CHANGED

MAKE UP FLUID

MAKE UP FLUID

FLUID CHANGED

METER ON FLUID

EQUIPMENT METER

PROCESS DATE

SAMPLE DATE

LAB CONTROL NUMBER

H160-47065-0121 03-Mar-2017 06-Mar-2017 1.8 HR 1.8 HR No No

Monitor Compartment

FIRST SAMPLE NO TREND ESTABLISHED. LOW OPERATING HOURS INDICATED. VALUES ARE ELEVATED; HOWEVER VALUES ARE OFTEN ELEVATED DURING LOWER OPERATING HOURS, IMPROVING AFTER APPROXIMATELY 3 OIL CHANGES AT THE RECOMMENDED INTERVAL. RESAMPLE AT NEXT INTERVAL. MONITOR COMPARTMENT.

Wear Metals (ppm)

	Copper	Iron	Chrome	Alum	Silicon	Lead	Sodium	Tin	Nickel	Barium	Silver	Zinc	Boron	Calcium	Phosphor	Magnesium	Potassium	Molybdenum	Titanium	Vanadium
H160-47065-0121	12	10	0	1	17	8	4	0	1	3	0	1423	8	2807	1237	350	0	5	0	0

Oil Condition / Particle Count (c/ml)

	ST	OXI	NIT	SUL	W	A	V100
H160-47065-0121	0	12	5	15	N	N	11.4

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, POI = POI Index, TAN = Total Acid Number, TBN = Total Base Number, H2O = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, ST_WT = %SOOT by Weight, PFC = Percent Fuel Content, PVI = Particle Volume Index

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

COMPANY NAME: EMPIRE POWER SYSTEMS
 CUSTOMER EQUIP NUM: 03364
 COMPARTMENT NAME: RADIATOR
 SERIAL NUMBER: 5YF03364
 MANUFACTURER: CATERPILLAR
 MODEL: 3208
 JOB SITE:
 CSA ACTIVE: False

SHOP JOB NUM: 3031601
 COMP SERIAL NUM:
 COMPARTMENT MODEL:
 COMP MANUFACTURER:
 SAMPLE LABEL NUM:
 FLUID BRAND/WEIGHT:
 FLUID TYPE:
 CSA EXPIRATION: 0



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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

H160-47065-1002	24-Feb-2017	06-Mar-2017	118 HR	118 HR	Unknown		
<p>MAGNETIC SOLIDS WERE DETECTED IN THIS SAMPLE. ***KEEP IN MIND THESE SOLIDS ARE ABRASIVE AND CAN INCREASE WEAR*** CHECK FOR LOCALIZED OVERHEATING OR RESTRICTED FLOW IN THE COOLING SYSTEM. MONITOR COMPARTMENT.</p>							

Metals (ppm)	BP	FP	GL	pH	CON
H160-47065-1002	107	-34	48	8.6	4301

Other	NO2	Odor	Color	App	Foam	PAmt	PApp	PCol	PProp
H160-47065-1002	545	norm	yellow/fluorescent	clear	norm	moderate	granular	blk sol	mag

Al = Aluminum, Cu = Copper, Fe = Iron, K = Potassium, Na = Sodium, Pb = Lead, Sn = Tin, V = Vanadium, Zn = Zinc, B03 = Borate, CaC = Ca as CaCO3, MgC = Mg as CaCO3, MoO4 = Molybdate, PO4 = Phosphate, SiO3 = Silicate, TH = Total Hardness, CL = Chloride, CO3 = Carbonate, GLO = Glycolate, NO2 = Nitrite, NO3 = Nitrate, PO4 = Phosphate, SAC = Sulfate, SO4 = Sulfate, TT = Toluene, PP = Precipitate Amount, PApp = Precipitate Appearance, PCol = Precipitate Color, PProp = Precipitate Property
 GL = Glycol, CON = Conductivity, App = Appearance, PAmt = Precipitate Amount, PApp = Precipitate Appearance, PCol = Precipitate Color, PProp = Precipitate Property

COMPANY NAME : EMPIRE POWER SYSTEMS
 CUSTOMER EQUIP NUM : 03364
 COMPARTMENT NAME : ENGINE
 SERIAL NUMBER : 5YF03364
 MANUFACTURER : CATERPILLAR
 MODEL : 3208
 JOB SITE :
 CSA ACTIVE : False

SHOP JOB NUM : 3031601
 COMP SERIAL NUM :
 COMPARTMENT MODEL :
 COMP MANUFACTURER :
 SAMPLE LABEL NUM : 278739
 FLUID BRAND/WEIGHT :
 FLUID TYPE :
 CSA EXPIRATION : 0



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FAX :
 PHONE :
SAMPLE TYPE: OIL
 SAMPLE SHIP TIME (days) : 10

LAB CONTROL NUMBER SAMPLE DATE PROCESS DATE EQUIPMENT METER METER ON FLUID FLUID CHANGED MAKE UP FLUID MAKE UP FLUID UNITS FILTER CHANGED

H160-47065-0122 24-Feb-2017 06-Mar-2017 118 HR 118 HR Yes Yes

Monitor Compartment
 FIRST SAMPLE NO TREND ESTABLISHED. IRON IS ELEVATED AND MAY INDICATE WEAR FROM CYLINDER LINERS, PISTONS, CRANKSHAFT, CAMSHAFT, PUSHRRODS. COPPER IS ELEVATED. COPPER MAY BE ASSOCIATED WITH OIL COOLER LEACHING, SOME SECONDARY BUSHING/BEARING WEAR. MONITOR COMPARTMENT. MORE SAMPLE HISTORY NEEDED TO ESTABLISH A NORMAL WEAR TREND.

Wear Metals (ppm)	Copper	Iron	Chrom	Alum	Silicon	Lead	Sodium	Tin	Nickel	Barium	Silver	Zinc	Boron	Calcium	Phosphor	Magnesium	Potassium	Molybdenum	Titanium	Vanadium
H160-47065-0122	81	76	1	1	4	5	4	1	2	0	0	1228	17	1763	1077	486	0	30	1	0

Oil Condition / Particle Count (c/ml)	ST	OXI	NIT	SUL	W	A	F	V100
H160-47065-0122	0	12	5	16	N	N	N	13.9

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, POI = POI Index, TAN = Total Acid Number, TBN = Total Base Number, H2O = Karl Fisher result, V100 = Viscosity@100C, V40 = Viscosity@40C, ST_WT = %SOOT by Weight, PFC = Percent Fuel Content, PVI = Particle Volume Index

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