

MUSTANG
POWER SYSTEMS



Functional Test Report

Customer: HongHua

Project: TBD

Site: TBD

Purchase Order: 0023318-00

Date March 3, 2016

Work Order MK-F1064

Revision: 0

Unit Number: 1 of 3

Salesman: Gregg Bare

Coordinator: Derek Torres

Tested By: Michael Elliott

Date 5.19.16

Witness: _____

Date _____

Company: _____

Title _____



Test Location: Manufacturing Test Facility, Tomball, Texas

Test Equipment Used for Testing

Make/Model	Description	Serial Number	Calibration Due Date
BALMAC 200	Vibration meter	0501017	6.10.16
SHACK 100	meter	82-0025300515	9.04.16



Engine/Generator Functional Test Report

Project:

Customer: HongHua S.O. No.: MK-F1064
 Project: TBD Location: TBD
 Equipment ID: Drilling Rig Genset Unit No.: 1 of 3

Equipment tested:

Engine:

Make:	<u>Caterpillar</u>	Model:	<u>3512C</u>	Serial No.	<u>LLA05192</u>
Arrangement Number:	<u>250-7623</u>	ECM Software:	<u>435-8655</u>	Caterpillar Pkg. ID No.:	<u>N/A</u>

Generator:

Make:	<u>Kato</u>	Model:	<u>AA27673014</u>	Serial No.	<u>41244-01</u>
Arrangement Number:	<u>6P6-3150</u>	Voltage Regulator:	<u>*</u>	Control Panel:	<u>Caterpillar 125-7089</u>
Voltage:	<u>346/600</u>	Connection:	<u>Wye</u>	No. of Leads:	<u>6</u>
Amps:	<u>1684</u>	kW:	<u>1225</u>	kVA:	<u>1750</u>
Frequency:	<u>60 Hz</u>	P.F.:	<u>0.7</u>	RPM:	<u>1200</u>

* Caterpillar CDVR used for testing

Scope:

This report covers the test of a generator set for the assurance of proper operation. This report will provide a record of functional test data for future reference. All blanks on this Test Report will be filled in by the Test Technician.

- 1.) The test will be witnessed by the customer.
- 2.) Due to the limits of the test pad equipment, the test will be conducted at 480 VAC.
- 3.) The load test will be at rated load, 480 V, 60 Hz, 1203 A, 1000 kW, 1.0 PF, for 1 hour at 100% load.
- 4.) The engine safeties will be simulated for proper function.
- 5.) During the load test, when the genset has reached operating temperature and while the genset is operating at full load, record the vibration levels.
- 6.) Record the final service meter reading (SMR) at the end of all testing

✓
✓
✓
✓
✓
✓



Test Record:

1.0 GENSET CONTROLS:

1.1 Engine Safeties

A. Test the emergency shutdown by pressing the emergency stop (E-Stop) pushbutton while the engine is operating at rated speed. Observe the following:

- 1. Verify the engine stops: ✓
- 2. Verify the air inlet shut-offs trip: ✓
- 3. Reset the E-Stop pushbutton : ✓
- 4. Reset the air inlet shut-offs: ✓
- 5. Reset the ECM by placing the engine control switch (ECS) in the Off-Reset position. Follow reset procedures: ✓
- 6. Re-start the engine: ✓

B. "Check Mark" for GOOD "X" FOR FAILS "N/A" for NOT APPLICABLE

Safety	Alarm Design Setting	Shutdown Design Setting	Alarm	Shut-down	CB Trip	Visual Indic.	Audible Indic.
Low Oil Pressure	32 PSI	26 PSI	✓	✓	N/A	✓	✓
High Water Temperature	216 °F	225 °F	✓	✓	N/A	✓	✓
Overspeed	N/A	1416 RPM	N/A	✓	N/A	✓	✓
Emergency Stop	N/A	Button Pushed In	N/A	✓	N/A	✓	✓



2.0 Load Test:

Apply load to the genset at 1.0 PF using resistive load banks.

Use the attached test sheet to record load test results. Record test data every 15 minutes. The first and last readings will be taken at no load, 5 minutes before the load test and 5 minutes after the load test.

The load test will be at rated load, 1000 kW, 1.0 PF, for 1 hour;

1 hour at 100% load



3.0 Vibration Test:

See attached sheets.



5.0 Test Completion:

At the completion of all tests, record the final service meter reading.

Verify that all documents are completed, all blanks are filled in, and any required signatures have been obtained.

Make copies of the completed test report. Distribute the original and copies as required.



COMMENTS: _____



Vibration Test

PROCEDURE

SCOPE:

This test procedure covers the functional testing for vibration of the engine, generator, and radiator on Mustang's test stand for assurance of reliable operation of the generator package.

PROCEDURE:

The engine/generator will be started and running under the proper percentage of load. Check the appropriate load condition block on the vibration report. If required, test at each different level of load percentage.

Double BEARING GENERATOR

Measure and record the vibration meter reading for horizontal, vertical, and axial directions for each of the following 4 monitoring points.

1. At the front of the engine, perpendicular to the front main bearing, in line with the crankshaft.
2. The rear end of the engine, perpendicular to the rear main bearing, in line with the crankshaft.
3. The front of the generator, perpendicular to the front generator bearing, in line with the rotor.
4. The rear of the generator, perpendicular to the rear generator bearing, in line with the rotor.

The vibration levels recorded are in thousandths of an inch (mils) displacement. The meter is unfiltered. Vibrations of all orders are represented in the measurement. The maximum reading allowed is 8 mils displacement (0.008") in any axis.



Vibration Record

Customer HongHua Work Order MK-F1064 Unit Number 1 of 3

Driver Make: Caterpillar Model 3512C Serial Number LLA05192

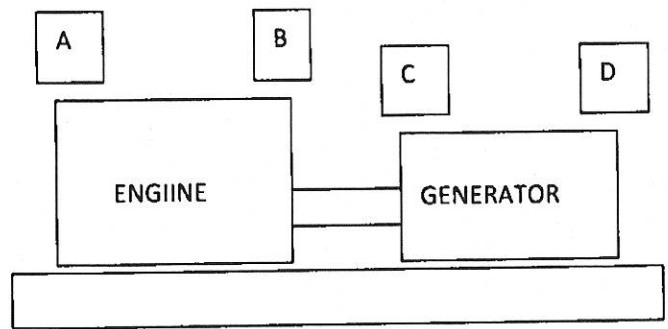
Driven Make: Kato Model AA27673014 Serial Number 41244-01

Coupling Make: Caterpillar Part Number 5N-3765 Type Viscous

LEGEND

- RECORDING POINT
- PLAIN BEARING
- BALL BEARING
- RIDGID COUPLING
- FLEX COUPLING
- PILLOW BLOCK
- out, DRIVER
- out, TRANS. or GEAR
- in, DRIVEN

EQUIPMENT SKETCH



H=Horizontal V=Vertical A=Axial

Record Point	[] 0% Load		[] 25% Load		[] 50% Load		[] 75% Load		[X] 100% Load	
	Mils Displ	In./Sec.	Mils Displ	In./Sec.	Mils Displ	In./Sec.	Mils Displ	In./Sec.	Mils Displ	In./Sec.
A H									2.53	N/A
V									2.21	N/A
A									2.77	N/A
B H									3.67	N/A
V									2.55	N/A
A									2.41	N/A
C H									2.77	N/A
V									3.57	N/A
A									2.99	N/A
D H									3.06	N/A
V									4.78	N/A
A									2.98	N/A



LOAD TEST REPORT

Customer: HongHua	Project: TBD	S.O. MK-F1064
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Engine: Caterpillar	Generator: Kato	Control Panel: Caterpillar
Make/Model: 3512C Petroleum	Make/Model: AA27673014	Make/Model: 125-7089
Serial Number: LLA05192	Serial Number: 41244-01	Unit Number: 1 of 3
Rating: 1103 kW @ 1200 RPM	Rating: 600 Volts	kW: 1103

TEST CONDITIONS: TEST LOCATION Mustang CAT Tomball Test Facility TYPE OF TEST Standard 1 Hour Load Test

Time	Volts	Amps Ø1	Amps Ø2	Amps Ø3	KW	PF	Hz	RPM	Boost Press PSI	Fuel Press PSI	Jw Temp °F	Oil Press PSI	After Cooler °F	Left Exh °F	Right Exh °F	Amb Temp °F
10:00	480	0	0	0	0	1	60	1200	0	70	145	80	88	360	350	72
10:05	480	1190	1222	1242	1005	1	60	1200	35	63	180	70	95	1000	1018	72
10:20	480	1284	1221	1241	1003	1	60	1200	36	63	180	66	93	1024	1029	72
10:35	480	1189	1221	1241	1004	1	60	1200	36	63	180	65	97	1042	1060	72
10:50	480	1184	1221	1241	1003	1	60	1200	36	63	180	65	93	1054	1080	72
11:05	480	1188	1220	1240	1004	1	60	1200	36	63	180	65	93	1054	1074	72
11:10	490	0	0	0	0	1	60	1200	3	66	176	69	84	522	466	72

Final Service Meter Reading _____ Hours

Tested By: Michael Elliott Witness: _____ Date: 5.19.16