

(附件 三) 1/1

**FACTORY ACCEPTANCE TEST
OF
DIESEL GENERATOR SET**



MODEL NO : 2800 REOZD

KOHLER SERIAL NO : 2132365

Work Order : SO 13008

Date : 19 JAN 2007

STS 06016

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Factory Inspection and Testing Procedure

DIESEL GENERATOR SET

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1.0 VISUAL INSPECTION OF GENERATOR SET UNIT

1.0.a OBJECTIVE

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- a. To ensure the generator set is in good condition with out any physical damages.
- b. To verify that all major components are fitted to the generator set.

1.0.b SET UP

- a. No specific setting up required.

1.0.c VERIFICATION PROCEDURE

- a. To verify the diesel engine make, model and serial number.
- b. To verify the A.C. alternator make, model and serial number.
- c. To verify the all ancillary equipment are fitted to the generator set.
- d. To verify that there is no physical damage on the generator set.



1.0.d INSPECTION RESULT

- a. To record data KC-001 , KC-002 , KC-003 , KC-004

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VISUAL INSPECTION RECORD KC - 001

1)	General condition of Generator	Check	Remarks
1.a	Any Physical Damage	✓	
1.b	Loose Component / Connection	✓	
1.c	Loose Bolt / Nut	✓	
1.d	Loose Hoses / Crimp	✓	
1.f	Loose Beltings	✓	
1.g	Others		

VISUAL INSPECTION RECORD KC - 002

2)	General condition of Generator	Check	Remarks
2.a	Radiator	✓	
2.b	Radiator Fan Belt	✓	
2.c	Starter Motor 24V DC	✓	
2.d	Charging Alternator 24V DC	✓	
2.e	Charging Alternator Belt	✓	
2.f	Air Cleaner	✓	
2.g	Fuel Filter	✓	
2.h	Lube Oil Filter	✓	
2.i	Woodward ProAct Controller	X	
2.j	Engine Control Panel	✓	
2.k	Skid Base	✓	
2.l	Others		

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VISUAL INSPECTION RECORD KC-003

3)	Record of generator set data :-	
3.a	Genset Model	: KOHLER 2800REOZD
3.b	Generator Rating	: 3125KVA / 2500KW
3.c	Volt / Speed / Hz / P.F.	: 6900V / 1500RPM / 50HZ / 0.8 PF
3.d	Engine Make	: mtu - DDC
3.e	Engine Model	: 20V4000
3.f	Engine Serial No	: 528 100 413
3.g	Alternator Make	: LEROY SOMER
3.h	Alternator Model	: LSAS4 L8 - 4P
3.i	Alternator Serial No	: 601271 / 1
3.j	Engine Controller	: DEC 550
3.k	Others	:

VISUAL INSPECTION RECORD KC- 004

4)	All ancillary fitted to Generator	Check	Remarks
4a	Digital Voltage Regulator	<input checked="" type="checkbox"/>	
4b	Current Transformer	<input checked="" type="checkbox"/>	
4c	Others	<input type="checkbox"/>	

Checked by : E.S. TAN

Witnessed by : CTCI

Signature :




Signature :

T.M. Kao

Date : 19 JAN 2007

Date : 19 JAN 2007

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Witnessed by :

Signature :

Date :

2.0 SETTING UP INSPECTION

- 2.0.a OBJECTIVE**
- a. To make sure the Generator is properly set up for subsequent testing.
 - b. To make sure there is sufficient diesel fuel for testing.

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2.0.b TOOLS / TESTING EQUIPMENT

- a. Overhead crane / forklift
- b. Resistive Load Bank

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2.0.c SETTING UP

The following is setting up as an internal preparation for the inspection. Detailed procedures shall be in accordance to our Kohler Co.'s standard procedures.

- a. Move the generator to the Test Cell using the overhead crane / forklift in the factory.
- b. Position the generator set, couple the exhaust outlet with the flexible hose.
- c. Fill up the radiator with the clean water and check that the engine oil is at the full level.
- d. Connect the power cables from generator to the load banks.
- e. Connect the fuel supply and return line accordingly.
- f. Tightening all loose clamps, wire and hoses.
- h. Connect the battery to the starter motor.

2.0.d INSPECTION PROCEDURE

The following inspection shall be carried out jointly with the client and the engineer :-

- a. To verify the exhaust is firmly couple to the flexible pipe.
- b. To verify the radiator is filled with water and the engine lube oil to the correct level.
- c. To verify all the cables are properly connected.
- d. To verify the fuel supply system is connected.
- e. To verify the polarity of the battery to the starter motor is correct.
- f. To verify all mechanical parts are tightened.
- g. To verify there is no fuel oil or water leaks from the engine.



2.0.e SETTING UP INSPECTION RECORD

- a. Result / finding in according to the above procedure shall be recorded in test record refer to KC-005

SETTING UP INSPECTION RECORD KC-005

Setting up Inspection of generator set	Check	Remarks
a. Exhaust flexible	✓	
b. Radiator water is filled	✓	
c. Engine lube oil is filled	✓	
d. Fuel supply system connected	✓	
e. Polarity of the battery / connection	✓	
f. All cables are properly connected	✓	
g. All mechanical parts tightened	✓	
h. All hoses clamps tightened	✓	
i. Any fuel oil or water leakage	✓	
j. AC / DC Wiring connection / tightened	✓	

3.0.a OBJECTIVE

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- a. To ensure the generator set can be controlled manually.

3.0.b TOOLS / TESTING EQUIPMENT

- a. No tools are required for manual test.

3.0.c SETTING UP

- a. No special setting up is required

3.0.d TESTING PROCEDURE

- a. Manual start and stop the generator .
- b. Simulation fault shutdown and reset.


3.0.e MANUAL CONTROL TEST RECORD

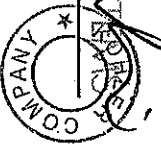
- a. Result / finding in accordance to the above procedure shall be recorded in the test record. Refer to KC-006

MANUAL CONTROL TEST RECORD KC-006

Manual Control Test	Check	Remarks
a. Manual Start and Stop	✓	
b. Emergency stop button	✓	
c. Manual reset	✓	

Checked by : E. STAY Verified by : CTCI

Signature :  Signature : T.M. Kans
 Date : 19 JAN 2007 Date : _____



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Verified by : _____
 Signature : _____
 Date : _____

4.0 ENGINE PROTECTION TEST (FUNCTIONAL TEST)

4.0.a OBJECTIVE

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- a. To ensure the protection devices are functioning and interconnected properly.

4.0.b TOOLS / TESTING EQUIPMENT

- a. Water temperature and lube oil pressure simulator.
 b. Woodward Proact Hand Held Programmer.

4.0.c PROTECTION DEVICES TESTING PROCEDURE

- a. High Coolant Temperature warning and shutdown.
 b. Low Lube Oil Pressure warning and shutdown.
 c. Engine Over Speed shutdown.
 d. Low Coolant Level Shutdown.

4.0.d PROTECTION DEVICES TEST RECORD

- a. Result / finding in accordance to the above procedure shall be recorded in test record. Refer to KC-007

PROTECTION DEVICES TEST RECORD KC-007

(DECS50 ENGINE CONTROLLER)

Protection Testing Procedure	Test Result	Remarks
a. High Coolant Temperature Warning	<input type="checkbox"/>	97°C (Alarm)
b. High Coolant Temperature Shutdown	<input type="checkbox"/>	99°C (Shutdown)
c. Low Lube Oil Pressure Warning	<input type="checkbox"/>	421Kpa (Alarm)
d. Low Lube Oil Pressure Shutdown	<input type="checkbox"/>	372Kpa (Shutdown)
e. Engine Overspeed	<input type="checkbox"/>	2100 RPM
f. Radiator Low Coolant Level Shutdown	<input type="checkbox"/>	Simulation

Checked by : E.S. TAY

Verified by : CTCI

Signature : [Signature]

Signature : T.M. Koo

Date : 19 JAN 2007

Date : _____

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Verified by : _____

Signature : _____

Date : _____

5.0. FACTORY LOAD TESTING

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5.0.a OBJECTIVE

- a. To ensure the generator set is able to deliver the designed load of rated 3125 KVA

5.0.b TOOLS / TESTING EQUIPMENT

- a. Resistive Load Bank.
- b. Voltmeter
- c. Ammeter
- d. Kilowatt Meier
- e. Frequency Meter
- f. Power factor Meter

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5.0.c SETTING UP

This setting up procedure can be carried out as an internal preparation for actual testing :-

- a. Start up the generator and let it warm up for 5 minutes at no load.
- b. Check and rectify any excessive vibration and due to loose connection.
- c. Shut down the generator and tidy up for actual Load testing.

5.0.d TESTING PROCEDURE

- a. Start up the generator and let it warm up for minutes at no load. Detailed procedures shall be in accordance to our Kohler Co.'s standard test procedures.
- b. Start the LOAD TEST (3125KVA) in accordance to following steps and duration :-

Load	KW	Duration
0%	0	5 mins.
50%	1250	30 mins.
75%	1875	1 hour
100%	2500	2 hours
25%	625	30 mins
0%	0	5 mins

- c. Record the following data's at every 15 minutes interval.
 - Time for testing.
 - KW output
 - Output Voltages (Line to Line) .
 - Output Currents (Per Phase) .
 - Percentage of load.
 - Generator frequency HZ.
 - Engine speed .
 - Engine coolant temperature.
 - Engine lube oil pressure .
 - Ambient Temperature
- d. The engine shall be checked for Lube Oil , coolant or fuel leakage at the same intervals.
- e. Remove the load and allow the generator to run for 05 minutes and shut down.



5.0.e LOAD TEST RECORD

- a. Result / finding in accordance to the above procedure shall be record in test record refer to GENERATOR LOAD AND ACCEPTANCE TEST RECORD KC - 008

Ref : SO12790

TEST TICKET

Serial # : 2132365

Model No : 2800REOZD
Sales Ord : SO13088
Battery V : 24 DC

KW : 2500
Volt : 3980 / 6900
Amps : 261

Spec : ES-69477-GA1
Hertz : 60
RPM : 1800

Phase : 3
Fuel : Diesel
Paint : Kohler's Beige

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Engine : mtu -DDC
M/No : 20V4000
S/No : 528 100 413

Alternator : Leroy Somer
M/No : LSA5418 - 4P
S/No : 601271/1

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GENERATOR LOAD AND ACCEPTANCE TEST RECORD KC - 008

Time (Hrs)	Approx. Load % (%)	Volts L1 - L2 (V)	Volts L2 - L3 (V)	Volts L1 - L3 (V)	Amps L-1 (A)	Amps L-2 (A)	Amps L-3 (A)	Watts (KW)	Cycle		Power Factor Unity	Lube Oil Pressure Kpa	Coolant Water Temp. Deg.°C	Room Temp. Deg.°C	Durations step minutes
									Freq Hz	Speed RPM					
1200	0	6900	6900	6900	0	0	0	0	60.0	1800	-	765	60	31.7	5
1215	50	6868	6872	6859	105	106	113	1255	60.0	1800	1	680	80	32.9	15
1230	50	6867	6869	6857	105	106	112	1253	60.0	1800	1	675	80	34.2	15
1245	75	6853	6858	6845	154	157	164	1876	60.0	1800	1	655	83	35.3	15
1300	75	6852	6857	6844	154	156	163	1875	60.0	1800	1	652	83	35.7	15
1315	75	6852	6857	6844	154	156	163	1875	60.0	1800	1	646	84	36.2	15
1330	75	6851	6856	6844	154	156	163	1875	60.0	1800	1	645	84	36.9	15
1345	100	6835	6844	6827	206	208	219	2501	60.0	1800	1	625	87	37.5	15
1400	100	6835	6843	6826	206	208	219	2500	60.0	1800	1	612	90	37.9	15
1415	100	6835	6842	6825	206	208	219	2500	60.0	1800	1	612	89	37.6	15
1430	100	6835	6843	6824	206	208	219	2500	60.0	1800	1	609	90	37.8	15
1445	100	6835	6843	6824	206	208	219	2499	60.0	1800	1	607	91	38.3	15
1500	100	6835	6842	6824	206	208	219	2500	60.0	1800	1	597	91	38.9	15
1515	100	6835	6842	6826	206	208	219	2500	60.0	1800	1	598	92	39.2	15
1530	100	6835	6842	6826	206	208	219	2500	60.0	1800	1	592	92	39.5	15
1545	25	6884	6885	6883	52	52	54	626	60.0	1800	1	663	77	37.1	15
1600	25	6884	6885	6884	52	52	54	625	60.0	1800	1	665	76	36.7	15
1605	0	6900	6900	6900	0	0	0	0	60.0	1800	-	672	75	35.6	5

Tested By:	Signature	Date	Witness & Accepted By:	Signature
12873 VELU S/O MARIAPPAN		01/19/07 mm/dd/yy	CTCI	T. M. Kae



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NOTE



Ref.: SO12726.2