

ENERFLEX
SYSTEMS LTD.
COMPRESSION AND POWER DIVISION

FABRICATION CHECKLIST
GENERATOR SET PACKAGE
TEST RUN REPORT

FCD-50114 Rev 3
03/21/2003
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Report FCD-50114-8

GENERAL INFORMATION

DATE: <u>Apr 30/05</u>		SHOP START-UP ☒ <u>Unit #1</u>		FIELD START-UP ☐	
DRIVER MAKE / MODEL: <u>F11GSI</u>			DRIVER SERIAL NO.: <u>(Spec. C-14483) 8703109</u>		
IGNITION TIMING:	NATURAL GAS: <u>140</u>	BTDC	PROPANE:	BTDC	
FLYWHEEL TEETH: <u>148</u>	CRANK DISC. SET: <u>30</u>	%	FUEL GAS PRESSURE: <u>12-15</u>	PSI	
OVERSPEED SET: <u>1980</u>	RPM	RATED SPEED: <u>1800</u>	RPM	OVERCRANK SET: <u>75</u>	SEC.
GENERATOR MAKE / MODEL: <u>Marathon 431RSL4007</u>			GENERATOR SERIAL NO.: <u>Lm-246243-0305</u>		
POWER RATING: <u>150</u>	KW	VOLTAGE: <u>480</u>	V	PHASE: <u>3</u>	
REQUIRED AMPERAGE: <u>226</u>	@ 0.8 pF	REQUIRED AMPERAGE: <u>180</u>	@ 1.0 pF		
COOLER MAKE / MODEL: <u>Young Touchstone DS 500117</u>			COOLER SERIAL NO.: <u>2922818</u>		
PANEL MAKE / MODEL: <u>UCS200</u>			PANEL SERIAL NO.: <u>W-030642-1</u>		
CONTROL VOLTAGE: <u>24</u>	Vdc	PANEL VOLTAGE: <u>480-120</u>	Vac	BREAKER TRIP SET: <u>237.5</u>	AMPS
CONTROLLER TYPE: <u>MEC 20</u>					

SHUTDOWN / ALARM LIST

DESCRIPTION	SETTING	SHUTDOWN	ALARM	INITIAL
LOW OIL PRESSURE	<u>30 PSI</u>	☒		<u>GB</u>
HIGH JACKET WATER TEMPERATURE	<u>210 °F</u>	☒		<u>GB</u>
HIGH INTAKE MANIFOLD TEMPERATURE	<u>✓</u>			
HIGH OIL TEMPERATURE	<u>210 °F</u>	☒		<u>GB</u>
LOW OIL LEVEL	<u>✓</u>	☒		<u>GB</u>
LOW JACKET WATER LEVEL	<u>✓</u>	☒		<u>GB</u>
LOW AUXILIARY WATER LEVEL	<u>✓</u>	☒		<u>GB</u>
HIGH ENGINE VIBRATION	<u>✓</u>	☒		<u>GB</u>
HIGH COOLER VIBRATION	<u>✓</u>	☒		<u>GB</u>
LOSS OF SPEED SIGNAL	<u>✓</u>	☒		<u>GB</u>
EMERGENCY STOP	<u>✓</u>	☒		<u>GB</u>
OVERSPEED	<u>1980 RPM</u>	☒		<u>GB</u>
LOW FUEL PRESSURE	<u>✓</u>			
UNDERSPEED / FREQUENCY	<u>57 HZ</u>		☒	<u>GB</u>
UNDERVOLTAGE	<u>384 VAC</u>	☒		<u>GB</u>
OVERVOLTAGE	<u>538 VAC</u>	☒		<u>GB</u>
REVERSE POWER	<u>✓</u>			
GROUND FAULT	<u>✓</u>			
BREAKER TRIPPED	<u>✓</u>			
AUTO START TEST	<u>✓</u>			
DETONATION (DSM)	<u>✓</u>			
PHASE ROTATION	<u>ABC</u>			<u>GB</u>
OVERCRANK	<u>(3x) 15 SEC</u>	☒		<u>GB</u>
BATTERY VOLTAGE CHECK	<u>26.5 VDC</u>			<u>GB</u>

COMMENTS:

GENERAL INFORMATION

DATE: <u>Apr 30/05</u>	SHOP START-UP ☒ <u>Unit #2</u>	FIELD START-UP ☐
DRIVER MAKE / MODEL: <u>FUGSI</u>		DRIVER SERIAL NO.: <u>(Spec. C-14484) 8703103</u>
IGNITION TIMING:	NATURAL GAS: <u>140</u>	PROPANE: BTDC
FLYWHEEL TEETH: <u>148</u>	CRANK DISC. SET: <u>30</u> %	FUEL GAS PRESSURE: <u>12-15</u> PSI
OVERSPEED SET: <u>1980</u> RPM	RATED SPEED: <u>1800</u> RPM	OVERCRANK SET: <u>75</u> SEC.
GENERATOR MAKE / MODEL: <u>Marathon 431RSL4007</u>		GENERATOR SERIAL NO.: <u>LM-246008-0305</u>
POWER RATING: <u>150</u> KW	VOLTAGE: <u>480</u> V	PHASE: <u>3</u>
REQUIRED AMPERAGE: <u>226</u> @ 0.8 pF	REQUIRED AMPERAGE: <u>180</u> @ 1.0 pF	
COOLER MAKE / MODEL: <u>Young DS 500117</u>		COOLER SERIAL NO.: <u>2922817</u>
PANEL MAKE / MODEL: <u>TIE UCS 200</u>		PANEL SERIAL NO.: <u>W-030642-02</u>
CONTROL VOLTAGE: <u>24</u> Vdc	PANEL VOLTAGE: <u>480-120</u> Vac	BREAKER TRIP SET: <u>237.5</u> AMPS
CONTROLLER TYPE: <u>MEC 20</u>		

SHUTDOWN / ALARM LIST

DESCRIPTION	SETTING	SHUTDOWN	ALARM	INITIAL
LOW OIL PRESSURE	<u>30 PSI</u>	☒		<u>GB</u>
HIGH JACKET WATER TEMPERATURE	<u>210°F</u>	☒		<u>GB</u>
HIGH INTAKE MANIFOLD TEMPERATURE	<u>-</u>	☒		<u>GB</u>
HIGH OIL TEMPERATURE	<u>✓ 210°F</u>	☒		<u>GB</u>
LOW OIL LEVEL	<u>✓</u>	☒		<u>GB</u>
LOW JACKET WATER LEVEL	<u>✓</u>	☒		<u>GB</u>
LOW AUXILIARY WATER LEVEL	<u>✓</u>	☒		<u>GB</u>
HIGH ENGINE VIBRATION	<u>✓</u>	☒		<u>GB</u>
HIGH COOLER VIBRATION	<u>✓</u>	☒		<u>GB</u>
LOSS OF SPEED SIGNAL	<u>✓</u>	☒		<u>GB</u>
EMERGENCY STOP	<u>✓</u>	☒		<u>GB</u>
OVERSPEED	<u>1980 RPM</u>	☒		<u>GB</u>
LOW FUEL PRESSURE	<u>-</u>			
UNDERSPEED / FREQUENCY	<u>57 Hz</u>		☒	<u>GB</u>
UNDERVOLTAGE	<u>324 VAC</u>	☒		<u>GB</u>
OVERVOLTAGE	<u>528 VAC</u>	☒		<u>GB</u>
REVERSE POWER	<u>-</u>			
GROUND FAULT	<u>-</u>			
BREAKER TRIPPED	<u>✓</u>			
AUTO START TEST	<u>✓</u>			
DETONATION (DSM)	<u>-</u>			
PHASE ROTATION	<u>ABC</u>			<u>GB</u>
OVERCRANK	<u>3X 155EC</u>	☒		<u>GB</u>
BATTERY VOLTAGE CHECK	<u>26.5 VDC</u>			<u>GB</u>

COMMENTS:

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CONTROL DEVICE SETTINGS		
SHOP LOAD TEST ☒ <u>Unit #1</u>		FIELD LOAD TEST ☐
GOVERNOR MAKE / MODEL: <u>GAC ESD2110</u>		GOVERNOR TYPE: ISOCH ☒ DROOP ☐
GAIN: <u>3.5</u>		STABILITY / RESET: <u>4.5</u>
START FUEL LIMIT: <u>4.5</u>		RAMP TIME: <u> </u>
LOW IDLE SPEED: <u> </u> RPM		ACTUATOR COMPENSATION: <u> </u>
LOAD GAIN SIGNAL: <u> </u> V _{DC} @ <u> </u> KW		DROOP: <u> </u>
GENERATOR / VOLTAGE / CURRENT PROTECTION		
UNDER FREQUENCY: <u>57</u> Hz		OVER FREQUENCY: <u>63</u> Hz
UNDER VOLTAGE: <u>384</u> V _{AC}		TIME: <u>5</u> SEC
OVER VOLTAGE: <u>528</u> V _{AC}		TIME: <u>2</u> SEC
REVERSE POWER: <u> </u> % = <u> </u> KW		TIME: <u> </u> SEC
SYNC. CHECK RELAY: <u> </u> %		TIME: <u> </u> SEC
OVERCURRENT SET I = <u>248</u> AMP		I/T <u>20 sec</u>
TEMPERATURE RELAY SETTINGS (RTD):	ALARM: <u> </u> °C	SHUTDOWN <u> </u> °C
HI-POT TEST REPORT		
SYSTEM VOLTAGE <u>480</u> V		PHASE: <u>3</u>
TEST VOLTAGE: <u>1960</u> V		
TEST VOLTAGE: L1	<u>1960</u> V	CURRENT: <u>0</u> MICROAMPS
L2	<u>1960</u> V	CURRENT: <u>0</u> MICROAMPS
L3	<u>1960</u> V	CURRENT: <u>0</u> MICROAMPS
NEUTRAL:	<u> </u> V	CURRENT: <u> </u> MICROAMPS
DURATION: <u>1</u> MINUTES		
COMMENTS:		

Signature:  Date: 05/06/05

Employee #: _____

CONTROL DEVICE SETTINGS

SHOP LOAD TEST ☒ Unit #2	FIELD LOAD TEST ☐
GOVERNOR MAKE / MODEL: GAC ESD 2110	GOVERNOR TYPE: ISOCH ☒ DROOP ☐
GAIN: 3.5	STABILITY / RESET: 3.5
START FUEL LIMIT: 4.5	RAMP TIME: —
LOW IDLE SPEED: — RPM	ACTUATOR COMPENSATION: —
LOAD GAIN SIGNAL: — V _{dc} @ kW	DROOP: —

GENERATOR / VOLTAGE / CURRENT PROTECTION

UNDER FREQUENCY: 57 Hz	OVER FREQUENCY: 63 Hz
UNDER VOLTAGE: 384 V _{ac}	TIME: 5 SEC
OVER VOLTAGE: 528 V _{ac}	TIME: 2 SEC
REVERSE POWER: — % = kW	TIME: SEC
SYNC. CHECK RELAY: — %	TIME: SEC
OVERCURRENT SET I = 248 AMP	IT 20 sec
TEMPERATURE RELAY SETTINGS (RTD):	ALARM: — °C SHUTDOWN °C

HI-POT TEST REPORT

SYSTEM VOLTAGE 480 V	PHASE: 3
TEST VOLTAGE: 1960 V	
TEST VOLTAGE: L1 1960 V	CURRENT: 0 MICROAMPS
L2 1960 V	CURRENT: 0 MICROAMPS
L3 1960 V	CURRENT: 0 MICROAMPS
NEUTRAL: — V	CURRENT: — MICROAMPS
DURATION: 1 MINUTES	

COMMENTS:

Signature: G. [Signature]

Date: 05/06/05

Employee #: _____

ENERFLEX

SYSTEMS LTD.

COMPRESSION AND POWER DIVISION

Unit #1

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AMBIENT TEMP. (°C)	COOLANT TEMP. (°C)	OIL TEMP. (°C)	INTAKE MANIFOLD TEMP. (°C)	EXHAUST TEMP. (°C)	OIL PRESSURE (PSI)	FUEL PRESSURE (H ₂ O)	CRANKCASE PRESSURE (H ₂ O)	MANIFOLD VACUUM (H ₂)	INLET RESTRICTION (H ₂ O)	VOLTS	AMPS	KW	Hz	TIME
66°F	192°F	174°F	—	760°F	90 PSI	6"	-1"	+14"	—	480	181	150.5	60.0	8:00
72°F	193°F	176°F		775°F	90 PSI	6"	-1.5"	+14"		480	182	151.3	60.1	8:30
69°F	192°F	176°F		770°F	90	6"	-1.5"	+14"		480	181	150.5	60.0	9:00
70°F	192°F	177°F		775°F	90	6"	-2"	+14"		481	181	150.8	60.0	9:30
72°F	192°F	176°F		780°F	90	6"	-2"	+14"		481	181	150.8	60.1	10:00
68°F	192°F	176°F		795°F	90	6"	-1.5"	+14"		480	181	150.5	60.1	10:30
70°F	193°F	177°F		790°F	90	6"	-1.5"	+14"		480	181	150.5	60.0	11:00
74°F	193°F	177°F		785°F	90	6"	-1.5"	+14"		480	181	150.5	60.0	11:30
76°F	193°F	178°F		795°F	90	6"	-2"	+14"		481	181	150.8	60.1	12:00

Signature:

G. Sall.

Date:

05/17/05

Customer Signature:

(if required)

Date:

Employee #:

ENERFLEX

SYSTEMS LTD.

COMPRESSION AND POWER DIVISION

Unit #2

FABRICATION CHECKLIST

GENERATOR SET PACKAGE

TEST RUN REPORT

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AMBIENT TEMP. (°C)	COOLANT TEMP. (°C)	OIL TEMP. (°C)	INTAKE MANIFOLD TEMP. (°C/°F)	EXHAUST TEMP. (°C/°F)	OIL PRESSURE (in. / MPa)	FUEL PRESSURE (in. / MPa)	CRANKCASE PRESSURE (in. / MPa)	MANIFOLD VACUUM (in. / MPa)	INLET RESTRICTION (in. / MPa)	VOLTS	AMPS	KW	Hz	TIME
65°F	191°F	178°F	—	690°F	99 PSI	6"	-1.5"	+13"	—	481	182	150.8	60.0	7:30
68°F	195°F	183°F		765°F	99 PSI	6"	-1.5"	+13"		481	181	150.8	60.2	8:00
69°F	195°F	184°F		780°F	99	6"	-1.5"	+13"		481	181	150.8	60.1	8:30
71°F	195°F	186°F		760°F	99	6"	-1.5"	+13"		480	181	150.5	60.1	9:00
68°F	195°F	186°F		755°F	99	6"	-1.5"	+12"		480	181	150.5	59.9	9:30
72°F	195°F	186°F		765°F	99	6"	-2"	+12"		480	181	150.5	60.2	10:00
73°F	195°F	186°F		780°F	99	6"	-1.5"	+13"		480	181	150.5	60.0	10:30
76°F	196°F	186°F		785°F	98	6"	-1.5"	+13"		480	182	151.6	60.3	11:00
74°F	195°F	186°F		765°F	98	6"	-1.5"	+12"		480	181	150.5	59.9	11:30

Signature:

G. Khan

Date:

05/19/05

Customer Signature:

(if required)

Date:

Employee #: