Linear Power Systems Pte Ltd

Generator Maintenance Services

Deutz

Cummins

Kohler

IVECO

Detroit Diesel

MTU

Volvo/Penta

Perkins

John Deere

Mitsubishi

Is your building generator's manufacture in this list?

Your generator needs regular servicing to maintain it for those critical times when there is a power interruption. Our factory-trained service technicians will keep your system in peak condition under our maintenance contract so you do not have to worry about it.

During our regular maintenance calls, we:

- ✓ **Inspect and test the batteries,**
- ✓ **Check and top-up the lube oil if necessary,**
- ✓ **Run the engine to assure it is in peak condition.**
- ✓ **Inspect all of the service parts and maintain a supply of original-equipment and factory-authorized service and replacement parts.**
- ✓ **You receive a comprehensive maintenance report with our professional maintenance guidelines.**
- ✓ **Our service plan can include standby and emergency service, diagnostic service, lube oil and filter change, radiator coolant check and change, engine oil testing., resistive load bank testing..**
- ✓ **We can provide standby for annual FSB inspections with PE endorsement**

Please contact us to discuss your requirements and for details of our standard service plans

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We specialize in expert service for your facility generator set.

Regular Servicing

- ✓ **Monthly/Quarterly servicing of your engine using our 56-point checklist and service guidelines assure your equipment is ready should it be needed in an emergency.**

Annual Servicing

- ✓ **Every engine manufacturer recommends a lube oil change every 250 running hours or at least once per year.**
- ✓ **We dispose of the used oil through NEA approved vendor at no cost to you.**
- ✓ **We use only manufacturer-approved grade lube oil and genuine service parts for all of our servicing needs which include the lub oil filters, by-pass filters, fuel filters, water filters, etc.**

Load Bank Testing for Generator

- ✓ **All engine manufacturer's recommend regular testing under load to keep your engine performing well.**
- ✓ **We use our own load banks to test your diesel generator set at its rated load. This removes built-up carbon, prevents buildup of acids in the lube oil, and buildup of detrimental carbon particles in the exhaust valves and help maintenance of the piston ring seals.**
- ✓ **Your engine will run better, more efficiently, and you are assured you are doing everything necessary to prevent an inconvenient power outage from becoming a disaster.**

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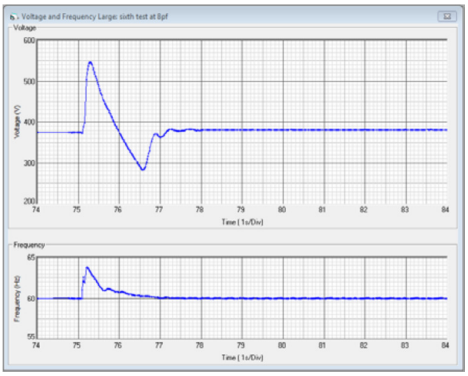
OUR LOAD BANK

- ✓ Most of our load banks are from the UK to test power supplies from 1 kW to several MW.
- ✓ The Intelligent Hand Held Terminal (IHT) provides full load control and three-phase instrumentation on any equipped load bank.
- ✓ All electrical enclosures are to IP54.
- ✓ An emergency stop/disconnect switch gives full isolation of the fan and control supply.
- ✓ As well as the MS66 and MSI 10 described here, an extensive range of resistive, inductive or capacitive load banks is also available.

Load Bank Control

All instrumentation measurements are made using high accuracy voltage and current transformers located within the load bank. This information is processed. Digitally, using high-speed sampling of the raw data; this provides full three-phase true rms measurements with high update rates.

- ✓ Three instrumentation display 'pages' show all the main electrical parameters.
- ✓ The displays are designed to simplify the setup and adjustment of Generator and UPS supplies.
- ✓ A large display of Voltage and Frequency to assist in initial setup.
- ✓ When full-load testing, one 'page' shows all the true rms three-phase measurements of Voltage (V), Frequency (Hz), Current (A), Power (both kW & kVA) & Power Factor (Cos F).
- ✓ For transient-response testing, the voltage and frequency of the last load change are captured and displayed on the dynamic graph including maximum and minimum data.



Alternative to the Intelligent Hand-held Terminal (IHT), our load bank do have PC software, It provides further enhanced load control along with –

- ✓ Transient speed instrumentation,
- ✓ Full data acquisition reporting with graphical displays.
- ✓ Real time data such as crest factor recovery times and % errors necessary for testing to ISO8528.

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Why test your generator to full capacity

Engine manufacturers all recommend running your engine at a partial load on a regular basis to prevent carbon fouling (buildup of carbon on cylinder heads, pistons and valves) and wet-stacking (unburned diesel fuel accumulation in the cylinder) which rob power from your generator and reduce the lifespan of the engine. Running the engine at idle and without a load are the cause of these maintenance faults.

Singapore Standard CP 31:1996 defines a series of tests and records required for standby generator sets. Our standard maintenance schedule assures that your generator maintenance program meets or exceeds this standard.

The NFPA 110:1999 requires all standby generators run at full load at least once a year to assure they come up to speed and settle in at the proper power to support the emergency equipment that they are in place to run.

Linear Power Systems engineers and technicians provide the necessary equipment to run the full series of tests under load required under the above codes and in compliance with Singapore and international standards and procedures.

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Others Service

All of your Generator and critical systems maintenance and repair in one set of hands, one invoice, one payment. We can customize one of our standard service plans to fit your needs and budget.

We provide standard and customized service plans to fit your needs and budget.

- ✓ **Preventative maintenance.**
- ✓ **One time inspection and servicing**
- ✓ **Predictive maintenance**
- ✓ **Emergency and critical service response available**
- ✓ **Stand-by system support for your annual shut-down exercises.**
- ✓ **Full load functional testing with resistive load banks (to 6000KW) with our own equipment.**
- ✓ **Rental generators from 20KVA to 1250KVA**
- ✓ **We can provide stand-by system support for your annual FSB inspection and shut-down exercises as well as electrical systems maintenance and service by certified professionals. We are able to provide Professional Engineer endorsement for our testing services.**
- ✓ **Uninterrupted Power Supply (UPS) Load Bank testing.**

RENTAL OF LOAD BANK AND POWER CABLES

- ✓ **We have a wide range of load bank and power cables for rental.**

Appendix A.

Renewal of Storage tank licensing

To assist you in your On-line electronic renewal of Flammable Materials Storage

License for the above premise, which would include the following scope of services:

- ✓ **To liaise with FSSD, SCDF on the matter of License Application,**
- ✓ **To advise you the amount of License payable.**
- ✓ **To submit the Emergency Response Plan as required by FSSD,**
- ✓ **To provide Visual Inspection and issue Certificates of Fitness with QP endorsement.**

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MAINTENANCE CHECKLIST FOR STANDBY GENERATOR

A. BEFORE STARTING

1. ENGINE SYSTEM: -

i) LUBRICATING SYSTEM: -

- PIPE & CONNECTION FOR LEAKAGE
- OIL FILTER
- RECORD OIL LEVEL (TOP-UP IF NECESSARY).

ii) COOLING SYSTEM: -

- PIPES & HOSES FOR LEAKAGE
- COOLANT LEVEL (TOP-UP IF NECESSARY)
- AIR RESTRICTIONS
- FAN BELTS (ADJUST/TIGHTEN IF NECESSARY)
- PULLY, WATER PUMP ETC. (GREASE IF NECESSARY)

iii) AIR SYSTEM: -

- PIPE & CONNECTION FOR LEAKAGE
- AIR FILTER (CLEAN IF NECESSARY)

iv) FUEL SYSTEM

- PIPE & CONNECTION FOR LEAKAGE
- FUEL TANK LEVEL
- LINKS & FUEL PUMPS (GREASE IF NECESSARY
- DRAIN SEDIMENT IN DAY TANK. (IF NECESSARY)
- FOR WATER IN DIESEL TANK (DRIAN IF NECESSARY)
- STORAGE TANK LEVEL

v) EXHAUST SYSTEM

- PIPE & CONNECTION FOR LEAKAGE
- EXHAUST MANIFOLD
- EXHAUST SILENCER
- TURBOCHARGER
- EXHAUST COLOUR

vi) HEAT EXCHANGER

- LEAKAGE

vii) OTHERS: -

- VIBRATION ISOLATORS
- HOLDING DOWN BOLTS
- COUPLING BOLTS

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2. ELECTRICAL SYSTEMS

i) CONTROL PANEL: -
- WIRING CONNECTIONS
- MOUNTING SCREWS
- METERS
- LAMPS

ii) ALTERNATOR
- POWER CABLE CONNECTION
- CLEANLINESS IN TERMINATION

3. BATTERY CHARGER SYSTEMS

i) BATTERY
- BATTERY CONDITION
- ELECTROLYTE LEVEL
- SPECIFIC GRAVITY
- LUGS AND TERMINALS

ii) BATTERY CHARGER
- CHARGING VOLTAGE
- CHARGING CURRENT
- CHARGER ON BOOST, FLOAT OR AUTOMATIC

B. ENGINE RUNNING RECORD

1. ENGINE PANEL: -
- ENIGNE SPEED
- OIL PRESSURE
- ENGINE TEMPERATURE.
- OIL TEMPERATURE.
- EXHAUST TEMPERATURE

2. GENERATOR CONTROL PANEL
- GENERATOR OUTPUT VOLTAGE. (ADJUST IF NECESSARY)
- GENERATOR FREQUENCY. (ADJUST IF NECESSARY)
- GENERATOR OUTPUT CURRENT.
- GENERATOR OUTPUT KILOWATT.

C. RECOMMENDATION / OTHERS

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Appendix A

KW		Size (mm)			Weight	Discharge	Controller	Aux Supply	Main Breaker
400V (50Hz)	480V (60Hz)	Length	Width	Height	(Kg)				
903	1300	3545	2060	2525	1500	Side	Loader	Internal / External	No
903	1300	3545	2060	2525	1500	Side	Loader	Internal / External	No
903	1300	2340	1540	2070	1500	Up	Loader	Internal / External	No
903	1300	2340	1540	2070	1500	Up	Loader	Internal / External	No
600		1830	1240	1520	668	Side	Loader	Internal / External	No
600		1830	1240	1520	664	Side	Toggle Sw	Internal / External	No
600		1240	1300	1560	510	Up	MCCB	Internal	Yes
400		1800	1420	1740	888	Side	MCCB	Internal	Yes
400		1800	1420	1740	886	Side	MCCB	Internal	Yes
300		825	875	1350	280	Side	Loader	Internal / External	No
300		825	875	1350	280	Side	Loader	Internal / External	No
200		1000	810	1580	242	Side	Loader	External	No
150		1530	1150	1260	328	Side	Contactor	Internal	No
100		980	740	1065	150	Up	Loader	Internal	No
100		980	740	1065	150	Up	Loader	Internal	No
100		980	740	1065	150	Up	Loader	Internal	No
100		980	740	1065	150	Up	Loader	Internal	No
80		110	70	150	214	Side	MCCB	External	No
50		1240	1040	1200	254	Side	Contactor	Internal	No

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