



**LM2500 GAS TURBINE
GENERATOR SET**



LM2500 Overview



POWERING BUSINESS. EMPOWERING PEOPLE

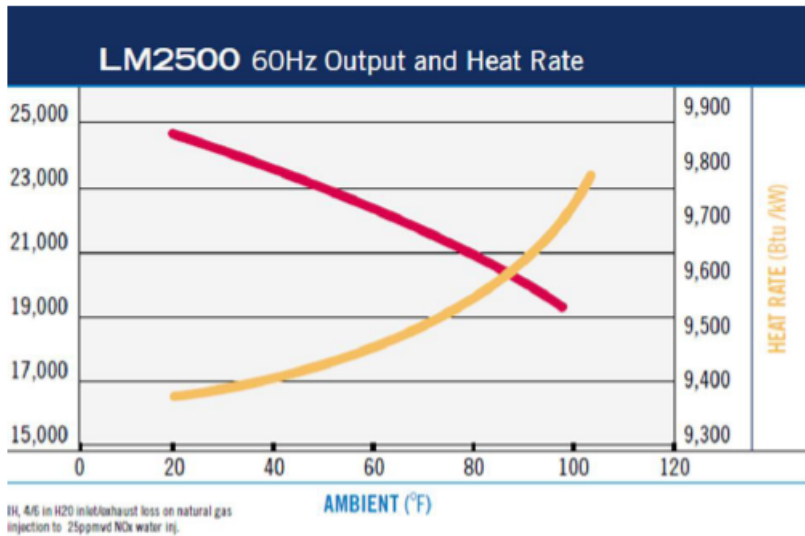
- The LM2500 package was installed at Hitachi Zosen in Japan in 1994 and removed in 2011.
- It is a three piece split skid (generator, turbine & air intake), 50HZ.
- The package was only used for peaking power and after 15 years of operation only accumulated approximately 7,200 hours.
- The engine has been converted from a PH to a PE.
- Brush generator assembly.
- Equipped with Netcon 5000 control system.
- Engine overhauled.



Estimated (ISO) Performance



POWERING BUSINESS. EMPOWERING PEOPLE



ISO performance based on natural gas with water injection to 25 ppmvd NO_x.

	LM2000	LM2500	LM2500+
Power Output (kWe)	18,000	22,000	30,500
Heat Rate LHV (Btu/kWe-Hr)	9,900	9,465	8,850
Exhaust Flow (lbs/sec)	134	149	191
Exhaust Temperature (°F)	927	990	960
Emissions (ppmvd)	NO _x /CO	NO _x /CO	NO _x /CO
Gas-DLE	25/25	25/25	25/25
Gas or Liquid-Water	25/75, 42/60	25/50, 42/30	25/60, 42/60
Gas-Steam	25/74	25/30	25/138
Power Turbine Speed (rpm)	3,600	3,600	3,600
No. of Compressor Stages	16	16	17
No. of Turbine Stages	6	6	6 or 2

LM2500 PE

LM2500 PACKING LIST



POWERING BUSINESS. EMPOWERING PEOPLE

LM2500 Gas Turbine Generator Package				
Case No.	Tag No.	Description	Weight	Measurement
1	1-1	Generator 1 PC	Net: 50,000 KGS.	(L) 629 X (W) 321 X (H) 291 CM 58.756
			Gross: 50,320 KGS.	
2	4 - 1	Turbine - 1PC	Net: 28,000 KGS.	(L) 766 X (W) 355 X (H) 382 CM 103.877
	5 - 1	Turbine Base - 1PC	Gross: 28,300 KGS.	
3	6 - 1	Inlet Plenum Base - 1PC	Net: 9,000 KGS.	(L) 436 X (W) 349 X (H) 383 CM 58.279
			Gross: 9,200 KGS.	
4	2 - 3 - 1	Gen. Lube Oil Unit Pipe - 1PC	Net: 8,700 KGS.	(L) 772 X (W) 355 X (H) 188 CM 51.523
	2 - 3 - 2	Gen. Lube Oil Unit Pipe - 1PC	Gross: 8,950 KGS.	
	2 - 3 - 3	Gen. Lube Oil Unit Pipe - 1PC		
	2 - 3 - 6	Gen. Lube Oil Unit Pipe - 1PC		
	2 - 3 - 13	Gen. Lube Oil Unit Pipe - 1PC		
	2 - 3 - 15	Gen. Lube Oil Unit Pipe - 1PC		
	3 - 1	Gen. Base - 1PC		
	4 - 4	Rubber Boots Retainer Rings - 3PCS		
	5 - 4 - 1	Turbine lube Pipe - 1PC		
	5 - 4 - 2	Turbine lube Pipe - 2PCS		
5	9	Inlet Transition Assy. - 1PC	Net: 2,800 KGS.	(L) 661 X (W) 304 X (H) 356 CM 71.536
			Gross: 2,900 KGS.	
6	10 - 1	Inlet Duct - 1PC	Net: 2,000 KGS.	(L) 402 X (W) 322 X (H) 189 CM 24.465
			Gross: 2,790 KGS.	
7	10 - 2	Inlet Silencer - 1PC	Net: 3,700 KGS.	(L) 402 X (W) 322 X (H) 222 CM 28.737
			Gross: 4,630 KGS.	
8	11	Inlet Elbow Assy. - 1PC	Net: 3,000 KGS.	(L) 364 X (W) 309 X (H) 380 CM 42.741
			Gross: 3,360 KGS.	
9	13 - 1	Roof Skid Base - 1PC	Net: 3,500 KGS.	(L) 361 X (W) 244 X (H) 206 CM 18.145
			Gross: 4,220 KGS.	
10	15 - 1	Gen. Inlet Filter - 1PC	Net: 800 KGS.	(L) 312 X (W) 218 X (H) 165 CM 11.223
			Gross: 1,250 KGS.	
11	15 - 2	Gen. Inlet Filter - 1PC	Net: 800 KGS.	(L) 312 X (W) 218 X (H) 165 CM 11.223
			Gross: 1,250 KGS.	

LM2500 PACKING LIST



POWERING BUSINESS. EMPOWERING PEOPLE

Case No.	Tag No.	Description	Weight	Measurement
12	21	Lube Oil Cooler Skid - 1PC	Net: 6,000 KGS.	(L) 730 X (W) 264 X (H) 266 CM 51.264
			Gross: 7,800 KGS.	
13	7 - 1	Air Filter - 1PC	Net: 2,500 KGS.	(L) 754 X (W) 345 X (H) 137 CM 35.638
	7 - 4 - 11	Airfilter Cartridge Retainer - 15PCS	Gross: 3,640 KGS.	
	7 - 4 - 12	Airfilter Cartridge Retainer - 13PCS		
	7 - 4 - 13	Airfilter Cartridge Retainer - 14PCS		
	7 - 4 - 14	Airfilter Cartridge Retainer - 11PCS		
	7 - 4 - 15	Airfilter Cartridge Retainer - 12PCS		
	7 - 4 - 16	Airfilter Cartridge Retainer - 11PCS		
	7 - 4 - 17	Airfilter Cartridge Retainer - 10PCS		
	7 - 4 - 18	Airfilter Cartridge Retainer - 11PCS		
	7 - 4 - 19	Airfilter Cartridge Retainer - 11PCS		
	7 - 4 - 20	Airfilter Cartridge Retainer - 12PCS		
	7 - 4 - 21	Airfilter Cartridge Retainer - 12PCS		
	7 - 4 - 22	Airfilter Cartridge Retainer - 9PCS		
14	7 - 2	Air Filter - 1PC	Net: 2,500 KGS.	(L) 754 X (W) 345 X (H) 137 CM 35.638
	7 - 4 - 1	Airfilter Cartridge Retainer - 10PCS	Gross: 3,640 KGS.	
	7 - 4 - 2	Airfilter Cartridge Retainer - 11PCS		
	7 - 4 - 3	Airfilter Cartridge Retainer - 14PCS		
	7 - 4 - 4	Airfilter Cartridge Retainer - 14PCS		
	7 - 4 - 5	Airfilter Cartridge Retainer - 12PCS		
	7 - 4 - 6	Airfilter Cartridge Retainer - 10PCS		
	7 - 4 - 7	Airfilter Cartridge Retainer - 9PCS		
	7 - 4 - 8	Airfilter Cartridge Retainer - 12PCS		
	7 - 4 - 9	Airfilter Cartridge Retainer - 13PCS		
7 - 4 - 10	Airfilter Cartridge Retainer - 11PCS			
	7 - 8	Air Filter Spare Parts - 1PC		
15	4 - 2 - 1	Turbine Sensor Adjusting Tool - 1PC	Net: 110 KGS.	(L) 180 X (W) 125 X (H) 127 CM 2.858
	5 - 3	Turbine Base Fuel Spare Valve - 1PC	Gross: 300 KGS.	
	36 - 1	VDC Power Supply - 1PC		
	38 - 1	Isolator - 1PC		
	39 - 1	Duo-Chek Valve-2PCS		
	40 - 1	Spare Sensor - 8PCS		

LM2500 PACKING LIST



POWERING BUSINESS. EMPOWERING PEOPLE

Case No.	Tag No.	Description	Weight	Measurement
	40 - 1 - 1	Maintenance Manual - 1PC		
	40 - 1 - 2	Maintenance Manual - 1PC		
	40 - 1 - 3	Maintenance Manual - 1PC		
	40 - 1 - 4	Maintenance Manual - 1PC		
	40 - 1 - 5	Maintenance Manual - 1PC		
	40 - 1 - 6	Maintenance Manual - 1PC		
	40 - 1 - 7	Maintenance Manual - 1PC		
16	1 - 4 - 1	Gen. Sensor - 1PC	Net: 60 KGS.	(L) 123 X (W) 125 X (H) 127 CM 1.953
	2 - 4	Gen. Lube Oil Sensor - 1PC	Gross: 200 KGS.	
	4 - 3 - 1	Maintenance Tool - 1PC		
	4 - 3 - 2	Maintenance Tool - 1PC		
	32 - 1 - 1	Spare Fuel Oil Filter - 5PCS		
	32 - 1 - 2	Spare Fuel Oil Filter - 6PCS		
	32 - 1 - 3	Spare Fuel Oil Filter - 6PCS		
	33	Spare Fuel Oil Filter Gen. - 22 PCS		
	34	Spare Fuel Oil Filter Turbine - 7PCS		
	35 - 1	Spare Hydraulic Filter - 25PCS		
	35 - 2 - 1	Spare Hydraulic Filter - 15PCS		
	35 - 2 - 2	Spare Hydraulic Filter - 13PCS		
	40 - 2	Spare Gauge - 4PCS		
17	4 - 5	Turbine Coupling - 1PC	Net: 300 KGS.	(L) 246 X (W) 85 X (H) 89 CM 1.861
	4 - 6 - 1	Turbine Coupling Bolts (GT) - 48PCS	Gross: 430 KGS.	
	4 - 6 - 2	Turbine Coupling Bolts (Gen.) - 20PCS		
18	12 - 1 - 1	Lineside/Neutral Cubicles - 1PC	Net: 1,200 KGS.	(L) 418 X (W) 123 X (H) 171 CM 8.792
			Gross: 1,530 KGS.	
19	12 - 1 - 2	Lineside/Neutral Cubicles - 1PC	Net: 1,200 KGS.	(L) 418 X (W) 123 X (H) 171 CM 8.792
			Gross: 1,530 KGS.	
20	12 - 2 - 1	Neutral Gnd Resistor - 1PC	Net: 420 KGS.	(L) 192 X (W) 141 X (H) 217 CM 5.875
	12 - 2 - 2	Neutral Gnd Resistor - 1PC	Gross: 640 KGS.	
21	13 - 2 - 1	Roof Skid Silencer - 1PC	Net: 800 KGS.	(L) 289 X (W) 136 X (H) 146 CM 5.738
			Gross: 1,020 KGS.	
22	13 - 2 - 2	Roof Skid Silencer - 1PC	Net: 800 KGS.	(L) 289 X (W) 136 X (H) 146 CM 5.738
			Gross: 1,020 KGS.	

LM2500 PACKING LIST



POWERING BUSINESS. EMPOWERING PEOPLE

Case No.	Tag No.	Description	Weight	Measurement
23	14 - 1 - 1	Rf Skd Extension Duct - 1PC	Net: 140 KGS.	(L) 287 X (W) 148 X (H) 127 CM 5.394
	14 - 1 - 2	Rf Skd Extension Duct - 1PC	Gross: 340 KGS.	
24	17 - 1	Gen. Exhaust Vent - 1PC	Net: 2,300 KGS.	(L) 613 X (W) 214 X (H) 239 CM 31.352
	30 - 2	Temporary Support Set Beam - 1PC	Gross: 3,110 KGS.	
25	17 - 2	Gen. Exhaust Vent - 1PC	Net: 1,300 KGS.	(L) 300 X (W) 211 X (H) 233 CM 14.749
			Gross: 1,700 KGS.	
26	19	Hydraulic Start Unit - 1PC	Net: 2,390 KGS.	(L) 263 X (W) 180 X (H) 200 CM 9.468
			Gross: 2,710 KGS.	
27	20 - 1	Fuel Pump Skid - 1PC	Net: 2,300 KGS.	(L) 300 X (W) 211 X (H) 196 CM 12.407
	20 - 2 - 1	Fuel Pump Skid Pipe - 1PC	Gross: 2,640 KGS.	
	20 - 2 - 2	Fuel Pump Skid Pipe - 1PC		
28	24	Cubicle 1-4 & Termination - 1PC	Net: 2,450 KGS.	(L) 377 X (W) 123 X (H) 289 CM 13.401
			Gross: 2,880 KGS.	
29	29	Lifting Beam Set for Engine - 1PC	Net: 200 KGS.	(L) 278 X (W) 138 X (H) 93 CM 3.568
	31	Bar for Arraignment - 1PC	Gross: 380 KGS.	
30	30 - 1	Temporary Support Set - 1PC	Net: 390 KGS.	(L) 458 X (W) 168 X (H) 111 CM 8.541
			Gross: 690 KGS.	
31	2 - 1	Gen. Lube Oil Unit Demister - 1PC	Net: 330 KGS.	(L) 215 X (W) 142 X (H) 106 CM 3.236
	2 - 3 - 4	Gen. Lube Oil Unit Pipe - 1PC	Gross: 530 KGS.	
	2 - 3 - 5	Gen. Lube Oil Unit Pipe - 1PC		
	2 - 3 - 7	Gen. Lube Oil Unit Pipe - 1PC		
	2 - 3 - 10	Gen. Lube Oil Unit Pipe - 1PC		
	2 - 3 - 11	Gen. Lube Oil Unit Pipe - 1PC		
	2 - 3 - 14	Gen. Lube Oil Unit Pipe - 1PC		
	2 - 3 - 16	Gen. Lube Oil Unit Pipe - 1PC		
	3 - 2	Gen. Base Pipe - 1PC		
	32	2 - 2 - 1	Gen. Lube Oil Unit Headtank - 1PC	Net: 200 KGS.
2 - 2 - 2		Gen. Lube Oil Unit Headtank - 1PC	Gross: 350 KGS.	
23		Water Wash Tank - 1PC		
33	7 - 5	Air Filter Local panel - 1PC	Net: 100 KGS.	(L) 104 X (W) 104 X (H) 81 CM 0.876
	7 - 6 - 1	Air Filter PDS1 - 1PC	Gross: 170 KGS.	
	7 - 6 - 2	Air Filter PDS2 - 1PC		
	7 - 6 - 3	Air Filter PDI - 1PC		

LM2500 PACKING LIST



POWERING BUSINESS. EMPOWERING PEOPLE

Case No.	Tag No.	Description	Weight	Measurement
	7 - 7	Air Filter Cable - 1PC		
34	2 - 3 - 8	Gen. Lube Oil Unit Pipe - 1PC	Net: 550 KGS.	(L) 246 X (W) 147 X (H) 96 CM 3.472
	2 - 3 - 9	Gen. Lube Oil Unit Pipe - 1PC	Gross: 740 KGS.	
	2 - 3 - 12	Gen. Lube Oil Unit Pipe - 1PC		
	5 - 2 - 1	Turbine Base Fuel Filter - 1PC		
	5 - 2 - 2	Turbine Base Fuel Filter - 1PC		
	5 - 5 - 1	Turbine Steam Pipe - 1PC		
	5 - 5 - 2	Turbine Steam Pipe - 1PC		
	5 - 5 - 3	Turbine Steam Pipe - 1PC		
	5 - 5 - 4	Turbine Steam Pipe - 1PC		
		6 - 2	Gas Bottle Guide Set - 1PC	
35	1 - 2 - 1	Gen. Half Rings - 2PCS	Net: 430 KGS.	(L) 210 X (W) 123 X (H) 111 CM 2.867
	3 - 3 - 1	Gen. Base Plate - 2PCS	Gross: 580 KGS.	
	3 - 3 - 2	Gen. Base Plate - 4PCS		
	3 - 3 - 3	Gen. Base Plate - 2PCS		
	3 - 3 - 4	Gen. Base Plate - 2PCS		
	5 - 6 - 1	Turbine Coupling Cover1 - 2PCS		
	5 - 6 - 2	Turbine Coupling Cover2 - 2PCS		
		Inner Case 1		
	1 - 2 - 2	Gen. Half Rings Bolts1 - 6PCS		
	1 - 2 - 3	Gen. Half Rings Bolts2 - 20PCS		
	1 - 3 - 1	Gen. Maunting Bolts - 3PCS		
	1 - 3 - 2	Gen. Maunting Bolts - 3PCS		
	1 - 3 - 3	Gen. Maunting Bolts - 3PCS		
	1 - 3 - 4	Gen. Maunting Bolts - 3PCS		
	1 - 5	Gen. Brg Cover Bolt Set - 1PC		
		Inner Case 2		
	4 - 7	Turbine Diffuser Bolts - 92PCS		
	4 - 8	Rubber Boots Retainer Bolt Set - 1PC		
	4 - 9	Turbine Diffuser Inner Bolts - 20PCS		
	4 - 10	Turbine Pipe Bolts - 4PCS		
	5 - 5 - 5	Turbine Steam pipe Bolts - 8PCS		
	5 - 6 - 3	Turbine Coupling Cover Bolt Set - 1PC		

LM2500 PACKING LIST



POWERING BUSINESS. EMPOWERING PEOPLE

Case No.	Tag No.	Description	Weight	Measurement
	5 - 7	Tubing Band Set - 1PC		
	5 - 8	Exhaust Bolt Set - 1PC		
	5 - 9	Turbine Sub Skid Mount Bolt Set - 1PC		
	5 - 10	Cable Pipe Support Set - 1PC		
		Inner Case 3		
	3 - 3 - 5	Gen. Base Plate Bolt Set - 1PC		
	6 - 3	CO2 hardware Set - 1PC		
	42 - 1 - 1	Base Connection Bolts - 12PCS		
	42 - 2 - 1	Base Connection Pins - 6 PCS		
	42 - 3	Base Anchor Nut Set - 1PC		
36	41	Lifting Beam - 1PC	Net: 1,000 KGS.	(L) 550 X (W) 25 X (H) 81 CM 1.114
			Gross: 1,000 KGS.	

LM2500 Maintenance Activities

Key Maintenance Recommendations

Borescope / Inspection:	Every 6 mo./8000 hrs.
Hot Section Inspections:	Every 25,000 hrs.
Major Overhauls:	Every 50,000 hrs.
Field Service:	On-call or on-site field techs available
Service Provider:	TransCanada Turbines (TCT) a Wood Group Joint Venture and EthosEnergy affiliate
Spare Parts:	Critical spares inventory with 24/7 parts service
Performance Guarantees:	Can be included as part of negotiated LTSA or O&M scope



Key Features

- Levelized Maintenance Fees = Predictable Costs
 - Fired hour / monthly fees
 - No “spike” in fees during major maintenance
 - Simplified maintenance budgeting
- Outage Flexibility = More Revenue
 - Routine maintenance by contracted service partner (TCT & EthosEnergy)
 - Ongoing record keeping and monitoring
 - Extended maintenance intervals based on condition
 - Parts and repair options
- Outage Planning and Execution = Lower Owner’s Risk
 - Scheduled and unscheduled maintenance
 - Maintenance planning, parts sourcing by EthosEnergy
 - Maintenance planned around scheduled plant outages
- Available Through TransCanada Turbines (TCT), a Level 4 Authorized Service Provider and Wood Group Joint Venture, EthosEnergy Affiliate

Key Features

- Experienced Staff = Lower Operating Costs
 - Staff trained by OEMs and EthosEnergy
 - Backed by most experienced O&M team and resources in industry – more than 20,000MW of installed power under O&M
 - Rigorous operations and maintenance procedures
- Engineering Resources = Greater Availability and Reliability
 - Hundreds of engineers supporting O&G and Power Generation contracts worldwide
 - Technology-specific maintenance modeling and scheduling programs
 - Remote monitoring and diagnostics available
- Integrated O&M / LTSA = Lower Maintenance Costs
 - Trend monitoring and diagnosis detects problems before they become maintenance events
 - Maintenance planning scheduled with Operations input
 - O&M on all key plant equipment...not just gas turbine