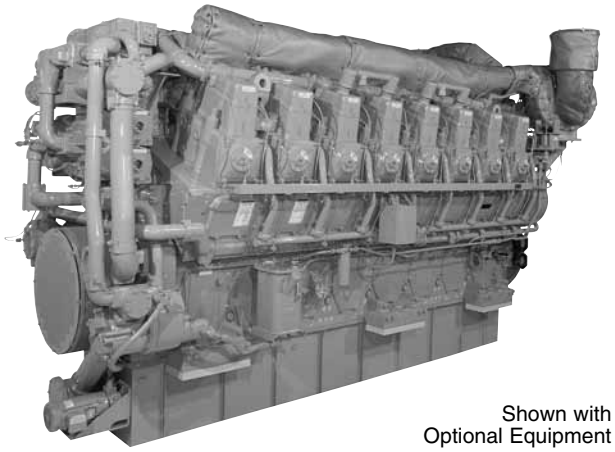
G3616 LE Gas Petroleum Engine

3531-3762 bkW (4735-5045 bhp) 1000 rpm



Shown with Optional Equipment

0.5 g/bhp-hr NOx or 0.7 g/bhp-hr NOx (NTE)

CAT® ENGINE SPECIFICATIONS

V-16, 4-Stroke-Cycle

Bore	300 mm (11.8 in.)
Stroke	300 mm (11.8 in.)
Displacement	339.18 L (20,698 cu. in.)
Aspiration	Turbocharged-Aftercooled
Digital Engine Management	
Governor and Protection	Electronic (ADEM™ A3)
Combustion	Low Emission (Lean Burn)
Engine Weight	
net dry (approx)	29,891 kg (65,900 lb)
Power Density	8.0 kg/kW (13.1 lb/hp)
Power per Displacement	14.9 bhp/L
Total Cooling System Capacity	972.9 L (257 gal)
Jacket Water	900.9 L (238 gal)
Aftercooler Circuit	71.9 L (19 gal)
Lube Oil System (refill)	1328.7 L (351 gal)
Oil Change Interval	5000 hours
Rotation (from flywheel end)	Counterclockwise
Flywheel Teeth	255

FEATURES

Engine Design
- Proven reliability and durability
- Ability to burn a wide spectrum of gaseous fuels
- Robust diesel strength design prolongs life and lowers owning and operating costs
- Broad operating speed range

Emissions
Meets U.S. EPA Spark Ignited Stationary NSPS Emissions for 2010/11 with the use of an oxidation catalyst

Lean Burn Engine Technology
Lean-burn engines operate with large amounts of excess air. The excess air absorbs heat during combustion reducing the combustion temperature and pressure, greatly reducing levels of NOx. Lean-burn design also provides longer component life and excellent fuel consumption.

Ease of Operation
- High-strength pan and rails for excellent mounting and stability
- Side covers on block allow for inspection of internal components

Advanced Digital Engine Management
ADEM A3 engine management system integrates speed control, air/fuel ratio control, and ignition/detonation controls into a complete engine management system. ADEM A3 has improved: user interface, display system, shutdown controls, and system diagnostics.

Full Range of Attachments
Large variety of factory-installed engine attachments reduces packaging time.

Testing
Every engine is full-load tested to ensure proper engine performance.

Gas Engine Rating Pro
GERP is a PC-based program designed to provide site performance capabilities for Cat® natural gas engines for the gas compression industry. GERP provides engine data for your site's altitude, ambient temperature, fuel, engine coolant heat rejection, performance data, installation drawings, spec sheets, and pump curves.

Product Support Offered Through Global Cat Dealer Network
More than 2,200 dealer outlets

Cat factory-trained dealer technicians service every aspect of your petroleum engine

Cat parts and labor warranty

Preventive maintenance agreements available for repair-before-failure options

S•O•S℠ program matches your oil and coolant samples against Caterpillar set standards to determine:
- Internal engine component condition
- Presence of unwanted fluids
- Presence of combustion by-products
- Site-specific oil change interval

Over 80 Years of Engine Manufacturing Experience
Over 60 years of natural gas engine production

Ownership of these manufacturing processes enables Caterpillar to produce high quality, dependable products
- Cast engine blocks, heads, cylinder liners, and flywheel housings
- Machine critical components
- Assemble complete engine

Web Site
For all your petroleum power requirements, visit www.catoilandgas.cat.com.

STANDARD EQUIPMENT

Air Inlet System
Air cleaner — standard duty
Inlet air adapter

Control System
A3 control system — provides electronic governing integrated with air/fuel ratio control and individual cylinder ignition timing control

Cooling System
Jacket water pump
Jacket water thermostats and housing
Aftercooler pump
Aftercooler water thermostats and housing
Single-stage aftercooler

Exhaust System
Dry wrapped exhaust manifolds
Vertical outlet adapter

Flywheel & Flywheel Housing
SAE standard rotation

Fuel System
Gas admission valves — electronically controlled fuel supply pressure

Ignition System
A3 control system — senses individual cylinder detonation and controls individual cylinder timing

Instrumentation
LCD display panel — monitors engine parameters and displays diagnostic codes

Lube System
Crankcase breathers — top mounted
Oil cooler
Oil filter
Oil pan drain valve

Mounting System
Engine mounting feet (six total)

Protection System
Electronic shutoff system with purge cycle
Crankcase explosion relief valves
Gas shutoff valve

Starting System
Air starting system

General
Paint — Cat yellow
Vibration dampers

OPTIONAL EQUIPMENT

Air Inlet System
Heavy-duty air cleaner with precleaners
Heavy-duty air cleaner with rain protection

Charging System
Charging alternators

Control System
Custom control system software — available for non-standard ratings, field programmable using flash memory

Cooling System
Expansion tank
Flexible connections
Jacket water heater

Exhaust System
Flexible bellows adapters
Exhaust expander
Weld flanges

Fuel System
Fuel filter
Gas pressure regulator
Flexible connection
Low energy fuel system
Corrosive gas fuel system

Ignition System
CSA certification

Instrumentation
Remote data monitoring and speed control
Compatible with Cat Electronic Technician (ET) and Data View
Communication Device — PL1000T/E
Display panel deletion is optional

Lube System
Air or electric motor-driven prelube
Duplex oil filter
LH or RH service
Lube oil makeup system

Mounting System
Mounting plates (set of six)

Power Take-Offs
Front stub shafts

Starting System
Air pressure reducing valve
Natural gas starting system

General
Engine barring device
Damper guard

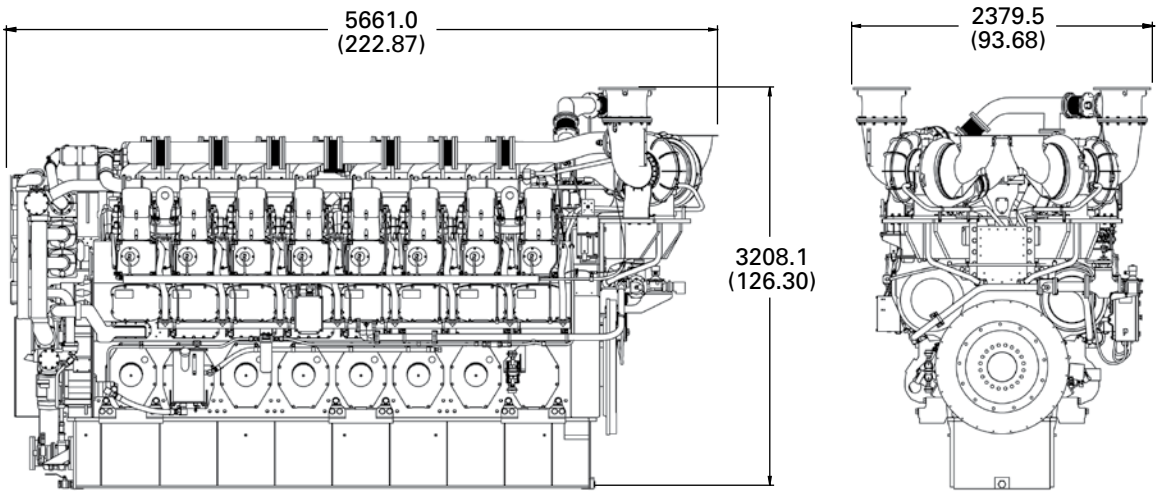
TECHNICAL DATA

G3616 LE Gas Petroleum Engine — 1000 rpm

		DM5133-03	DM5563-03	DM5564-03	DM8608-02
Engine Power					
@ 100% Load	bkW (bhp)	3646 (4890)	3531 (4735)	3762 (5045)	3531 (4735)
@ 75% Load	bkW (bhp)	2735 (3668)	2648 (3551)	2882 (3784)	2648 (3551)
Engine Speed	rpm	**1000**	**1000**	**1000**	**1000**
Max Altitude @ Rated Torque and 38°C (100°F)	m (ft)	1219.2 (4000)	609.6 (2000)	1219.2 (4000)	609.6 (2000)
Speed Turndown @ Max Altitude, Rated Torque, and 38°C (100°F)	%	20	24	20	24
SCAC Temperature	°C (°F)	43 (110)	54 (130)	32 (90)	54 (130)
Emissions*					
NOx	g/bkW-hr (g/bhp-hr)	.94 (0.7)	.94 (0.7)	.94 (0.7)	.67 (0.5)
CO	g/bkW-hr (g/bhp-hr)	3.4 (2.5)	3.4 (2.5)	3.4 (2.5)	3.7 (2.75)
CO_2	g/bkW-hr (g/bhp-hr)	585 (436)	587 (437)	583 (435)	589 (439)
VOC**	g/bkW-hr (g/bhp-hr)	0.78 (0.58)	0.81 (0.6)	0.76 (0.57)	0.85 (0.63)
Fuel Consumption***					
@ 100% Load	MJ/bkW-hr (Btu/bhp-hr)	9.28 (6556)	9.3 (6576)	9.25 (6537)	9.35 (6605)
@ 75% Load	MJ/bkW-hr (Btu/bhp-hr)	9.67 (6834)	9.71 (6863)	9.63 (6805)	9.75 (6893)
Heat Balance					
Heat Rejection to Jacket Water					
@ 100% Load	bkW (Btu/min)	869 (49,438)	842 (47,922)	894 (50,884)	842 (47,935)
@ 75% Load	bkW (Btu/min)	764 (43,434)	730 (41,488)	798 (45,348)	735 (41,766)
Heat Rejection to Aftercooler					
@ 100% Load	bkW (Btu/min)	660 (37,526)	578 (32,889)	744 (42,366)	602 (34,290)
@ 75% Load	bkW (Btu/min)	317 (18,044)	261 (14,841)	376 (21,397)	274 (15,569)
Heat Rejection to Exhaust LHV to 25°C (77° F)					
@ 100% Load	bkW (Btu/min)	3627 (206,280)	3596 (204,497)	3655 (207,837)	3609 (205,248)
@ 75% Load	bkW (Btu/min)	2927 (166,440)	2916 (165,846)	2933 (166,812)	2928 (166,501)
Exhaust System					
Exhaust Gas Flow Rate					
@ 100% Load	m^3/min (cfm)	913.87 (32,273)	898.35 (31,725)	928.85 (32,802)	908.97 (32,100)
@ 75% Load	m^3/min (cfm)	726.21 (25,646)	716.90 (25,317)	734.94 (25,954)	725.36 (25,616)
Exhaust Stack Temperature					
@ 100% Load	°C (°F)	461 (862)	469 (876)	453 (847)	458 (856)
@ 75% Load	°C (°F)	481 (898)	492 (918)	469 (877)	481 (897)
Intake System					
Air Inlet Flow Rate					
@ 100% Load	m^3/min (scfm)	348.10 (12,293)	338.47 (11,953)	357.73 (12,633)	348.13 (12,294)
@ 75% Load	m^3/min (scfm)	269.12 (9504)	261.76 (9244)	276.49 (9764)	269.21 (9507)
Gas Pressure	kPag (psig)	295-324 (42.8-47)	295-324 (42.8-47)	295-324 (42.8-47)	295-324 (42.8-47)

*at 100% load and speed, all values are listed as not to exceed
**Volatile organic compounds as defined in U.S. EPA 40 CFR 60, subpart JJJJ
***ISO 3046/1

GAS PETROLEUM ENGINE



DIMENSIONS		
Length	mm (in)	5661.0 (222.87)
Width	mm (in)	2379.5 (93.68)
Height	mm (in)	3208.1 (126.30)
Shipping Weight	kg (lb)	29,891 (65,900)

Note: General configuration not to be used for installation. See general dimension drawing number 246-1515 for detail.

RATING DEFINITIONS AND CONDITIONS

Engine performance is obtained in accordance with SAE J1995, ISO3046/1, BS5514/1, and DIN6271/1 standards.

Transient response data is acquired from an engine/ generator combination at normal operating temperature and in accordance with ISO3046/1 standard ambient conditions. Also in accordance with SAE J1995, BS5514/1, and DIN6271/1 standard reference conditions.

Conditions: Power for gas engines is based on fuel having an LHV of 33.74 kJ/L (905 Btu/cu ft) at 101 kPa (29.91 in. Hg) and 15° C (59° F). Fuel rate is based on a cubic meter at 100 kPa (29.61 in. Hg) and 15.6° C (60.1° F). Air flow is based on a cubic foot at 100 kPa (29.61 in. Hg) and 25° C (77° F). Exhaust flow is based on a cubic foot at 100 kPa (29.61 in. Hg) and stack temperature.

Performance Numbers: DM5133-03, DM5563-03, DM5564-03, DM8608-02
LEHW0042-03 (8-10)