

# Engine Data Sheet And General Arrangement

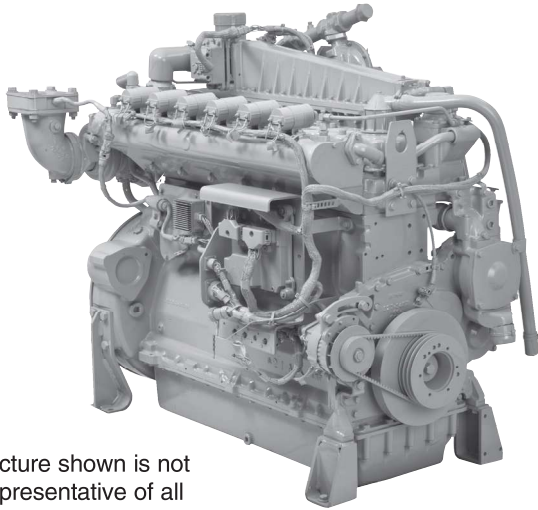
Customer	YPFB TRANSPORTE S.A.				
Project	ADQUISICIÓN DE 2 UNIDADES DE BOMBEO PRINCIPALES PARA EL POLIDUCTO VILLAMONTES TARIJA (PVT)				
Purchase Order Number	151006962				
Tag Number	UBP-4 (VILLAMONTES) UBP-3 (ENTRE RÍOS)				
Pump Type/Size	RDPL 150				
Ruhrpumpen Pump Number	157400003A (VILLAMONTES) 157400003B (ENTRE RÍOS)				
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## G3306B TA Gas Petroleum Engine

151-157 bkW  
(203-211 bhp)  
1800 rpm



Picture shown is not  
representative of all  
possible configurations.

### CAT® ENGINE SPECIFICATIONS

#### In-Line 6, 4-Stroke-Cycle

Bore .....	121 mm (4.8 in)
Stroke .....	152 mm (6.0 in)
Displacement.....	10.5 L (638 cu in)
Compression Ratio.....	8:1
Aspiration .....	Turbocharged-Aftercooled
Rotation (from flywheel end).....	Counterclockwise
Flywheel .....	SAE No. 11-1/2 or SAE No. 14
Flywheel Housing .....	SAE No. 1
Flywheel teeth .....	156
Shipping Weight (dry) .....	1111 kg (2450 lb)
Power Density .....	11.95 lb/hp
Power per Displacement.....	19.5 bhp/L
Capacity for Liquids — L (U.S. gal)	
Cooling System	
(Jacket Water Refill) <sup>1</sup> .....	20 L (5.25 U.S. gal)
Lube Oil System (refill) .....	44.5 L (11.9 U.S. gal)
Oil Change Interval <sup>2</sup> .....	750 hours
Governor.....	Electronic ADEM™ A4
Ignition, Protection .....	Electronic ADEM A4

<sup>1</sup>Engine only.

<sup>2</sup>Can be extended through S•O•S<sup>SM</sup> program

### FEATURES

#### Engine Design

- Tough and durable, built on industry standard G3300 platform
- Runs on a broad range of fuels and speeds at any emissions level
- Factory-installed components with single connection point eases packaging

#### Advanced Digital Engine Management

The ADEM A4 system represents the next generation of engine management systems while reducing the number of mechanical components and easing troubleshooting. Features include:

- Electronic ignition
- Electronic governing/speed control
- Start/stop logic
- Engine protection & monitoring

#### Full Range of Attachments

Large variety of factory-installed engine attachments reduces packaging time

#### Multiple Available Configurations

- SCAC (Separate Circuit Aftercooler)
- ATAAC (Air-to-Air Aftercooler)
- Caterpillar supplied AFRC (Air/Fuel Ratio Control) & TWC (Three-Way Catalyst)
- Caterpillar supplied AFRC & customer catalyst
- Customer AFRC & catalyst

#### Caterpillar Supplied AFRC & TWC:

- Caterpillar supplied AFRC and TWC designed specifically for this engine to provide superior emissions control with NSPS and non-attainment zone compliance
- 0.5 g and 1 g NO<sub>x</sub> settings available
- Integrated operator interface panel, TWC and AFRC reduces hands-on time with the engine
- Operator interface panel allows setup and servicing without a laptop

#### Gas Engine Rating Pro (GERP)

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

Caterpillar parts and labor warranty

Preventive maintenance agreements available for repair-before-failure options

S•O•S<sup>SM</sup> 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.cat.com/oilandgas](http://www.cat.com/oilandgas).



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**STANDARD EQUIPMENT**

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**Air Inlet System**

Air cleaner — intermediate duty, dry

Air cleaner rain cap (shipped loose)

Service indicator

**Control System**

ADEM A4

**Cooling System**

Thermostats and housing — full open

temperature 99°C (210°F)

Jacket water pump — gear-driven, centrifugal, non-self-priming

Aftercooler water pump, gear driven, centrifugal, non-self-priming

Aftercooler core, for treated water

**Exhaust System**

Exhaust manifolds — watercooled

Exhaust elbow — dry, 127 mm (5 in)

**Flywheels & Flywheel Housings**

Flywheel, SAE No. 11-1/2 or SAE No. 14

Flywheel housing, SAE No. 1

SAE standard rotation

**Fuel System**

Air/fuel ratio control

Gas pressure regulator

Requires 83-172 kPa (12.0-24.9 psi) gas

Natural gas carburetor

**Ignition System**

ADEM A4 ignition

**Lube System**

Crankcase breather, top mounted

Oil cooler

Oil filter

Oil pan, full sump

Oil filler and dipstick

**Protection System**

The following parameters include alarm and shutdown

- inlet manifold air temperature

- inlet manifold air pressure

- oil pressure

- oil temperature

- coolant temperature

- engine speed (overspeed)

- battery voltage

- catalyst inlet/outlet temperature (sensors shipped loose)

Display only — service hours

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**OPTIONAL EQUIPMENT**

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**Charging Alternator**

24V, 35A alternator

24V, 35A CSA alternator

**Cooling System**

Radiators — JW only

Jacket water pump inlet adapter

**Exhaust System**

Exhaust flex fitting — ANSI flange

Exhaust elbow

Exhaust flange — ANSI flange

Three-way catalyst — 1.0 g NOx and 0.5 g NOx catalyst options

**Guards**

Fan guard

Damper guard

**Ignition System**

CSA certified electronics and ignition

**Instrumentation**

Operator interface panel

Operator interface panel enclosure

15', 25' and 50' interconnect harness

**Starting System**

Air pressure regulator

Air start silencer

Vane starter

Electric starter

Turbine starter



# G3306B TA GAS PETROLEUM ENGINE

151-157 bkW (203-211 bhp)

## TECHNICAL DATA

### G3306B Gas Petroleum Engine — 1800 rpm SCAC

		DM9398 0.5 g/bhp-hr NTE	DM9399 1.0 g/bhp-hr NTE	DM9455 0.3% O <sub>2</sub>	EM0844 0.3% O <sub>2</sub>
<b>Configuration</b> Customer/Cat AFRC & TWC		Cat AFRC & TWC	Cat AFRC & TWC	Cat AFRC & Cust. TWC	Cust. AFRC & TWC
<b>Engine Power</b> @ 100% Load @ 75% Load	bkW (bhp) bkW (bhp)	151 (203) 113 (152)	151 (203) 113 (152)	151 (203) 113 (152)	151 (203) 113 (152)
<b>Engine Speed</b> Max Altitude @ Rated Torque and 38°C (100°F) Speed Turndown @ Max Altitude, Rated Torque, and 38°C (100°F)	rpm m (ft) %	1800 0 33	1800 0 33	1800 0 33	1800 0 33
<b>Aftercooler Temperature</b> JW Temperature SCAC Temperature	°C (°F) °C (°F)	99 (210) 54 (130)	99 (210) 54 (130)	99 (210) 54 (130)	99 (210) 54 (130)
<b>Emissions*</b> NO <sub>x</sub> CO CO <sub>2</sub> VOC**	g/bkW-hr (g/bhp-hr) g/bkW-hr (g/bhp-hr) g/bkW-hr (g/bhp-hr) g/bkW-hr (g/bhp-hr)	1.34 (1.00) 2.68 (2.00) 665 (496) 0.14 (0.10)	1.34 (1.00) 2.68 (2.00) 665 (496) 0.14 (0.10)	20.49 (15.28) 20.48 (15.27) 665 (496) 0.14 (0.11)	20.49 (15.28) 20.48 (15.27) 665 (496) 0.14 (0.11)
<b>Fuel Consumption***</b> @ 100% Load @ 75% Load	MJ/bkW-hr (Btu/bhp-hr) MJ/bkW-hr (Btu/bhp-hr)	11.43 (8083) 11.96 (8455)	11.43 (8083) 11.96 (8455)	11.46 (8100) 11.98 (8470)	11.46 (8100) 11.98 (8470)
<b>Heat Balance</b> Heat Rejection to Jacket Water @ 100% Load @ 75% Load Heat Rejection to Oil Cooler @ 100% Load @ 75% Load Heat Rejection to Aftercooler @ 100% Load @ 75% Load Heat Rejection to Exhaust @ 100% Load @ 75% Load Heat Rejection to Atmosphere @ 100% Load @ 75% Load	bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min)	161 (9155) 134 (7623) 24 (1365) 20 (1137) 8 (462) 4 (214) 117 (6654) 91 (5158) 19 (1093) 15 (858)	161 (9155) 134 (7623) 24 (1365) 20 (1137) 8 (462) 4 (214) 117 (6654) 91 (5158) 19 (1093) 15 (858)	161 (9163) 134 (7640) 24 (1367) 20 (1139) 8 (458) 4 (211) 118 (6705) 91 (5177) 19 (1096) 15 (859)	161 (9163) 134 (7640) 24 (1367) 20 (1139) 8 (458) 4 (211) 118 (6705) 91 (5177) 19 (1096) 15 (859)
<b>Exhaust System</b> Exhaust Gas Flow Rate @ 100% Load @ 75% Load Exhaust Stack Temperature @ 100% Load @ 75% Load	m <sup>3</sup> /min (cfm) m <sup>3</sup> /min (cfm) °C (°F) °C (°F)	27.3 (964) 21.5 (758) 576 (1068) 555 (1060)	27.3 (964) 21.5 (758) 576 (1068) 555 (1060)	27.4 (968) 21.5 (761) 580 (1076) 558 (1036)	27.4 (968) 21.5 (761) 580 (1076) 558 (1036)
<b>Intake System</b> Air Inlet Flow Rate @ 100% Load @ 75% Load	m <sup>3</sup> /min (scfm) m <sup>3</sup> /min (scfm)	8.6 (302) 6.9 (244)	8.6 (302) 6.9 (244)	8.6 (302) 6.9 (244)	8.6 (302) 6.9 (244)
<b>Gas Pressure</b>	kPag (psig)	83-172 (12.0-24.9)	83-172 (12.0-24.9)	83-172 (12.0-24.9)	83-172 (12.0-24.9)

\*at 100% load and speed, listed as not to exceed

\*\*Volatile organic compounds as defined in U.S. EPA 40 CFR 60, subpart JJJJ

\*\*\*ISO 3046/1



# G3306B TA GAS PETROLEUM ENGINE

151-157 bkW (203-211 bhp)

## TECHNICAL DATA

### G3306B Gas Petroleum Engine — 1800 rpm ATAAC

		DM8968 1.0 g/bhp-hr NTE	DM8969 0.5 g/bhp-hr NTE	EM0421 0.3% O <sub>2</sub>
<b>Configuration</b> Customer/Cat AFRC & TWC		Cat AFRC & TWC	Cat AFRC & TWC	Cat AFRC & Cust. TWC
<b>Engine Power</b> @ 100% Load @ 75% Load	bkW (bhp) bkW (bhp)	157 (211) 118 (158)	157 (211) 118 (158)	157 (211) 118 (158)
<b>Engine Speed</b> Max Altitude @ Rated Torque and 38°C (100°F) Speed Turndown @ Max Altitude, Rated Torque, and 38°C (100°F)	rpm m (ft) %	1800 1828.8 (6000) 1.6	1800 1828.8 (6000) 1.6	1800 1828.8 (6000) 1.6
<b>Aftercooler Temperature</b> JW Temperature AC Temperature	°C (°F) °C (°F)	99 (210) 32 (90)	99 (210) 32 (90)	99 (210) 32 (90)
<b>Emissions*</b> NO <sub>x</sub> CO CO <sub>2</sub> VOC**	g/bkW-hr (g/bhp-hr) g/bkW-hr (g/bhp-hr) g/bkW-hr (g/bhp-hr) g/bkW-hr (g/bhp-hr)	1.34 (1.00) 2.68 (2.00) 672 (501) 0.12 (0.09)	0.67 (0.50) 2.68 (2.00) 672 (501) 0.12 (0.09)	19.67 (14.67) 19.67 (14.67) 669 (499) 0.13 (0.09)
<b>Fuel Consumption***</b> @ 100% Load @ 75% Load	MJ/bkW-hr (Btu/bhp-hr) MJ/bkW-hr (Btu/bhp-hr)	11.38 (8048) 11.97 (158)	11.38 (8048) 11.97 (158)	11.41 (8069) 11.99 (8478)
<b>Heat Balance</b> Heat Rejection to Jacket Water @ 100% Load @ 75% Load Heat Rejection to Aftercooler @ 100% Load @ 75% Load Heat Rejection to Exhaust @ 100% Load @ 75% Load Heat Rejection to Atmosphere @ 100% Load @ 75% Load	bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min) bkW (Btu/min)	161 (9169) 138 (7874) 8 (434) 5 (287) 127 (7227) 94 (5345) 20 (1130) 16 (891)	161 (9169) 138 (7874) 8 (434) 5 (287) 127 (7227) 94 (5345) 20 (1130) 16 (891)	161 (9177) 139 (7880) 8 (430) 5 (285) 128 (7294) 95 (5397) 19 (1096) 15 (859)
<b>Exhaust System</b> Exhaust Gas Flow Rate @ 100% Load @ 75% Load Exhaust Stack Temperature @ 100% Load @ 75% Load	m <sup>3</sup> /min (cfm) m <sup>3</sup> /min (cfm) °C (°F) °C (°F)	28.94 (1022) 21.95 (775) 613 (1136) 578 (1072)	28.94 (1022) 21.95 (775) 613 (1136) 578 (1072)	29.08 (1027) 22.03 (778) 619 (1146) 581 (1079)
<b>Intake System</b> Air Inlet Flow Rate @ 100% Load @ 75% Load	m <sup>3</sup> /min (scfm) m <sup>3</sup> /min (scfm)	8.66 (306) 6.85 (242)	8.66 (306) 6.85 (242)	8.64 (305) 6.82 (241)
<b>Gas Pressure</b>	kPag (psig)	83-172 (12.0-24.9)	83-172 (12.0-24.9)	83-172 (12.0-24.9)

\*at 100% load and speed, listed as not to exceed

\*\*Volatile organic compounds as defined in U.S. EPA 40 CFR 60, subpart JJJJ

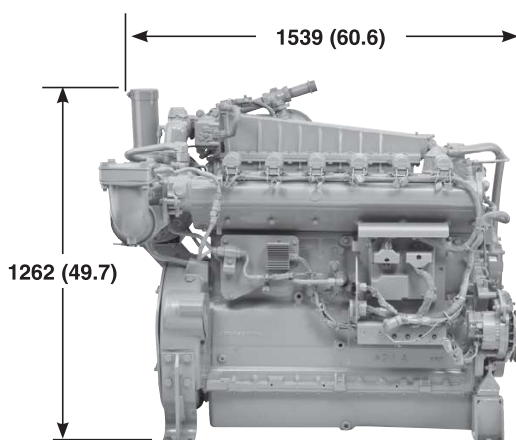
\*\*\*ISO 3046/1



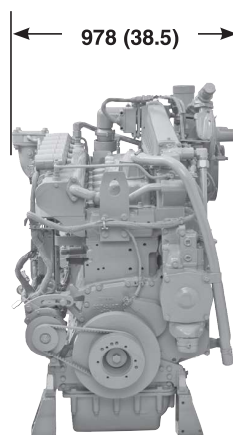
## G3306B TA GAS PETROLEUM ENGINE

151-157 kW (203-211 bhp)

### GAS PETROLEUM ENGINE



RIGHT SIDE VIEW



FRONT VIEW

**Note:** Dimensions are in mm (inches).

DIMENSIONS		
Length	mm (in)	1539 (60.6)
Width	mm (in)	978 (38.5)
Height	mm (in)	1262 (49.7)
Shipping Weight	kg (lb)	1111 (2450)

## 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.

Materials and specifications are subject to change without notice. The International System of Units (SI) is used in this publication. CAT, CATERPILLAR, their respective logos, ADEM, S•O•S, "Caterpillar Yellow", the "Power Edge" trade dress as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.