

# Dongfeng Cummins Techical Operations



ENGINE MODEL: 4B3.9-G2  
Used for 45kVA generator



## Generator Engine Performance Data

DONGFENG CUMMINS ENGINE Co.,LTD

Xiangfan, Hubei Province, China  
<http://www.dcec.com.cn>

Basic Engine Model:

**4B3.9-G2**

**FR92539**

**FR92539 @ 1500 RPM**

Configuration

D381004GX02

CPL Code

CPL: 3114

Revision

2009-4-15

Compression Ratio: **17.3:1**

Bore: **102 mm**

Stroke: **120 mm**

Governor Regulation: **≤5%**

Aspiration: **Naturally Aspirated**

Displacement: **3.9 L**

No. of Cylinders: **4**

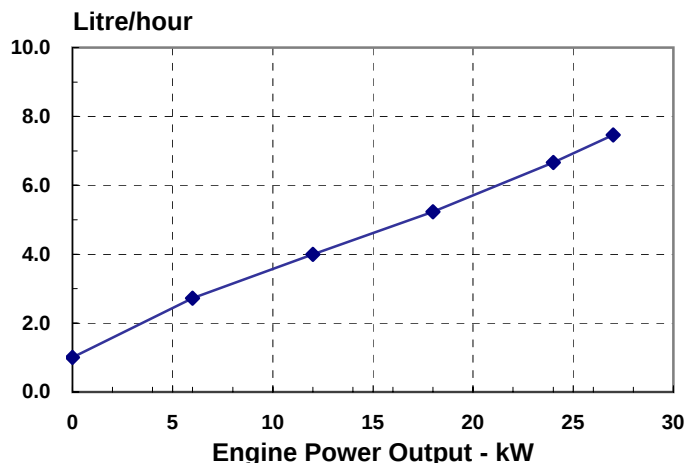
Fuel System: **BYC A/GAC 24V**

All data is based on the engine operating with fuel system, water pump, and 10 in H<sub>2</sub>O (2.488 kPa) inlet air restriction with 5.98 in (152mm) inner diameter, and with 2.01 in Hg (7 kPa) exhaust restriction with 4.02 in (102 mm) inner diameter; not included are alternator, fan, optional equipment and driven components. Coolant flows and heat rejection data based on coolants as 50% ethylene glycol/50% water. All data is subject to change without notice.

| Engine Speed | Standby Power |    | Prime Power |    | Continuous Power |     |
|--------------|---------------|----|-------------|----|------------------|-----|
| RPM          | kW            | HP | kW          | HP | kW               | HP  |
| 1500         | 27            | 36 | 24          | 32 | TBD              | TBD |

### Engine Performance Data @ 1500 RPM

| OUTPUT POWER     |     |     | FUEL CONSUMPTION |     |
|------------------|-----|-----|------------------|-----|
| %                | kW  | HP  | g/kW.h           | L/h |
| STANDBY POWER    |     |     |                  |     |
| 100              | 27  | 36  | 228              | 7.5 |
| PRIME POWER      |     |     |                  |     |
| 100              | 24  | 32  | 229              | 6.7 |
| 75               | 18  | 24  | 240              | 5.2 |
| 50               | 12  | 16  | 275              | 4.0 |
| 25               | 6   | 8   | 374              | 2.7 |
| CONTINUOUS POWER |     |     |                  |     |
| TBD              | TBD | TBD | TBD              | TBD |



### Engine Performance Data @ 1800 RPM

Not Available at 1800 RPM

Not Available at 1800 RPM

Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with GB/T18297 conditions of 100kPa (29.61 in. Hg) barometric pressure [80 m (263 ft.) altitude], 25°C (77°F) inlet air temperature, and 1 kPa (0.30 in. Hg) water vapor pressure with No.0 diesel fuel. The engine may be operated without changing the fuel setting up to 2200 m (7218ft.) altitude.

## GENERAL ENGINE DATA

|                                                                  |                    |       |
|------------------------------------------------------------------|--------------------|-------|
| Approximate Engine Weight (wet).....                             | -kg                | 308   |
| Mass Moment of Inertia of Rotating Components (No Flywheel)..... | -kg-m <sup>2</sup> | 0.143 |
| Center of Gravity from Rear Face of Block.....                   | -mm                | 373   |
| Center of Gravity above Crankshaft Centerline.....               | -mm                | 163   |
| Crankshaft Thrust Bearing Load Limit                             |                    |       |
| —Maximum Intermittent.....                                       | -N                 | 3425  |
| —Maximum Continuous.....                                         | -N                 | 1112  |

## ENGINE MOUNTING

|                                                                        |                    |      |
|------------------------------------------------------------------------|--------------------|------|
| Maximum (Static) Bending Moment at Front Support Mounting Surface..... | -N.m               | 435  |
| Maximum (Static) Bending Moment at Side Pad Mounting Surface.....      | -N.m               | TBD  |
| Maximum (Static) Bending Moment at Rear Face of Block.....             | -N.m               | 1356 |
| Moment of Inertia of Complete Engine                                   |                    |      |
| — Roll Axis.....                                                       | -kg·m <sup>2</sup> | 16.5 |
| — Pitch Axis.....                                                      | -kg·m <sup>2</sup> | 41.1 |
| — Yaw Axis.....                                                        | -kg·m <sup>2</sup> | 35.4 |

## EXHAUST SYSTEM

|                                                                        |         |      |
|------------------------------------------------------------------------|---------|------|
| Maximum Back Pressure.....                                             | -kPa    | 10   |
| Exhaust Pipe Size Normally Acceptable.....                             | -mm     | 75   |
| Maximum Static Supported Weight at the Turbocharger Outlet Flange..... | -N.m    | 13.5 |
| Exhaust Manifold Insulation Acceptable.....                            | -Yes/No | No   |
| Turbocharger Insulation Acceptable.....                                | -Yes/No | No   |

## AIR INTAKE SYSTEM

|                                                                             |        |    |
|-----------------------------------------------------------------------------|--------|----|
| Maximum Intake Air Restriction with Heavy Duty Air Cleaner                  |        |    |
| — Dirty Element.....                                                        | -kPa   | 6  |
| — Clean Element.....                                                        | -kPa   | 4  |
| Minimum Dirt Holding Capacity with Heavy Duty Air Cleaner.....              | -g/cfm | 53 |
| Maximum Temperature Rise from Ambient to the Inlet of the Turbocharger..... | -°C    | 17 |
| Recommended intake piping size (inner diameter).....                        | -mm    | 76 |

## LUBRICATION SYSTEM

|                                                                                      |        |           |
|--------------------------------------------------------------------------------------|--------|-----------|
| Minimum Engine Oil Pressure for Engine Protection Devices:                           |        |           |
| -Idle Speed.....                                                                     | -kPa   | 207       |
| -Governed Speed.....                                                                 | -kPa   | 345       |
| Maximum Oil Temperature.....                                                         | -°C    | 121       |
| Oil Capacity with OP 9006 Oil Pan : High - Low.....                                  | -litre | 9.5 - 8.5 |
| Minimum Required Lube System Capacity - Sump plus Filters.....                       | -litre | 10.9      |
| Angularity of Standard Oil Pan: (Values stated are for intermittent operation only): |        |           |
| — Front Down.....                                                                    | - °    | 40        |
| — Front Up.....                                                                      | - °    | 40        |
| — Side to Side.....                                                                  | - °    | 40        |

## FUEL SYSTEM

|                                                                                              |                        |
|----------------------------------------------------------------------------------------------|------------------------|
| Type Injection System.....                                                                   | BYC A Direct Injection |
| Maximum Restriction at Lift Pump.....                                                        | -mmHg 102              |
| Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head) |                        |
| .....                                                                                        | -mmHg 508              |
| Total Drain Flow (constant for all loads).....                                               | -litre/hr 30           |

## COOLING SYSTEM

|                                                                   |        |           |
|-------------------------------------------------------------------|--------|-----------|
| Coolant Capacity - Engine Only.....                               | -litre | 7.2       |
| Maximum Coolant Friction Head External to Engine...-1800 rpm..... | -kPa   | 35        |
| -1500 rpm.....                                                    | -kPa   | 28        |
| Maximum Static Head of Coolant Above Engine Crank Centerline..... | -m     | 14        |
| Standard Thermostat (Modulating) Range.....                       | -°C    | 82 - 95   |
| Minimum Pressure Cap.....                                         | -kPa   | 69        |
| Maximum Top Tank Temperature for Standby / Prime Power.....       | -°C    | 104 / 100 |

**ELECTRICAL SYSTEM**

|                                                       |          |         |       |
|-------------------------------------------------------|----------|---------|-------|
| Cranking Motor (Heavy Duty, Positive Engagement)..... | -volt    | 12V     | 24V   |
| Battery Charging System, Negative Ground.....         | -ampere  | 63      | 40    |
| Maximum Allowable Resistance of Cranking Circuit..... | -ohm     | 0.00075 | 0.002 |
| Minimum Recommended Battery Capacity                  |          |         |       |
| • Cold Soak @ 10 °F (-12 °C) and Above.....           | -0°F CCA | 625     | (312) |

Fuel Rating Option used for these Data: **FR92539**

|                                   |             |
|-----------------------------------|-------------|
| Governed Engine Speed.....        | -rpm        |
| Engine Idle Speed.....            | -rpm        |
| Gross Engine Power Output.....    | -kW         |
| Piston Speed.....                 | -m/s        |
| Friction Horsepower.....          | -kW         |
| Engine Water Flow to Engine:..... | -litre/sec. |
| Intake Air Flow.....              | -litre/sec. |
| Exhaust Gas Temperature.....      | -°C         |
| Exhaust Gas Flow.....             | -litre/sec. |
| Radiated Heat to Ambient.....     | -kW         |
| Heat Rejection to Coolant.....    | -kW         |
| Heat Rejection to Exhaust.....    | -kW         |

| STANDBY POWER |            | PRIME POWER |            |
|---------------|------------|-------------|------------|
| 1800          | 1500       | 1800        | 1500       |
| N/A           | 950 - 1050 | N/A         | 950 - 1050 |
|               | 27         |             | 24         |
|               | 6          |             | 6          |
|               | 8.2        |             | 8.2        |
|               | 2.2        |             | 2.2        |
|               | 33         |             | 33         |
|               | 410        |             | 380        |
|               | 71         |             | 68         |
|               | TBD        |             | TBD        |
|               | 29         |             | 25.9       |
|               | TBD        |             | TBD        |

ALL DATA CERTIFIED WITHIN 5%

TBD = To Be Decided

N/A = Not Applicable

N.A. = Not Available

All data is subject to change without notice, sorry for inform.

Dongfeng Cummins Engine Co., Ltd.