



## CHONGQING CUMMINS ENGINE COMPANY LTD. ENGINE PERFORMANCE CURVE

**CONFIGURATION**  
D233020DX02

**ENGINE MODEL:** KTA38-G2

**CURVE NUMBER:** FR-6082

**CPL No.:** 0851

**DATE:** 2013/9/23

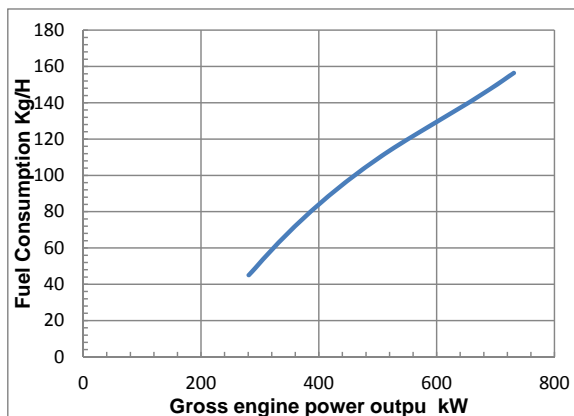
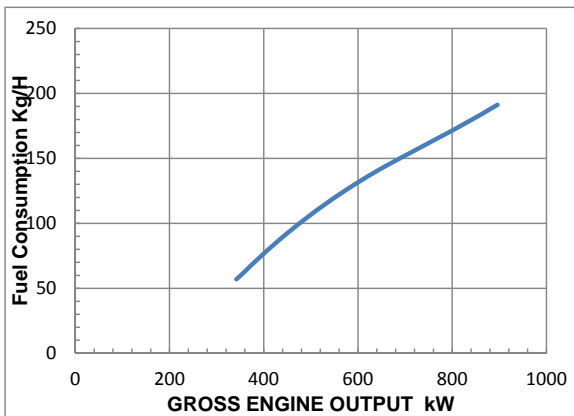
|  |  |                            |  |
|--|--|----------------------------|--|
| Displacement: 38L (2300)               | Aspiration: Turbocharged , Aftercooled | RATING                     |  |
| BoreXStroke: 159X159mm (6.25X6.25 in.) | Fuel System: Cummins PT                | 896 kW(1200 BHP)@1800r/min |  |
| Compress Ratio: 14.5:1                 | No. of Cylinder: V-12                  | 731 kW(980 BHP)@1500r/min  |  |

All data is based on the engine operating with fuel system, water pump, and 20 in. H<sub>2</sub>O(4.98kPa) inlet air restriction with 5.8 in.(147mm) inner diameter, and with 2 in. Hg(7kPa) exhaust restriction with 8 in.(203mm) inner diameter; not included are alternator, fan, optional equipment and driven components. Coolant flows and heat rejection data based on coolant as 50% ethylene glycol/50% water. All data is subject to change without notice.

### GROSS ENGINE POWER OUTPUT

| SPEED<br>rpm | STANDBY POWER |     | PRIME POWER |     | CONTINUOUS POWER |     |
|--------------|---------------|-----|-------------|-----|------------------|-----|
|              | BHP           | kW  | BHP         | kW  | BHP              | kW  |
| 1800         | 1200          | 896 | 1085        | 810 | 900              | 672 |
| 1500         | 980           | 731 | 890         | 664 | 810              | 604 |

### FUEL CONSUMPTION



|                | OUTPUT POWER |     | CONSUMPTION |      | BFSC |        |          |
|----------------|--------------|-----|-------------|------|------|--------|----------|
|                | %            | BHP | kW          | Lb/h | Kg/h | g/kW.h | Lb/BHP.h |
| <b>1800RPM</b> |              |     |             |      |      |        |          |
| STANDBY        |              |     |             |      |      |        |          |
| 100            | 1200         | 896 | 422         | 191  | 213  | 0.351  |          |
| PRIME          |              |     |             |      |      |        |          |
| 100            | 1085         | 810 | 382         | 173  | 214  | 0.352  |          |
| 75             | 814          | 608 | 294         | 133  | 219  | 0.361  |          |
| 50             | 611          | 456 | 208         | 94   | 207  | 0.340  |          |
| 25             | 458          | 342 | 126         | 57   | 167  | 0.274  |          |
| <b>1500RPM</b> |              |     |             |      |      |        |          |
| STANDBY        |              |     |             |      |      |        |          |
| 100            | 980          | 731 | 345         | 156  | 214  | 0.352  |          |
| PRIME          |              |     |             |      |      |        |          |
| 100            | 890          | 664 | 313         | 142  | 214  | 0.352  |          |
| 75             | 668          | 498 | 240         | 109  | 218  | 0.359  |          |
| 50             | 501          | 374 | 169         | 77   | 205  | 0.337  |          |
| 25             | 376          | 281 | 99          | 45   | 160  | 0.264  |          |

Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with SAE J1995 conditions of 29.61 in. Hg(100kPa) barometric pressure [300ft.(91m) altitude] 77deg F (25 deg C) inlet temperature, and 0.30 in. Hg(1kPa) water vapor pressure with No.2 diesel fuel.

TECHNICAL DATA DEPT.

CERTIFIED WITHIN 5%

CHIEF ENGINEER

**Cummins Confidential**



## POWER RATING APPLICATION GUIDELINES FOR GENERATOR DRIVE ENGINES

These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations. Generator drive engines are not designed for and shall not be used in variable speed D.C. generator set applications.

**STANDBY POWER RATING** is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the standby Power rating.

This rating should be applied where reliable utility power is available. A standby rated engine should be sized for a maximum of an 80% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Standby Power rating. Standby ratings should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency.

### **CONTINUOUS POWER RATING**

Applicable for supplying utility power at a constant 100% load for an unlimited number of hours per year. No overload capability is available for this rating.

**PRIME POWER RATING** is applicable for supplying electric power in lieu of commercially purchased power. Prime Power applications must be in the form of one of the following two categories:

### **UNLIMITED TIME RUNNING PRIME POWER**

Prime Power is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of period of 250 hours.

The total operating time at 100% Prime Power shall not exceed 500 hours per year.

A 10% overload capability is available for a period of 1 hour within a 12 hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

### **LIMITED TIME RUNNING PRIME POWER**

Prime Power is available for a limited number of hours in a non-variable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating. The customer should be aware, however, that the life of any engine will be reduced by this constant high load operation. Any operation exceeding 750 hours per year at Prime Power rating should use the Continuous Power rating.

### **Reference Standards:**

BS-5514 and DIN-6271 standards are based on ISO-3046.

### **Operation At Elevated Temperature And Altitude:**

The engine may be operated at:

1800RPM up to 5,000 ft.(1,500m) and 104°F (40°C) without power deration.

1500RPM up to 5,000 ft.1,500m) and 104°F (40°C) without power deration.

For sustained operation above these conditions, derate by 4% per 1,000ft. (300m), and 1% per 10°F (2% per 11°C).





# CHONGQING CUMMINS ENGINE COMPANY LTD. ENGINE DATA SHEET

|   |         |           |
|---|---------|-----------|
| Maximum Raw Water Inlet Pressure @ Heat Exchanger HX 4073—PSI(kPa).....             | 50      | (344.7)   |
| Maximum Raw Water Inlet Pressure @ Heat Exchanger HX 6076 —PSI(kPa).....            | 50      | (344.7)   |
| Maximum Allowable Top Tank Temperature (Stand_by/Prime) —°F(°C).....                | 220/212 | (104/100) |
| Standard Thermostat (modulating) Range— °F(°C).....                                 | 180-200 | (82-93)   |
| Maximum Allowable Coolant Temperature —°F(°C).....                                  | 205     | (96.1)    |
| Minimum Coolant Makeup Capacity —U.S.Gal(L).....                                    | 6.3     | (23.8)    |
| Maximum Raw water Inlet Friction —PSI(kPa).....                                     | 10      | (254.0)   |
| Minimum Allowable Fill Rate —U.S.GPM(L/min).....                                    | 5       | (18.9)    |
| Maximum Allowable Initial Fill Time —min.....                                       | 5       |           |
| Minimum Allowable Coolant Expansion Space —% of System Capacity.....                | 5       |           |
| Maximum Allowable Inlet Coolant Temperature at Limited situation (Stand_by/Prime) — | 160/150 | (71/66)   |

## LUBRICATION SYSTEM

### Oil Pressure

|  |       |           |
|--|-------|-----------|
| @ Idle —PSI(kPa).....                          | 20    | (138)     |
| @ Rated Speed —PSI(kPa).....                   | 45-65 | (310-448) |
| Oil Flow at Rated Speed —U.S.GPM(L/min).....   | 124   | (469.4)   |
| Maximum Allowable Oil Temperature —°F(°C)..... | 250   | (121.0)   |

### By-Pass Filter Capacity

|  |         |            |
|--|---------|------------|
| Spin-on Cartridge Type —U.S.Gal(L).....    | 2 X 0.7 | (2 X 2.6)  |
| Replaceable Element Type —U.S.Gal(L) ..... | 2 X 2.9 | (2 X 11.0) |

### Oil Pan Capacity (Option OP6024)

|   |      |         |
|---|------|---------|
| High —U.S.Gal(L).....   | 40.0 | (151.4) |
| Total System Capacity (Excluding By-Pass Filter) —U.S.Gal(L)..... | 45.0 | (170.3) |
| Total System Capacity (Excluding By-Pass Filter) —U.S.Gal(L)..... | 35.7 | (135.1) |

### Angularity of Standard Oil Pan ( Option OP)

|                 |     |
|-----------------|-----|
| Front Down..... | 30° |
|-----------------|-----|

## FUEL SYSTEM

Fuel Injection System..... Cummins PT

Maximum Fuel Consumption at Maximum Rated Output and Speed —lb/h(kg/h).....

### Maximum allowable Restriction to PT Fuel Pump

|   |    |         |
|---|----|---------|
| With Clean Fuel Filter —in.Hg(kPa)..... | 4  | (13.55) |
| With Dirty Fuel Filter —in.Hg(kPa)..... | 10 | (33.86) |

Maximum Fuel Supply at Rated Power and Speed —lb/h(kg/h).....

### Maximum Allowable Injector Return Line Restriction

|                                    |   |      |
|------------------------------------|---|------|
| With Check Valves —in.Hg(kPa)..... | 7 | (22) |
| Less Check Valves —in.Hg(kPa)..... | 3 | (8)  |

Minimum Allowable Fuel Tank Vent Capability —ft<sup>3</sup>/h (L/h) ..... 15 (425)  
(With 2.5 in. Hg (63 mm Hg) or Less Back Pressure)

Starter (Heavy, Anode)—Volt..... 24

Battery Recharge System,Negative ground—A..... 35

Maximum Allowable Resistance of Starting Circuit—Ω..... 0.002

### Minimum Recommended Battery Capacity

|   |      |
|---|------|
| ·Cold Soak at 50°F(10°C) or Above—0°F CCA.....      | 1200 |
| ·Cold Soak at 32~50°F(0~10°C) or Above—0°F CCA..... | 1280 |
| ·Cold Soak at 0~32°F(-18~0°C) or Above—0°F CCA..... | 1800 |



# CHONGQING CUMMINS ENGINE COMPANY LTD. ENGINE DATA SHEET

**PERFORMANCE DATA**

All data is based on the engine operating with fuel system, water pump, lubricating oil pump, air cleaner, and muffler, not included are alternator, compressor, fan, optional equipment and driven components. Data represents gross engine performance capabilities obtained and corrected in accordance with SAE J1349 conditions for 29.61 in Hg(100 kPa) barometric pressure[300ft. (90 m) altitude], 77°F (25 °C) inlet air temperature, and 0.30 in. Hg (1kPa) water vapor pressure with No. 2 diesel fuel or a fuel corresponding to ASTM D2. All data is subject to change without notice.

|   | STAND_BY   |            | PRIME      |            |
|---|------------|------------|------------|------------|
|   | 60 Hz      | 50 Hz      | 60 Hz      | 50 Hz      |
| Engine Speed r/min.....                     | 1800       | 1500       | 1800       | 1500       |
| Idle Speed r/min.....                       | 725-775    | 725-775    | 725-775    | 725-775    |
| Gross Power Output BHP(kW).....             | 1200(896)  | 980(731)   | 1085(810)  | 890(664)   |
| Brake Mean Effective Pressure PSI(kPa)..... | 228(1574)  | 224(1541)  | 206(1423)  | 203(1400)  |
| Piston Speed ft/min(m/s).....               | 1870(9.5)  | 1555(7.9)  | 1870(9.5)  | 1555(7.9)  |
| Friction Horsepower BHP(kW).....            | 170(127)   | 115(86)    | 170(127)   | 115(86)    |
| Intake Air FlowCFM( L/s).....               | 2900(1369) | 1950(920)  | 2650(1251) | 1800(850)  |
| Exhaust Gas Flow CFM( L/s).....             | 7795(3679) | 5580(2634) | 6970(3290) | 5080(2398) |
| Exhaust Gas Temperature °F(°C).....         | 935(502)   | 1025(552)  | 905(485)   | 1005(541)  |
| Heat Rejection to Ambient BTU/min(kW).....  | 7720(136)  | 6300(111)  | 7015(0)    | 5745(101)  |
| Heat Rejection to Coolant BTU/min(kW).....  | 31200(549) | 25480(448) | 28210(496) | 23140(407) |
| Engine Water Flow L/s(U.S.GPM) @ 4psi.....  | 390(24.6)  | 310(19.6)  | 390(24.6)  | 310(19.6)  |

| Change Log |          |                         |
|------------|----------|-------------------------|
| Date       | Author   | Change Description      |
| 2013/6/25  | Jiang Li | Released                |
| 2013/9/23  | Jiang Li | Added Continuous Rating |