



# 3512C Land Electric-Drive Drilling Engine

1101 bkW (1476 bhp)  
1200 rpm



Image shown with optional attachments.

## CAT® ENGINE SPECIFICATIONS

### V-12, 4-Stroke-Cycle-Diesel

|                               |   |
|-------------------------------|---|
| Emissions                     | U.S. EPA Tier 2 Nonroad Equivalent<br>(not currently EPA certified) |
| Bore                          | 170 mm (6.7 in)   |
| Stroke                        | 190 mm (7.5 in)   |
| Displacement                  | 51.8 L (3161 in <sup>3</sup> )                                      |
| Aspiration                    | Turbocharged-Aftercooled  |
| Fuel System                   | EUI   |
| Engine Control and Protection | ADEM™ A3  |
| Instrumentation               | EIP, EMCP 4.3/4.4 optional  |

## FEATURES

### Product Design

- Developed specifically to meet the demands of oil and gas drilling applications
- Optional EMCP 4.3/4.4 control panel features simplified rig integration, remote monitoring capabilities, and single-point interface for the engine and generator
- Proven reliability and durability
- Robust design prolongs life and lowers owning and operating costs
- Market-leading power density
- Long overhaul life proven in oilfield applications
- Core engine components designed for reconditioning and reuse at overhaul

### Safety

- E-stop pushbutton on instrument panel
- Air shutoff and explosion relief valves available
- Configurable alarm, derate, and shutdown set points
- Extra alarms, inputs, and outputs available

### Ease of Installation and Packaging

- EMCP control panel uses standard communication protocols to integrate easily with rig monitoring equipment to track productivity, health, and performance
- Paralleling and load sharing capability (EMCP 4.4 only)

### Reduction of Owning and Operating Costs

- Long filter change intervals, aligned with service intervals
- Excellent fuel economy – direct fuel injection via electronic unit injectors precisely meter fuel

### Custom Packaging

For any oilfield application, trust Caterpillar to meet your project needs with custom factory generator sets and mechanical packages. Cat® engines, generators, controls,

radiators, and transmissions can be custom designed and matched in collaboration with our local dealers to create unique solutions. Custom packages are globally supported and are covered by a one-year warranty after startup.

### Testing

- Every Cat engine is full-load tested to ensure proper engine performance.
- Standard configurations are assembled, tested, and validated as a package to ensure performance, reliability and durability.

### Product Support Offered Through Global Cat Dealer Network

- More than 2,200 dealer outlets
- Caterpillar factory-trained dealer technicians service every aspect of your Cat petroleum product
- Worldwide parts availability, service, and 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 and combustion by-products
  - Site-specific oil change interval

### Over 80 Years of Engine Manufacturing Experience

The Caterpillar Production System enables manufacturing of products with the highest quality standards for long and dependable operation.

### Web Site

For all your petroleum power requirements, visit [www.catoilandgasinfo.com](http://www.catoilandgasinfo.com)



## CONFIGURATION

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### Air Inlet System

Corrosion-resistant aftercooler core

Air cleaner options:

- Regular duty, with soot filter
- \*Heavy duty

\*Pre-cleaner, heavy duty

\*Air inlet manifold flame arrestors (for use with DGB kit)

\*Remote air inlet adapter, rectangular

\*Remote air inlet adapter, round

### Control System

ADEM A3 ECU

\*Direct rack control 0-200 mA

\*Load sharing governor, 2301A

\*Load sharing module, 2301A

### Cooling System

Separate-circuit aftercooled

Outlet controlled jacket water thermostat

Jacket water pump – gear driven

Dual outlet

Aftercooler water pump – gear driven

Aftercooler water thermostat

\*Caterpillar supplied radiator, 46/CVS-stacked, includes blower fan, fan drive, pulley, belt guard, regulator, fuel cooler

\*Single water outlet connection (for use with customer-supplied radiator)

\*Coolant level sensor

\*Coolant conditioner

### Exhaust System

Dry exhaust manifold

Dual turbochargers, water-cooled bearings

Exhaust outlet 292 mm (11.5 in)

Exhaust expander 297 mm to 340 mm (11.7 in to 13.4 in)

Exhaust flexible fitting 318 ID mm (12.5 in)

Weldable flange 360 mm (14.2 in)

### Flywheel and Housing

SAE No. 00 flywheel

SAE No. 00 flywheel housing

SAE standard rotation

### Fuel System

Fuel filter

Fuel transfer pump

Flexible fuel lines

Fuel priming pump

Electronically controlled unit injectors

\*Fuel/water separator

### Instrumentation

Emergency stop button

Electronic Instrument Panel (EIP)

- Engine oil pressure
- Engine coolant temperature
- Fuel pressure
- DC voltage
- Air inlet restriction
- Exhaust temperature (pre-turbo)
- Fuel filter differential pressure
- Oil filter differential pressure
- Service meter
- Tachometer
- Instantaneous fuel consumption
- Total fuel consumed

\*Optional attachment

\*EMCP 4.3 controls (replaces EIP)

- EMCP 4.3 control panel
- Fuel pressure gauge
- Engine oil pressure gauge
- Engine oil temperature gauge
- Engine coolant temperature gauge
- DC voltage
- Engine percent load

\*EMCP 4.4 controls (replaces EIP)

- Includes EMCP 4.4 panel and same gauges as EMCP 4.3 option

### Lubrication System

Crankcase breather

Oil cooler

Oil filter

Shallow oil pan

Oil drain extension, 2 in NPT female connection

\*Crankcase fumes disposal

\*Centrifugal oil filter

\*Oil level regulator

### Mounting System

Rails, mounting, floor type, 254 mm (10 in)

### Power Take-off

Accessory drive

Front housing, two-sided

Lower LH front available for PTO

\*Alternator, 24V, 60 A

\*Crankshaft pulley

### Protection System

Alarms:

- ECU voltage
- Oil pressure
- Low/high water temperature
- Overspeed
- Crankcase pressure
- Aftercooler temperature
- Low water level (optional)
- Air inlet restriction
- Exhaust stack temperature
- Oil/fuel filter differential pressure

Derate:

- High water temperature
- Crankcase pressure
- Aftercooler temperature
- Air inlet restriction
- Exhaust temperature

Shutdown:

- Oil pressure
- Low/high water temperature
- Overspeed
- Crankcase pressure
- Aftercooler temperature

### Starting System

TDI air starting motor, RH – 1034 kPa (150 psi)

Air silencer

### General

\*Coupling hub

\*Barring group

\*Jacket water heater 120-240 V

\*Jacket water heater 240-480 V

\*Jacket water heater lines



## TECHNICAL DATA AND SPECIFICATIONS

| Engine Data                                | Units                | DM7912-03    |
|--|----------------------|--------------|
| Rated power                                | bkW (bhp)            | 1101 (1476)  |
| Engine speed                               | rpm                  | 1200         |
| Max. altitude without derate (@ 25°C)      | m (ft)               | 2000 (6562)  |
| BMEP @ rated                               | kPa (psi)            | 2127 (308)   |
| BSFC @ 100% load                           | g/bkW-hr (lb/bhp-hr) | 206 (0.34)   |
| BSFC @ 75% load                            | g/bkW-hr (lb/bhp-hr) | 213 (0.35)   |
| BSFC @ 50% load                            | g/bkW-hr (lb/bhp-hr) | 221 (0.36)   |
| BSFC @ 25% load                            | g/bkW-hr (lb/bhp-hr) | 248 (0.41)   |
| Fuel consumption (nominal)                 | L/hr (gal/hr)        | 270.5 (71.5) |
| Air flow rate @ 25°C (101.3 kPa)           | m³/min (ft³/min)     | 95.5 (3373)  |
| Inlet manifold pressure @ rated            | kPa (psi)            | 265 (38.5)   |
| Inlet manifold temperature @ rated         | °C (°F)              | 55 (131.0)   |
| Cooling system type                        |                      | SCAC         |
| Aftercooler water temperature              | °C (°F)              | 50 (122)     |
| Jacket water temperature                   | °C (°F)              | 99 (210)     |
| Exhaust stack temperature                  | °C (°F)              | 400 (752)    |
| Exhaust flow rate @ stack temp (101.3 kPa) | m³/min (ft³/min)     | 222 (7836)   |

## HEAT REJECTION DATA

| Percent Load | Engine Power |      | Rejection to Jacket Water |         | Rejection to Atmosphere |         | Rejection to Exhaust |         | Rejection to Aftercooler |         |
|--------------|--------------|------|---------------------------|---------|-------------------------|---------|----------------------|---------|--------------------------|---------|
|              | bkW          | bhp  | kW                        | Btu/min | kW                      | Btu/min | kW                   | Btu/min | kW                       | Btu/min |
| 100          | 1101         | 1476 | 420                       | 23,902  | 111                     | 6313    | 964                  | 54,848  | 277                      | 15,751  |
| 90           | 991          | 1329 | 391                       | 22,263  | 108                     | 6142    | 886                  | 50,384  | 239                      | 13,565  |
| 80           | 881          | 1181 | 364                       | 20,682  | 105                     | 5976    | 805                  | 45,786  | 199                      | 11,344  |
| 75           | 826          | 1107 | 350                       | 19,880  | 104                     | 5895    | 764                  | 43,438  | 180                      | 10,214  |
| 70           | 771          | 1034 | 334                       | 19,013  | 102                     | 5816    | 722                  | 41,064  | 158                      | 9004    |
| 60           | 661          | 886  | 303                       | 17,207  | 100                     | 5661    | 637                  | 36,201  | 117                      | 6637    |
| 50           | 551          | 738  | 269                       | 15,307  | 97                      | 5510    | 548                  | 31,186  | 79                       | 4472    |
| 40           | 440          | 591  | 234                       | 13,319  | 92                      | 5208    | 456                  | 25,946  | 49                       | 2784    |
| 30           | 330          | 443  | 197                       | 11,192  | 84                      | 4803    | 362                  | 20,580  | 26                       | 1453    |
| 25           | 275          | 369  | 177                       | 10,075  | 80                      | 4562    | 314                  | 17,849  | 16                       | 920     |
| 20           | 220          | 295  | 156                       | 8875    | 75                      | 4280    | 266                  | 15,107  | 8                        | 483     |
| 10           | 110          | 148  | 111                       | 6322    | 64                      | 3626    | 168                  | 9547    | -2                       | -119    |



ALTITUDE AND AMBIENT CAPABILITY

Table with 8 columns (Altitude, 10°C, 20°C, 25°C, 30°C, 40°C, 50°C, 60°C) and 11 rows (0 m to 4500 m) showing ambient capability values.

EMCP 4.3/4.4 FEATURES

140 mm (5.5 in) Graphical Display

- Generator AC voltage
- 3-phase (L-L & L-N)
- ± 0.25% accuracy
• rpm and battery voltage
• Generator AC current (per phase and average)
• Generator frequency
• Power metering (kW, kVA, kVA, pf)
• Hour meters (kW-hour, kVA-hour)
• Engine oil pressure (psi, kPa or bar)
• Engine oil temperature (°C or °F)
• Engine coolant temperature (°C or °F)
• Multiple language support
• Engine start and crank attempt counter
• Real time clock

Communication

- Accessory CAN data link
• RS-485 annunciator data link
• RS-485 SCADA (Modbus RTU)
• Ethernet SCADA (Modbus TCP)

Controls

- Auto/start/stop
• Engine cooldown timer
• Emergency stop
• Engine cycle crank
• Programmable cycle timer
• Paralleling up to eight units\*

Generator Set Protection

- Over/under voltage
• Over/under frequency
• Generator phase sequence
• Over current (timed and inverse)
• Reverse kW, kVA
• Current balance

- Bus phase sequence\*
• Low oil pressure
• High coolant temperature
• Low coolant level
• Fail to start
• Overspeed

Outputs

- 16 (17\*) programmable digital outputs
• 3 programmable (4-20mA or ±10V)
• 2 programmable (PWM)

Inputs

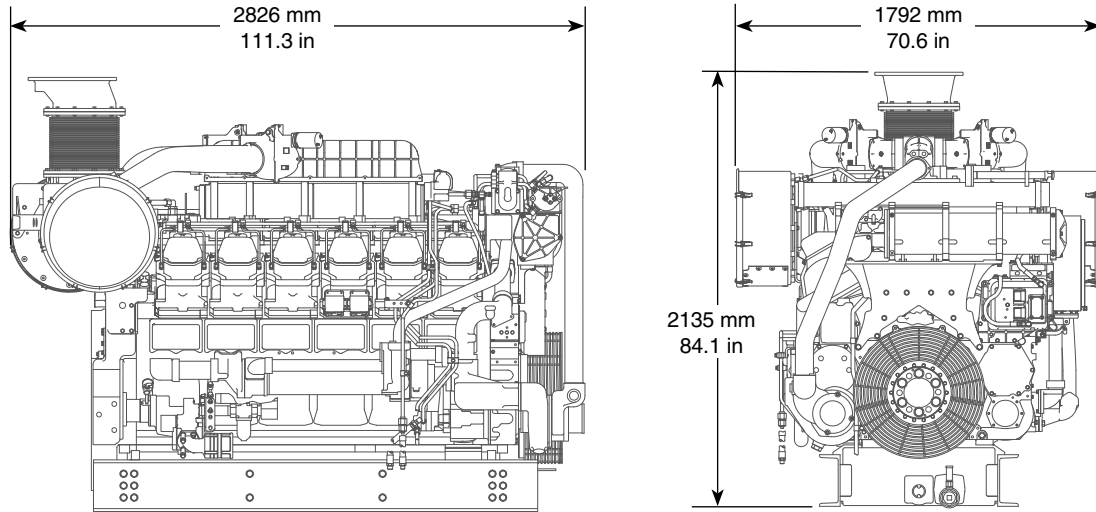
- Emergency stop
• Remote start
• 12 programmable digital inputs
• Oil pressure and water temperature
• 3 (\*4) programmable inputs (±10V, PWM, current, or resistive)
• Oil temperature, fuel level

Other Features

- 16 languages supported:
- Arabic - Greek
- Chinese - Italian
- Danish - Japanese
- Dutch - Portuguese
- English - Russian
- Finnish - Spanish
- French - Swedish
- German - Turkish
• Programmable security levels
• Reduced power mode
• Programmable kW relay
• Cat switchgear integration
• Status event log

\*EMCP 4.4 feature

## DIMENSIONS AND WEIGHT



| Dimensions and Weight |         |           |
|-----------------------|---------|-----------|
| <b>Length</b>         | 2826 mm | 111.3 in  |
| <b>Width</b>          | 1792 mm | 70.6 in   |
| <b>Height</b>         | 2135 mm | 84.1 in   |
| <b>Weight</b>         | 5423 kg | 11,956 lb |

**Note:** Do not use for installation design. See installation drawing for details.

## RATING DEFINITIONS AND CONDITIONS

**Prime Rating** – Output available with varying load for an unlimited time. Prime power in accordance with ISO8528. Typical load factor 60-70%

**Conditions** – Performance is obtained and corrected in accordance with ISO 3046/1. Reference atmospheric inlet air: 100 kPa (29.61 in Hg), 25°C (77°F), 30% relative humidity at stated aftercooler temperature. Performance is also in accordance with SAE J1995, BS5514/1, and DIN6271/1 standard reference conditions

**Diesel Fuel** – Reference fuel is #2 distillate diesel with a 35 degree API gravity, lower heating value is 42 780 kJ/kg (18,390 Btu/lb) when used at 29°C (84.2°F), where the density is 838.9 g/L (7.001 lb/gal).

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