# Cat® C15 GC DIESEL GENERATOR SETS

**Standby: 60Hz, 480V & 600V**


| | |
|---|---|
| Engine Model | Cat® C15 ACERT™ In-line 6, 4-cycle diesel |
| Bore x Stroke | 137mm x 171mm (5.4in x 6.8in) |
| Displacement | 15.2 L (928 in³) |
| Compression Ratio | 16.1:1 |
| Aspiration | Turbocharged Air-to-Air Aftercooled |
| Fuel Injection System | MEUI |
| Governor | Electronic ADEM™ A4 |

| Standby | Performance Strategy |
|---|---|
| **500 ekW, 625 kVA** | **EPA Certified for Stationary Emergency Application** |

## PACKAGE PERFORMANCE

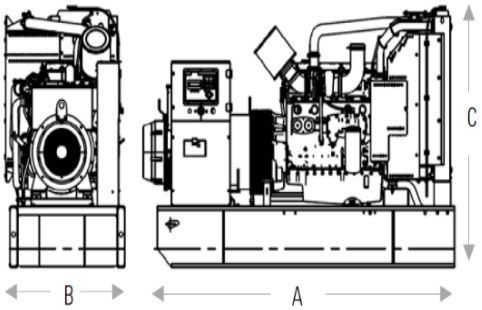
| Performance | Standby | |
|---|---|---|
| Frequency | 60 Hz | |
| Genset Power Rating | 625 kVA | |
| Gen set power rating with fan @ 0.8 power factor | 500 ekW | |
| Fuelling strategy | TIER 3 | |
| Performance Number | DM8155 | |
| **Fuel Consumption** | | |
| 100% load with fan | 137.0 L/hr | 36.2 gal/hr |
| 75% load with fan | 110.5 L/hr | 29.2 gal/hr |
| 50% load with fan | 71.3 L/hr | 18.8 gal/hr |
| 25% load with fan | 41.9 L/hr | 11.1 gal/hr |
| **Cooling System[1]** | | |
| Radiator air flow restriction (system) | 0.12 kPa | 0.48 in. Water |
| Radiator air flow | 720 m3/min | 25426 cfm |
| Engine coolant capacity | 20.8 L | 5.5 gal |
| Radiator coolant capacity | 54 L | 14 gal |
| Total coolant capacity | 75 L | 20 gal |
| **Inlet Air** | | |
| Combustion air inlet flow rate | 38.2 m³/min | 1347.7 cfm |
| Max. Allowable Combustion Air Inlet Temp | 49 ° C | 120 ° F |
| **Exhaust System** | | |
| Exhaust stack gas temperature | 531.1 ° C | 988.0 ° F |
| Exhaust gas flow rate | 102.1 m³/min | 3605.5 cfm |
| Exhaust system backpressure (maximum allowable) | 10.0 kPa | 40.0 in. water |
| **Heat Rejection** | | |
| Heat rejection to jacket water | 182 kW | 10375 Btu/min |
| Heat rejection to exhaust (total) | 493 kW | 28039 Btu/min |
| Heat rejection to aftercooler | 121 kW | 6860 Btu/min |
| Heat rejection to atmosphere from engine | 91 kW | 5182 Btu/min |
| Heat rejection from alternator | 29 kW | 1655 Btu/min |

# Cat® C15 GC DIESEL GENERATOR SETS

| Emissions (Nominal)[2] | Standby | |
|---|---|---|
| NOx | 2129.1 mg/Nm³ | 4.6 g/hp-hr |
| CO | 301.5 mg/Nm³ | 0.6 g/hp-hr |
| HC | 8.8 mg/Nm³ | 0.03 g/hp-hr |
| PM | 9.5 mg/Nm³ | 0.03 g/hp-hr |

| Alternator[3] | Standby | | | |
|---|---|---|---|---|
| Voltages | **480V** | | **600V** | |
| Motor Starting Capability @ 30% Voltage Dip | 1019 | | 1103 | |
| Current | 751.8 | | 601.4 | |
| Frame Size | M3154L4 | | M3136L4 | |
| Excitation | Shunt Excitation | | AREP | |
| Temperature Rise | 105°C | 189°F | 130°C | 234°F |

## WEIGHTS & DIMENSIONS – OPEN SET




| Base | Dim "A" mm (in) | Dim "B" mm (in) | Dim "C" mm (in) | Generator Set Weight kg (lb) |
|---|---|---|---|---|
| **Skid (Wide Base)** | 4815 (189.6) | 1630 (64.2) | 2034 (80.1) | 3756 (8280.6) |
| **Integral Tank base** | 4815 (189.6) | 1630 (64.2) | 2584 (101.7) | 4693 (10346.3) |

## FUEL TANK CAPACITY

| Tank Design | Total Capacity | | Useable Capacity | |
|---|---|---|---|---|
| | **Litre** | **Gallon** | **Litre** | **Gallon** |
| **Integral** | 3671 | 969.7 | 3323 | 877.8 |

**DEFINITIONS AND CONDITIONS:**

[1] For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.

[2] Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77° F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 BTU/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

[3] UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics. Generator temperature rise is based on a 40° C ambient per NEMA MG1-32.

**APPLICABLE CODES AND STANDARDS:**

AS1359, CSA C22.2 No100-04, UL142, UL489, UL869, UL2200, NFPA37, NFPA70, NFPA99, NFPA110, IBC, IEC60034-1, ISO3046, ISO8528, NEMA MG1-22, NEMA MG1-33, 2006/95/EC, 2006/42/EC, 2004/108/EC.
Note: Codes may not be available in all model configurations. Please consult your local Cat Dealer representative for availability.

**STANDBY:** Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

**RATINGS:** Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions.
Fuel Rates are based on fuel oil of 35° API [16° C (60° F)] gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29° C (85° F) and weighing 838.9 g/litre (7.001 lbs/U.S. gal.). Additional ratings may be available for specific customer requirements, contact your Caterpillar representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.



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# Cat® GC Control Panel

Image shown might not reflect actual configuration

## GCCP 1.2 - Control Panel

GCCP 1.2 is an auto Start Control Module suitable for a wide variety of diesel gen-set applications. Monitoring an extensive number of engine parameters, the modules will display warnings, shutdown and engine status information on the back-lit LCD screen, illuminated LEDs and remote PC.

## FEATURES

- 4-line back-lit LCD text display
- Multiple display languages
- Five-key menu navigation
- LCD alarm indication
- Customisable power-up text and images
- Data logging facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB & RS485 communication
- Front panel configuration with PIN protection
- Power save mode
- 3-phase generator sensing and protection
- Generator current and power monitoring (kW, kvar, kVA, pf)
- kW and kvar overload and reverse power alarms
- Over current protection
- Unbalanced load protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using CAN
- Support for 0 V to 10 V & 4 mA to 20 mA sensors
- 8 configurable digital inputs (3 available for Customer use)
- 8 configurable digital outputs (5 available for Customer use)
- 4 configurable analogue outputs (3 available for Customer Use)
- CAN, MPU and alternator frequency speed sensing in one variant
- Real time clock
- Engine pre-heat and post-heat functions
- Engine run-time scheduler
- Engine idle control for starting &stopping
- Fuel usage monitor and low fuel level alarms
- 3 configurable maintenance alarms

## BENEFITS

- Hours counter provides accurate information for monitoring and maintenance periods
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored & displayed simultaneously for full visibility
- The module can be configured to suit a wide range of applications for user flexibility
- PLC editor allows user configurable functions to meet user specific application requirements.
- RS485 Communication port can be used for the Remote Monitoring Communication (Compatible with Cat PLG)

## SPECIFICATION

**DC SUPPLY**
**CONTINUOUS VOLTAGE RATING**
8 V to 35 V Continuous
5 V for upto 1 minute

**CRANKING DROPOUTS**
Able to survive 0 V for 100 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries.
LEDs and backlight will not be maintained during cranking.

**MAXIMUM OPERATING CURRENT**
260 mA at 12 V, 150 mA at 24 V

**MAXIMUM STANDBY CURRENT**
145 mA at 12 V, 85 mA at 24 V

**CHARGE FAIL/EXCITATION RANGE**
0 V to 35 V

**GENERATOR & MAINS (UTILITY) VOLTAGE RANGE**
15 V to 415 V AC (Ph to N)
26 V to 719 V AC (Ph to Ph)

**FREQUENCY RANGE**
3.5 Hz to 75 Hz

**MAGNETIC PICKUP VOLTAGE RANGE**
+/- 0.5 V to 70 V

**FREQUENCY RANGE**
10,000 Hz (max)

**INPUTS**
**DIGITAL INPUTS A TO H**
Negative switching

**ANALOGUE INPUTS A & D**
Configurable as:
Negative switching digital input 0 V to 10 V sensor
4 mA to 20 mA sensor Resistive sensor

**ANALOGUE INPUTS B & C**
Configurable as:
Negative switching digital input Resistive sensor

**OUTPUTS**
**OUTPUT A & B (FUEL & START)**
15 A DC at supply voltage

**AUXILIARY OUTPUTS C, D, E, F, G & H**
2 A DC at supply voltage

**DIMENSIONS OVERALL**
216 mm x 158 mm x 43 mm
8.5" x 6.2" x 1.5"

**PANEL CUT-OUT**
184 mm x 137 mm
7.2" x 5.3"

**MAXIMUM PANEL THICKNESS**
8 mm
0.3"

**STORAGE TEMPERATURE RANGE**
-40°C to +85°C
-40 °F to +185 °F

**OPERATING TEMPERATURE RANGE**
-30°C to +70°C
-22 °F to +158 °F



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# PERFORMANCE DATA[DM8155]

January 21, 2020

**Performance Number: DM8155** **Change Level: 04**

| | | | |
|---|---|---|---|
| **SALES MODEL:** | C15 | **COMBUSTION:** | DIRECT INJECTION |
| **BRAND:** | CAT | **ENGINE SPEED (RPM):** | 1,800 |
| **ENGINE POWER (BHP):** | 762 | **HERTZ:** | 60 |
| **GEN POWER WITH FAN (EKW):** | 500.0 | **FAN POWER (HP):** | 33.7 |
| **COMPRESSION RATIO:** | 16.1 | **ASPIRATION:** | TA |
| **RATING LEVEL:** | STANDBY | **AFTERCOOLER TYPE:** | ATAAC |
| **PUMP QUANTITY:** | 1 | **AFTERCOOLER CIRCUIT TYPE:** | JW+OC, ATAAC |
| **FUEL TYPE:** | DIESEL | **INLET MANIFOLD AIR TEMP (F):** | 120 |
| **MANIFOLD TYPE:** | DRY | **JACKET WATER TEMP (F):** | 192.2 |
| **GOVERNOR TYPE:** | ELEC | **TURBO CONFIGURATION:** | SINGLE |
| **CAMSHAFT TYPE:** | STANDARD | **TURBO QUANTITY:** | 1 |
| **IGNITION TYPE:** | CI | **TURBOCHARGER MODEL:** | GTA5518BS-56T-1.58 |
| **INJECTOR TYPE:** | EUI | **CERTIFICATION YEAR:** | 2006 |
| **REF EXH STACK DIAMETER (IN):** | 6 | **PISTON SPD @ RATED ENG SPD (FT/MIN):** | 2,025.0 |
| **MAX OPERATING ALTITUDE (FT):** | 3,281 | | |

| INDUSTRY | SUBINDUSTRY | APPLICATION |
|---|---|---|
| ELECTRIC POWER | STANDARD | PACKAGED GENSET |
| OIL AND GAS | LAND PRODUCTION | PACKAGED GENSET |

## General Performance Data

| GENSET POWER WITH FAN | PERCENT LOAD | ENGINE POWER | BRAKE MEAN EFF PRES (BMEP) | BRAKE SPEC FUEL CONSUMPTN (BSFC) | VOL FUEL CONSUMPTN (VFC) | INLET MFLD PRES | INLET MFLD TEMP | EXH MFLD TEMP | EXH MFLD PRES | ENGINE OUTLET TEMP |
|---|---|---|---|---|---|---|---|---|---|---|
| EKW | % | BHP | PSI | LB/BHP-HR | GAL/HR | IN-HG | DEG F | DEG F | IN-HG | DEG F |
| 500.0 | 100 | 762 | 361 | 0.333 | 36.2 | 68.2 | 120.4 | 1,296.3 | 46.8 | 988.0 |
| 450.0 | 90 | 683 | 324 | 0.348 | 34.0 | 67.0 | 119.4 | 1,280.7 | 45.9 | 973.8 |
| 400.0 | 80 | 607 | 288 | 0.358 | 31.0 | 61.6 | 115.2 | 1,250.1 | 42.3 | 956.6 |
| 375.0 | 75 | 570 | 271 | 0.358 | 29.2 | 56.4 | 111.0 | 1,229.5 | 38.8 | 947.8 |
| 350.0 | 70 | 534 | 253 | 0.356 | 27.2 | 50.1 | 106.0 | 1,205.6 | 34.6 | 938.3 |
| 300.0 | 60 | 462 | 219 | 0.347 | 22.9 | 36.6 | 95.5 | 1,148.6 | 25.6 | 915.7 |
| 250.0 | 50 | 392 | 186 | 0.336 | 18.8 | 24.0 | 86.2 | 1,080.0 | 17.4 | 887.9 |
| 200.0 | 40 | 323 | 153 | 0.339 | 15.6 | 16.9 | 83.6 | 1,003.8 | 13.3 | 838.1 |
| 150.0 | 30 | 253 | 120 | 0.347 | 12.5 | 11.3 | 81.0 | 910.6 | 10.2 | 768.4 |
| 125.0 | 25 | 218 | 103 | 0.355 | 11.1 | 9.1 | 79.8 | 857.1 | 9.0 | 725.6 |
| 100.0 | 20 | 182 | 86 | 0.368 | 9.6 | 7.0 | 78.6 | 795.3 | 8.0 | 674.7 |
| 50.0 | 10 | 109 | 52 | 0.420 | 6.5 | 3.3 | 76.2 | 639.0 | 6.1 | 542.9 |

| GENSET POWER WITH FAN | PERCENT LOAD | ENGINE POWER | COMPRESSOR OUTLET PRES | COMPRESSOR OUTLET TEMP | WET INLET AIR VOL FLOW RATE | ENGINE OUTLET WET EXH GAS VOL FLOW RATE | WET INLET AIR MASS FLOW RATE | WET EXH GAS MASS FLOW RATE | WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG) | DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG) |
|---|---|---|---|---|---|---|---|---|---|---|
| EKW | % | BHP | IN-HG | DEG F | CFM | CFM | LB/HR | LB/HR | FT3/MIN | FT3/MIN |
| 500.0 | 100 | 762 | 73 | 405.8 | 1,347.7 | 3,605.5 | 6,001.8 | 6,255.3 | 1,224.6 | 1,109.4 |
| 450.0 | 90 | 683 | 72 | 402.2 | 1,345.2 | 3,558.0 | 5,981.4 | 6,219.2 | 1,220.4 | 1,110.6 |
| 400.0 | 80 | 607 | 66 | 381.3 | 1,283.7 | 3,364.8 | 5,686.7 | 5,904.2 | 1,168.1 | 1,066.0 |
| 375.0 | 75 | 570 | 61 | 361.0 | 1,219.4 | 3,187.1 | 5,381.2 | 5,585.8 | 1,113.3 | 1,016.3 |
| 350.0 | 70 | 534 | 54 | 336.1 | 1,139.2 | 2,970.6 | 5,001.5 | 5,191.7 | 1,044.7 | 953.4 |
| 300.0 | 60 | 462 | 40 | 282.1 | 965.5 | 2,500.8 | 4,183.5 | 4,344.1 | 894.0 | 815.5 |
| 250.0 | 50 | 392 | 27 | 229.6 | 799.0 | 2,040.7 | 3,407.8 | 3,539.6 | 744.6 | 679.6 |
| 200.0 | 40 | 323 | 19 | 195.0 | 697.8 | 1,729.1 | 2,959.9 | 3,069.2 | 655.1 | 600.0 |
| 150.0 | 30 | 253 | 13 | 165.5 | 615.8 | 1,447.5 | 2,601.3 | 2,689.1 | 579.6 | 534.1 |
| 125.0 | 25 | 218 | 11 | 152.7 | 581.8 | 1,317.2 | 2,454.7 | 2,532.1 | 546.4 | 505.6 |
| 100.0 | 20 | 182 | 9 | 140.6 | 551.1 | 1,190.0 | 2,322.2 | 2,389.2 | 515.8 | 479.7 |
| 50.0 | 10 | 109 | 5 | 118.5 | 497.4 | 940.2 | 2,088.6 | 2,134.4 | 461.1 | 434.6 |

## Heat Rejection Data

| GENSET POWER WITH FAN | PERCENT LOAD | ENGINE POWER | REJECTION TO JACKET WATER | REJECTION TO ATMOSPHERE | REJECTION TO EXH | EXHAUST RECOVERY TO 350F | FROM OIL COOLER | FROM AFTERCOOLER | WORK ENERGY | LOW HEAT VALUE ENERGY | HIGH HEAT VALUE ENERGY |
|---|---|---|---|---|---|---|---|---|---|---|---|

# PERFORMANCE DATA[DM8155]

January 21, 2020

| EKW | % | BHP | BTU/MIN | BTU/MIN | BTU/MIN | BTU/MIN | BTU/MIN | BTU/MIN | BTU/MIN | BTU/MIN | BTU/MIN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 500.0 | 100 | 762 | 10,375 | 5,182 | 28,039 | 17,119 | 4,138 | 6,860 | 32,301 | 77,688 | 82,757 |
| 450.0 | 90 | 683 | 9,686 | 4,904 | 27,298 | 16,583 | 3,881 | 6,775 | 28,958 | 72,867 | 77,622 |
| 400.0 | 80 | 607 | 8,796 | 4,826 | 25,540 | 15,270 | 3,549 | 6,061 | 25,750 | 66,626 | 70,974 |
| 375.0 | 75 | 570 | 8,322 | 4,716 | 24,127 | 14,230 | 3,337 | 5,388 | 24,187 | 62,652 | 66,740 |
| 350.0 | 70 | 534 | 7,911 | 4,524 | 22,387 | 13,011 | 3,104 | 4,610 | 22,642 | 58,272 | 62,074 |
| 300.0 | 60 | 462 | 7,240 | 4,038 | 18,412 | 10,458 | 2,621 | 3,127 | 19,611 | 49,217 | 52,428 |
| 250.0 | 50 | 392 | 6,630 | 3,455 | 14,380 | 8,084 | 2,153 | 1,957 | 16,633 | 40,417 | 43,054 |
| 200.0 | 40 | 323 | 5,924 | 2,968 | 11,812 | 6,328 | 1,786 | 1,321 | 13,687 | 33,524 | 35,712 |
| 150.0 | 30 | 253 | 5,187 | 2,459 | 9,434 | 4,713 | 1,435 | 880 | 10,732 | 26,935 | 28,692 |
| 125.0 | 25 | 218 | 4,807 | 2,196 | 8,319 | 3,963 | 1,264 | 716 | 9,239 | 23,729 | 25,277 |
| 100.0 | 20 | 182 | 4,414 | 1,924 | 7,227 | 3,212 | 1,093 | 577 | 7,727 | 20,530 | 21,869 |
| 50.0 | 10 | 109 | 3,615 | 1,370 | 5,008 | 1,677 | 749 | 353 | 4,629 | 14,057 | 14,974 |

## Emissions Data

### RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

| **GENSET POWER WITH FAN** | | **EKW** | **500.0** | **375.0** | **250.0** | **125.0** | **50.0** |
|---|---|---|---|---|---|---|---|
| **PERCENT LOAD** | | **%** | **100** | **75** | **50** | **25** | **10** |
| **ENGINE POWER** | | **BHP** | **762** | **570** | **392** | **218** | **109** |
| TOTAL NOX (AS NO2) | | G/HR | 3,707 | 1,682 | 1,937 | 1,368 | 803 |
| TOTAL CO | | G/HR | 877 | 987 | 558 | 317 | 377 |
| TOTAL HC | | G/HR | 30 | 45 | 33 | 31 | 39 |
| PART MATTER | | G/HR | 38.1 | 59.8 | 79.3 | 48.8 | 31.4 |
| TOTAL NOX (AS NO2) | (CORR 5% O2) | MG/NM3 | 2,299.5 | 1,358.3 | 2,369.2 | 2,773.4 | 2,656.6 |
| TOTAL CO | (CORR 5% O2) | MG/NM3 | 563.8 | 767.7 | 677.2 | 661.9 | 1,406.0 |
| TOTAL HC | (CORR 5% O2) | MG/NM3 | 16.6 | 30.0 | 34.1 | 56.2 | 121.3 |
| PART MATTER | (CORR 5% O2) | MG/NM3 | 18.5 | 41.0 | 80.1 | 84.7 | 94.9 |
| TOTAL NOX (AS NO2) | (CORR 5% O2) | PPM | 1,120 | 662 | 1,154 | 1,351 | 1,294 |
| TOTAL CO | (CORR 5% O2) | PPM | 451 | 614 | 542 | 530 | 1,125 |
| TOTAL HC | (CORR 5% O2) | PPM | 31 | 56 | 64 | 105 | 226 |
| TOTAL NOX (AS NO2) | | G/HP-HR | 4.94 | 2.98 | 4.97 | 6.30 | 7.37 |
| TOTAL CO | | G/HP-HR | 1.17 | 1.75 | 1.43 | 1.46 | 3.46 |
| TOTAL HC | | G/HP-HR | 0.04 | 0.08 | 0.08 | 0.14 | 0.35 |
| PART MATTER | | G/HP-HR | 0.05 | 0.11 | 0.20 | 0.22 | 0.29 |
| TOTAL NOX (AS NO2) | | LB/HR | 8.17 | 3.71 | 4.27 | 3.01 | 1.77 |
| TOTAL CO | | LB/HR | 1.93 | 2.18 | 1.23 | 0.70 | 0.83 |
| TOTAL HC | | LB/HR | 0.07 | 0.10 | 0.07 | 0.07 | 0.09 |
| PART MATTER | | LB/HR | 0.08 | 0.13 | 0.17 | 0.11 | 0.07 |

### RATED SPEED NOMINAL DATA: 1800 RPM

| **GENSET POWER WITH FAN** | | **EKW** | **500.0** | **375.0** | **250.0** | **125.0** | **50.0** |
|---|---|---|---|---|---|---|---|
| **PERCENT LOAD** | | **%** | **100** | **75** | **50** | **25** | **10** |
| **ENGINE POWER** | | **BHP** | **762** | **570** | **392** | **218** | **109** |
| TOTAL NOX (AS NO2) | | G/HR | 3,432 | 1,558 | 1,793 | 1,266 | 743 |
| TOTAL CO | | G/HR | 469 | 528 | 298 | 170 | 202 |
| TOTAL HC | | G/HR | 16 | 24 | 17 | 17 | 20 |
| TOTAL CO2 | | KG/HR | 357 | 287 | 186 | 110 | 65 |
| PART MATTER | | G/HR | 19.6 | 30.6 | 40.7 | 25.0 | 16.1 |
| TOTAL NOX (AS NO2) | (CORR 5% O2) | MG/NM3 | 2,129.1 | 1,257.7 | 2,193.7 | 2,567.9 | 2,459.9 |
| TOTAL CO | (CORR 5% O2) | MG/NM3 | 301.5 | 410.5 | 362.1 | 354.0 | 751.9 |
| TOTAL HC | (CORR 5% O2) | MG/NM3 | 8.8 | 15.9 | 18.0 | 29.7 | 64.2 |
| PART MATTER | (CORR 5% O2) | MG/NM3 | 9.5 | 21.1 | 41.1 | 43.4 | 48.7 |
| TOTAL NOX (AS NO2) | (CORR 5% O2) | PPM | 1,037 | 613 | 1,068 | 1,251 | 1,198 |
| TOTAL CO | (CORR 5% O2) | PPM | 241 | 328 | 290 | 283 | 602 |
| TOTAL HC | (CORR 5% O2) | PPM | 16 | 30 | 34 | 55 | 120 |
| TOTAL NOX (AS NO2) | | G/HP-HR | 4.58 | 2.76 | 4.60 | 5.83 | 6.82 |
| TOTAL CO | | G/HP-HR | 0.63 | 0.93 | 0.76 | 0.78 | 1.85 |
| TOTAL HC | | G/HP-HR | 0.02 | 0.04 | 0.04 | 0.08 | 0.19 |
| PART MATTER | | G/HP-HR | 0.03 | 0.05 | 0.10 | 0.12 | 0.15 |
| TOTAL NOX (AS NO2) | | LB/HR | 7.57 | 3.43 | 3.95 | 2.79 | 1.64 |
| TOTAL CO | | LB/HR | 1.03 | 1.16 | 0.66 | 0.37 | 0.44 |
| TOTAL HC | | LB/HR | 0.04 | 0.05 | 0.04 | 0.04 | 0.05 |
| TOTAL CO2 | | LB/HR | 786 | 633 | 410 | 243 | 144 |
| PART MATTER | | LB/HR | 0.04 | 0.07 | 0.09 | 0.06 | 0.04 |
| OXYGEN IN EXH | | % | 8.3 | 9.6 | 9.4 | 11.4 | 14.3 |

## Regulatory Information

| EPA TIER 2 | | 2006 - 2010 | | |
|---|---|---|---|---|
| GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS. | | | | |
| **Locality** | **Agency** | **Regulation** | **Tier/Stage** | **Max Limits - G/BKW - HR** |
| U.S. (INCL CALIF) | EPA | NON-ROAD | TIER 2 | CO: 3.5 NOx + HC: 6.4 PM: 0.20 |

| EPA EMERGENCY STATIONARY | | 2011 - ---- | | |
|---|---|---|---|---|
| GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS. | | | | |
| **Locality** | **Agency** | **Regulation** | **Tier/Stage** | **Max Limits - G/BKW - HR** |
| U.S. (INCL CALIF) | EPA | STATIONARY | EMERGENCY STATIONARY | CO: 3.5 NOx + HC: 6.4 PM: 0.20 |

## Altitude Derate Data

### ALTITUDE CORRECTED POWER CAPABILITY (BHP)

| AMBIENT OPERATING TEMP (F) | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | NORMAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALTITUDE (FT) | | | | | | | | | | | | | |
| 0 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 |
| 1,000 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 757 | 744 | 762 |
| 2,000 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 762 | 754 | 741 | 728 | 716 | 762 |
| 3,000 | 762 | 762 | 762 | 762 | 762 | 762 | 752 | 739 | 726 | 713 | 701 | 689 | 762 |
| 4,000 | 762 | 762 | 762 | 762 | 751 | 737 | 724 | 711 | 698 | 686 | 674 | 663 | 759 |
| 5,000 | 762 | 762 | 750 | 736 | 722 | 709 | 696 | 683 | 671 | 660 | 649 | 638 | 735 |
| 6,000 | 751 | 736 | 722 | 708 | 694 | 681 | 669 | 657 | 646 | 634 | 624 | 613 | 712 |
| 7,000 | 722 | 707 | 693 | 680 | 667 | 655 | 643 | 632 | 620 | 610 | 599 | 589 | 689 |
| 8,000 | 693 | 680 | 666 | 653 | 641 | 629 | 618 | 607 | 596 | 586 | 576 | 566 | 666 |
| 9,000 | 666 | 653 | 640 | 628 | 616 | 604 | 593 | 583 | 572 | 563 | 553 | 544 | 644 |
| 10,000 | 639 | 627 | 614 | 602 | 591 | 580 | 570 | 559 | 550 | 540 | 531 | 522 | 623 |
| 11,000 | 614 | 601 | 589 | 578 | 567 | 557 | 547 | 537 | 527 | 518 | 509 | 501 | 602 |
| 12,000 | 588 | 577 | 565 | 555 | 544 | 534 | 524 | 515 | 506 | 497 | 489 | 481 | 582 |
| 13,000 | 564 | 553 | 542 | 532 | 522 | 512 | 503 | 494 | 485 | 477 | 469 | 461 | 562 |
| 14,000 | 541 | 530 | 520 | 510 | 500 | 491 | 482 | 473 | 465 | 457 | 449 | 442 | 542 |
| 15,000 | 518 | 508 | 498 | 488 | 479 | 470 | 462 | 453 | 445 | 438 | 430 | 423 | 523 |

## Cross Reference

| Test Spec | Setting | Engine Arrangement | Engineering Model | Engineering Model Version | Start Effective Serial Number | End Effective Serial Number |
|---|---|---|---|---|---|---|
| 0K6281 | PP5612 | 2864923 | GS282 | - | FTE02794 | |
| 0K6281 | PP5612 | 2864924 | GS282 | - | FTE02794 | |

## Performance Parameter Reference

**Parameters Reference:DM9600-11**

**PERFORMANCE DEFINITIONS**

PERFORMANCE DEFINITIONS DM9600
APPLICATION:
Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in

part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS:

Power +/- 3%
Torque +/- 3%
Exhaust stack temperature +/- 8%
Inlet airflow +/- 5%
Intake manifold pressure-gage +/- 10%
Exhaust flow +/- 6%
Specific fuel consumption +/- 3%
Fuel rate +/- 5%
Specific DEF consumption +/- 3%
DEF rate +/- 5%
Heat rejection +/- 5%
Heat rejection exhaust only +/- 10%
Heat rejection CEM only +/- 10%

Heat Rejection values based on using treated water.

Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.

On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.

These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS:

Heat rejection +/- 10%
Heat rejection to Atmosphere +/- 50%
Heat rejection to Lube Oil +/- 20%
Heat rejection to Aftercooler +/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS:

Torque +/- 0.5%
Speed +/- 0.2%
Fuel flow +/- 1.0%
Temperature +/- 2.0 C degrees
Intake manifold pressure +/- 0.1 kPa

OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR

FOR 3500 ENGINES AND SMALLER

SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.

FOR 3600 ENGINES

Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE

Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER

The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL

DIESEL

Reference fuel is #2 distillate diesel with a 35API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 29 deg C (84.2 deg F), where the density is 838.9 G/Liter (7.001 Lbs/Gal).

GAS

Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD

Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY

Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance

data set.
Standard temperature values versus altitude could be seen on TM2001.
When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.
Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.
Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.
REGULATIONS AND PRODUCT COMPLIANCE
TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.
EMISSION CYCLE LIMITS:
Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.
EMISSIONS DEFINITIONS:
Emissions : DM1176
EMISSION CYCLE DEFINITIONS
1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets
test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.
HEAT REJECTION DEFINITIONS:
Diesel Circuit Type and HHV Balance : DM9500
HIGH DISPLACEMENT (HD) DEFINITIONS:
3500: EM1500
RATING DEFINITIONS:
Agriculture : TM6008
Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040
Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038
SOUND DEFINITIONS:
Sound Power : DM8702
Sound Pressure : TM7080
Date Released : 07/10/19

# *PACKAGE DATA [C15DEPB]*

***JANUARY 21, 2020***

**For Help Desk Phone Numbers** Click here

| | | | | | |
|---|---|---|---|---|---|
| **Feature Code:** | C15DEPB | **Rating Type:** | STANDBY | **Sales model Package:** | D500GC |
| **Engine Sales Model:** | C15 | **Engine Arrangement Number:** | 4206876 | **Hertz:** | 60 |
| **EKW W/F:** | 500.0 | **Noise Reduction:** | 0 dBA | **Back Pressure:** | 0.0 inH2O |

## Engine Package Information

Engine Package Data

## Package Cooling Information

**SA Level 2 Canopy Cooling Data**

| % Load | Airflow Rate scfm | Ambient Capability Sea Level (Deg F) | Ambient Capability 300 m (Deg F) | Ambient Capability 600 m (Deg F) | Ambient Capability 900 m (Deg F) |
|---|---|---|---|---|---|
| 100.0 | 17692 | 122 | 118 | 114 | 111 |
| 75.0 | 17692 | 141 | 138 | 134 | 131 |
| 50.0 | 17692 | 159 | 156 | 152 | 149 |
| 25.0 | 17692 | 179 | 176 | 172 | 168 |

## Package Sound Information

## Sound Comments :

## Open Sound Data

**Distance:** 3.3 Feet

| EKW W/F | % LOAD | OVERALL SOUND DB(A) | OBCF 63HZ DB | OBCF 125HZ DB | OBCF 250HZ DB | OBCF 500HZ DB | OBCF 1000HZ DB | OBCF 2000HZ DB | OBCF 4000HZ DB | OBCF 8000HZ DB |
|---|---|---|---|---|---|---|---|---|---|---|
| 500.0 | 100.0 | 105.0 | 102.0 | 95.0 | 99.0 | 98.0 | 100.0 | 98.0 | 93.0 | 100.0 |
| 375.0 | 75.0 | 104.0 | 101.0 | 94.0 | 99.0 | 98.0 | 99.0 | 96.0 | 92.0 | 97.0 |

**Distance:** 23.0 Feet

| EKW W/F | % LOAD | OVERALL SOUND DB(A) | OBCF 63HZ DB | OBCF 125HZ DB | OBCF 250HZ DB | OBCF 500HZ DB | OBCF 1000HZ DB | OBCF 2000HZ DB | OBCF 4000HZ DB | OBCF 8000HZ DB |
|---|---|---|---|---|---|---|---|---|---|---|
| 500.0 | 100.0 | 95.0 | 92.0 | 85.0 | 89.0 | 88.0 | 90.0 | 88.0 | 83.0 | 90.0 |
| 375.0 | 75.0 | 94.0 | 91.0 | 84.0 | 89.0 | 88.0 | 89.0 | 86.0 | 82.0 | 87.0 |

**Distance:** 49.2 Feet

| EKW W/F | % LOAD | OVERALL SOUND DB(A) | OBCF 63HZ DB | OBCF 125HZ DB | OBCF 250HZ DB | OBCF 500HZ DB | OBCF 1000HZ DB | OBCF 2000HZ DB | OBCF 4000HZ DB | OBCF 8000HZ DB |
|---|---|---|---|---|---|---|---|---|---|---|
| 500.0 | 100.0 | 89.0 | 86.0 | 79.0 | 83.0 | 82.0 | 84.0 | 82.0 | 77.0 | 84.0 |
| 375.0 | 75.0 | 88.0 | 85.0 | 78.0 | 83.0 | 82.0 | 83.0 | 80.0 | 76.0 | 81.0 |

## SA Level 2 Canopy Sound Data

**Distance:** 3.3 Feet

| EKW W/F | % LOAD | OVERALL SOUND DB(A) | OBCF 63HZ DB | OBCF 125HZ DB | OBCF 250HZ DB | OBCF 500HZ DB | OBCF 1000HZ DB | OBCF 2000HZ DB | OBCF 4000HZ DB | OBCF 8000HZ DB |
|---|---|---|---|---|---|---|---|---|---|---|
| 500.0 | 100.0 | 82.2 | 95.7 | 89.7 | 86.3 | 76.6 | 74.0 | 68.4 | 65.0 | 73.3 |
| 375.0 | 75.0 | 81.0 | 93.7 | 86.9 | 85.1 | 76.6 | 73.0 | 66.9 | 63.5 | 71.4 |
| 250.0 | 50.0 | 80.1 | 91.5 | 85.0 | 84.5 | 76.4 | 72.5 | 65.9 | 62.1 | 67.2 |
| 125.0 | 25.0 | 79.6 | 89.1 | 83.9 | 84.5 | 76.0 | 72.4 | 65.3 | 60.9 | 60.8 |

**Distance:** 23.0 Feet

| EKW W/F | % LOAD | OVERALL SOUND DB(A) | OBCF 63HZ DB | OBCF 125HZ DB | OBCF 250HZ DB | OBCF 500HZ DB | OBCF 1000HZ DB | OBCF 2000HZ DB | OBCF 4000HZ DB | OBCF 8000HZ DB |
|---|---|---|---|---|---|---|---|---|---|---|
| 500.0 | 100.0 | 72.6 | 89.4 | 80.8 | 78.2 | 66.6 | 64.4 | 59.4 | 55.1 | 61.2 |
| 375.0 | 75.0 | 71.5 | 87.2 | 78.6 | 78.5 | 66.1 | 62.7 | 57.0 | 52.8 | 58.9 |
| 250.0 | 50.0 | 70.6 | 85.2 | 77.1 | 77.9 | 65.6 | 61.7 | 55.4 | 51.1 | 55.0 |
| 125.0 | 25.0 | 69.9 | 83.4 | 76.2 | 76.5 | 65.2 | 61.4 | 54.7 | 50.0 | 49.6 |

**Distance:** 49.2 Feet

| EKW W/F | % LOAD | OVERALL SOUND DB(A) | OBCF 63HZ DB | OBCF 125HZ DB | OBCF 250HZ DB | OBCF 500HZ DB | OBCF 1000HZ DB | OBCF 2000HZ DB | OBCF 4000HZ DB | OBCF 8000HZ DB |
|---|---|---|---|---|---|---|---|---|---|---|
| 500.0 | 100.0 | 66.6 | 83.4 | 74.8 | 72.2 | 60.6 | 58.4 | 53.4 | 49.1 | 55.2 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 375.0 | 75.0 | 65.5 | 81.2 | 72.6 | 72.5 | 60.1 | 56.7 | 51.0 | 46.8 | 52.9 |
| 250.0 | 50.0 | 64.6 | 79.2 | 71.1 | 71.9 | 59.6 | 55.7 | 49.4 | 45.1 | 49.0 |
| 125.0 | 25.0 | 63.9 | 77.4 | 70.2 | 70.5 | 59.2 | 55.4 | 48.7 | 44.0 | 43.6 |

# GENERATOR DATA

**JANUARY 22, 2020**

**For Help Desk Phone Numbers** Click here

## Selected Model

| | | | |
|---|---|---|---|
| **Engine:** C15 | **Generator Frame:** M3154L4 | **Genset Rating (kW):** 500.0 | **Line Voltage:** 480 |
| **Fuel:** Diesel | **Generator Arrangement:** 5652331 | **Genset Rating (kVA):** 625.0 | **Phase Voltage:** 277 |
| **Frequency:** 60 | **Excitation Type:** Self Excited | **Pwr. Factor:** 0.8 | **Rated Current:** 751.8 |
| **Duty:** STANDBY | **Connection:** - STAR | **Application:** EPG | **Status:** Current |

**Version:** 42423 /43607 /43655 /8556

## Spec Information

### Generator Specification

| | |
|---|---|
| **Frame:** M3154L4 **Type:** SR500 | **No. of Bearings:** 1 |
| **Winding Type:** RANDOM WOUND | **Flywheel:** 14.0 |
| **Connection:** - STAR | **Housing:** 1 |
| **Phases:** 3 | **No. of Leads:** 6 |
| **Poles:** 4 | **Wires per Lead:** 0 |
| **Sync Speed:** 1800 | **Generator Pitch:** 0.6667 |

### Generator Efficiency

| Per Unit Load | kW | Efficiency % |
|---|---|---|
| 0.25 | 125.0 | 93.3 |
| 0.5 | 250.0 | 95.2 |
| 0.75 | 375.0 | 95.4 |
| 1.0 | 500.0 | 95.1 |

| Reactances | Per Unit | Ohms |
|---|---|---|
| SUBTRANSIENT - DIRECT AXIS $X''_d$ | 0.1161 | 0.0428 |
| SUBTRANSIENT - QUADRATURE AXIS $X''_q$ | 0.1571 | 0.0579 |
| TRANSIENT - SATURATED $X'_d$ | 0.1657 | 0.0611 |
| SYNCHRONOUS - DIRECT AXIS $X_d$ | 2.9397 | 1.0837 |
| SYNCHRONOUS - QUADRATURE AXIS $X_q$ | 1.4993 | 0.5527 |
| NEGATIVE SEQUENCE $X_2$ | 0.1364 | 0.0503 |
| ZERO SEQUENCE $X_0$ | 0.0068 | 0.0025 |

| Time Constants | Seconds |
|---|---|
| OPEN CIRCUIT TRANSIENT - DIRECT AXIS $T'_{d0}$ | 1.7735 |
| SHORT CIRCUIT TRANSIENT - DIRECT AXIS $T'_d$ | 0.1000 |
| OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS $T''_{d0}$ | 0.0142 |
| SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS $T''_d$ | 0.0100 |
| OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS $T''_{q0}$ | 0.0955 |
| SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS $T''_q$ | 0.0100 |
| EXCITER TIME CONSTANT $T_e$ | 0.0220 |
| ARMATURE SHORT CIRCUIT $T_a$ | 0.0150 |

| | | |
|---|---|---|
| Short Circuit Ratio: 0.4 | Stator Resistance = 0.0087 Ohms | Field Resistance = 0.5791 Ohms |

### Voltage Regulation

| | |
|---|---|
| **Voltage level adjustment: +/-** | 5.0% |
| **Voltage regulation, steady state: +/-** | 1.0% |
| **Voltage regulation with 3% speed change: +/-** | 1.0% |
| **Waveform deviation line - line, no load: less than** | 2.0% |
| **Telephone influence factor: less than** | 50 |

### Generator Excitation

| | No Load | Full Load, (rated) pf | |
|---|---|---|---|
| | | Series | Parallel |
| **Excitation voltage:** | 10.64 Volts | 46.58 Volts | Volts |
| **Excitation current** | 1.0 Amps | 3.6 Amps | Amps |

## Selected Model

| | | | |
|---|---|---|---|
| **Engine:** C15 | **Generator Frame:** M3154L4 | **Genset Rating (kW):** 500.0 | **Line Voltage:** 480 |
| **Fuel:** Diesel | **Generator Arrangement:** 5652331 | **Genset Rating (kVA):** 625.0 | **Phase Voltage:** 277 |
| **Frequency:** 60 | **Excitation Type:** Self Excited | **Pwr. Factor:** 0.8 | **Rated Current:** 751.8 |
| **Duty:** STANDBY | **Connection:** - STAR | **Application:** EPG | **Status:** Current |

**Version:** 42423 /43607 /43655 /8556

## Generator Mechanical Information

### Center of Gravity

| | | |
|---|---|---|
| Dimension X | -511.0 mm | -20.1 IN. |
| Dimension Y | 0.0 mm | 0.0 IN. |
| Dimension Z | 0.0 mm | 0.0 IN. |

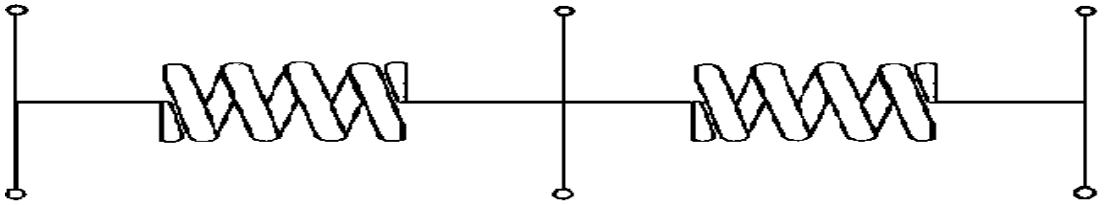
- "X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details
- "Y" is measured vertically from rotor center line. Up is positive.
- "Z" is measured to left and right of rotor center line. To the right is positive.

Generator WT = 1240 kg (2,734 LB) * Rotor WT = 496 kg (1,093 LB) * Stator WT = 744 kg (1,640 LB)

Rotor Balance = 0.0 mm deflection PTP

Overspeed Capacity = 125% of synchronous speed

## Generator Torsional Data



**J1 = Coupling and Fan** | **J2 = Rotor** | **J3 = Exciter End**

**TOTAL J = J1 + J2 + J3**

**K1 = Shaft Stiffness between J1 + J2 (Diameter 1)**

**K2 = Shaft Stiffness between J2 + J3 (Diameter 2)**

| J1 | K1 | Min Shaft Dia 1 | J2 | K2 | Min Shaft Dia 2 | J3 |
|---|---|---|---|---|---|---|
| 17.5 LB IN. $s^2$ | 52.0 MLB IN./rad | 4.2 IN. | 49.1 LB IN. $s^2$ | 36.1 MLB IN./rad | 4.5 IN. | 1.9 LB IN. $s^2$ |
| 1.979 N m $s^2$ | 5.87638 MN m/rad | 106.0 mm | 5.546 N m $s^2$ | 4.08 MN m/rad | 115.0 mm | 0.216 N m $s^2$ |

**Total J**

68.5 LB IN. $s^2$

7.741 N m $s^2$


## Selected Model

| | | | |
|---|---|---|---|
| **Engine:** C15 | **Generator Frame:** M3154L4 | **Genset Rating (kW):** 500.0 | **Line Voltage:** 480 |
| **Fuel:** Diesel | **Generator Arrangement:** 5652331 | **Genset Rating (kVA):** 625.0 | **Phase Voltage:** 277 |
| **Frequency:** 60 | **Excitation Type:** Self Excited | **Pwr. Factor:** 0.8 | **Rated Current:** 751.8 |
| **Duty:** STANDBY | **Connection:** - STAR | **Application:** EPG | **Status:** Current |

**Version:** 42423 /43607 /43655 /8556

## Generator Cooling Requirements - Temperature - Insulation Data

| | | | |
|---|---|---|---|
| **Cooling Requirements:** | | **Temperature Data: (Ambient 40 $^0$C)** | |
| **Heat Dissipated:** | 25.8 kW | **Stator Rise:** | 105.0 $^0$C |
| **Air Flow:** | 66.0 m$^3$/min | **Rotor Rise:** | 105.0 $^0$C |

**Insulation Class:** H

**Insulation Reg. as shipped:** 100.0 MΩ minimum at 40 $^0$C

## Thermal Limits of Generator

| | |
|---|---|
| **Frequency:** | 60 Hz |
| **Line to Line Voltage:** | 480 Volts |
| **B BR 80/40** | 552.0 kVA |
| **F BR -105/40** | 627.9 kVA |
| **H BR - 125/40** | 690.0 kVA |
| **F PR - 130/40** | 690.0 kVA |
| **H PR - 150/40** | 731.4 kVA |
| **H PR27 - 163/27** | 759.0 kVA |

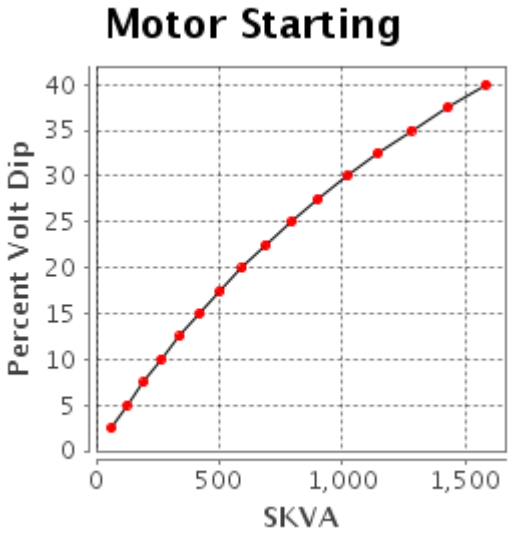
## Selected Model

| | | | |
|---|---|---|---|
| **Engine:** C15 | **Generator Frame:** M3154L4 | **Genset Rating (kW):** 500.0 | **Line Voltage:** 480 |
| **Fuel:** Diesel | **Generator Arrangement:** 5652331 | **Genset Rating (kVA):** 625.0 | **Phase Voltage:** 277 |
| **Frequency:** 60 | **Excitation Type:** Self Excited | **Pwr. Factor:** 0.8 | **Rated Current:** 751.8 |
| **Duty:** STANDBY | **Connection:** - STAR | **Application:** EPG | **Status:** Current |

**Version:** 42423 /43607 /43655 /8556

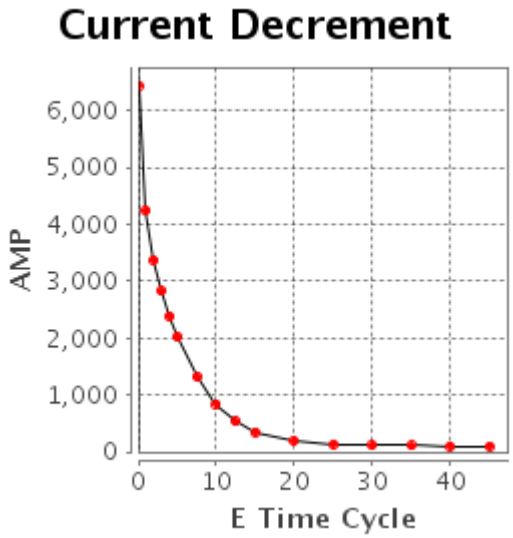
## Starting Capability & Current Decrement
## Motor Starting Capability (0.6 pf)

| SKVA | Percent Volt Dip |
|---|---|
| 61 | 2.5 |
| 125 | 5.0 |
| 193 | 7.5 |
| 264 | 10.0 |
| 340 | 12.5 |
| 420 | 15.0 |
| 504 | 17.5 |
| 594 | 20.0 |
| 690 | 22.5 |
| 793 | 25.0 |
| 902 | 27.5 |
| 1,019 | 30.0 |
| 1,145 | 32.5 |
| 1,280 | 35.0 |
| 1,427 | 37.5 |
| 1,585 | 40.0 |



## Current Decrement Data

| E Time Cycle | AMP |
|---|---|
| 0.0 | 6,441 |
| 1.0 | 4,242 |
| 2.0 | 3,372 |
| 3.0 | 2,821 |
| 4.0 | 2,385 |
| 5.0 | 2,017 |
| 7.5 | 1,316 |
| 10.0 | 845 |
| 12.5 | 529 |
| 15.0 | 346 |
| 20.0 | 190 |
| 25.0 | 135 |
| 30.0 | 115 |
| 35.0 | 106 |
| 40.0 | 102 |
| 45.0 | 101 |




**Instantaneous 3 Phase Fault Current:** 6441 Amps **Instantaneous Line - Line Fault Current:** 5126 Amps

**Instantaneous Line - Neutral Fault Current:** 8645 Amps

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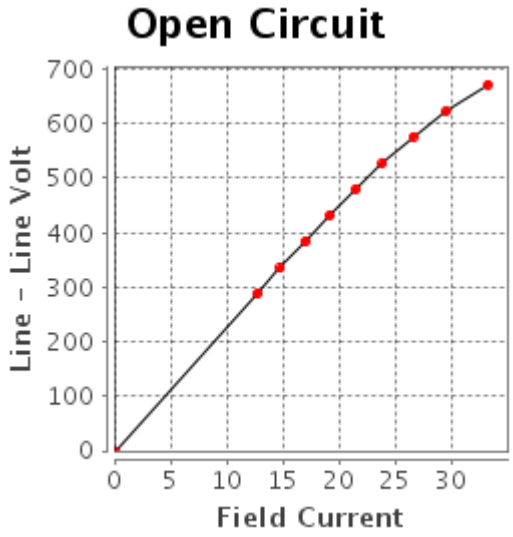
## Selected Model

| | | | |
|---|---|---|---|
| **Engine:** C15 | **Generator Frame:** M3154L4 | **Genset Rating (kW):** 500.0 | **Line Voltage:** 480 |
| **Fuel:** Diesel | **Generator Arrangement:** 5652331 | **Genset Rating (kVA):** 625.0 | **Phase Voltage:** 277 |
| **Frequency:** 60 | **Excitation Type:** Self Excited | **Pwr. Factor:** 0.8 | **Rated Current:** 751.8 |
| **Duty:** STANDBY | **Connection:** - STAR | **Application:** EPG | **Status:** Current |

**Version:** 42423 /43607 /43655 /8556

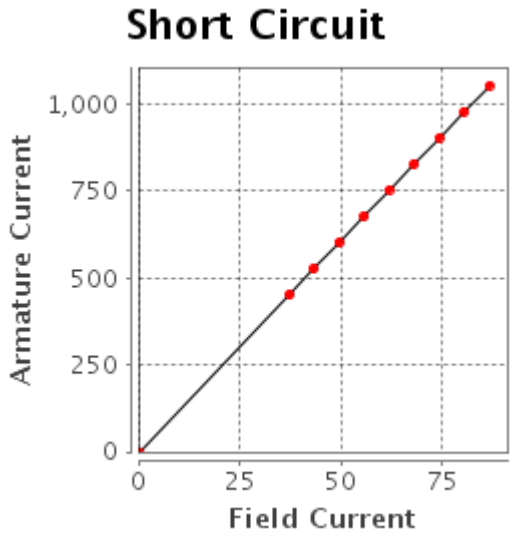
## Generator Output Characteristic Curves
### Open Circuit Curve

| Field Current | Line - Line Volt |
|---|---|
| 0.0 | 0 |
| 12.7 | 288 |
| 14.8 | 336 |
| 17.0 | 384 |
| 19.2 | 432 |
| 21.5 | 480 |
| 23.9 | 528 |
| 26.6 | 576 |
| 29.6 | 624 |
| 33.3 | 672 |



## Short Circuit Curve

| Field Current | Armature Current |
|---|---|
| 0.0 | 0 |
| 37.2 | 451 |
| 43.3 | 526 |
| 49.5 | 601 |
| 55.7 | 677 |
| 61.9 | 752 |
| 68.1 | 827 |
| 74.3 | 902 |
| 80.5 | 977 |
| 86.7 | 1,052 |



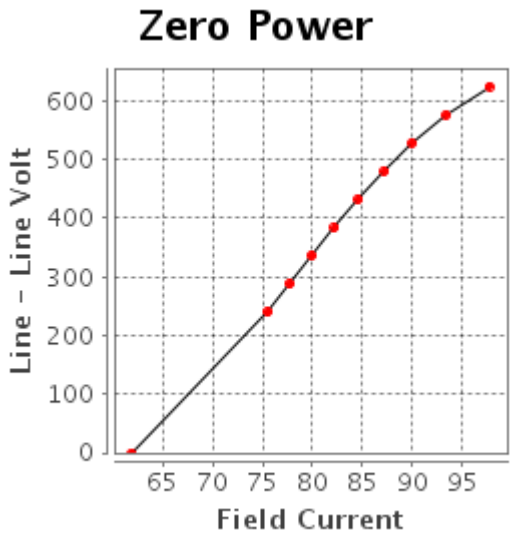

## Selected Model

| | | | |
|---|---|---|---|
| **Engine:** C15 | **Generator Frame:** M3154L4 | **Genset Rating (kW):** 500.0 | **Line Voltage:** 480 |
| **Fuel:** Diesel | **Generator Arrangement:** 5652331 | **Genset Rating (kVA):** 625.0 | **Phase Voltage:** 277 |
| **Frequency:** 60 | **Excitation Type:** Self Excited | **Pwr. Factor:** 0.8 | **Rated Current:** 751.8 |
| **Duty:** STANDBY | **Connection:** - STAR | **Application:** EPG | **Status:** Current |

**Version:** 42423 /43607 /43655 /8556

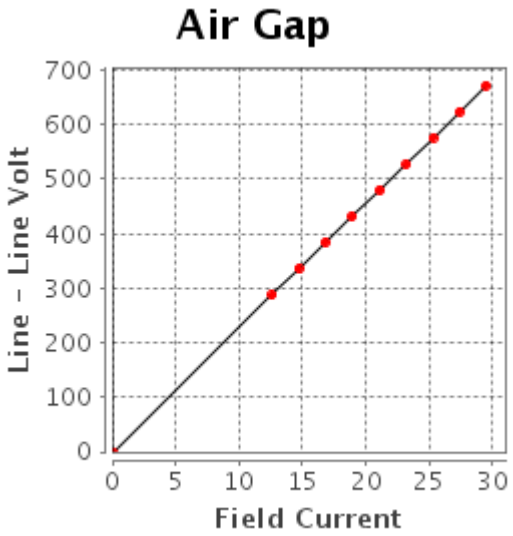
## Generator Output Characteristic Curves
## Zero Power Factor Curve

| Field Current | Line - Line Volt |
|---|---|
| 61.9 | 0 |
| 75.5 | 240 |
| 77.7 | 288 |
| 79.9 | 336 |
| 82.2 | 384 |
| 84.6 | 432 |
| 87.2 | 480 |
| 90.0 | 528 |
| 93.4 | 576 |
| 97.7 | 624 |



## Air Gap Curve

| Field Current | Line - Line Volt |
|---|---|
| 0.0 | 0 |
| 12.6 | 288 |
| 14.7 | 336 |
| 16.8 | 384 |
| 18.9 | 432 |
| 21.1 | 480 |
| 23.2 | 528 |
| 25.3 | 576 |
| 27.4 | 624 |
| 29.5 | 672 |




## Selected Model

**Engine:** C15 **Generator Frame:** M3154L4 **Genset Rating (kW):** 500.0 **Line Voltage:** 480

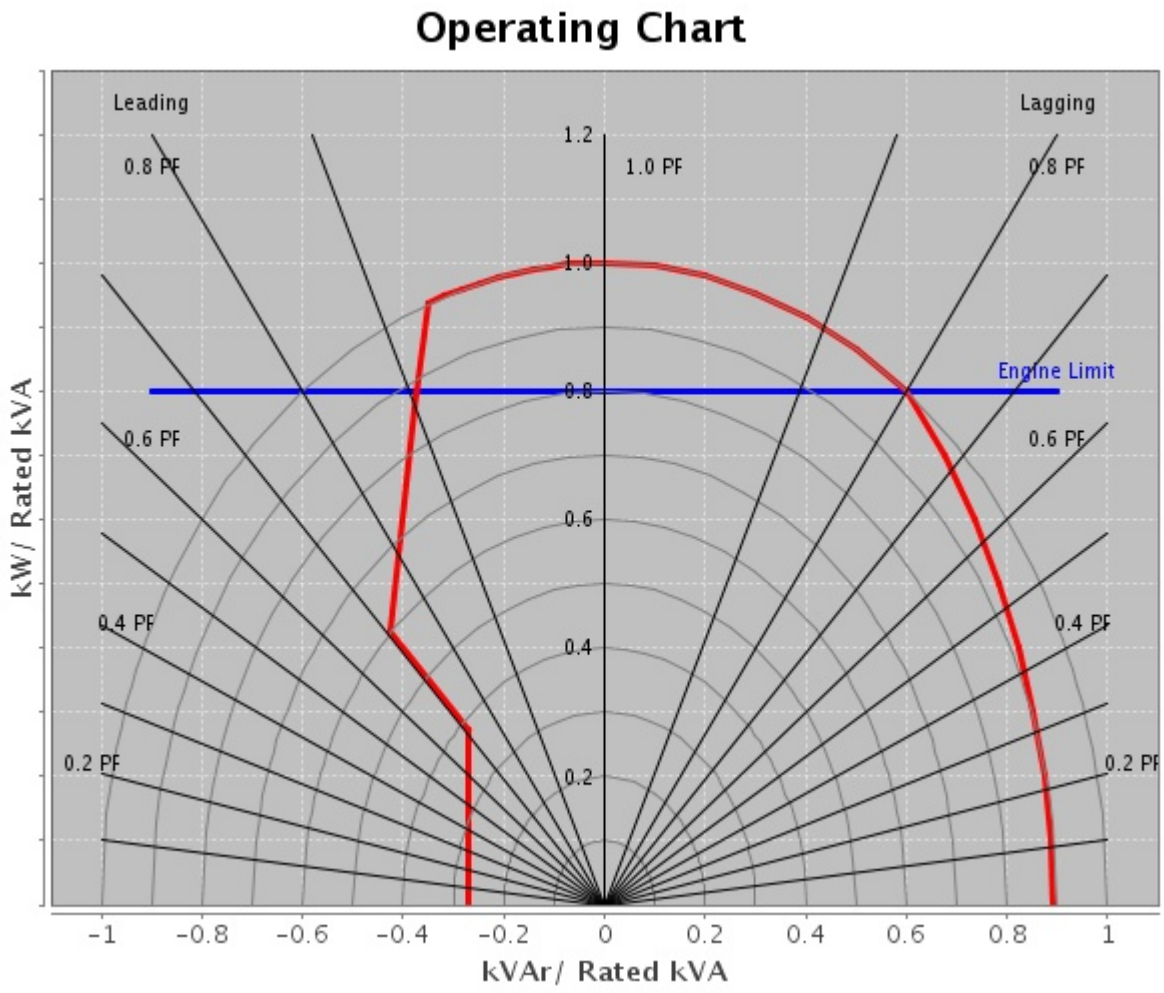
**Fuel:** Diesel **Generator Arrangement:** 5652331 **Genset Rating (kVA):** 625.0 **Phase Voltage:** 277

**Frequency:** 60 **Excitation Type:** Self Excited **Pwr. Factor:** 0.8 **Rated Current:** 751.8

**Duty:** STANDBY **Connection:** - STAR **Application:** EPG **Status:** Current

**Version:** 42423 /43607 /43655 /8556

## Reactive Capability Curve



## Selected Model

| | | | |
|---|---|---|---|
| **Engine:** C15 | **Generator Frame:** M3154L4 | **Genset Rating (kW):** 500.0 | **Line Voltage:** 480 |
| **Fuel:** Diesel | **Generator Arrangement:** 5652331 | **Genset Rating (kVA):** 625.0 | **Phase Voltage:** 277 |
| **Frequency:** 60 | **Excitation Type:** Self Excited | **Pwr. Factor:** 0.8 | **Rated Current:** 751.8 |
| **Duty:** STANDBY | **Connection:** - STAR | **Application:** EPG | **Status:** Current |

**Version:** 42423 /43607 /43655 /8556

**Systems Data**
Reference Number: DM8155

CATERPILLAR®

January 21, 2020
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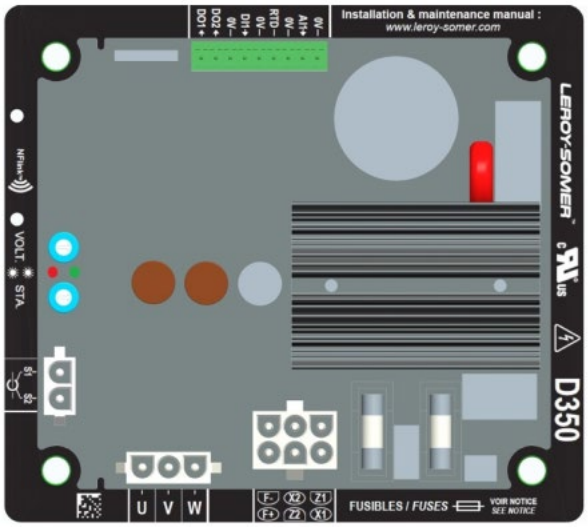
Click Here

| | | |
|---|---|---|
| **AIR INTAKE SYSTEM** | | |
| *THE INSTALLED SYSTEM MUST COMPLY WITH THE SYSTEM LIMITS BELOW FOR ALL EMISSIONS CERTIFIED ENGINES TO ASSURE REGULATORY COMPLIANCE.* | | |
| MAXIMUM ALLOWABLE INTAKE RESTRICTION WITH CLEAN ELEMENT | 15 | IN-H20 |
| MAXIMUM ALLOWABLE INTAKE RESTRICTION WITH DIRTY ELEMENT | 25 | IN-H20 |
| MAXIMUM PRESSURE DROP FROM COMPRESSOR OUTLET TO MANIFOLD INLET (OR MIXER INLET FOR EGR) | 4.4 | IN-HG |
| **COOLING SYSTEM** | | |
| ENGINE ONLY COOLANT CAPACITY | 5.5 | GAL |
| MAXIMUM ALLOWABLE JACKET WATER OUTLET TEMPERATURE | 219 | DEG F |
| REGULATOR LOCATION FOR JW (HT) CIRCUIT | OUTLET | |
| MAXIMUM UNINTERRUPTED FILL RATE | 5.0 | G/MIN |
| **ENGINE SPEC SYSTEM** | | |
| CYLINDER ARRANGEMENT | INLINE | |
| NUMBER OF CYLINDERS | 6 | |
| CYLINDER BORE DIAMETER | 5.4 | IN |
| PISTON STROKE | 6.7 | IN |
| TOTAL CYLINDER DISPLACEMENT | 928 | CU IN |
| STANDARD CRANKSHAFT ROTATION FROM FLYWHEEL END | CCW | |
| STANDARD CYLINDER FIRING ORDER | 1-5-3-6-2-4 | |
| NUMBER 1 CYLINDER LOCATION | FRONT | |
| STROKES/COMBUSTION CYCLE | 4 | |
| **EXHAUST SYSTEM** | | |
| *THE INSTALLED SYSTEM MUST COMPLY WITH THE SYSTEM LIMITS BELOW FOR ALL EMISSIONS CERTIFIED ENGINES TO ASSURE REGULATORY COMPLIANCE.* | | |
| MAXIMUM ALLOWABLE SYSTEM BACK PRESSURE | 40 | IN-H20 |
| MANIFOLD TYPE | DRY | |
| **FUEL SYSTEM** | | |
| MAXIMUM FUEL FLOW FROM TRANSFER PUMP TO ENGINE | 69.2 | G/HR |
| MAXIMUM ALLOWABLE FUEL SUPPLY LINE RESTRICTION | 8.0 | IN-HG |
| MAXIMUM ALLOWABLE FUEL TEMPERATURE AT TRANSFER PUMP INLET | 140 | DEG F |
| MAXIMUM ALLOWABLE FUEL RETURN LINE RESTRICTION | 14.8 | IN-HG |
| NORMAL FUEL PRESSURE IN A CLEAN SYSTEM | 90.1 | PSI |
| FUEL SYSTEM TYPE | MEUI | |
| MAXIMUM TRANSFER PUMP PRIMING LIFT WITHOUT PRIMING PUMP | 12.1 | FT |
| MAXIMUM ALLOWABLE FUEL TEMPERATURE AT ENGINE OUTLET | 225 | DEG F |
| **LUBE SYSTEM** | | |
| CRANKCASE VENTILATION TYPE | TO_ATMOSPHERE | |

| | | |
|---|---|---|
| **MOUNTING SYSTEM** | | |
| CENTER OF GRAVITY LOCATION - X DIMENSION - FROM REAR FACE OF BLOCK - (REFERENCE TM7077) | 22.2 | IN |
| CENTER OF GRAVITY LOCATION - Y DIMENSION - FROM CENTERLINE OF CRANKSHAFT - (REFERENCE TM7077) | 9.4 | IN |
| CENTER OF GRAVITY LOCATION - Z DIMENSION - FROM CENTERLINE OF CRANKSHAFT - (REFERENCE TM7077) | 0 | IN |
| **STARTING SYSTEM** | | |
| MINIMUM CRANKING SPEED REQUIRED FOR START | 115 | RPM |
| LOWEST AMBIENT START TEMPERATURE WITHOUT AIDS | 32 | DEG F |

# AUTOMATIC VOLTAGE REGULATOR



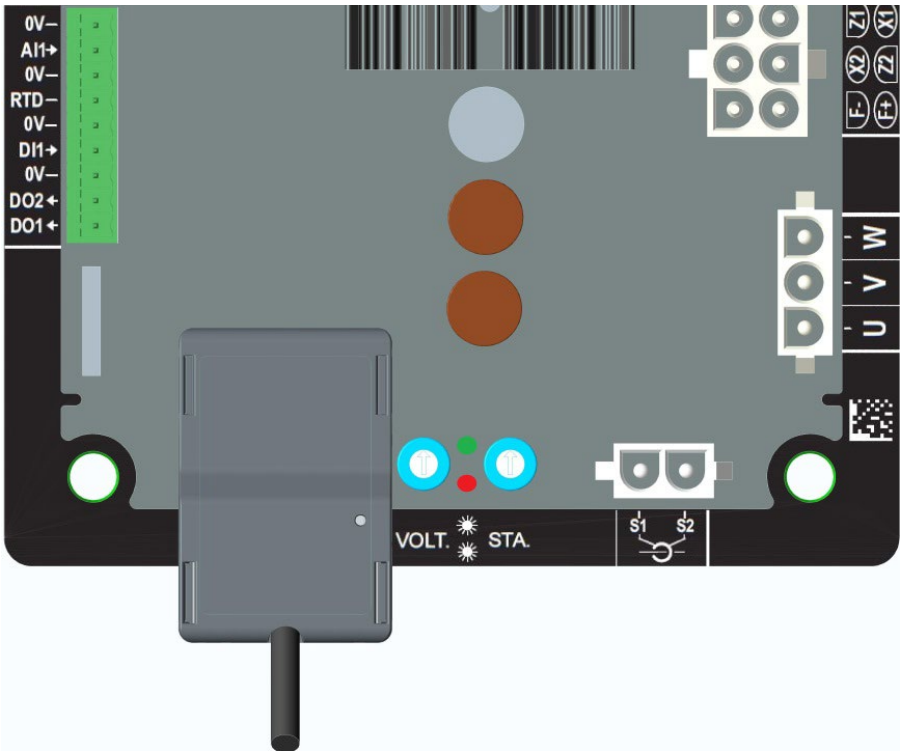

## D350 AVR

The D350, Digital Voltage Regulator is used to regulate alternators with a field current of less than 5 A in continuous operations, and 10 A maximum in the event of short-circuit for 10 seconds maximum.

Its design is in accordance with mounting in a generator terminal box or a control cabinet. It is required, at a minimum, to follow the local protection and safety standards, especially those specific to electrical installations for voltages of 300 VAC phase-to-neutral maximum.

## NFLink™ configuration module

The D350 is equipped with NFC technology for communication and configuration purposes. The configuration module is placed over the two dedicated positioning holes on the plastic enclosure as shown below. Once the configuration is done, the NF Link must be removed as it is not supposed to be left on the



# AUTOMATIC VOLTAGE REGULATOR

## Technical characteristics

D350 regulator can be used to perform the following functions:

Voltage regulation

- With or without reactive droop compensation (Reactive droop to allow parallel operation)
- With or without line droop compensation.

Regulation of the field current, or manual mode, which allows direct control of the field current.

The D350 can also be used to:

- Adjust the reference for the regulation mode in progress, using an analogue input (0-10V
- and potentiometer)
- Monitoring of temperature sensor (Pt100 or CTP)
- Limit the minimum field current delivered to the exciter field
- Monitoring of the maximum stator current limit
- Loss of voltage sensing
- Withstand a sudden short-circuit for 10 seconds maximum in AREP, PMG
- Signals monitoring (events logger).
- 2 digital outputs for various trip, regulation mode and measurement data

**Alternator voltage sensing:**

- 3 phases without neutral, 2 phases or 1 phase with neutral
- Three-phase range 0-530VAC
- Consumption < 2VA

**Stator current measurement with CT:**

- Range 0-1A or 0-5A
- Consumption < 2VA

**Power supply:**

- 4 terminals for PMG, AREP, SHUNT
- Range 50-277 VAC
- Consumption max < 3000VA

**Field excitation:**

- Rated 0-5 A
- Short-circuit 10A max.
- Field winding resistance > 4 ohms

**Frequency:**

- Range 10-100Hz

# AUTOMATIC VOLTAGE REGULATOR

- Regulation accuracy: +/-0.25% of the average of the three phases on a linear load, with harmonic distortion less than 5%
- Voltage adjustment range: 0 to 150% of the rated voltage
- Quadrature droop adjustment range: -20% to 20%
- Under frequency protection: integrated, adjustable threshold, slope adjustable from 0.5 to 3V/Hz in steps of 0.1 V/Hz
- Excitation ceiling: adjustable by configuration at 3 points
- Environment: ambient temperature from -40°C to +65°C, relative humidity of less than 95% non-condensing, mounted in a cabinet or in a terminal box

**Easy Reg Advanced:**

- All the D350 settings are entered / configured using the "EasyReg Advanced" software.
- This program is only compatible with computers running WINDOWS® versions Windows 7 and Windows 10 operating systems.

**Dimensions:**

- Height : 52.9mm
- width : 125mm
- Length : 140mm

**Mounting:**

- Holes spacing on the Length : 115mm
- Holes spacing on the width: 100mm

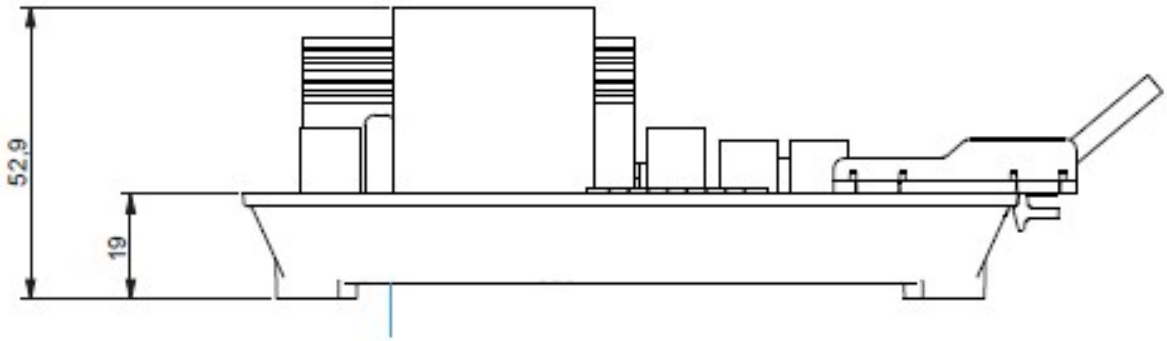
**Weight:** 0.45kg

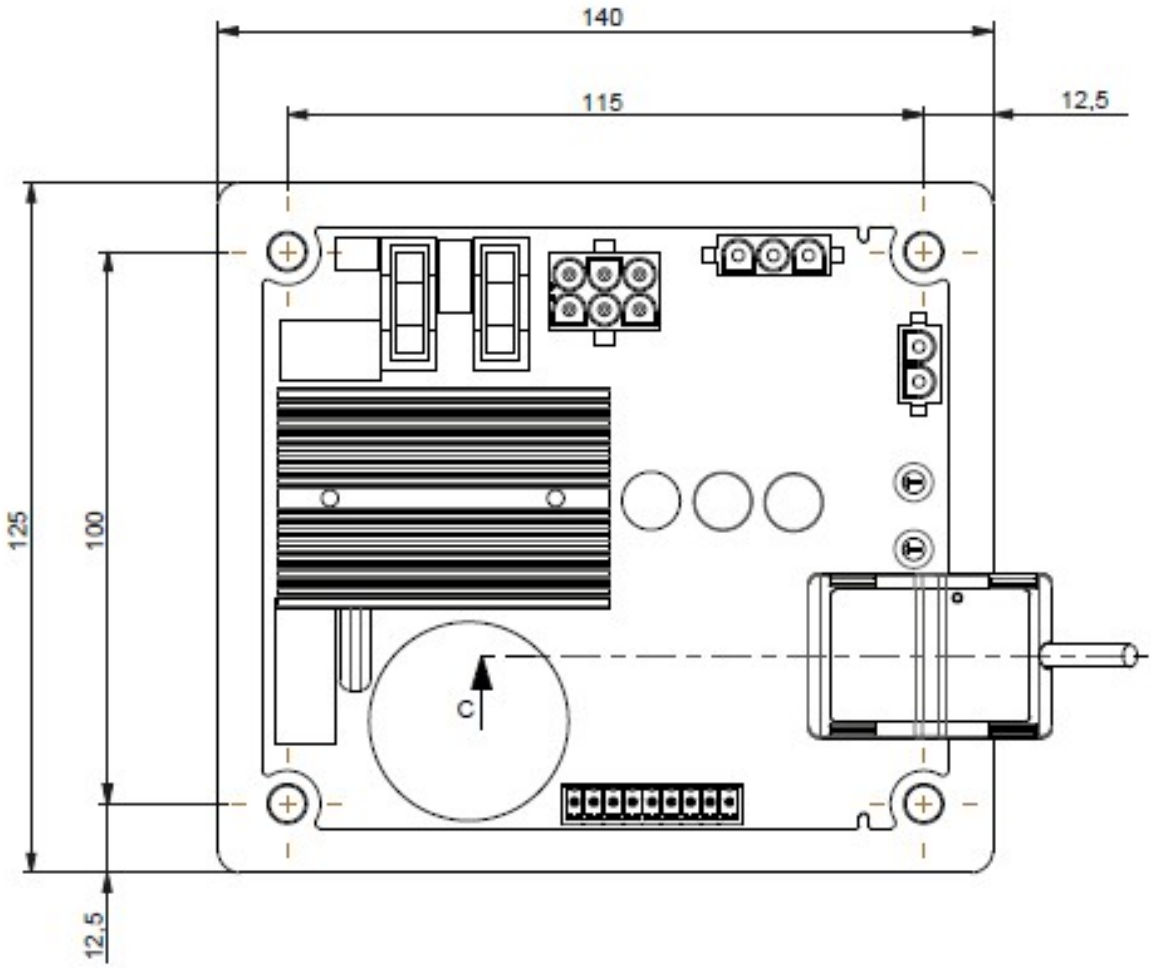
**Conformity to standards**

- EMC: IEC 61000-6-2, IEC 61000-6-4
- Humidity: IEC 60068-1 and test in accordance with IEC 60068-2-14
- Dry heat: IEC 60068-2-2
- Damp heat: IEC 60028-2-30
- Cold: IEC 600068-2-1

# AUTOMATIC VOLTAGE REGULATOR

## D350 AVR and NFLink™ Dimensions



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# C9 ACERT™, C13 ACERT, C15 ACERT, C18 ACERT Circuit Breakers

## Manually Operated Circuit Breakers

| Current (A) | Frame | Number of Poles | Interrupting Ratings (kA rms) | | | Trip Units | (Lugs) Cable Size Range / Phase | Auxiliary Options |
|---|---|---|---|---|---|---|---|---|
| | | | 240V | 480V | 600V | | | |
| 100 | H | 3 | 65 | 35 | 18 | Electronic LSI | 8-30 AWG | Form C (1NO + 1NC) Shunt Trip 24VDC |
| 250 | J | 3 | 65 | 35 | 18 | | (2) 3/0 – 250 kcmil | |
| 400 | T5N | 3 | 65 | 25 | 18 | Electronic LS/I (S or I) or LSI | (2) 3/0 – 250 kcmil | 1 Form C + 1 Bell Alarm 250VAC/VDC Shunt Trip 24VDC |
| 600 | T6N | 3 | 65 | 35 | 20 | | (3) 2/0 – 400 kcmil | |
| 800 | T6N | 3 | 65 | 35 | 20 | | (3) 2/0 – 400 kcmil | 1 Form C + 1 Bell Alarm 400VAC / 250VDC Shunt Trip 24VDC |
| 1200 | T7S | 3 | 65 | 50 | 25 | | (4) 2/0 – 500 kcmil | |
| 1600 | R | 3 | 65 | 35 | 18 | Electronic LSI | BUS BAR | Form C (1NO + 1NC) Shunt Trip 24VDC |
| 2000 | R | 3 | 65 | 35 | 18 | | BUS BAR | |
| 2500 | R | 3 | 65 | 35 | 18 | | BUS BAR | |
| 3000 | R | 3 | 65 | 35 | 18 | | BUS BAR | |

## Electrically Operated Circuit Breakers

| Current (A) | Frame | Number of Poles | Interrupting Ratings (kA rms) | | | Trip Units | (Lugs) Cable Size Range / Phase | Auxiliary Options |
|---|---|---|---|---|---|---|---|---|
| | | | 240V | 480V | 600V | | | |
| 800 | T 7M-S | 3 | 65 | 50 | 25 | Electronic LSI | (4) 4/0 – 500 kcmil | 2 Form C + 1 Bell Alarm 24VDC |
| 1200 | T 7M-S | 3 | 65 | 50 | 25 | Electronic LSI | (4) 4/0 – 500 kcmil | 2 Form C + 1 Bell Alarm 24VDC |
| 2000 | T8M-S | 3 | 125 | 125 | 100 | Electronic LSI | BUS BAR | 2 Form C + 1 Bell Alarm 24VDC |
| 3000 | T8M-S | 3 | 125 | 125 | 100 | Electronic LSI | BUS BAR | 2 Form C + 1 Bell Alarm 24VDC |

# Circuit Breakers

### Single Breaker Options (250 – 3000A)

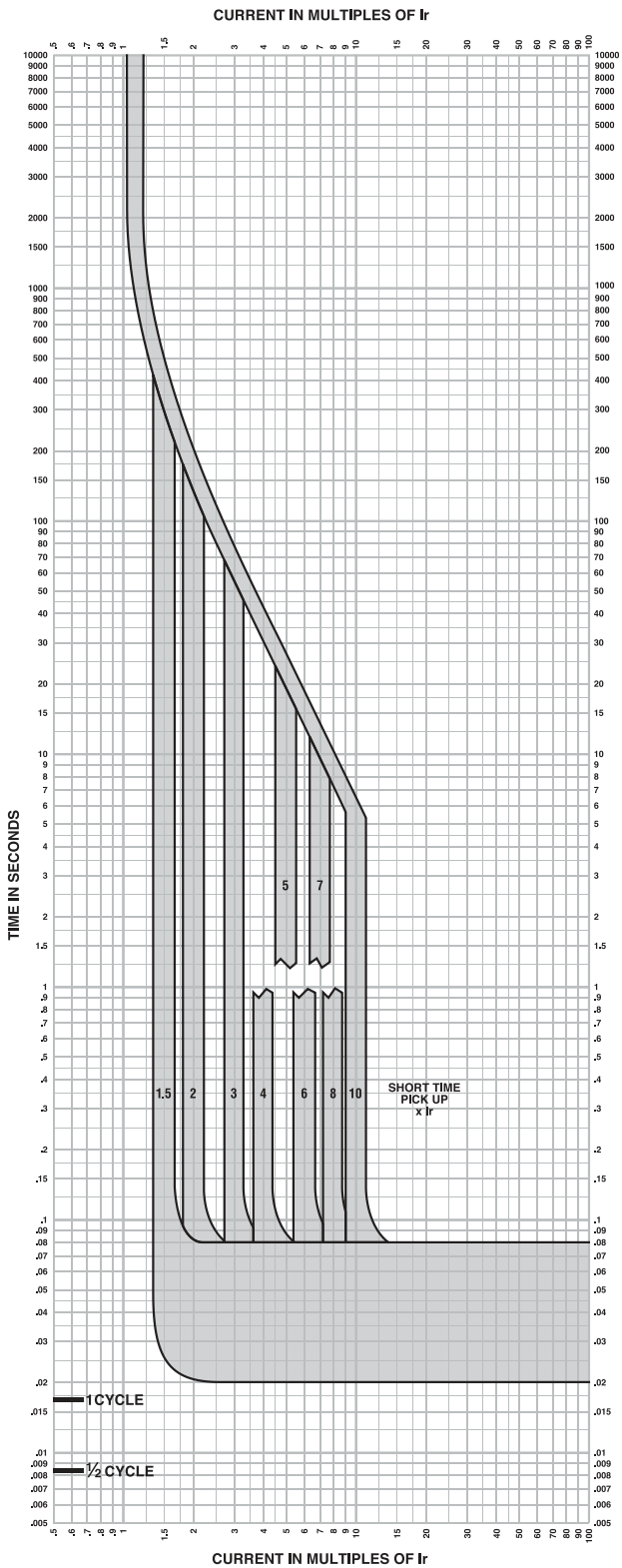
| Model | Current (A) | Operation |
|---|---|---|
| C9 ACERT™ | 250 | Manually Operated |
| C9 ACERT | 400 | Manually Operated |
| C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT | 600 | Manually Operated |
| C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT | 800 | Manually Operated or Electrically Operated |
| C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT | 1200 | Manually Operated or Electrically Operated |
| C13 ACERT, C15 ACERT, C18 ACERT | 1600 | Manually Operated |
| C15 ACERT, C18 ACERT | 2000 | Manually Operated or Electrically Operated |
| C18 ACERT | 2500 | Manually Operated |
| C18 ACERT | 3000 | Manually Operated or Electrically Operated |

### Multiple Breaker Options

| Model | Main Breaker Box | | Auxiliary Box |
|---|---|---|---|
| | 1st Breaker (Amps) | 2nd Breaker (Amps) | Breaker (Amps) |
| | Manually Operated | Manually Operated | Manually Operated |
| C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT | 250 | 250, 400, 600, 800, or 1200 | 3rd Breaker: 250 or 400 (Not available if 1st & 2nd Breaker = 1200A) |
| C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT | 400 | | |
| C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT | 600 | | |
| C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT | 800 | | |
| C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT | 1200 | | |
| C13 ACERT, C15 ACERT, C18 ACERT | 1600 | Not Available | 2nd Breaker: 250 or 400 |
| C15 ACERT, C18 ACERT | 2000 | | |
| C18 ACERT | 2500 | | |
| C18 ACERT | 3000 | | |

## H-Frame Circuit Breakers

### Electronic Trip Unit Long Time / Short Time Trip Curve




**Long Time/Short Time Trip Curve**
**60A, 100A, 150A H-Frame**

The time-current curve information is to be used for application and coordination purposes only.

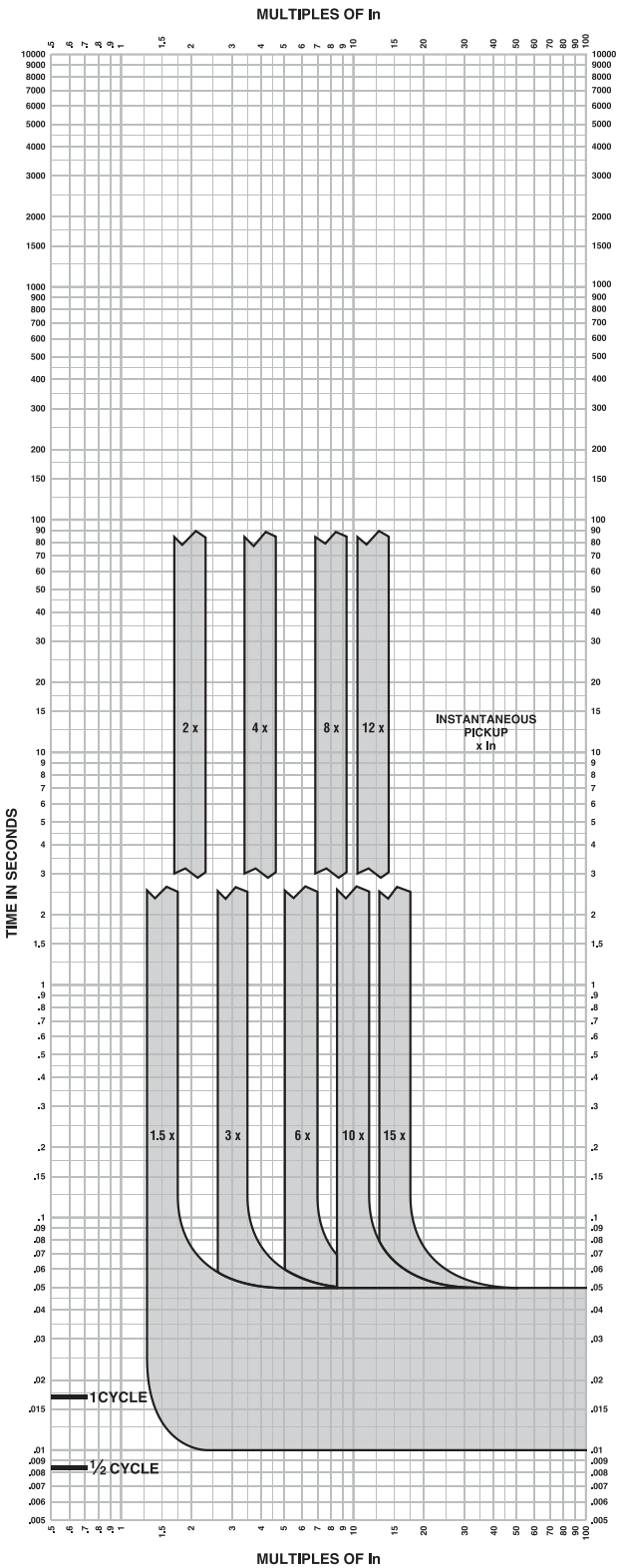
**Notes:**

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.

Curves apply from -35°C to +70°C (-31°F to +158°F) ambient temperature.

## H-Frame Circuit Breakers

### Electronic Trip Unit Instantaneous Trip Curve




**Instantaneous Trip Curve**
**60A, 100A, 150A H-Frame**

The time-current curve information is to be used for application and coordination purposes only.

**Notes:**

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. In = Maximum dial setting of Ir.
   60A H-Frame: In = 60A = Max Ir setting
   100A H-Frame: In = 100A = Max Ir setting
   150A H-Frame: In = 150A = Max Ir setting

Curves apply from -35°C to +70°C (-31°F to +158°F) ambient temperature.

## J-Frame 250 A Typical Peak Let-Through Curves

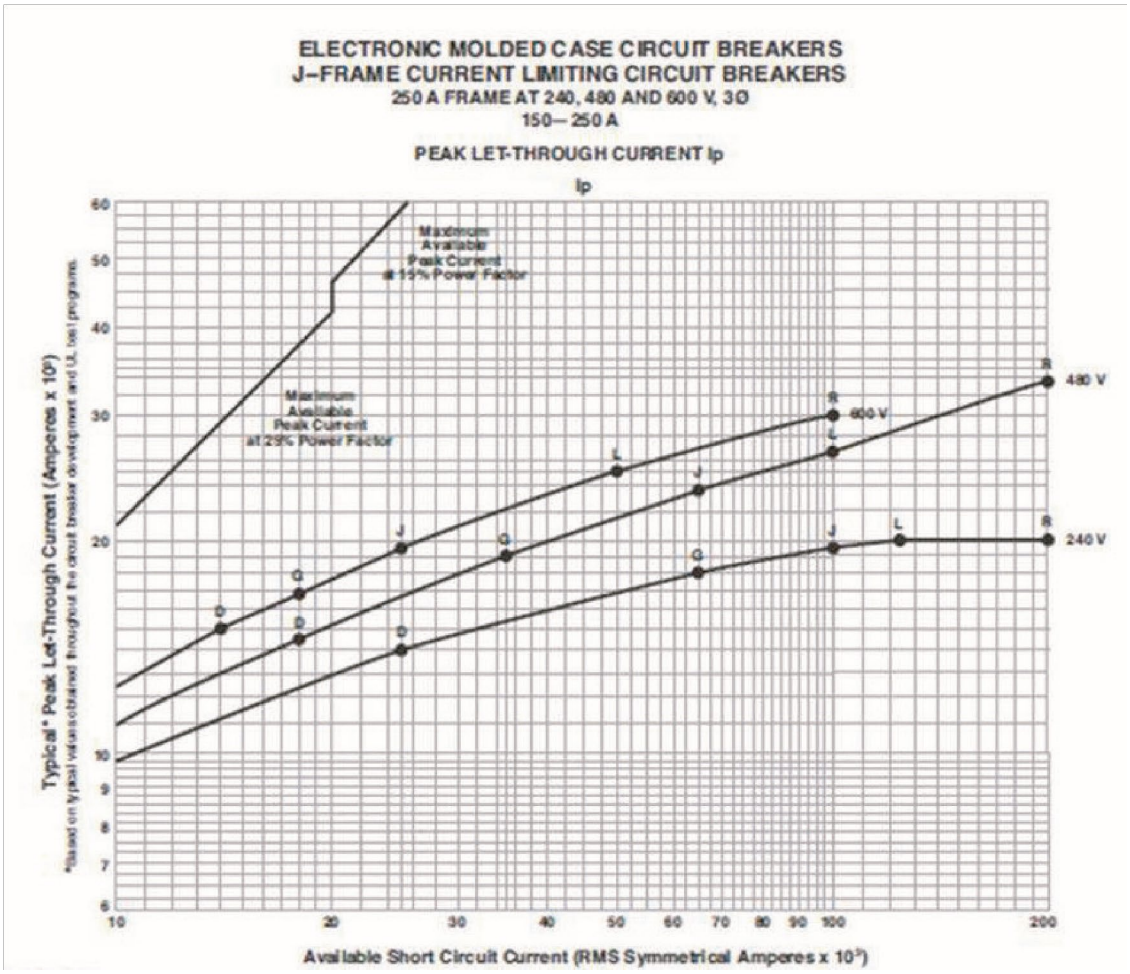



Figure 1

## J-Frame 150-250 A (JD, JG, JJ, JL, and JR) Thermal-Magnetic Trip

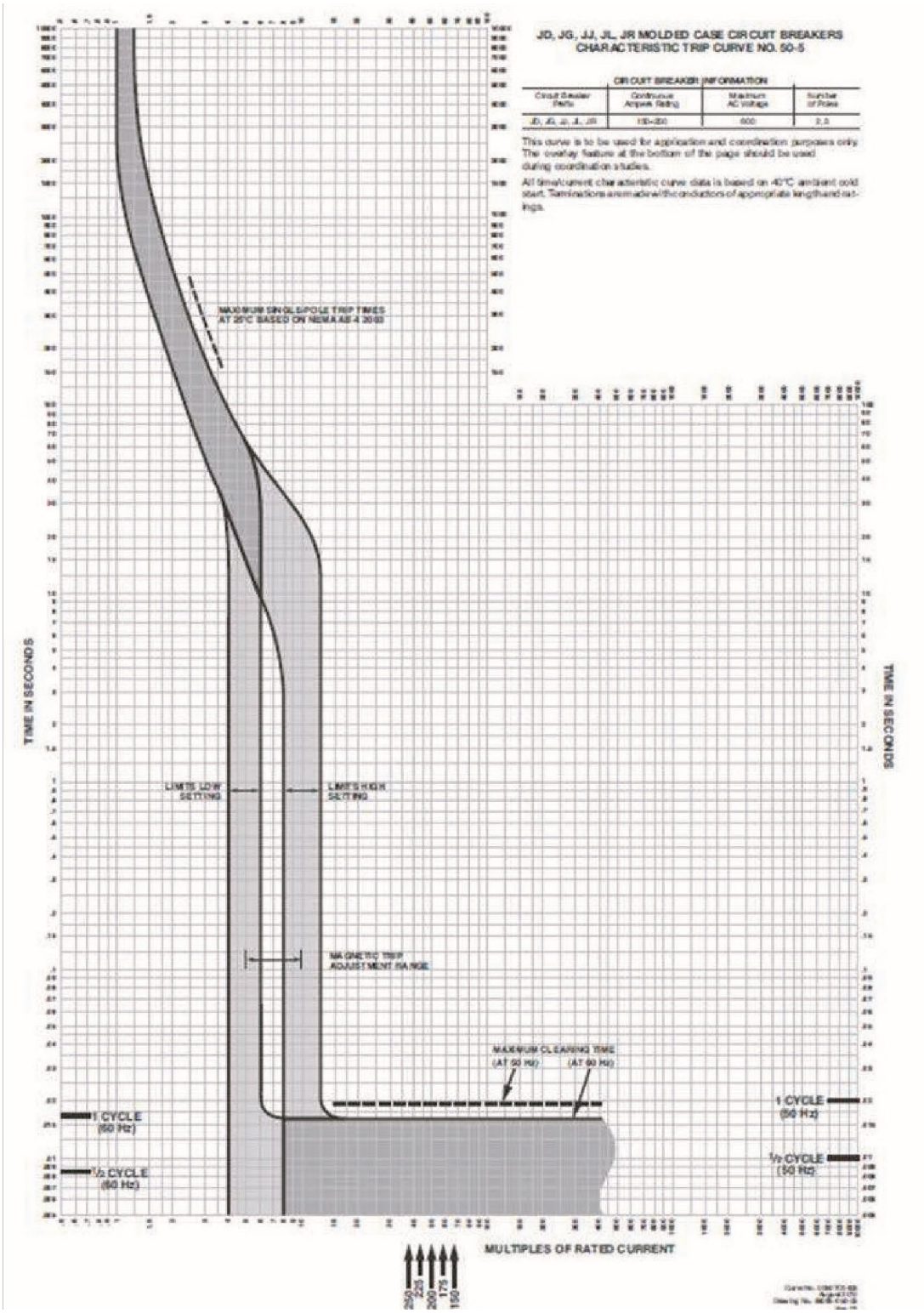



Figure 2

## Ground Fault Module GFM250JD Trip Curve

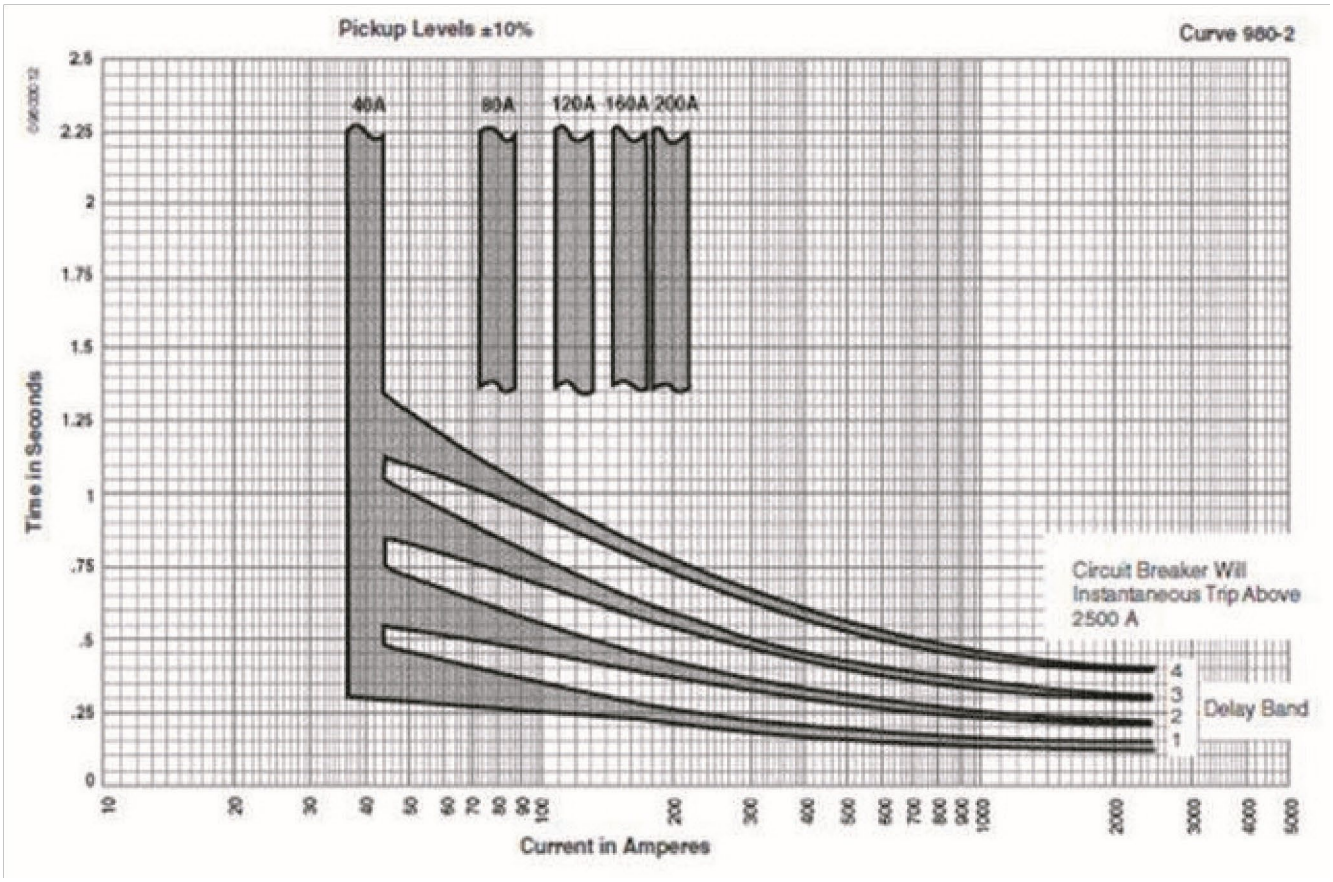



Figure 3

## T6 600 / 800 -PR221DS

L-1 Functions

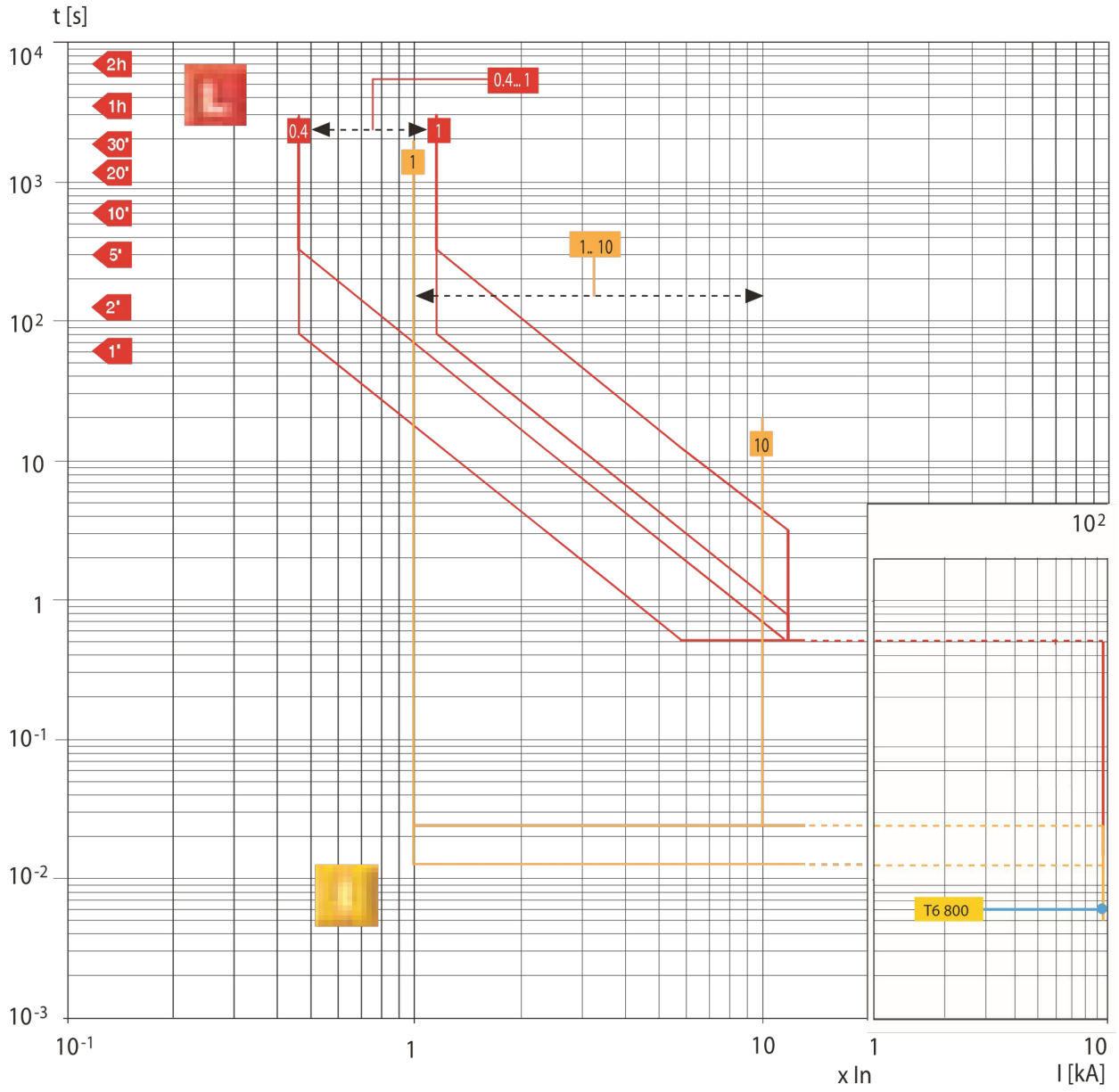



Figure 4

## T6 600 / 800 -PR221DS

L-S Functions

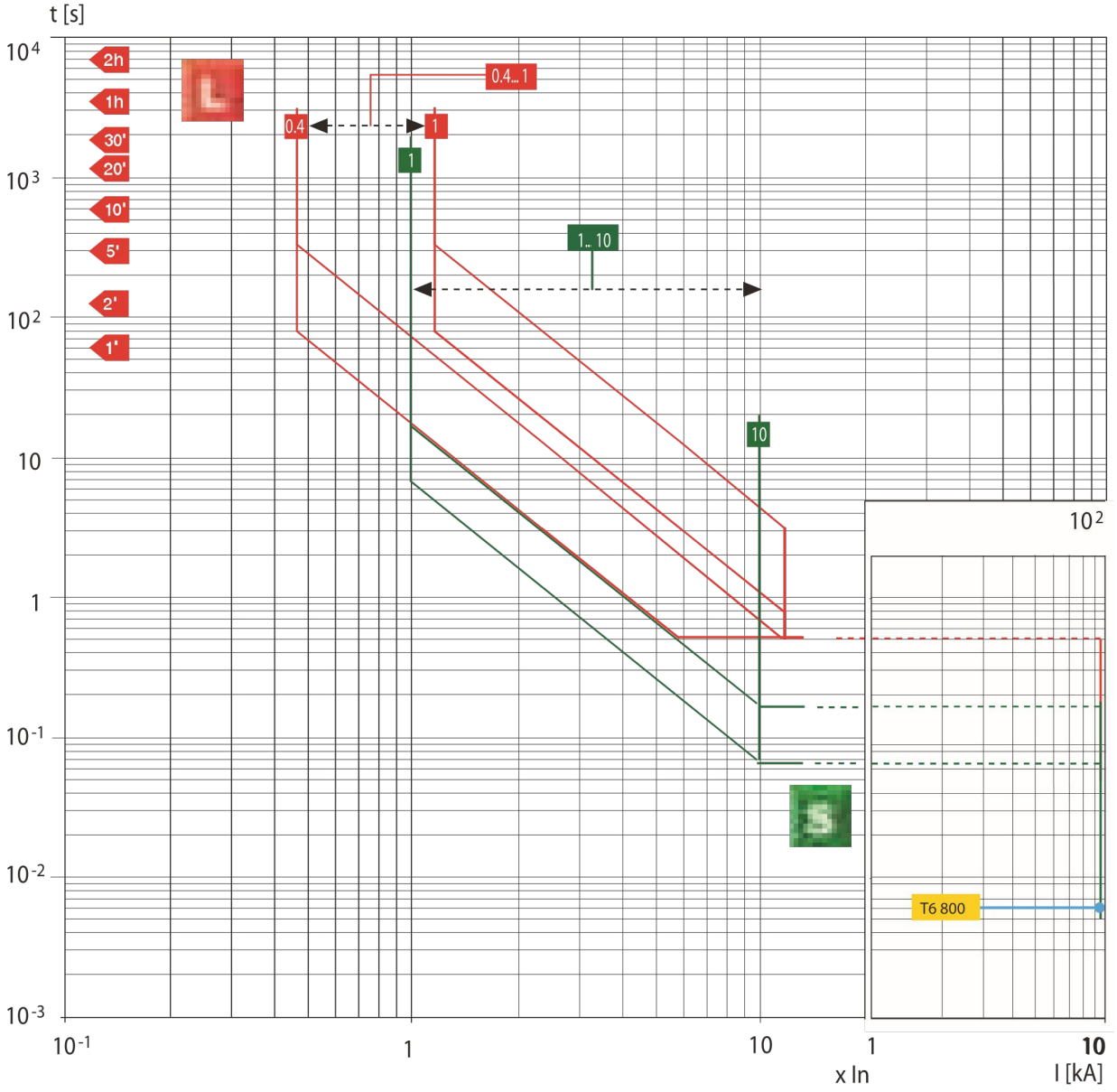



Figure 5

## Tmax T7 PR231/P Functions

L-S Functions

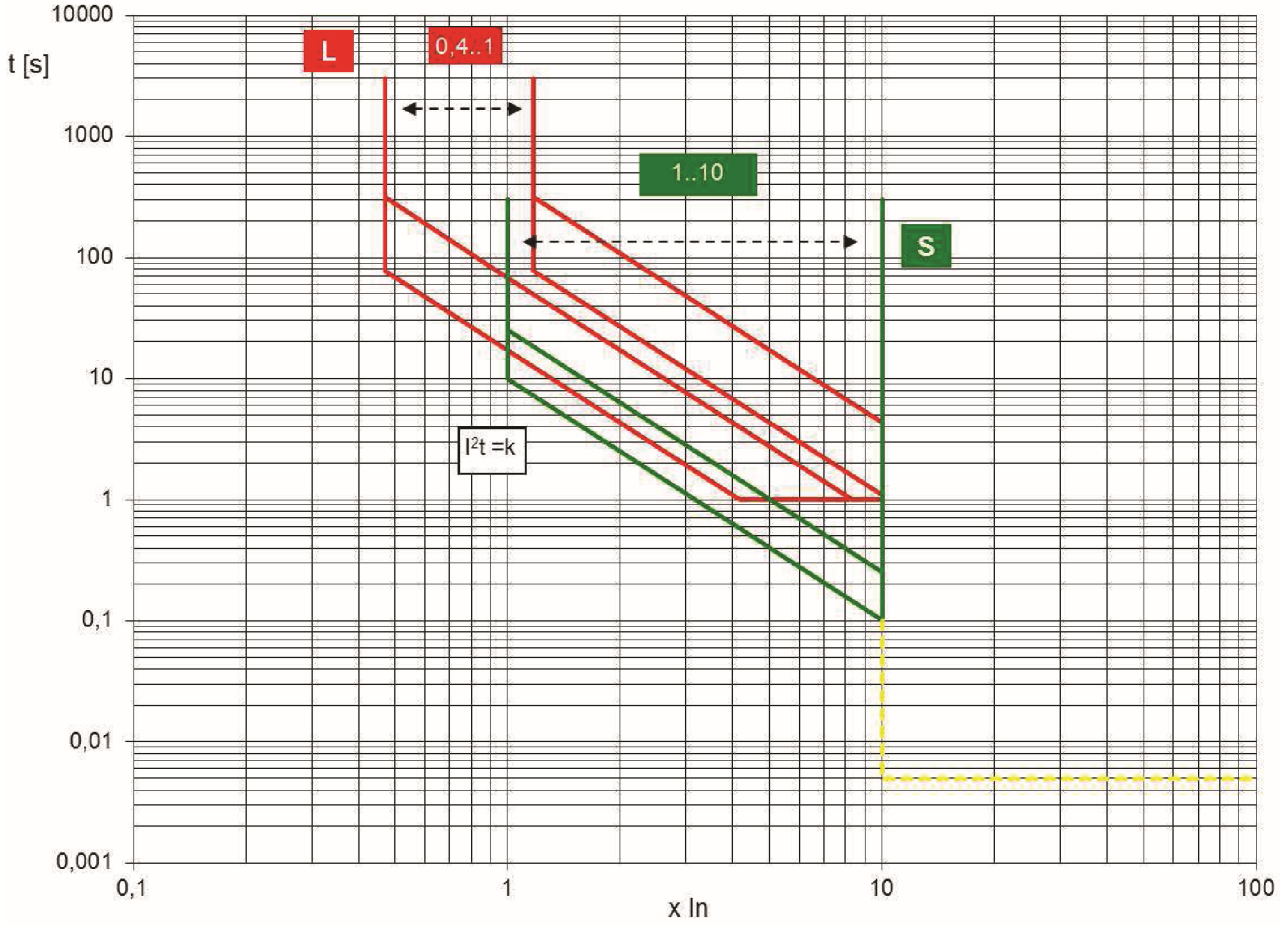



Figure 7

## T6 800 - PR222DS and PR222DS/PD-A

L-S-I Functions

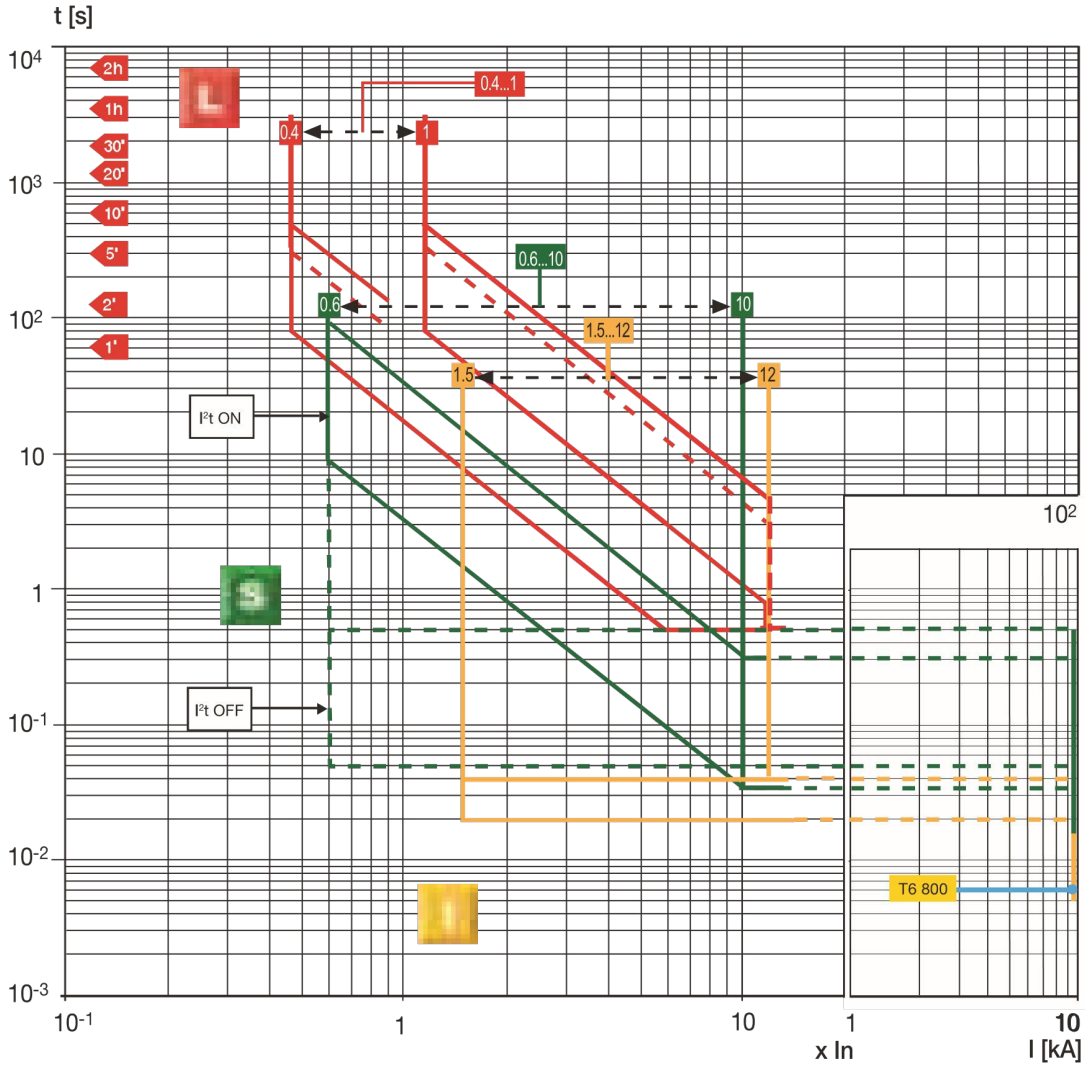



Figure 8

## T7 1000/1200 - PR232/P

L-S-I Functions

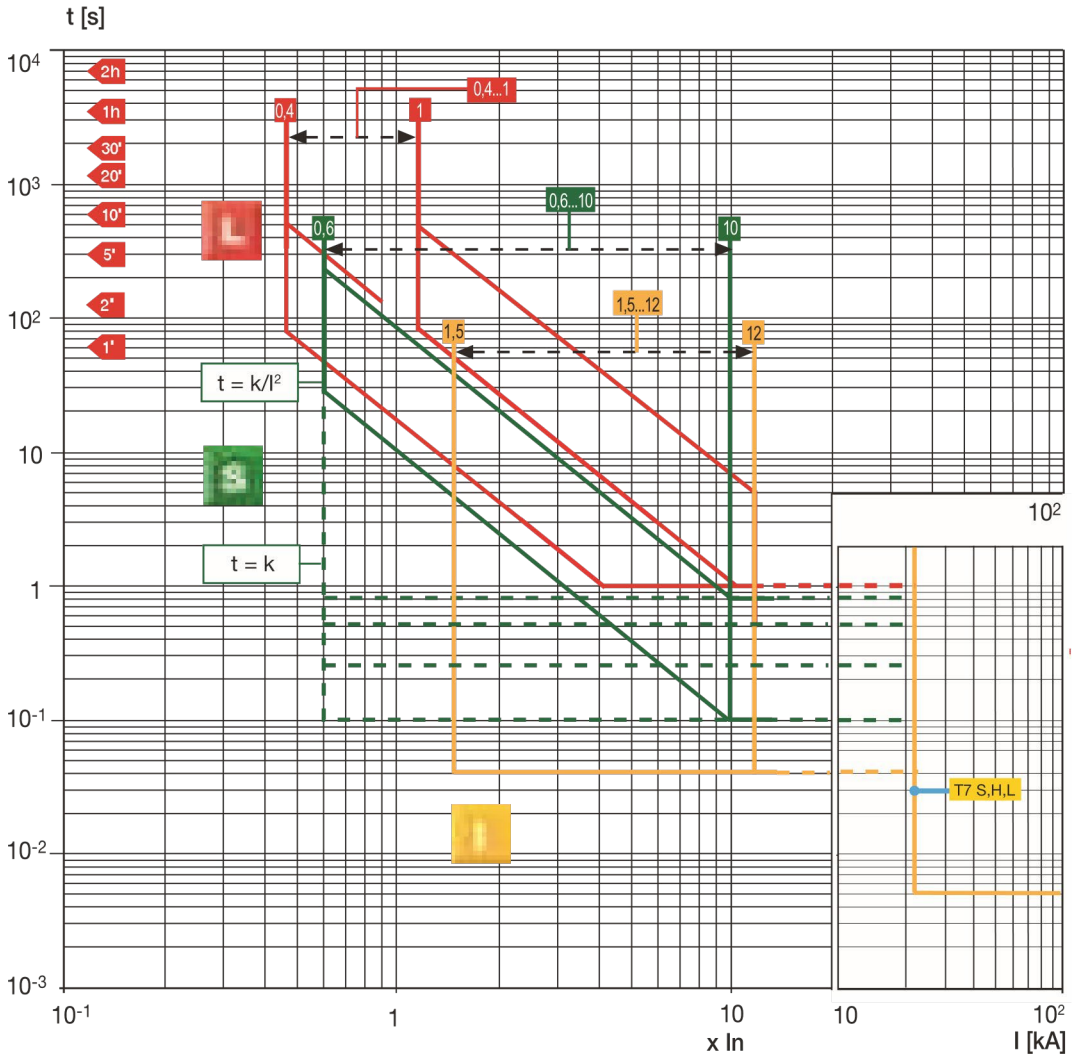



Figure 9

## T7 1000/1200 - PR332/P

L-S-I Functions

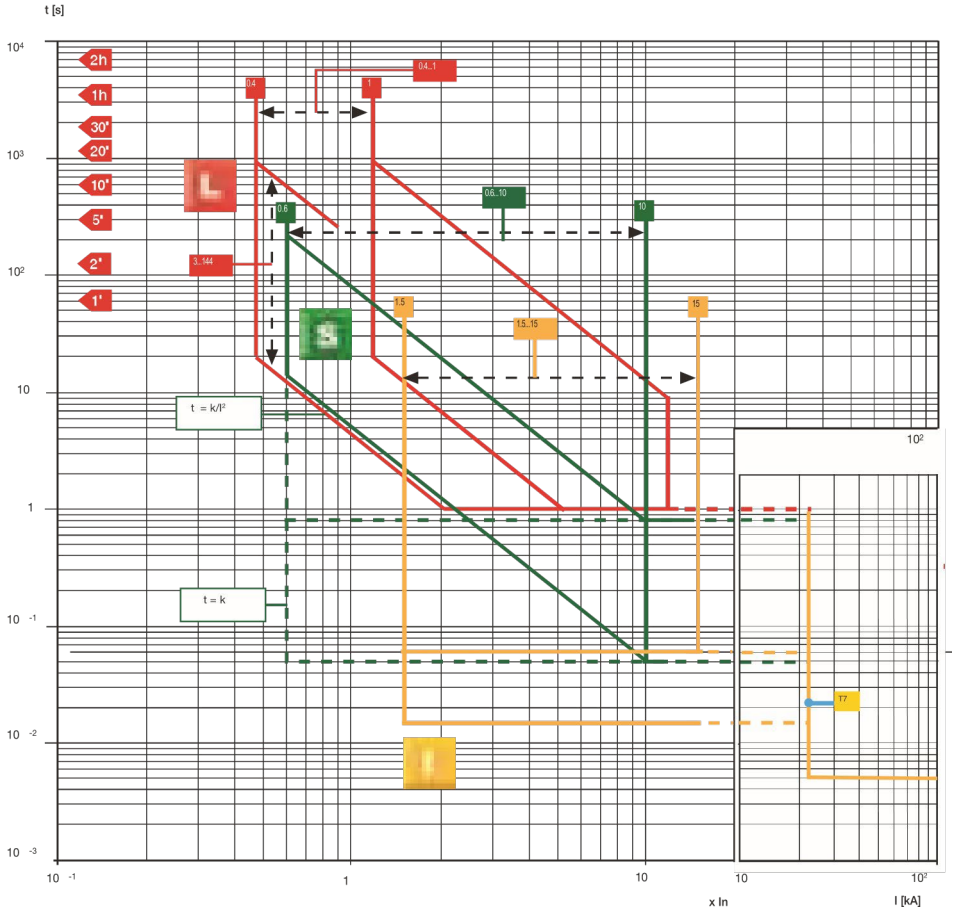



Figure 10

**T8 1600/2000/2500/3000 – PR232/P-T8**

L-S-I Functions

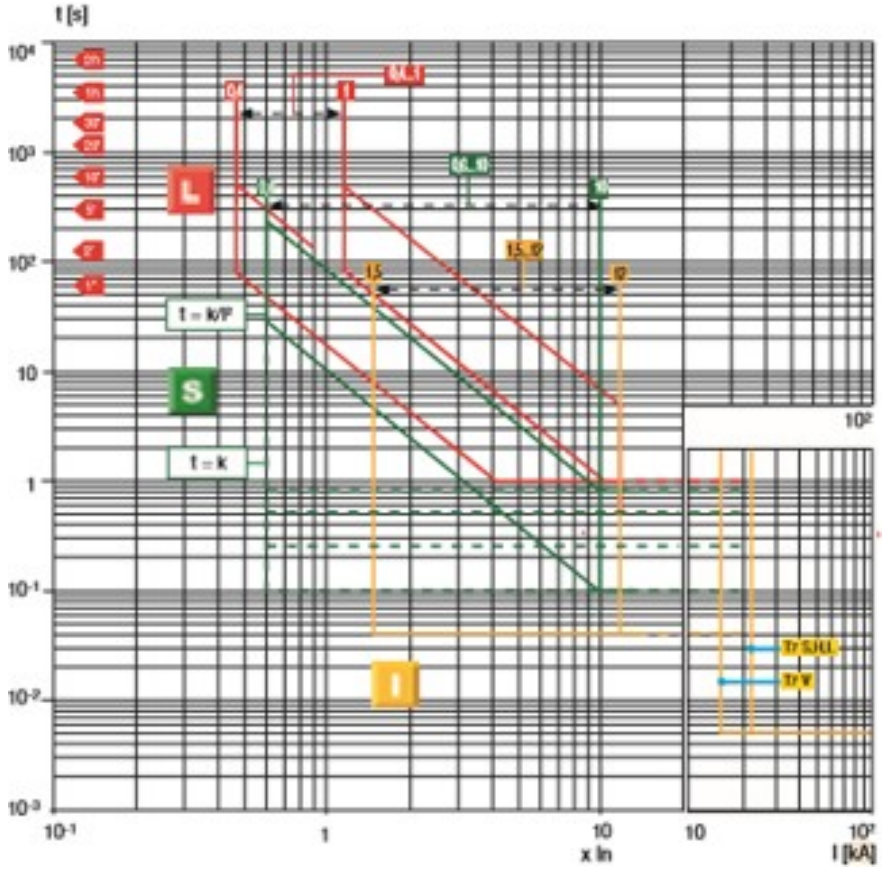



Figure - 11

## P, R, NS-Frame Long-Short Trip Curve and NW-Frame Long-Short Trip Curve

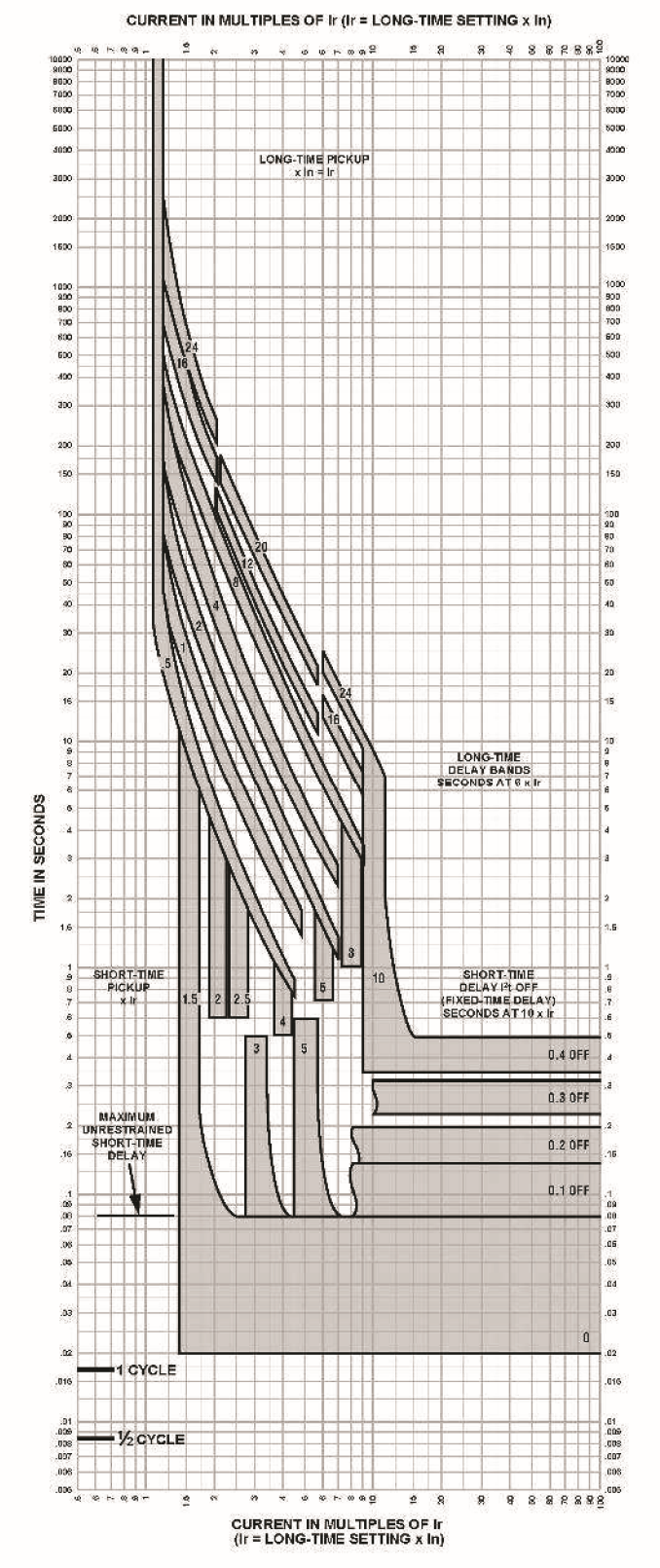



Figure - 12

### Long-time Pickup and Delay Short-time Pickup and I²t OFF Delay

The time-current curve information is to be used for application and coordination purposes only. Curves apply from -30°C to +60°C ambient temperature.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermalimaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. With zone-selective interlocking on, short-time delay utilized and no restraining signal, the maximum unrestrained short-time delay time band applies regardless of the setting.
4. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
5. For a withstand circuit breaker, instantaneous can be turned OFF. See Page 22 for instantaneous trip curve. See tables on pages 03-18 for instantaneous override values..
6. Overload indicator illuminates at 100%.

## P, R, NS-Frame Instant Curve and NW-Frame Instant Trip Curve

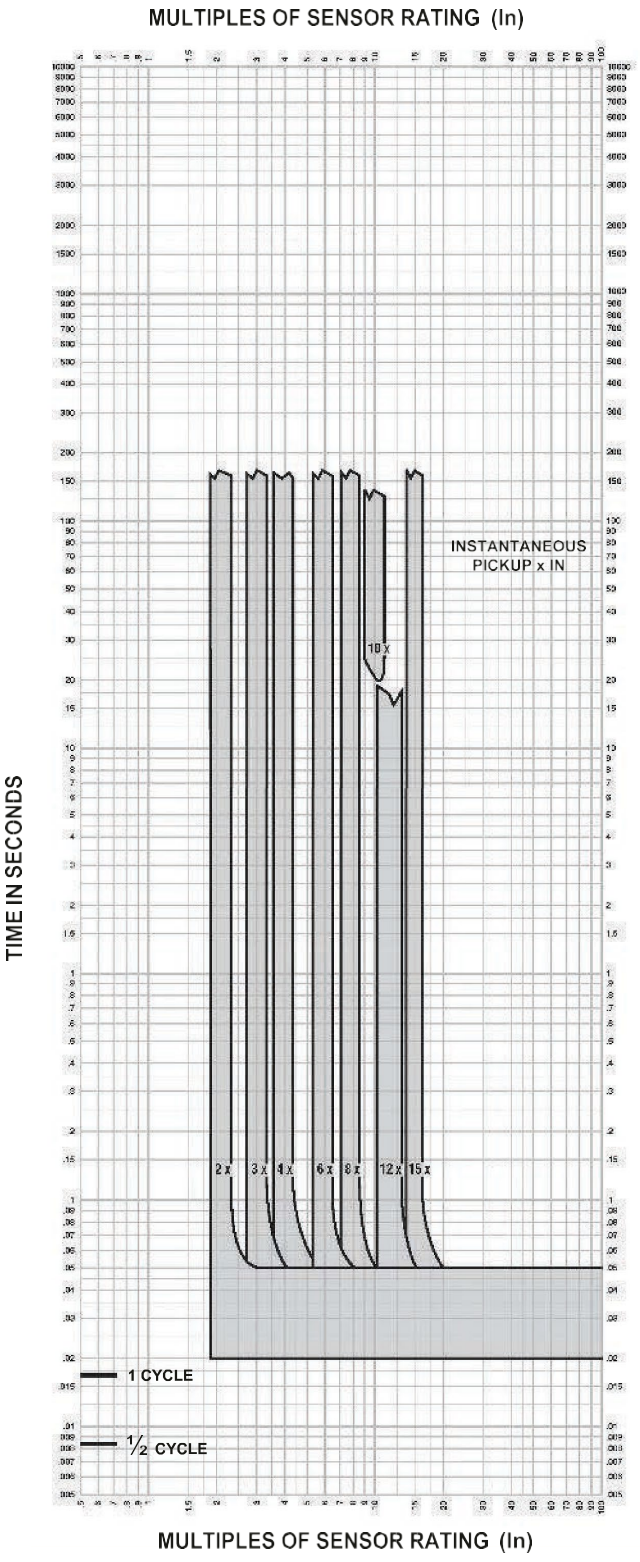



Figure 13

### Instantaneous Pickup 2x–15x and OFF

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -30° to +60°C ambient temperature.

Notes:

1. The end of the curve is determined by the interrupting rating of the circuit breaker.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. The instantaneous region of the trip curve shows maximum total clearing times. Actual clearing times in this region can vary depending on the circuit breaker mechanism design and other factors. The actual clearing time can be considerably faster than indicated. Contact your local Sales Office for additional information.
4. For a withstand circuit breaker, instantaneous can be turned OFF. See tables on pages 03-18 for instantaneous override values.
5. See page 22 for long-time pickup, long-time delay, short-time pickup, and short time delay trip curves.

## P, R, NS-Frame Ground Curve and NW-Frame Ground Fault Trip Curve

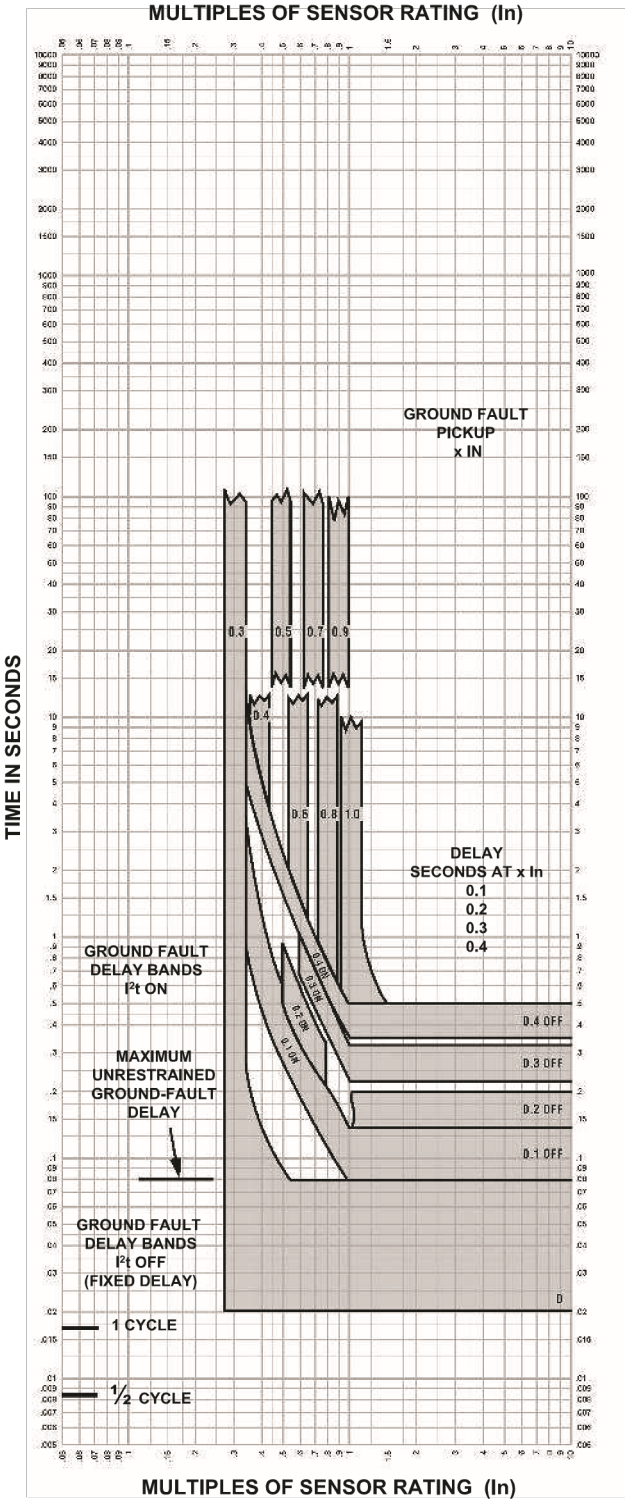



Figure 14

### Ground-fault $I^2t$ OFF and ON In ≤ 400 A

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -30°C to +60°C ambient temperature.

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# Attachments

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## BATTERY CHARGER

The intelligent battery charger has been developed with safety, usability, optimised battery performance and maximum battery lifetimes in mind.

A comprehensive range of input and output protections ensures a continued safe charging environment also enabling the use of the charger as a power supply.

## FEATURES

- Intelligent two, three and four stage charging profiles
- Configurable to suit most battery types (12V/24V)
- Adjustable current limit
- Can be used as a battery charger, power supply or both at the same time
- Automatic or Manual boost and storage charge functions to help maintain battery condition
- Digital Microprocessor Technology
- Temperature compensation for battery charging
- Low Output Ripple and superb line regulation
- Three LED Indicators
- AC input Under voltage
- AC input Over voltage
- Battery charger output Over voltage
- Battery charger output Over current
- Optional battery temperature compensation with over temperature protection
- Output short circuit and Inversion polarity with auto recovery
- Configurable charge termination

Automatic Boost Mode

- Boosts and equalises cell charge improving battery performance and life

Power Save Mode

- Once the battery is fully charged the chargers switch to Eco-Power to save energy

Communication

- Can be integrated into external systems through MODBUS RTU using RS485
- Fully configurable via PC Software
- External remote LCD option

## BENEFITS

- Fully flexible to maximise the life of the battery
- Suitable for a wide range of battery types
- Switched mode design
- Minimum 86% efficiency throughout full operating range
- No external intervention for boost mode
- Multiple chargers can be linked together to provide larger current output
- Can be permanently connected to battery and mains (utility) supply. No need to disconnect through high load conditions.

## SPECIFICATION

**AC SUPPLY**
VOLTAGE RANGE 90 V to 305 V (L-N)

**FREQUENCY RANGE**
48 Hz to 64 Hz (L-N)

**DC OUTPUT RATING**
10 A DC at 24 V DC

**RIPPLE AND NOISE**
<1%

**EFFICIENCY**
>86%

**REGULATION LINE**
<0.5%

**LOAD**
2%

**TEMPERATURE SENSOR INPUT**
PT1000

**PROTECTIONS**
Short Circuit
DC Over Voltage
DC Over Current
Reverse Polarity
Over Temperature
AC Under & Over Voltage

**CHARGE FAILURE RELAY**
3 A at 30 V DC volt free relay

**DIMENSIONS OVERALL**
70 mm x200 mm x 130 mm
2.7" x 7.9" x 5.1"

**WEIGHT**
0.75 kg

**OPERATING TEMPERATURE RANGE**
-30 °C to +80 °C
-22 °F to +176 °F

**STORAGE TEMPERATURE RANGE**
-40 °C to +70 °C
-22 °F to +158 °F

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## Jacket Water Heater (WHHH01)

Appropriate when the generator set is to be sited in a low ambient environment, the heater maintains the engine coolant at a temperature [typically 38°C (100°F)] which facilitates rapid starting and load acceptance. The heater assembly uses UL compliant components (to UL1030) and has CSA certification which is to both CSA and UL Standards.

The heater itself is powered by a 240V for 60 Hz AC auxiliary supply. A thermostatic controller is included to regulate the output temperature to within safe limits. When the generator set is not running the heater is automatically connected to the AC supply through a power relay mounted in the control panel.

## Features

- Uniform heat distribution
- Reduces wear from cold spots
- Improves startability
- Thermostatically controlled and protected
- 6’ (1.8m) cord
- Ensures generator is at optimal starting temperature and ready to accept load
- Durable pump with non-magnetic impeller that does not attract metal debris
- Robust die cast aluminum housing improves sealing of the hoses, eliminates leaking and breakage
- Corrosion resistant steel brackets for superior strength and durability
- Reduces thermal stress on coolant hoses
- Element designed for long life with maximum heat transfer
- IP44 Ingress Protection Rating
- No evaporation of coolant from hoses
- Reduces low coolant level alarms because coolant does not boil

| Part No | Outlet Location | Watts | Volts | Amps | Regulating Thermostat | Safety Thermostat |
|---|---|---|---|---|---|---|
| 577-1758/577-9355 | Right | 2700 | 240 | 11.25 | On 90°F (32°C)<br>Off 115°F (46°C) | 210°F (98°C) |

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# 100 Amp Load Center

Image shown may not reflect actual package

## Specifications

| | |
|---|---|
| Number of spaces | 6 |
| Number of circuits | 12 |
| Number of tandem circuit breakers | 6 |
| System voltage | 120/240VAC |
| NEMA degree of protection | NEMA 3R outdoor |
| Electrical connection | Lugs |
| Wiring configuration | 3-wire |
| Material | Tin plated aluminum busbar |
| Enclosure material | Welded galvannealed steel |
| Cover finish | Gray baked enamel |
| Product certifications | UL E-6294 |

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# Cat® GC Control Panel Options


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## Remote Annunciator Module

It is an LED expansion module that can be used with compatible control modules. The module has been designed to display a maximum of eight individual LED indications up to a maximum distance of 1 KM (0.6miles).

The Annunciator will consist of two modules to provide a 16 Channel Fault annunciation.

It is presented in a vertical enclosure. It includes an alarm sounder that is triggered when the host controller detects an alarm condition. The alarm can be muted using the front push button.

The Panels will be fitted with removable label cards which can be used to identify the standard NFPA alarms. If desired

It includes individual LEDs for each channel and a 'Power On' LED that flashes when the link with the host controller is lost.

## FEATURES

- The Remote annunciator has an integral Sounder / Horn
- Eight configurable LEDs (per module)
- Works up to 1 KM (0.6 miles) from the host controller
- A single Controller can support five Caterpillar Configured remote annunciator control boxes

## ENVIRONMENTAL TESTING STANDARDS

**ELECTRO-MAGNETIC COMPATIBILITY**
BS EN 61000-6-2
EMC Generic Immunity Standard for the Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the Industrial Environment

**ELECTRICAL SAFETY**
BS EN 60950
Safety of Information Technology Equipment, including Electrical Business Equipment

**TEMPERATURE**
BS EN 60068-2-1
Ab/Ae Cold Test -30 °C BS EN 60068-2-2
Bb/Be Dry Heat+70°C

**VIBRATION**
BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz @ +/-7.5 mm, 8 Hz to 500 Hz @ 2 gn

**SHOCK**
BS EN 60068-2-27
Three shocks in each of three major axes 15 gn in 11 Ms

**HUMIDITY**
BS EN 60068-2-30
Db Damp Heat Cyclic 20/55 °C @ 95% RH 48 Hours
BS EN 60068-2-78
Cab Damp Heat Static 40 °C @ 93% RH 48 Hours

**DEGREES OF PROTECTION PROVIDED BY ENCLOSURES BS EN 60529**
IP65 - Front of module when installed into the control panel with the supplied sealing gasket.

## SPECIFICATION

**CONTINUOUS VOLTAGE RATING**
8 V to 35 V Continuous

**CRANKING DROPOUTS**
Able to survive 0 V for 50 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries. LEDs and backlight will not be maintained during cranking.

**MAXIMUM OPERATING CURRENT**
112 mA at 12 V, 53 mA at 24 V

**MAXIMUM STANDBY CURRENT**
74 mA at 12 V, 35 mA at 24 V

**DIMENSIONS OVERALL**
275.5 mm x 214.2 mm x 108.8 mm
10.85" x 8.43" x 4.28"

**MAXIMUM PANEL THICKNESS**
8 mm
0.3"

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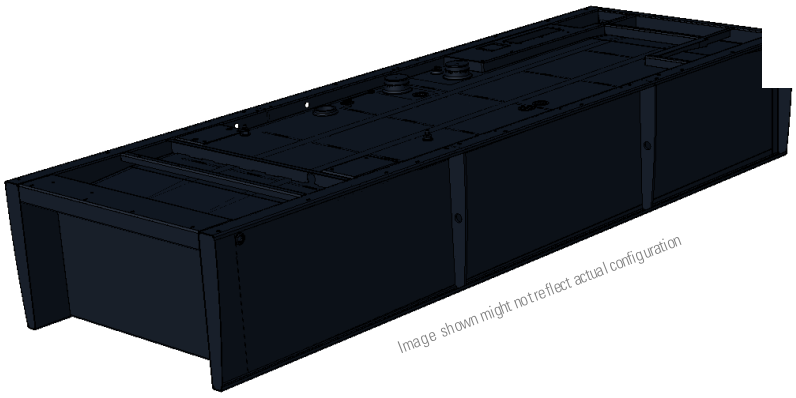
# Cat® GC INTEGRAL FUEL TANKS




## INTEGRAL FUEL TANKS
## DE250 GC – DE600 GC

## FEATURES

- UL Listed for United States (UL 142) and Canada (CAN/ULC S601)
- Facilitates compliance with NFPA 30 code, NFPA 37 and 110 standards and CSA C282 code
- Dual wall
- Low fuel level warning standard, customer configurable warning or shutdown
- Primary tank leak detection switch in containment basin
- Tank design provides capacity for thermal expansion of fuel
- Fuel supply dip tube is positioned so as not to pick up fuel sediment
- Fuel return and supply dip tube is separated by an internal baffle to prevent immediate re-supply of heated return fuel
- Pressure washed with an iron phosphate solution
- Interior tank surfaces coated with a solvent-based thin-film rust preventative
- Heavy gauge steel gussets with internal lifting rings
- Primary and secondary tanks are leak tested at 20.7 kPa (3 psi) minimum
- Compatible with open packages and enclosures
- Gloss black polyester alkyd enamel exterior paint
- Welded steel containment basin (minimum of 110% of primary tank capacity)
- Direct reading fuel gauge with variable electrical output
- Emergency vents on primary and secondary tanks are sized in accordance with NFPA 30.

### INTEGRAL

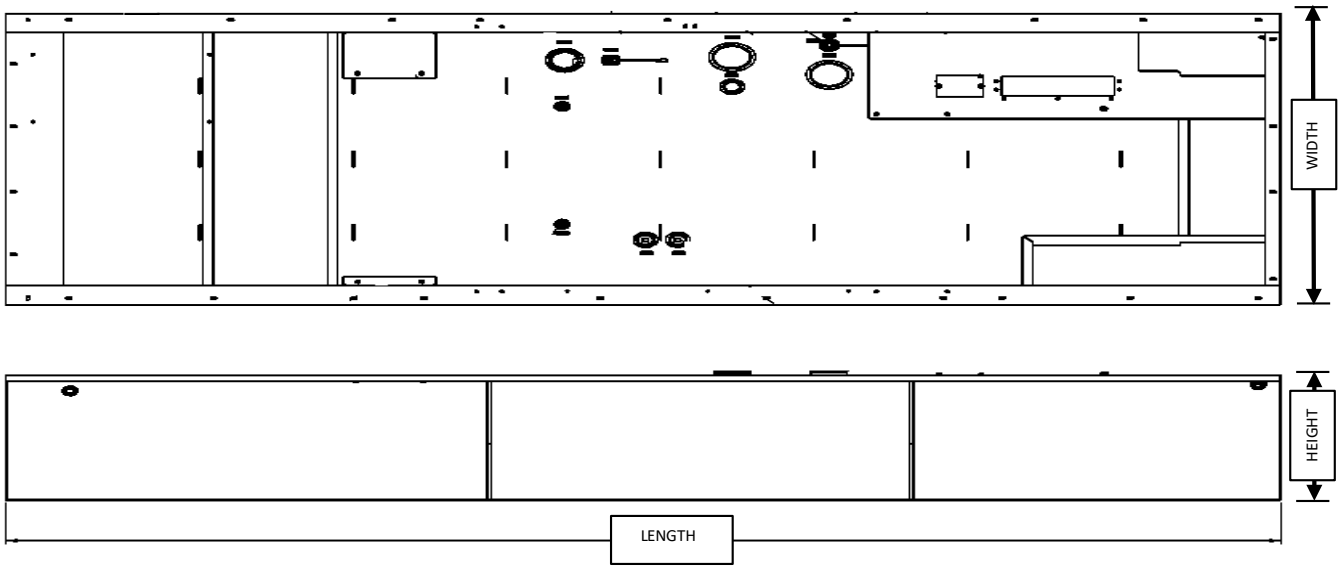
- Integral diesel fuel tank is incorporated into the generator set base frame
- Robust base design includes linear vibration isolators between tank base and engine generator.

### OPTIONS

- Audio/visual fuel level alarm panel
- 5gal (18.9 L) spill containment
- Locking Fuel Fill
- Overfill prevention Valve

## Integral Fuel Tank Base Useable Capacities with Fuel Tank Dimensions & Weights

| Standby ekW | Width mm | Width in |
|---|---|---|
| 250-300 | 1430 | 56.3 |
| 350-400 | 1630 | 64.1 |
| 450-500 | 1630 | 64.1 |
| 550-600 | 1865 | 73.4 |




The heights listed above do not include lumber used during manufacturing and shipping

## A. Open Set & Sound Attenuated Enclosure

| Tank Design | Feature Code | Total Capacity | | Useable Capacity | | Tank Only | | | | | | Overall Package Height with Tank | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Dry Weight | | Height 'H' | | Length 'L' | | Open | | Enclosure | |
| | | Litre | Gallon | Litre | Gallon | kg | lb | mm | in | mm | in | mm | in | mm | in |
| Integral Tank | FTDW035 | 2270.7 | 599.8 | 2059.9 | 543.9 | 970 | 2138 | 762.4 | 30.0 | 3958 | 155.8 | 2202 | 86.7 | 2487 | 97.9 |
| | FTDW036 | 2820 | 744.9 | 2553 | 674.4 | 1165 | 2568 | 818.8 | 32.2 | 4815 | 189.5 | 2584 | 101.7 | 2644 | 104 |
| | FTDW037 | 3671 | 969.7 | 3323 | 877.8 | 1331 | 2934 | 668.2 | 26.3 | 4622 | 181.9 | 2456 | 96.7 | 2644 | 104 |
| | FTDW038 | 4292 | 1133.8 | 3889 | 1027.3 | 1657 | 3653 | 816.4 | 32.1 | 4980 | 196 | 2560 | 100.7 | 2172 | 85.5 |

## B. Estimated Run Time (Hours)

| Tank Design | Feature Code | Standby Ratings (kVA) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | ekW | 100% | | 75% | | 50% | |
| | | | Hrs | L/hr | Hrs | L/hr | Hrs | L/hr |
| Integral Tank | FTDW035 | 250 | 28.1 | 73.3 | 35 | 58.8 | 47 | 43.8 |
| | | 300 | 24 | 86.0 | 30.8 | 66.8 | 40 | 51.5 |
| | FTDW036 | 350 | 27.1 | 94.3 | 31.2 | 81.9 | 42.4 | 60.2 |
| | | 400 | 24.1 | 105.9 | 28.1 | 90.7 | 38.6 | 66.2 |
| | FTDW037 | 450 | 25.2 | 131.7 | 31.3 | 106.1 | 42.0 | 79.1 |
| | | 500 | 24.3 | 137 | 30.1 | 110.5 | 46.6 | 71.3 |
| | FTDW038 | 550 | 25.7 | 151.1 | 32.9 | 118.1 | 45.2 | 86.1 |
| | | 600 | 24.1 | 161.6 | 30.0 | 129.6 | 42.4 | 91.7 |

Tanks with full electrical stub-up area include removable end channel. Tanks with RH stub-up include stubup area directly below the circuit breaker or power terminal strips.

Fuel tanks and applicable options facilitate compliance with the following United States NFPA Code and Standards:

NFPA 30: Flammable and Combustible Liquids Code

NFPA 37: Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines

NFPA 110: Standard for Emergency and Standby Power Systems

Fuel tanks and applicable options facilitate compliance with the following Canadian Standard and Code:

CSA C282 – Emergency Electrical Power Supply for Buildings

CSA B139-09 – Installation Code for Oil-Burning Equipment

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# Cat® GC ENCLOSURES

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## SOUND ATTENUATED LEVEL 2 ENCLOSURES

## D250GC – D600GC

## 60 Hz

## FEATURES

### Robust / Highly Corrosion Resistant Construction

- Factory installed on skid base or tanks base
- Environmentally friendly, polyester powder baked paint
- Enclosure constructed with 18-gauge steel
- Interior zinc plated fasteners
- Internally mounted exhaust silencing system
- Comply with ASCE /SEI 7 for Wind loads up to 100mph
- Designed and tested to comply with UL 2200 Listed generator set package

### Excellent Access

- Large cable entry area for installation ease.
- Accommodates side mounted single or multiple breakers.
- Two doors on both sides.
- Vertically hinged allow 180° opening rotation
- Radiator fill cover.

### Security and Safety

- Lockable access doors which give full access to control panel and breaker.
- Cooling fan and battery charging alternator fully guarded.
- Fuel fill, oil fill and battery can only be reached via lockable access.
- Externally mounted emergency stop button (Optional).
- Designed for spreader bar lifting to ensure safety.
- Stub-up area is rodent proof.

### Sound Attenuated Level 2

- Caterpillar white paint
- UL Listed integral fuel tank with 24 hours running time capacity (Optional).
- DC lighting package (Optional)

# Cat® GC ENCLOSURES

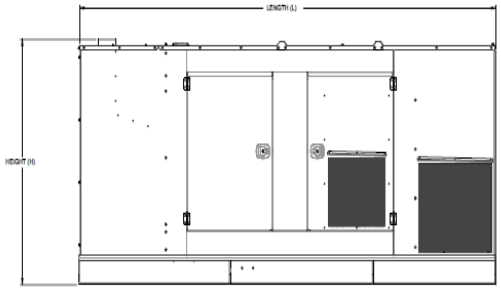
## Enclosure Package Operating Characteristics

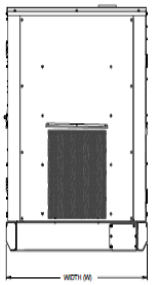
| Enclosure Type | Standby ekW | Cooling Air Flow Rate | | Ambient Capability* | | Sound Pressure Levels (dBA) at 7m (23 ft) |
|---|---|---|---|---|---|---|
| | | $m^3/s$ | cfm | °C | °F | 100% Load |
| Level 2 Sound Attenuated Enclosure (Steel) | 250 | 6.4 | 13561 | 57 | 135 | 74 |
| | 300 | 6.4 | 13561 | 51 | 125 | 74 |
| | 350 | 7.4 | 15680 | 57 | 134 | 71 |
| | 400 | 7.4 | 15680 | 53 | 127 | 71 |
| | 450 | 8.4 | 17692 | 54 | 130 | 73 |
| | 500 | 8.4 | 17692 | 50 | 122 | 73 |
| | 550 | 11.2 | 23731 | 56 | 133 | 73 |
| | 600 | 11.2 | 23731 | 53 | 127 | 73 |

*Cooling system performance at sea level. Consult your Cat® dealer for site specific ambient and altitude capabilities.

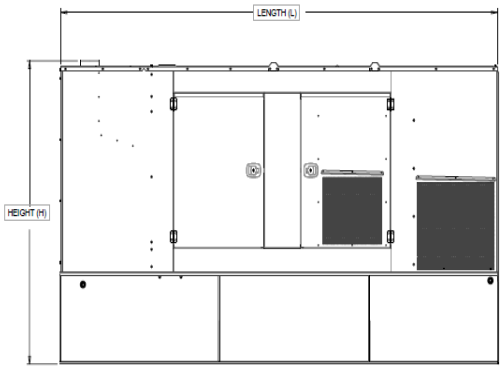
**Note:** Sound level measurements are subject to instrumentation, installation and manufacturing variability, as well as ambient site conditions.

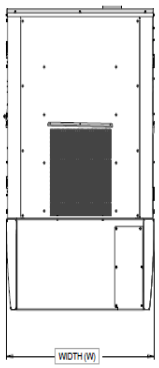
## DIMENSIONS





Sound Attenuated Enclosure on Skid Base




Sound Attenuated Enclosure on a UL Listed Integral Fuel Tank Base

Image shown might not reflect actual configuration

## WEIGHTS & DIMENSIONS

| Enclosure Type | Standby Ratings, ekW | Length, L | | Width, W | | Height, H | | Package Weights | |
|---|---|---|---|---|---|---|---|---|---|
| | | mm | in | mm | in | mm | in | kg | lb |
| Sound Attenuated Enclosure on Skid Base | 250 | 3958 | 155.8 | 1440 | 56.7 | 1991 | 78.4 | 2857 | 6298.6 |
| | 300 | | | | | | | 2945 | 6492.6 |
| | 350 | 4633 | 182.4 | 1630 | 64.2 | 2227 | 87.7 | 3983 | 8781.0 |
| | 400 | | | | | | | 4017 | 8856.0 |
| | 450 | 4823 | 189.8 | 1630 | 64.2 | 2777 | 109.3 | 4408 | 9718.0 |
| | 500 | | | | | | | 4457 | 9826.0 |
| | 550 | 4980 | 196.1 | 1865 | 73.4 | 2723 | 107.2 | 4754 | 10480.8 |
| | 600 | | | | | | | 4837 | 10663.8 |
| Sound Attenuated Enclosure on UL Listed Integral Fuel Tank Base | 250 | 3958 | 155.8 | 1440 | 56.7 | 2487 | 97.9 | 3497 | 7709.6 |
| | 300 | | | | | | | 3585 | 7903.6 |
| | 350 | 4633 | 182.4 | 1630 | 64.2 | 2644 | 104.1 | 4765 | 10505.0 |
| | 400 | | | | | | | 4799 | 10580.0 |
| | 450 | 4823 | 189.8 | 1630 | 64.2 | 2777 | 109.3 | 5345 | 11783.7 |
| | 500 | | | | | | | 5394 | 11891.7 |
| | 550 | 4980 | 196.1 | 1865 | 73.4 | 2723 | 107.2 | 5973 | 13168.2 |
| | 600 | | | | | | | 6056 | 13351.2 |

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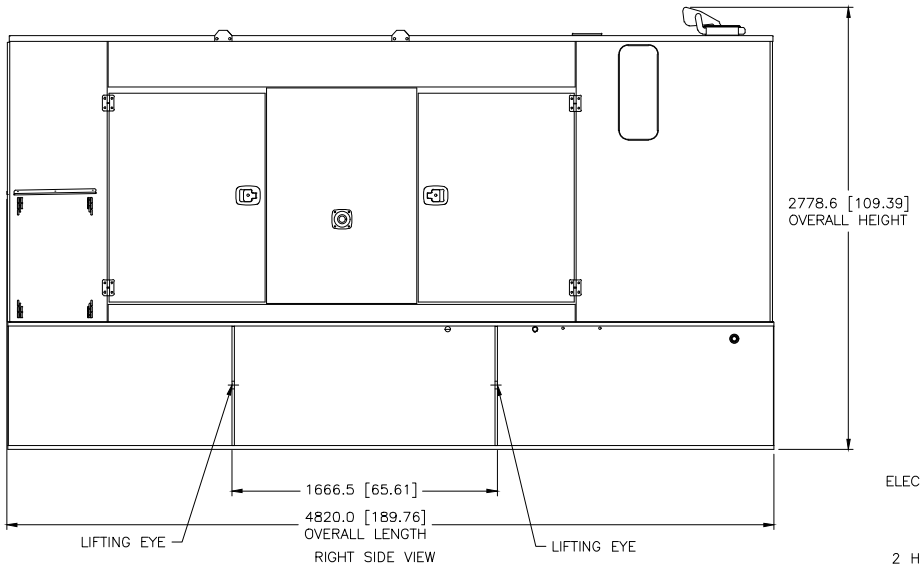
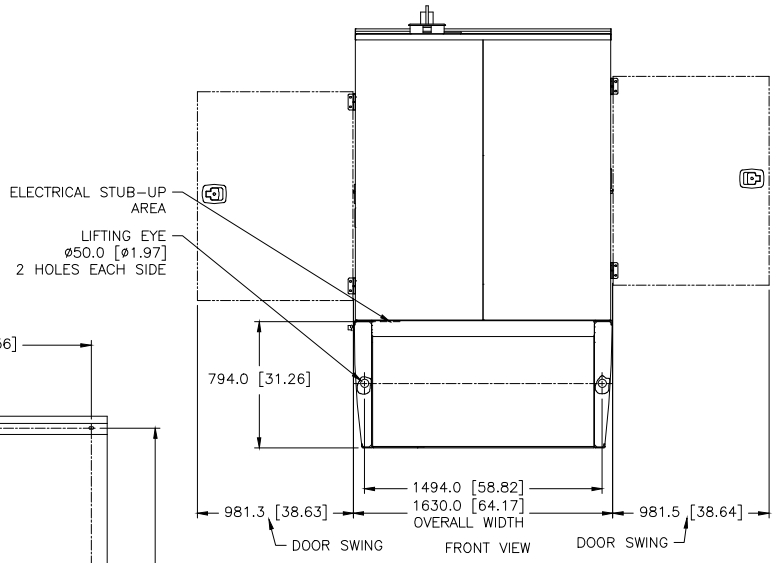
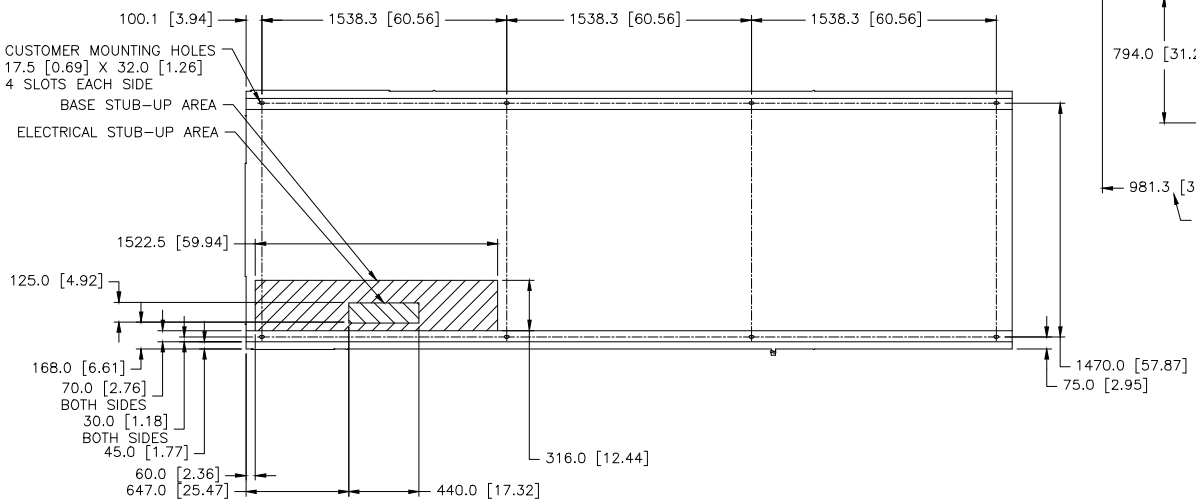
METRIC 588-8341

| QTY | ENGINE CONNECTIONS | SIZE | SHEET |
|---|---|---|---|
| 1 | COOLANT DRAIN | ø19.05 [ø0.75] I.D. | 2,3 |
| 1 | OIL DRAIN | ø25.4 [ø1.00] O.D. | 2,3 |
| 1 | EXHAUST | ø203.2 [ø8.00] O.D. | 2,3 |
| 1 | FUMES DISPOSAL HOSE | ø50.8 [ø2.0] O.D. | 3 |

| QTY | POSSIBLE TANK CONNECTIONS | SIZE | SHEET |
|---|---|---|---|
| 1 | FUEL SUPPLY | 13/16-16 THD | 3 |
| 1 | FUEL RETURN | 13/16-16 THD | 3 |
| 2 | SPARE PORTS | 2" NPTF THD | 3 |
| 1 | FUEL FILL | 4" NPT THD | 3 |
| 1 | MAIN TANK EMERGENCY VENT | 5" NPT THD | 3 |
| 1 | MAIN TANK NORMAL VENT | 2" NPTF THD | 2,3 |
| 1 | BASIN TANK EMERGENCY VENT | 5" NPT THD | 3 |




FOOTPRINT
(DIMENSIONED OUTLINE VIEW FROM ABOVE)
(RIGHT SIDE ORIENTATION)

| MODEL | TYPE | ENGINE AR | TANK AR | ENCLOSURE AR |
|---|---|---|---|---|
| C15 | Y | LS-3977 CHG 00 | LS-3871 CHG 00 | LS-3859 CHG 00 |
| | | LS-3978 CHG 00 | | |
| | | LS-3979 CHG 00 | | |
| | | LS-3980 CHG 00 | | |

PACKAGE LIFTED IN 4 PLACES

PACKAGE SHOWN WITH MORE DETAIL ON SHEETS 2 & 3

1E2966B IDENT
1F2733 DRAWING-AUTOCAD
1F0136W BRAND MARKINGS
1E0013G CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL

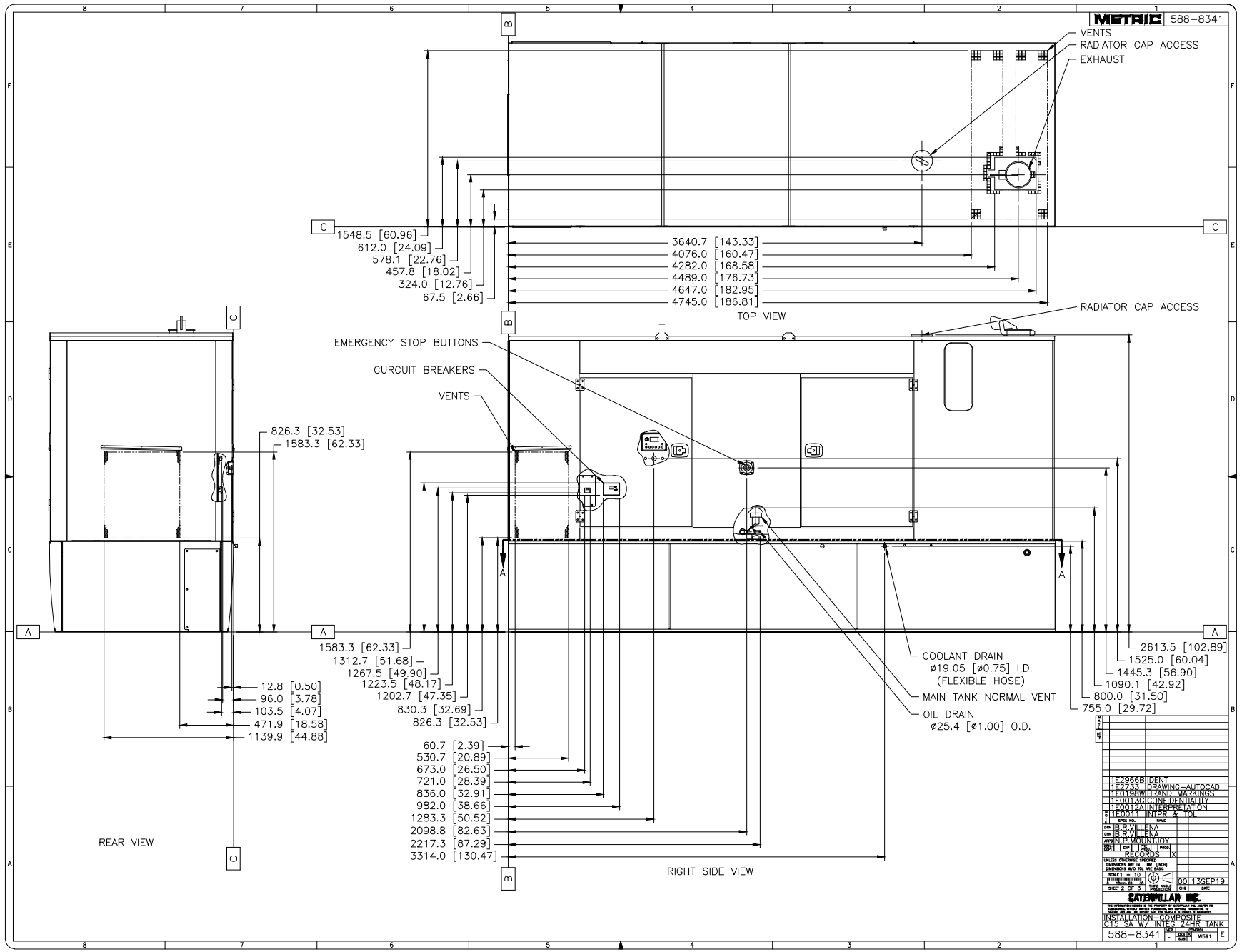
RECORDS

SCALE 1 = 10
SHEET 1 OF 3

CATERPILLAR INC.

INSTALLATION-COMPOSITE
C15 SA W/ INTEG 24HR TANK
588-8341 - E

METRIC 588-8341




1E2966B IDENT
1E2733 DRAWING-AUTOCAD
1E0136W BRAND MARKINGS
1E0013C CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL

| | SPEC NO. | MARK |
|---|---|---|
| DRN | B.R.VILLENA | |
| CHK | B.R.VILLENA | |
| APVD | P.MOUNTJOY | |

| CONT | CHF | ENG | PROD |
|---|---|---|---|
| RECORDS | | X | |

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MM [INCH]
DIMENSIONS W/O TOL ARE BASIC
SCALE 1 = 10
WEIGHT (KG) 00.13SEP19
SHEET 2 OF 3 THIRD ANGLE PROJECTION CHG DATE

CATERPILLAR INC.

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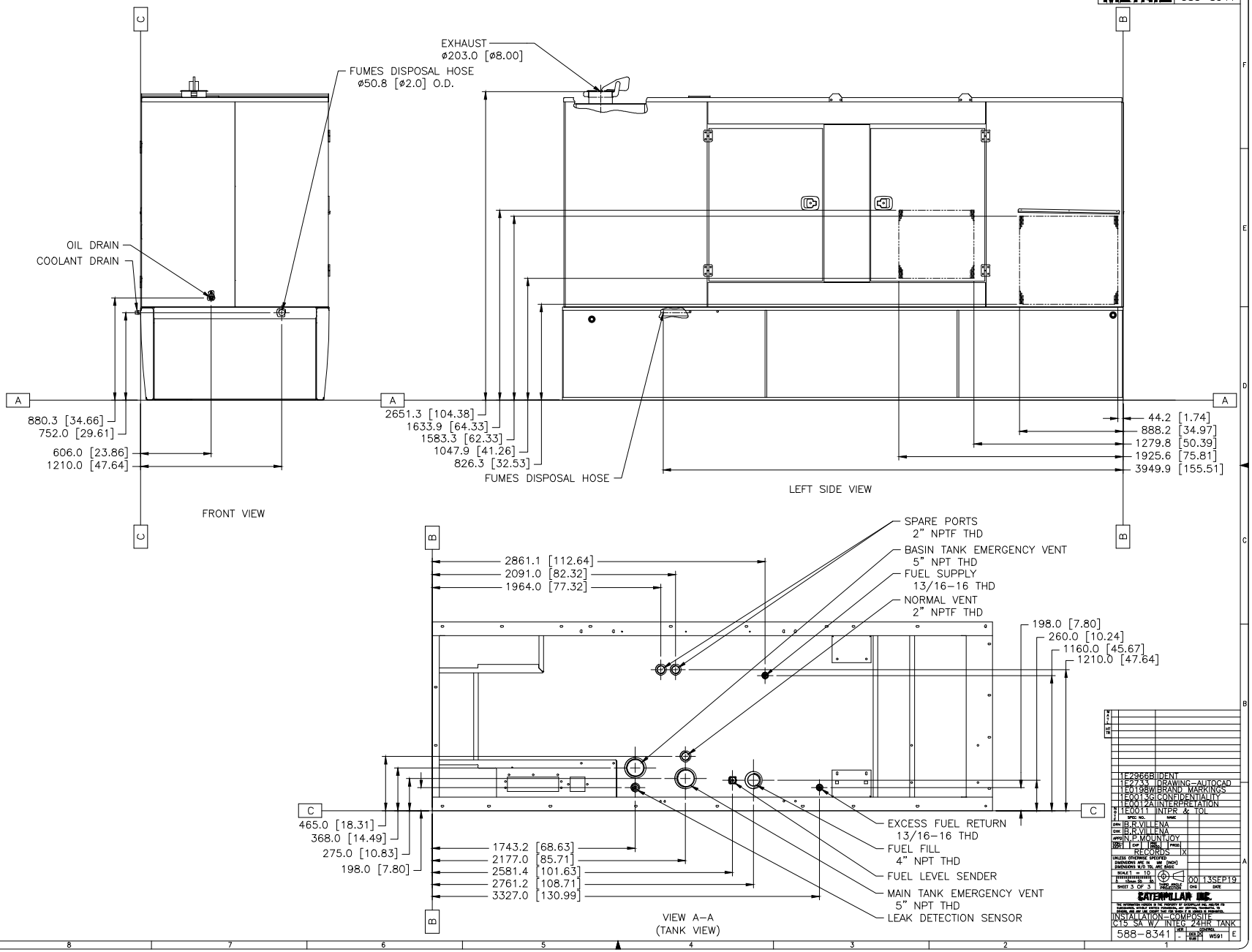
INSTALLATION-COMPOSITE
C15 SA W/ INTEG 24HR TANK

588-8341 - USE CONTROL DOC 24 SUB 1 W591 E

METRIC 588-8341




1E2966B IDENT
1E2733 DRAWING-AUTOCAD
1E0138W BRAND MARKINGS
1E0013G CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL

DRN B.R.VILLENA
CHK B.R.VILLENA
APVD P.MOUNTJOY
RECORDS
SCALE 1 = 10
SHEET 3 OF 3
00 13SEP19

CATERPILLAR INC.

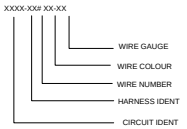
INSTALLATION-COMPOSITE
C13 SA W/ INTEG 24HR TANK
588-8341 - W591 E

# THIS DIAGRAM IS FOR GC GENSET MODELS (250kW to 600kW)
## FOR USE WITH : C9, C13, C15 & C18 ENGINES
## 6310 CONTROLLER

### SIGNAL NAMES

| CIRCUIT_ID | COLOR | DESCRIPTION |
|---|---|---|
| 10 | WH | AVR_SUPPLY_X2 (SHUNT) |
| 101 | RD | UNFUSED_BTRY_(+) |
| 105 | WH | (+24V DC)_ECM_SUPPLY |
| 109 | WH | (+24V DC )_PANEL_SUPPLY |
| 123 | WH | FUSED BTRY + |
| 14 | WH | AVR_SUPPLY_X1 (PMG) |
| 148 | WH | (+24 VDC) LIGHTING_SUPPLY |
| 15 | WH | AVR_SUPPLY_X2 (PMG) |
| 16 | WH | AVR_SUPPLY_Z1 (PMG) |
| 200 | GN-YL | GROUND |
| 208 | WH | BATTERY (-) |
| 229 | WH | CLEAN_GROUND |
| 344 | WH | EMERGENCY_STOP |
| 345 | WH | EMERGENCY_STOP |
| 346 | WH | EMERGENCY_STOP |
| 347 | WH | EMERGENCY_STOP |
| 348 | WH | EMERGENCY_STOP |
| 5+ | WH | GENERATOR EXCITATION (+) |
| 5- | WH | GENERATOR EXCITATION (-) |
| 879 | WH | REMOTE_START_INPUT |
| 892 | BK | CAT_DATA_LINK (-) |
| 893 | WH | CAT_DATA_LINK (+) |
| 9 | WH | AVR_SUPPLY_X1 (SHUNT) |
| 951 | WH | MODBUS A |
| 952 | BK | MODBUS B |
| 953 | CU | MODBUS COM |
| 954 | WH | DSENET A |
| 955 | BK | DSENET B |
| 956 | CU | DSENET SCREEN |
| SCR | CU | SCREEN |
| A309 | WH | DIGITAL_INPUT_(GENSET RUNNING) |
| A666 | WH | ENCLOSURE_LIGHTING |
| A774 | WH | EMERGENCY_STOP |
| A775 | WH | EMERGENCY_STOP |
| AC101 | WH | FUSED BTRY CHARGER (L) |
| AC102 | WH | BTRY CHARGER (L) |
| AC103 | WH | ALT HEATER BREAKER |
| AC104 | WH | ALT HEATER BREAKER |
| AC199 | WH | BTRY CHARGER (N) |
| AC703 | WH | ALT HEATER RELAY (11) |
| AC719 | WH | ALT HEATER RELAY (12) |
| AC720 | WH | ALT HEATER TERM |
| E486 | WH | SENSING_VOLTAGE-PHASE_A |
| E487 | WH | SENSING_VOLTAGE-PHASE_B |
| E488 | WH | SENSING_VOLTAGE-PHASE_C |
| E494 | WH | CT_SENSING-PHASE_A |
| E495 | WH | CT_SENSING-PHASE_B |
| E496 | WH | CT_SENSING-PHASE_C |
| E498 | WH | CT_SENSING-COMMON |
| E600 | WH | GROUND FAULT RELAY |
| E601 | WH | GROUND FAULT RELAY |
| F409 | WH | SENSING_VOLTAGE-NEUTRAL |
| F430 | WH | DIGITAL_INPUT_(D) |
| F434 | WH | GEN_PHASE_A |
| F435 | WH | GEN_PHASE_B |
| F436 | WH | GEN_PHASE_C |
| R756 | WH | HORN_OUTPUT |
| R733 | WH | ANALOG_I/P_SIGNAL_(FUEL_LEVEL) |
| R854 | WH | BREAKER_SHUNT_TRIP |
| R958 | WH | DIGITAL_OUTPUT_(SHUNT_TRIP) |
| R959 | WH | DIGITAL_OUTPUT_(ENCLOSURE_LIGHTS) |
| X861 | WH | STARTER_MAG_SWITCH |
| Y797 | YL | J1939_DATALINK_(CAN_+) |
| Y798 | BK | J1939_DATALINK_(CAN_-) |
| Y799 | CU | J1939_DATALINK_(CAN_SHLD) |
| Y983 | WH | DIGITAL_INPUT_(LOW_COOLANT_LEVEL) |
| Y984 | WH | DIGITAL_INPUT_(FUEL_LEAK) |
| Y985 | WH | DIGITAL_INPUT_(ENCLOSURE_LIGHTS) |

### WIRE NAME DEFINITION




### COLOUR ABBREVIATIONS

| ABBREVIATION | DESCRIPTION |
|---|---|
| RD | RED |
| WH | WHITE |
| OR | ORANGE |
| YL | YELLOW |
| PK | PINK |
| BK | BLACK |
| GY | GREY |
| PU | PURPLE |
| BR | BROWN |
| GN | GREEN |
| BU | BLUE |
| CU | COPPER |
| GN-YL | GREEN-YELLOW |

### ABBREVIATIONS

| ABBREVIATIONS | DESCRIPTION |
|---|---|
| AC | ALTERNATING CURRENT |
| AVR | AUTOMATIC VOLTAGE REGULATOR |
| BATT | BATTERY |
| CR | CONTROL RELAY |
| DC | DIRECT CURRENT |
| ECM | ENGINE CONTROL MODULE |
| ECR | ENGINE CRANK RELAY |
| ELR | ENRVILOSURE LIGHTS RELAY |
| E-STOP | EMERGENCY STOP |
| FLS | FUEL LEVEL SENDER |
| GFR | GERNERAL FAULT RELAY |
| GND | GROUND |
| GRR | GENERATOR RUNNING RELAY |
| LCL | LOW COOLANT LEVEL |
| MCB | MINIATURE CIRCUIT BREAKER |
| PMG | PERMANENT MAGNET GENERATOR |
| STR | SHUNT TRIP RELAY |
| TERM | PANEL TERMINAL |
| VFC | VOLT FREE CONTACT |

### SYMBOL LEGEND TABLE

| | |
|---|---|
| | MINIATURE CIRCUIT BREAKER |
| | EMERGENCY STOP PUSHBUTTON |
| | FUSED AUTOMOTIVE RELAY |
| | RESISTOR |
| | EARTH/GROUND |
| | CURRENT TRANSFORMER |
| X | PANEL TERMINAL |
| | TERMINAL |
| | CONNECTOR |
| | BATTERY |
| | SPLICE |
| | WIRE |
| | SCREEN CABLE |
| A | FUSE |

### INDEX TABLE

| SHEET INDEX | DESCRIPTION |
|---|---|
| 1 | CROSS REFERENCE SHEET INDEX, NOTES |
| 2 | CONTROL SCHEMATIC |
| 3 | POWER SCHEMATIC |
| 4 | OPTION SCHEMATIC |
| 5 | OPTION SCHEMATIC (CONTINUED) |
| 6 | CUSTOMER CONNECTIONS AND COMPONENT DETAILS |
| | |

### HARNESS LAYER TABLE

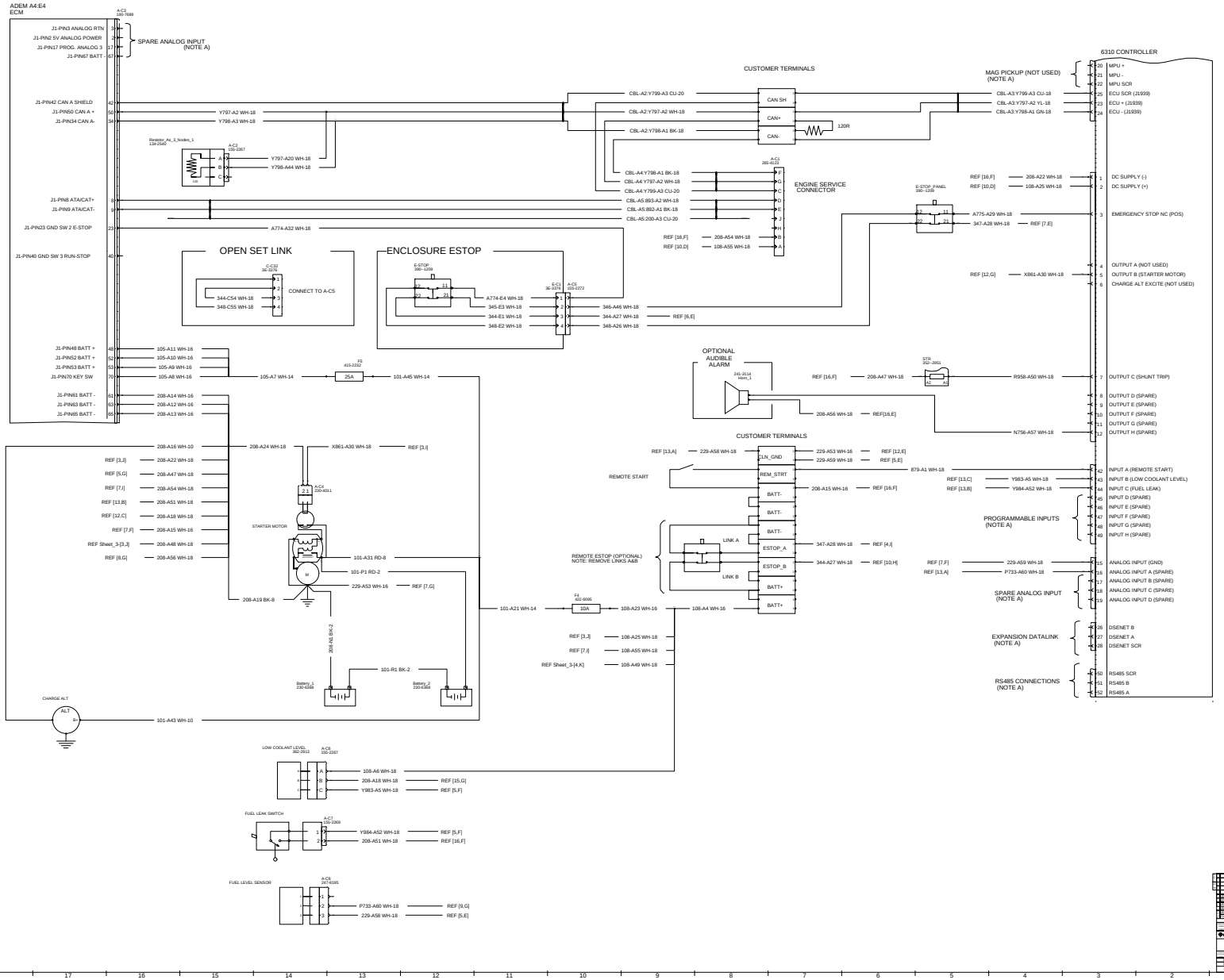
| IDENT | PART NO | CHG | LOC | DESCRIPTION | NOTE |
|---|---|---|---|---|---|
| HARNESS AS. | - | - | - | - | - |
| A | 572-5793 | 02 | SH 2 | MAIN HARNESS (C9-C13) | |
| A | 572-5795 | 02 | SH 2 | MAIN HARNESS (C15-C18) | |
| AN | 578-6063 | 01 | SH 4 | ANNUNCIATOR HARNESS | |
| B | 577-8429 | 01 | SH 4 | PLG 641 & 601 HARNESS (RS485) | |
| C | 580-2678 | 00 | SH 2 | E-STOP LINK (OPEN SET) | |
| CE | SB1-0536 | 00 | SH 5 | LC BATTERY CHARGER | |
| CO | 577-8711 | 00 | SH 5 | GFCI | |
| CP | SB1-0537 | 00 | SH 5 | LC ALT HEATER | |
| E | 572-5798 | 02 | SH 2 | E-STOP HARNESS (ENCLOSED SET) | |
| EL | 580-3699 | 01 | SH 4 | CANOPY LIGHTS HARNESS | |
| ER | 578-7682 | 01 | SH 5 | BATTERY CHARGER HARNESS | |
| GF | SB1-1932 | 01 | SH 5 | GROUND FAULT RELAY INDICATION HARNESS | |
| GR | 579-3092 | 00 | SH 4 | GENSET RUNNING & COMMON ALARM | |
| PG | 443-0637 | 00 | SH 4 | PMG ADAPTOR | |
| T | 577-3930 | 00 | SH 4 | PLG 641 & 601 HARNESS (POWER) | |
| RC | SB0-8446 | 01 | SH 5 | ALTERNATOR HEATER HARNESS | |
| AX | TBA | - | SH3 | 1200A CB AUX CONTACT HARNESS | |
| FF | TBA | - | SH3 | 1200A CB SHUNT TRIP HARNESS | |
| Y | SB6-4861 | 00 | SH 5 | PLG CANBUS HARNESS | |
| | | | | | |
| WIRE AS. / CABLE AS. | - | - | - | - | - |
| N | - | - | SH 2 | BATTERY NEGATIVE | |
| P | - | - | SH 2 | BATTERY POSSITIVE | |
| R | - | - | SH 2 | BATTERY LINK | |
| SEE SHEET 3 | - | - | SH 2 | 400A POWER CABLES | |
| SEE SHEET 3 | - | - | SH 3 | 600A POWER CABLES | |
| SEE SHEET 3 | - | - | SH 3 | 800A POWER CABLES | |
| SEE SHEET 3 | - | - | SH 3 | 1200A POWER CABLES | |

NOTE A: FACTORY WIRING NOT PROVIDED AS STANDARD. REFER TO MANUFACTURER INSTALLATION INSTRUCTIONS.

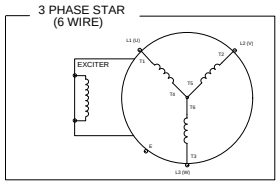
NOTE B: CONTACT OPEN IN DE-ENERGIZED STATE OR FAULT CONDITION.

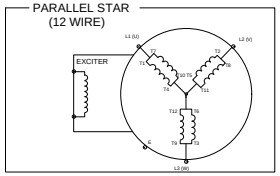
NOTE C: RESISTOR TO BE REMOVED IF ADDITIONAL EXPANSION MODULES ARE CONNECTED.

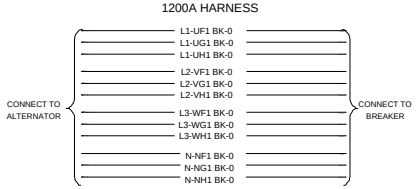
# CONTROL SCHEMATIC (DSE 6310)

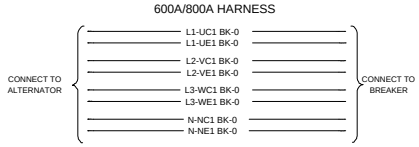


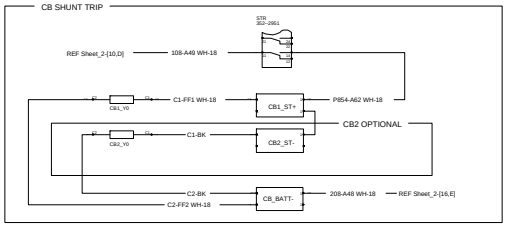
# POWER SCHEMATIC

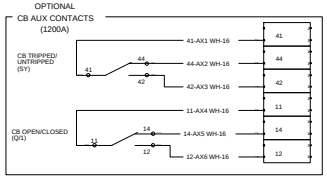


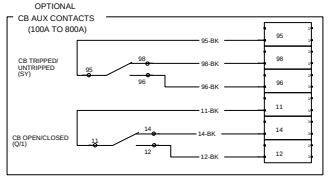



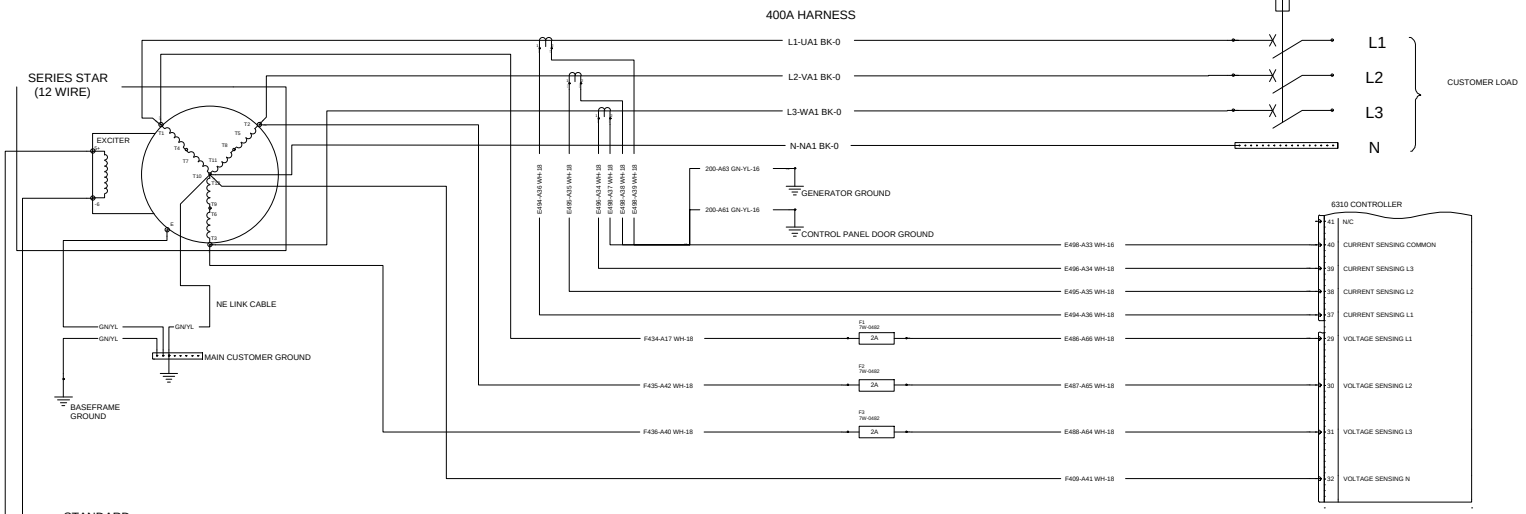



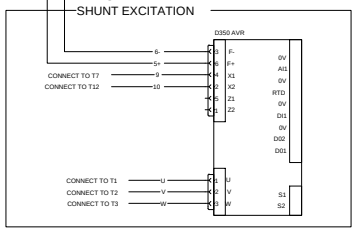



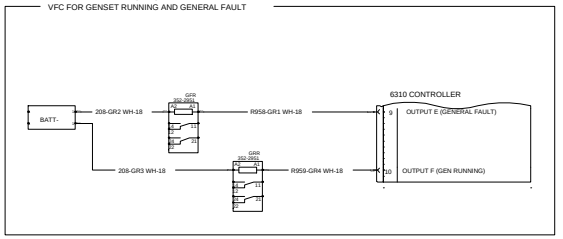



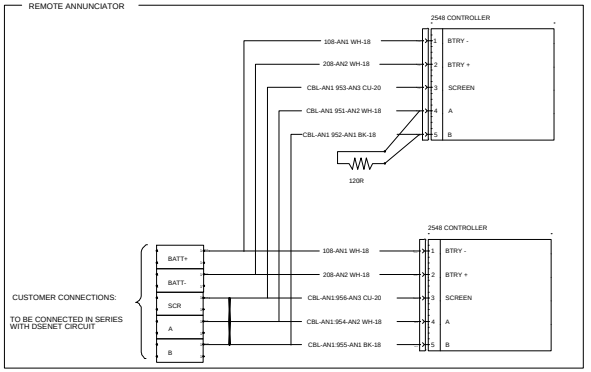



# ADDITIONAL OPTIONS

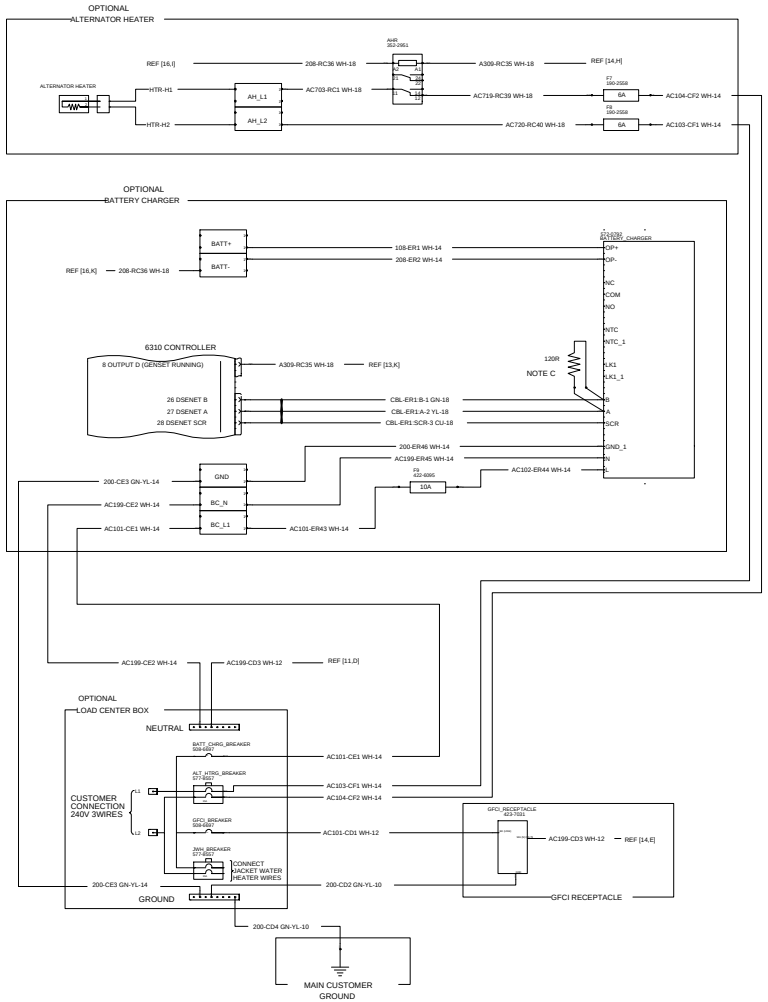
OPTIONAL
VFC FOR GENSET RUNNING AND GENERAL FAULT




OPTIONAL
REMOTE ANNUNCIATOR



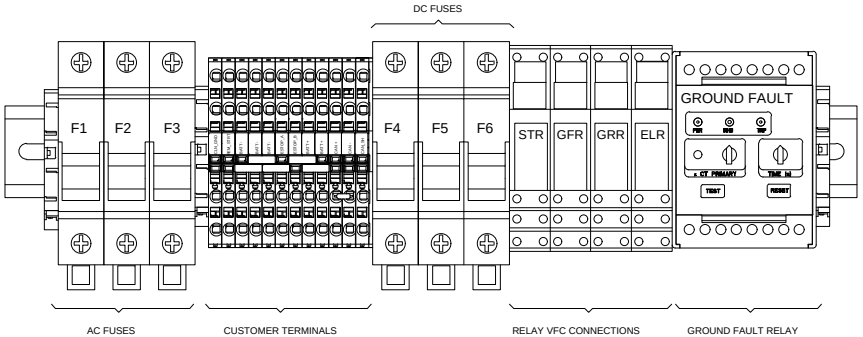
# ADDITIONAL OPTIONS



# ADDITIONAL INFORMATION - COMPONENT DETAILS & CUSTOMER CONNECTIONS

## MAIN CUSTOMER RAIL (OPTIONS INCLUDED)

| FUSE ID | CURRENT RATING | WIRE ID | DESCRIPTION |
|---|---|---|---|
| F4 | 10A | 101, 108 | PANEL SUPPLY |
| F5 | 25A | 101, 105 | ECM POWER |
| F6 | 2A | 148, 101 | ENCLOSURE LIGHTS |
| | | | |

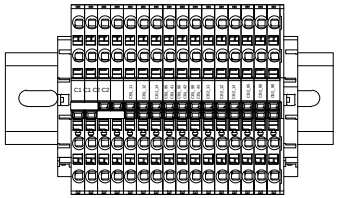



| FUSE ID | CURRENT RATING | WIRE ID | DESCRIPTION |
|---|---|---|---|
| F1 | 5A | F434, E486 | L1 SENSING AC |
| F2 | 5A | F435, E487 | L2 SENSING AC |
| F3 | 5A | F436, E488 | L3 SENSING AC |
| | | | |

| TERMINAL ID | WIRE ID | DESCRIPTION |
|---|---|---|
| CUN_GND | 229 | CLEAN GROUND FOR ANALOG INPUTS |
| REM_STRT | 879 | REMOTE START INPUT |
| BATT - | 308 | BATTERY NEGATIVE |
| BATT - | 308 | BATTERY NEGATIVE |
| BATT - | 308 | BATTERY NEGATIVE |
| ESTOP_A | 947 | ECM ESTOP INPUT |
| ESTOP_B | 944 | GENSET CONTROLLER ESTOP INPUT |
| BATT + | 108 | BATTERY POSITIVE (10A FUSED) |
| BATT + | 108 | BATTERY POSITIVE (10A FUSED) |
| CAN + | V797 | CAN + COMMS |
| CAN - | V798 | CAN - COMMS |
| CAN SH | V799 | CAN SH COMMS |
| | | |

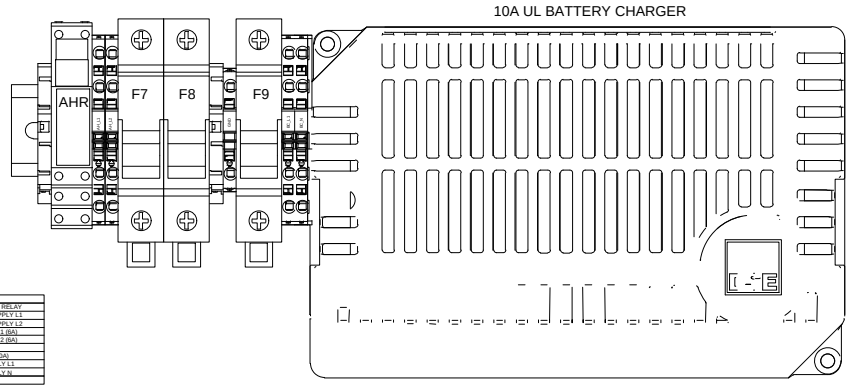
| RAIL | CURRENT RATING | DESCRIPTION |
|---|---|---|
| STR | 8A | SHUNT TRIP RELAY |
| GFR | 5A | GENERAL FAULT RELAY |
| GRR | 8A | GENSET RUNNING RELAY |
| ELR | 8A | ENCLOSURE LIGHTS RELAY |
| | | |

## CIRCUIT BREAKER RAIL (OPTIONS INCLUDED)



| TERMINAL ID | WIRE ID | DESCRIPTION |
|---|---|---|
| CB1_ST+ | C1 | CB1 SHUNT TRIP |
| CB2_ST+ | C1 | CB2 SHUNT TRIP |
| BATT- | C2 | BATTERY NEGATIVE |
| 11 | 11 | CB1 AUX COM |
| 12 | 12 | CB1 AUX NO |
| 14 | 14 | CB1 AUX NC |
| 61/41 | 61/41 | CB1 AUX COM |
| 61/42 | 61/42 | CB1 AUX NO |
| 61/44 | 61/44 | CB1 AUX NC |
| 11 | 11 | CB2 AUX COM |
| 12 | 12 | CB2 AUX NO |
| 14 | 14 | CB2 AUX NC |
| 95 | 95 | CB2 AUX COM |
| 96 | 96 | CB2 AUX NO |
| 98 | 98 | CB2 AUX NC |
| | | |

## SHORE POWER RAIL (OPTIONS INCLUDED)




| COMPONENT | DESCRIPTION |
|---|---|
| AHR | ALTERNATOR SPACE HEATER RELAY |
| AH_L1 | ALTERNATOR HEATER AC SUPPLY L1 |
| AH_L2 | ALTERNATOR HEATER AC SUPPLY L2 |
| F7 | ALTERNATOR HEATER FUSE L1 (8A) |
| F8 | ALTERNATOR HEATER FUSE L2 (8A) |
| GND | SHORE POWER GROUND |
| F9 | BATTERY CHARGR FUSE L1 (10A) |
| BC_L1 | BATTERY CHARGER AC SUPPLY L1 |
| BC_N | BATTERY CHARGER AC SUPPLY N |
| | |

*Effective with sales to the first user on or after August 1, 2016*

# CATERPILLAR LIMITED WARRANTY

## Industrial, Petroleum, Locomotive, and Agriculture Engine Products and Electric Power Generation Products

### Worldwide

Caterpillar Inc. or any of its subsidiaries ("Caterpillar") warrants new and remanufactured engines and new and rebuild electric power generation products sold by it (including any products of other manufacturers packaged and sold by Caterpillar), to be free from defects in material and workmanship.

This warranty does not apply engines sold for use in on-highway vehicle or marine applications; engines in machines manufactured by or for Caterpillar; C175, 3500 and 3600 series engines used in locomotive applications; 3000 Family engines, C0.5 through C4.4 and ACERT™ (C6.6, C7, C7.1, C9, C9.3, C11, C13, C15, C18, C27, and C32) engines used in industrial, mobile agriculture and locomotive applications; or Cat® batteries; or Electric Power Generation Products manufactured or assembled in India. These products are covered by other Caterpillar warranties.

This warranty is subject to the following:

**Warranty Period**

- For industrial engines, engines in a petroleum applications or Petroleum Power Systems (excluding petroleum fire pump application), or engines in a Locomotive application, or Uninterruptible Power Supply (UPS) systems, the warranty period is 12 months after date of delivery to the first user.
- For engines used in petroleum fire pump and mobile agriculture applications the warranty period is 24 months after date of delivery to the first user.
- For controls only (EPIC), configurable and custom switchgear products, and automatic transfer switch products, the warranty period is 24 months after date of delivery to the first user.
- For new CG132, CG170 and CG260 series power generation products the warranty period is 24 months/16,000 hours, whichever comes first, after date of delivery to first user.
- For electric power generation products other than CG132, CG170 and CG260 series in prime or continuous applications the warranty period is 12 months. For standby applications the warranty period is 24 months/1000 hours. For emergency standby applications the warranty period is 24 months/400 hours. All terms begin after date of delivery to the first user.
- For Caterpillar rebuild electric power generation products the warranty period is 12 months, but not to exceed 24 months from shipment of rebuilt electric power generation product from Caterpillar.
- For all other applications the warranty period is 12 months after date of delivery to the first user.

**Caterpillar Responsibilities**

If a defect in material or workmanship is found during the warranty period, Caterpillar will, during normal working hours and at a place of business of a Cat dealer or other source approved by Caterpillar:

- Provide (at Caterpillar's choice) new, Remanufactured, or Caterpillar approved repaired parts or assembled components needed to correct the defect.

**Note:** New, remanufactured, or Caterpillar approved repaired parts or assembled components provided under the terms of this warranty are warranted for the remainder of the warranty period applicable to the product in which installed as if such parts were original components of that product. Items replaced under this warranty become the property of Caterpillar.

- Replace lubricating oil, filters, coolant, and other service items made unusable by the defect.
- Provide reasonable and customary labor needed to correct the defect, including labor to disconnect the product from and reconnect the product to its attached equipment, mounting, and support systems, if required.

For new 3114, 3116, and 3126 engines and, new and Caterpillar rebuild electric power generation products (which includes the following: any new products of other manufacturers packaged and sold by Caterpillar)

- Provide travel labor, up to four hours round trip, if in the opinion of Caterpillar, the product cannot reasonably be transported to a place of business of a Cat dealer or other source approved by Caterpillar (travel labor in excess of four hours round trip, and any meals, mileage, lodging, etc. is the user's responsibility).

For all other products:

- Provide reasonable travel expenses for authorized mechanics, including meals, mileage, and lodging, when Caterpillar chooses to make the repair on-site.

**User Responsibilities**

The user is responsible for:

- Providing proof of the delivery date to the first user.
- Labor costs, except as stated under "Caterpillar Responsibilities," including costs beyond those required to disconnect the product from and reconnect the product to its attached equipment, mounting, and support systems.
- Travel or transporting costs, except as stated under "Caterpillar Responsibilities."
- Premium or overtime labor costs.
- Parts shipping charges in excess of those that are usual and customary.
- Local taxes, if applicable.
- Costs to investigate complaints, unless the problem is caused by a defect in Caterpillar material or workmanship.
- Giving timely notice of a warrantable failure and promptly making the product available for repair.
- Performance of the required maintenance (including use of proper fuel, oil, lubricants, and coolant) and items replaced due to normal wear and tear.
- Allowing Caterpillar access to all electronically stored data.

**Limitations**

Caterpillar is not responsible for:

- Failures resulting from any use or installation that Caterpillar judges improper.
- Failures resulting from attachments, accessory items, and parts not sold or approved by Caterpillar.
- Failures resulting from abuse, neglect, and/or improper repair.
- Failures resulting from user's delay in making the product available after being notified of a potential product problem.
- Failures resulting from unauthorized repairs or adjustments, and unauthorized fuel setting changes.
- Damage to parts, fixtures, housings, attachments, and accessory items that are not part of the engine, Cat Selective Catalytic Reduction System or electric power generation product (including any products of other manufacturers packaged and sold by Caterpillar).
- Repair of components sold by Caterpillar that is warranted directly to the user by their respective manufacturer. Depending on type of application, certain exclusions may apply. Consult your Cat dealer for more information.

*(Continued on reverse side…)*

This warranty covers every major component of the products. Claims under this warranty should be submitted to a place of business of a Cat dealer or other source approved by Caterpillar. For further information concerning either the location to submit claims or Caterpillar as the issuer of this warranty, write Caterpillar Inc., 100 N. E. Adams St., Peoria, IL USA 61629.

Caterpillar's obligations under this Limited Warranty are subject to, and shall not apply in contravention of, the laws, rules, regulations, directives, ordinances, orders, or statutes of the United States, or of any other applicable jurisdiction, without recourse or liability with respect to Caterpillar.

*A) For products operating outside of Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:*

**NEITHER THE FOREGOING EXPRESS WARRANTY NOR ANY OTHER WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED, IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS THAT IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.**

**THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EXCEPT CATERPILLAR EMISSION-RELATED COMPONENTS WARRANTIES FOR NEW ENGINES, WHERE APPLICABLE. REMEDIES UNDER THIS WARRANTY ARE LIMITED TO THE PROVISION OF MATERIAL AND SERVICES, AS SPECIFIED HEREIN.**

**CATERPILLAR IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

**CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.**

**IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS IS EXCLUDED IN ITS ENTIRETY.**

For personal or family use engines or electric power generation products, operating in the USA, its territories and possessions, some states do not allow limitations on how long an implied warranty may last nor allow the exclusion or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary by jurisdiction. To find the location of the nearest Cat dealer or other authorized repair facility, call (800) 447-4986. If you have questions concerning this warranty or its applications, call or write:

In USA and Canada: Caterpillar Inc., Engine Division, P. O. Box 610, Mossville, IL 61552-0610, Attention: Customer Service Manager, Telephone (800) 447-4986. Outside the USA and Canada: Contact your Cat dealer.

*B) For products operating in Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:*

T**HIS WARRANTY IS IN ADDITION TO WARRANTIES AND CONDITIONS IMPLIED BY STATUTE AND OTHER STATUTORY RIGHTS AND OBLIGATIONS THAT BY ANY APPLICABLE LAW CANNOT BE EXCLUDED, RESTRICTED OR MODIFIED ("MANDATORY RIGHTS"). ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED (BY STATUTE OR OTHERWISE), ARE EXCLUDED. WITHOUT LIMITING THE FOREGOING PROVISIONS OF THIS PARAGRAPH, WHERE A PRODUCT IS SUPPLIED FOR BUSINESS PURPOSES, THE CONSUMER GUARANTEES UNDER THE CONSUMER GUARANTEES ACT 1993 (NZ) WILL NOT APPLY.**

**NEITHER THIS WARRANTY NOR ANY OTHER CONDITION OR WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED (SUBJECT ONLY TO THE MANDATORY RIGHTS), IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS THAT IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.**

**IF THE MANDATORY RIGHTS MAKE CATERPILLAR LIABLE IN CONNECTION WITH SERVICES OR GOODS, THEN TO THE EXTENT PERMITTED UNDER THE MANDATORY RIGHTS, THAT LIABILITY SHALL BE LIMITED AT CATERPILLAR'S OPTION TO (a) IN THE CASE OF SERVICES, THE SUPPLY OF THE SERVICES AGAIN OR THE PAYMENT OF THE COST OF HAVING THE SERVICES SUPPLIED AGAIN AND (b) IN THE CASE OF GOODS, THE REPAIR OR REPLACEMENT OF THE GOODS, THE SUPPLY OF EQUIVALENT GOODS, THE PAYMENT OF THE COST OF SUCH REPAIR OR REPLACEMENT OR THE ACQUISITION OF EQUIVALENT GOODS.**

**CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.**

**CATERPILLAR IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES UNLESS IMPOSED UNDER MANDATORY RIGHTS.**

**IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS IS EXCLUDED IN ITS ENTIRETY.**

*C) For products supplied in Australia:*

**IF THE PRODUCTS TO WHICH THIS WARRANTY APPLIES ARE:**

- **I. PRODUCTS OF A KIND ORDINARILY ACQUIRED FOR PERSONAL, DOMESTIC OR HOUSEHOLD USE OR CONSUMPTION; OR**
- **II. PRODUCTS THAT COST AUD 40,000 OR LESS,**

**WHERE THOSE PRODUCTS WERE NOT ACQUIRED FOR THE PURPOSE OF RE-SUPPLY OR FOR THE PURPOSE OF USING THEM UP OR TRANSFORMING THEM IN THE COURSE OF PRODUCTION OR MANUFACTURE OR IN THE COURSE OF REPAIRING OTHER GOODS OR FIXTURES, THEN THIS SECTION C APPLIES.**

**THE FOLLOWING MANDATORY TEXT IS INCLUDED PURSUANT TO THE AUSTRALIAN CONSUMER LAW AND INCLUDES REFERENCES TO RIGHTS THE USER MAY HAVE AGAINST THE DIRECT SUPPLIER OF THE PRODUCTS: OUR GOODS COME WITH GUARANTEES THAT CANNOT BE EXCLUDED UNDER THE AUSTRALIAN CONSUMER LAW. YOU ARE ENTITLED TO A REPLACEMENT OR REFUND FOR A MAJOR FAILURE AND COMPENSATION FOR ANY OTHER REASONABLY FORESEEABLE LOSS OR DAMAGE. YOU ARE ALSO ENTITLED TO HAVE THE GOODS REPAIRED OR REPLACED IF THE GOODS FAIL TO BE OF ACCEPTABLE QUALITY AND THE FAILURE DOES NOT AMOUNT TO A MAJOR FAILURE. THE INCLUSION OF THIS TEXT DOES NOT CONSTITUTE ANY REPRESENTATION OR ACCEPTANCE BY CATERPILLAR OF LIABILITY TO THE USER OR ANY OTHER PERSON IN ADDITION TO THAT WHICH CATERPILLAR MAY HAVE UNDER THE AUSTRALIAN CONSUMER LAW.**

**TO THE EXTENT THE PRODUCTS FALL WITHIN THIS SECTION C BUT ARE NOT OF A KIND ORDINARILY ACQUIRED FOR PERSONAL, DOMESTIC OR HOUSEHOLD USE OR CONSUMPTION, CATERPILLAR LIMITS ITS LIABILITY TO THE EXTENT IT IS PERMITTED TO DO SO UNDER THE AUSTRALIAN CONSUMER LAW TO, AT ITS OPTION, THE REPAIR OR REPLACEMENT OF THE PRODUCTS, THE SUPPLY OF EQUIVALENT PRODUCTS, OR THE PAYMENT OF THE COST OF SUCH REPAIR OR REPLACEMENT OR THE ACQUISITION OF EQUIVALENT PRODUCTS.**

**THE WARRANTY SET OUT IN THIS DOCUMENT IS GIVEN BY CATERPILLAR INC. OR ANY OF ITS SUBSIDIARIES, 100 N. E. ADAMS ST, PEORIA, IL USA 61629, TELEPHONE 1 309 675 1000, THE USER IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH MAKING A CLAIM UNDER THE WARRANTY SET OUT IN THIS DOCUMENT, EXCEPT AS EXPRESSLY STATED OTHERWISE IN THIS DOCUMENT, AND THE USER IS REFERRED TO THE BALANCE OF THE DOCUMENT TERMS CONCERNING CLAIM PROCEDURES, CATERPILLAR RESPONSIBILITIES AND USER RESPONSIBILITIES.**

**TO THE EXTENT PERMISSIBLE BY LAW, THE TERMS SET OUT IN THE REMAINDER OF THIS WARRANTY DOCUMENT (INCLUDING SECTION B) CONTINUE TO APPLY TO PRODUCTS TO WHICH THIS SECTION C APPLIES.**

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