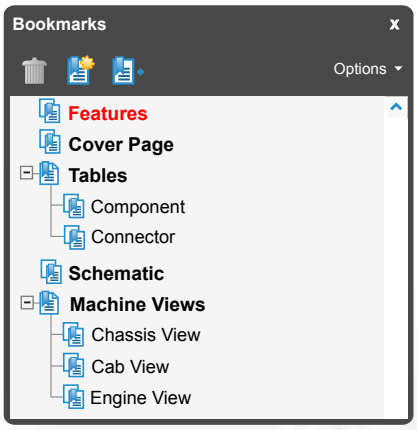
# INTERACTIVE SCHEMATIC

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Select **PROPERTIES**.
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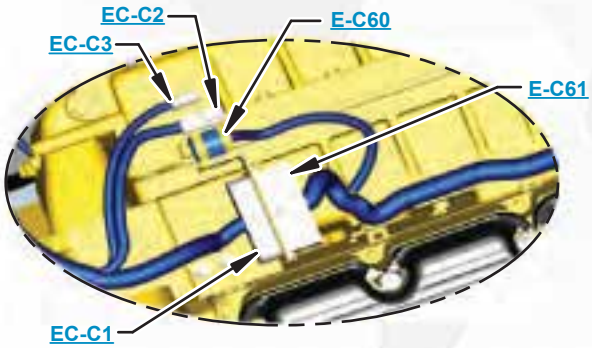


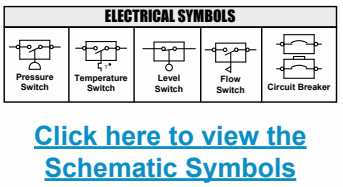

**Click on any text that is BLUE and underlined. These are hyperlinks that can be used to navigate the schematic and machine views.**

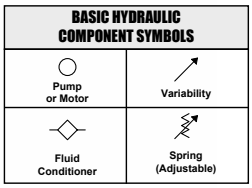
Click here to save a copy of this interactive schematic to your desktop

VIEW ALL CALLOUTS

**When only one callout is showing on a machine view, clicking on this button will make all of the callouts visible. This button is located in the top right corner of every machine view page.**

| HOTKEYS (Keyboard Shortcuts) | | |
|---|---|---|
| | **FUNCTION** | **KEYS** |
| | Zoom In | "CTRL" / "+" |
| | Zoom Out | "CTRL" / "-" |
| | Fit to Page | "CTRL" / "0" (zero) |
| | Hand Tool | "SPACEBAR" (hold down) |
| | Find | "CTRL" / "F" |
| | Search | "CTRL" / "SHIFT" / "F" |




Click here to view the Schematic Symbols and Definitions page

CATERPILLAR®

UENR7833
June 2016

# Schematic

## G3412C Generator Set with EMCP 4.2 Electrical System

**SPY1-UP**

**Volume 1 of 2: Engine**
**Volume 2 of 2: EMCP 4.2**



Printed in U.S.A.

# SCHEMATIC SYMBOLS AND DEFINITIONS

## VALVES

**ENVELOPES**

One Position | Two Position | Three Position

**PORTS**

Two-way | Three-Way | Four-Way

**CONTROL**

Normal Position (A B / P T) | Shifted Position (A B / P T) | Infinite Position

**CHECK**

Basic Symbol | Spring Loaded | Shuttle | Pilot Controlled

## INTERNAL PASSAGEWAYS

| FLOW IN ONE DIRECTION | FLOW ALLOWED IN EITHER DIRECTION | PARALLEL FLOW / CROSS FLOW |
|---|---|---|
| Infinite Positioning | Two Position | Three Position |

## CYLINDERS

Single Acting | Double Acting

## ACCUMULATORS

Spring Loaded | Gas Charged

## PUMPS

**FIXED DISPLACEMENT**

Unidirectional | Bidirectional

**VARIABLE DISPLACEMENT NON- COMPENSATED**

Unidirectional | Bidirectional

## MOTORS

**FIXED DISPLACEMENT**

Unidirectional | Bidirectional

**VARIABLE DISPLACEMENT NON- COMPENSATED**

Unidirectional | Bidirectional

## ROTATING SHAFTS

Unidirectional | Bidirectional

## BASIC HYDRAULIC COMPONENT SYMBOLS

| | |
|---|---|
| Pump or Motor | Variability |
| Fluid Conditioner | Spring (Adjustable) |
| Spring | Pressure Compensation |
| Control Valves | Line Restriction (Variable) |
| Restriction | Line Restriction (Fixed) |
| Line Restriction Variable and Pressure Compensated | MAIN AUX. 2-Section Pump |
| Attachment | Pump: Variable and Pressure Compensated |

Hydraulic Energy Triangles | Pneumatic

## PILOT CONTROL

**RELEASED PRESSURE**

External Return | Internal Return

**REMOTE SUPPLY PRESSURE**

Simplified | Complete | Internal Supply Pressure

## COMBINATION CONTROLS

Solenoid | Solenoid or Manual | Solenoid and Pilot | Solenoid and Pilot or Manual | Servo | Thermal | Detent

## LINES

Crossing | Joining

## MEASUREMENT

Pressure | Temperature | Flow

## MANUAL CONTROL

Push-pull Lever | Manual Shutoff | General Manual | Push Button | Pedal | Spring

## FLUID STORAGE RESERVOIRS

Vented | Pressurized | Return Above Fluid Level | Return Below Fluid Level

## HYDRAULIC SYMBOLS - ELECTRICAL

Transducer (Fluid) | Transducer (Gas / Air) | Generator | Electric Motor | Pressure Switch | Pressure Switch (Adjustable) | Temperature Switch | Electrical Wire

## ELECTRICAL SYMBOLS

Pressure Switch | Temperature Switch | Level Switch | Flow Switch | Circuit Breaker

## BASIC ELECTRICAL COMPONENT SYMBOLS

**Fuse:** A component in an electrical circuit that will open the circuit if too much current flows through it.

**Switch (Normally Open):** A switch that will close at a specified point (temp, press, etc.). The circle indicates that the component has screw terminals and a wire can be disconnected from it.

**Switch (Normally Closed):** A switch that will open at a specified point (temp, press, etc.). No circle indicates that the wire cannot be disconnected from the component.

**Ground (Wired):** This indicates that the component is connected to a grounded wire. The grounded wire is fastened to the machine.

**Ground (Case):** This indicates that the component does not have a wire connected to ground. It is grounded by being fastened to the machine.

**Reed Switch:** A switch whose contacts are controlled by a magnet. A magnet closes the contacts of a normally open reed switch; it opens the contacts of a normally closed reed switch.

**Sender:** A component that is used with a temperature or pressure gauge. The sender measures the temperature or pressure. Its resistance changes to give an indication to the gauge of the temperature or pressure.

**Relay (Magnetic Switch):** A relay is an electrical component that is activated by electricity. It has a coil that makes an electromagnet when current flows through it. The electromagnet can open or close the switch part of the relay.

**Solenoid:** A solenoid is an electrical component that is activated by electricity. It has a coil that makes an electromagnet when current flows through it. The electromagnet can open or close a valve or move a piece of metal that can do work.

**Magnetic Latch Solenoid:** An electrical component that is activated by electricity and held latched by a permanent magnet. It has two coils (latch and unlatch) that make electromagnet when current flows through them. It also has an internal switch that places the latch coil circuit open at the time the coil latches.

## HARNESS AND WIRE SYMBOLS

**Wire, Cable, or Harness Assembly Identification:** Includes Harness Identification Letters and Harness Connector Serialization Codes (see sample).

AG-C4 111-7898 | L-C12 3E-5179

**Part Number:** for Connector Plug

1 2

Plug | Receptacle Pin or Socket Number

**Harness Identification Letter(s):** (A, B, C, AA, AB, AC, ...)

**Harness Connector Serialization Code:** The "C" stands for "Connector" and the number indicates which connector in the harness (C1, C2, C3, ...)

L-C12 3E-5179

5A

**Fuse** (5 Amps)

9X-1123 Component Part Number

325-AG135 PK-14

**Harness identification code:** This example indicates wire group 325, wire 135 in harness "AG".

Wire Gauge | Wire Color

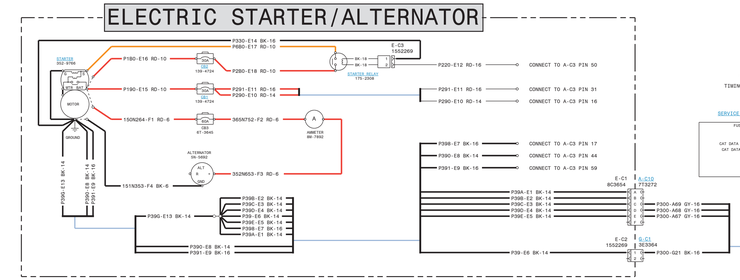
1 2

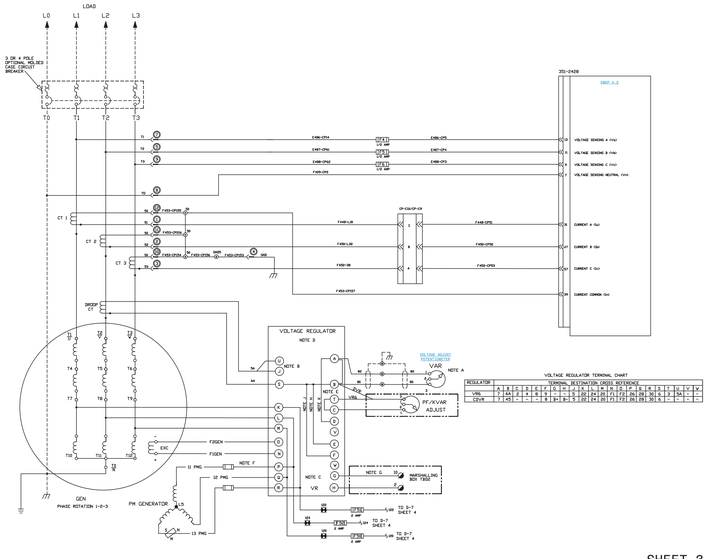
**Deutsch connector:** Typical representation of a Deutsch connector. The plug contains all sockets and the receptacle contains all pins.

1 2

**Sure-Seal connector:** Typical representation of a Sure-Seal connector. The plug and receptacle contain both pins and sockets.

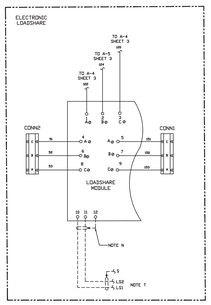
# ELECTRIC STARTER/ALTERNATOR

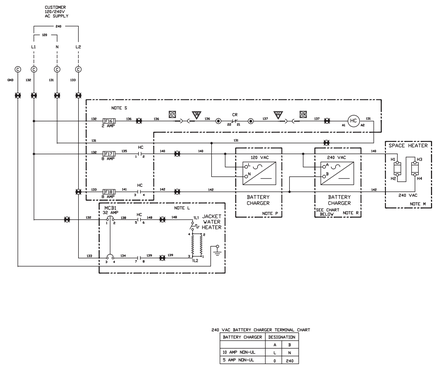





AC SCHEMATIC

SHEET 3




240 VAC BATTERY CHARGER TERMINAL CHART

| BATTERY CHARGER | DESIGNATION |
|---|---|
| | A | B |
| 10 AMP NON-UL | L | N |
| 5 AMP NON-UL | 0 | 240 |

AC OPTIONS

SHEET 4

ABBREVIATIONS

| | | | |
|---|---|---|---|
| ALT | ALTERNATOR | N | NEUTRAL |
| AUX | AUXILIARY TERMINAL STRIP | NC | NORMALLY CLOSED |
| | | NO | NORMALLY OPEN |
| BAT, BATT | BATTERY | PL | PANEL LIGHT |
| BC | BATTERY CHARGER | PLS | PANEL LIGHT SWITCH |
| BCF | BATTERY CHARGER FAILURE SWITCH | POT | POTENTIOMETER |
| | | PS | PINION SOLENOID |
| CB | CIRCUIT BREAKER | RAN | REMOTE ANNUNCIATOR |
| CDVR | CUSTOMER DIGITAL VOLTAGE REGULATOR | RR | RUN RELAY |
| CR | CONTROL RELAY | SHD | SHUTDOWN |
| CT | CURRENT TRANSFORMER | SHTC | SHUNT TRIP BREAKER SHUNT TRIP COIL |
| CTR | CRANK TERMINATION RELAY | SM | STARTING MOTOR |
| D | DIODE | SMMS | STARTING MOTOR MAGNETIC SWITCH |
| DDTC | DIAGNOSTIC TOOL CONNECTOR | SMR | STARTING MOTOR RELAY |
| DI | DIGITAL INPUT | SP | SPEED ADJUST POTENTIOMETER |
| DISN | DIGITAL IGNITION SYS | TB | TERMINAL BLOCK |
| DO | DIGITAL OUTPUT | TDB | TERMINAL BOX |
| DRS | DIAGNOSTIC RESET SWITCH | TM | TRANSFORMER |
| ECLS | ENGINE COOLANT LOSS SENSOR | VAR | VOLTAGE ADJUST RHEOSTAT |
| ECS | ENGINE CONTROL SWITCH | VR | VOLTAGE REGULATOR |
| ECTS | ENGINE COOLANT TEMPERATURE SENSOR | | |
| EFR | ENGINE FAILURE RELAY | | |
| EGA | ELECTRONIC GOVERNOR ACTUATOR | | |
| EGR | ELECTRONIC GOVERNOR RELAY | | |
| EHS | ENGINE HEATER SWITCH | | |
| EMFR | ENGINE FAILURE RELAY | | |
| EOPS | ENGINE OIL PRESSURE SENSOR | | |
| EOTS | ENGINE OIL TEMPERATURE SENSOR | | |
| ESSR | ENGINE SHUTDOWN RELAY | | |
| ESPB | EMERGENCY STOP PUSH BUTTON | | |
| ESTS | EMERGENCY STOP SWITCH ON ENCLOSURE | | |
| F | FUSE | | |
| FCR | FUEL CONTROL RELAY | | |
| GFR | GENSET FAULT RELAY | | |
| GDV | GOVERNOR | | |
| GRR | GENERATOR RUN RELAY | | |
| GSC | GENERATOR SET CONTROL | | |
| GSDV | GAS SHUTOFF VALVE | | |
| GND | GROUND | | |
| HC | HEATER CONTACTOR | | |
| HATS | HIGH INLET AIR TEMPERATURE SWITCH | | |
| IC | REMOTE START/STOP INITIATE CONTACT | | |
| ISRR | IGNITION SHUTDOWN RELAY | | |
| KW/R | KILOWATT RELAY | | |
| L | LINE | | |
| LSM | LOAD SHARE MODULE | | |
| MCB | MARSHALLING BOX CIRCUIT BREAKER | | |
| MPU | MAGNETIC SPEED PICKUP | | |

SYMBOLS

- STANDARD WIRING
- CUSTOMER WIRING
- IDENTIFIER FOR PACKAGE OPTIONS
- ALTERNATIVE WIRING
- SHIELDED WIRE
- ENGINE MOUNTED COMPONENT
- RELAY CONTACT (NORMALLY OPEN)
- RELAY CONTACT (NORMALLY OPEN)
- RELAY CONTACT (NORMALLY CLOSED)
- RELAY CONTACT (NORMALLY CLOSED)
- EARTH GROUND
- SOLENOID
- SOLENOID
- RESISTOR
- RESISTOR
- TEMPERATURE SWITCH
- TEMPERATURE SWITCH
- LIQUID LEVEL SWITCH
- LIQUID LEVEL SWITCH
- LAMP
- BREAKDOWN DIODE BIDIRECTIONAL
- BREAKDOWN DIODE BIDIRECTIONAL
- DIODE
- DIODE
- FUSE
- FUSE
- EMERGENCY SWITCH
- RELAY COIL
- RELAY COIL
- CIRCUIT BREAKER
- CIRCUIT BREAKER
- GAS ENGINE TERMINAL
- MARSHALLING BOX 3C TERMINAL
- MARSHALLING BOX 4C TERMINAL
- CONTROL PANEL TERMINAL
- PANEL 70 WAY CONNECTOR
- 3C CONNECTOR NO. 1 (BLACK)
- 3C CONNECTOR NO. 2 (GREY)
- AC CONNECTOR FROM GEN (GREEN)
- MARSHALLING BOX 40 WAY DC CONNECTOR
- MARSHALLING BOX 40 WAY AC CONNECTOR
- MARSHALLING BOX CUSTOMER DC TERMINAL
- MARSHALLING BOX CUSTOMER AC TERMINAL
- MAGNETIC PICK-UP ENGINE CONNECTOR
- COOLANT TEMPERATURE ENGINE CONNECTOR (ECTS)
- OIL PRESSURE ENGINE CONNECTOR (EOPS)
- COOLANT LOSS ENGINE CONNECTOR (ECLS)
- OIL TEMPERATURE ENGINE CONNECTOR (EOTS)
- ENGINE 70 WAY CONNECTOR
- ELECTRONIC GOVERNOR ACTUATOR ENGINE CONNECTOR
- DIGITAL DIAGNOSTIC TOOL CONNECTOR




DC SCHEMATIC

SHEET 5




SENSORS AND SPARES

SHEET 6





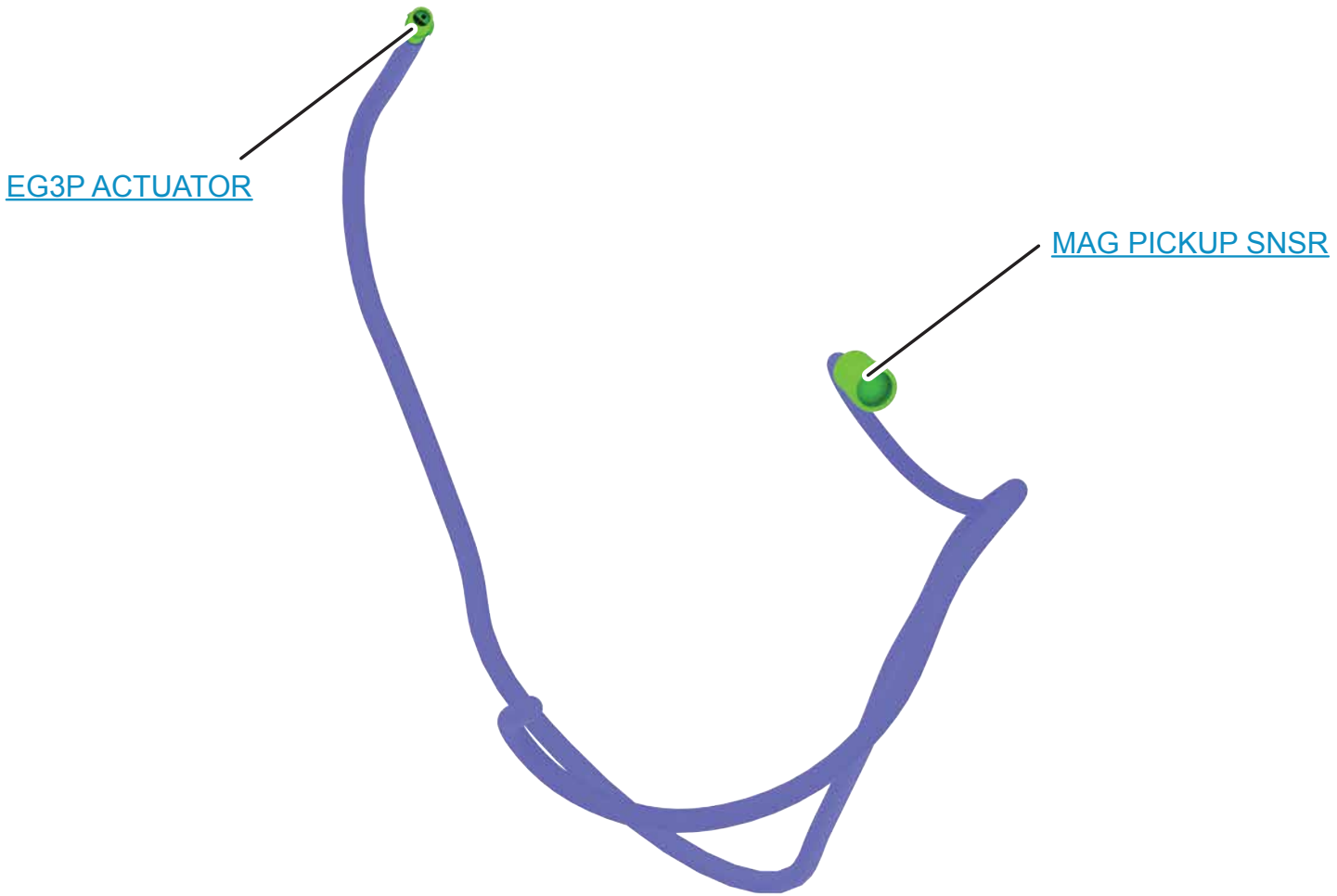


DC OPTIONS

SHEET 7

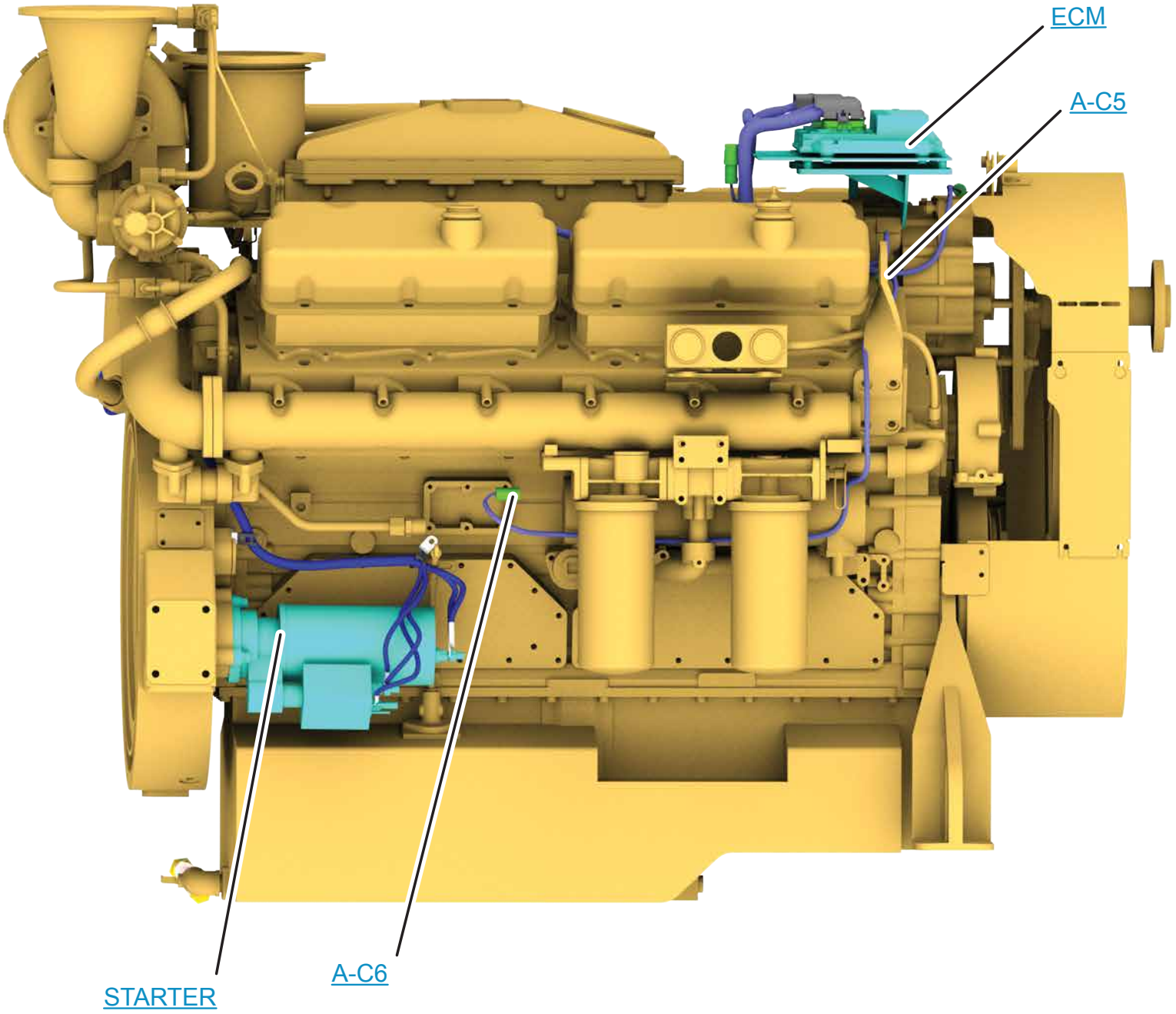
# C - HARNESS

VIEW ALL CALLOUTS



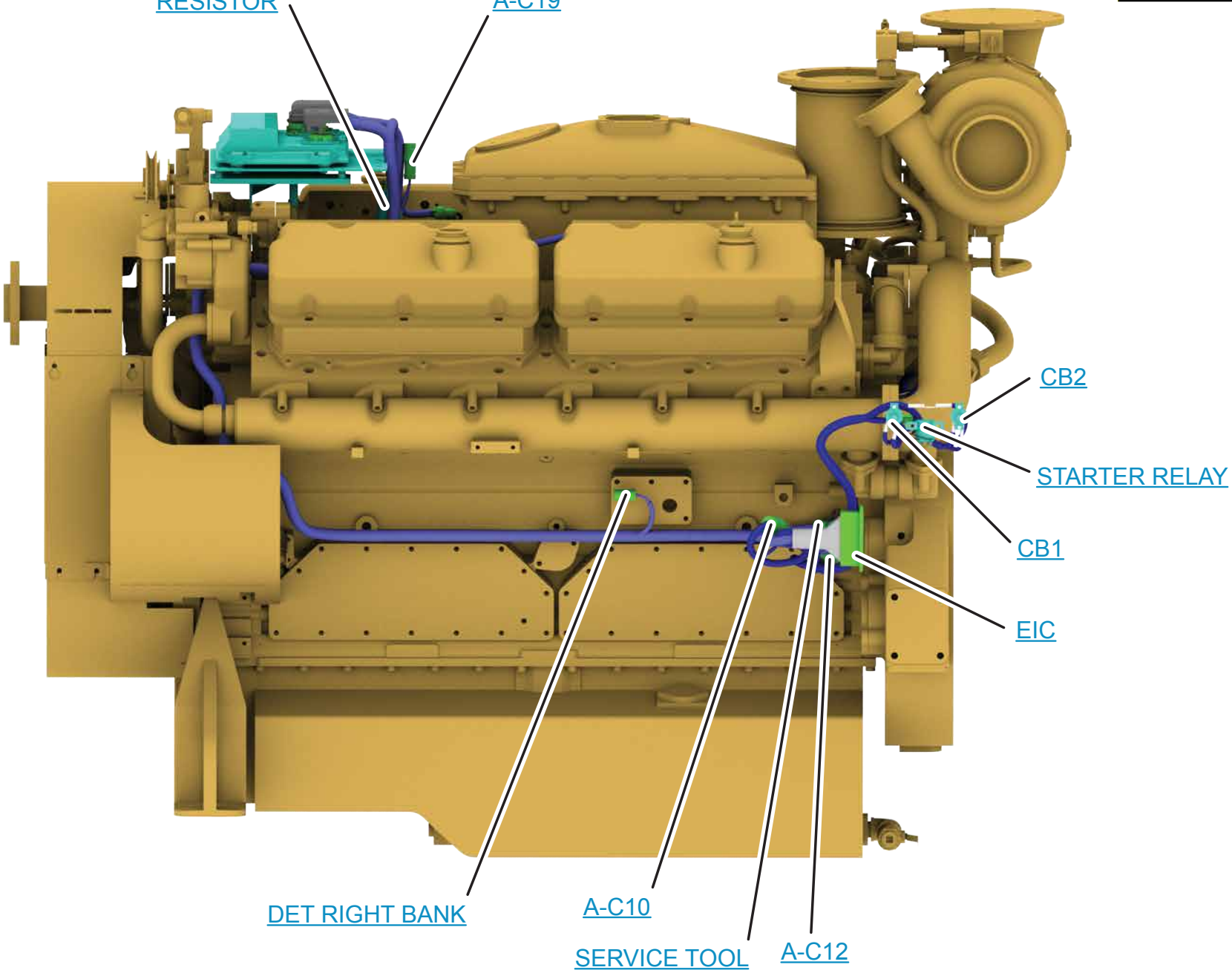
# ENGINE - LEFT SIDE VIEW

VIEW ALL CALLOUTS



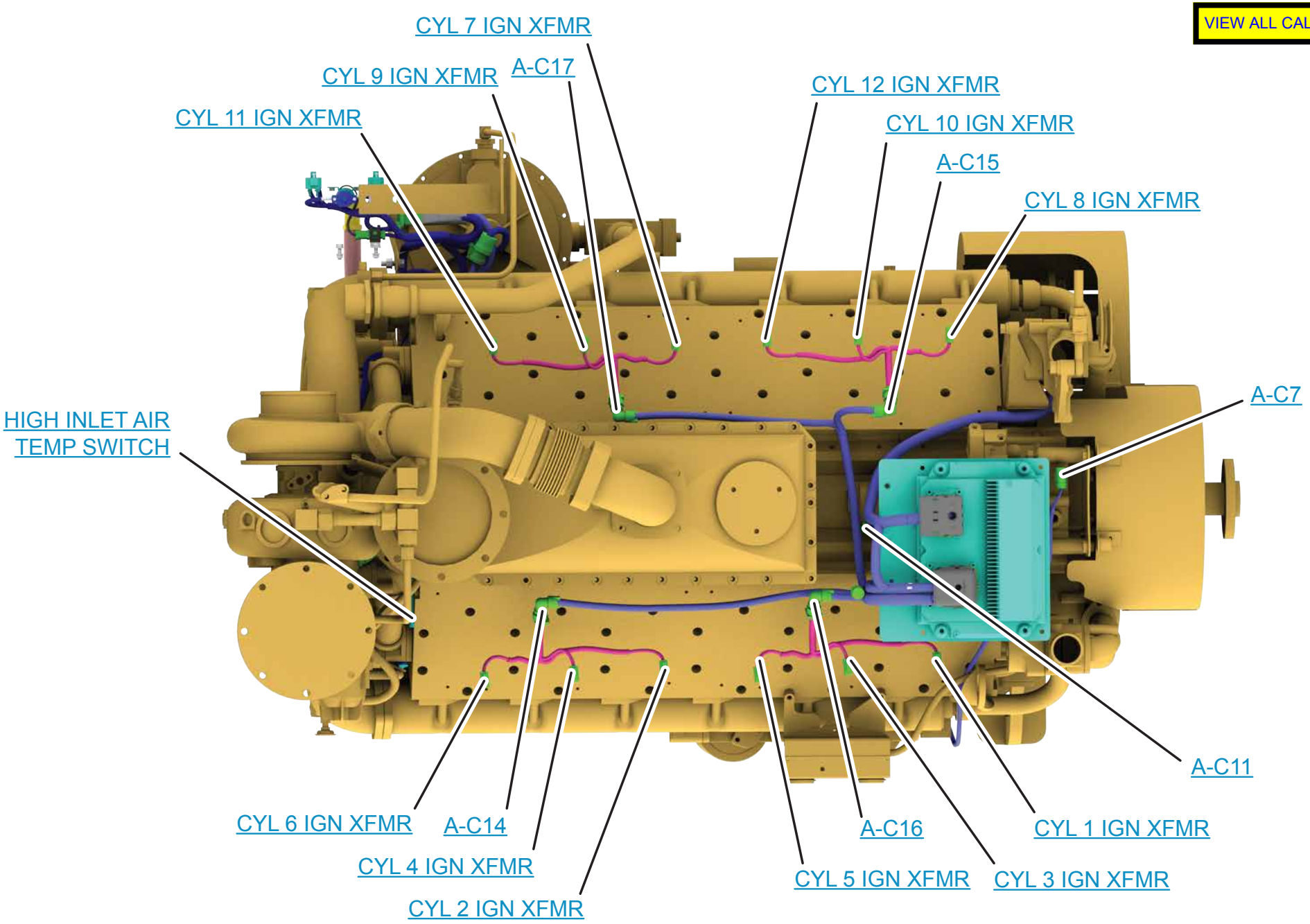
# ENGINE - RIGHT SIDE VIEW

VIEW ALL CALLOUTS



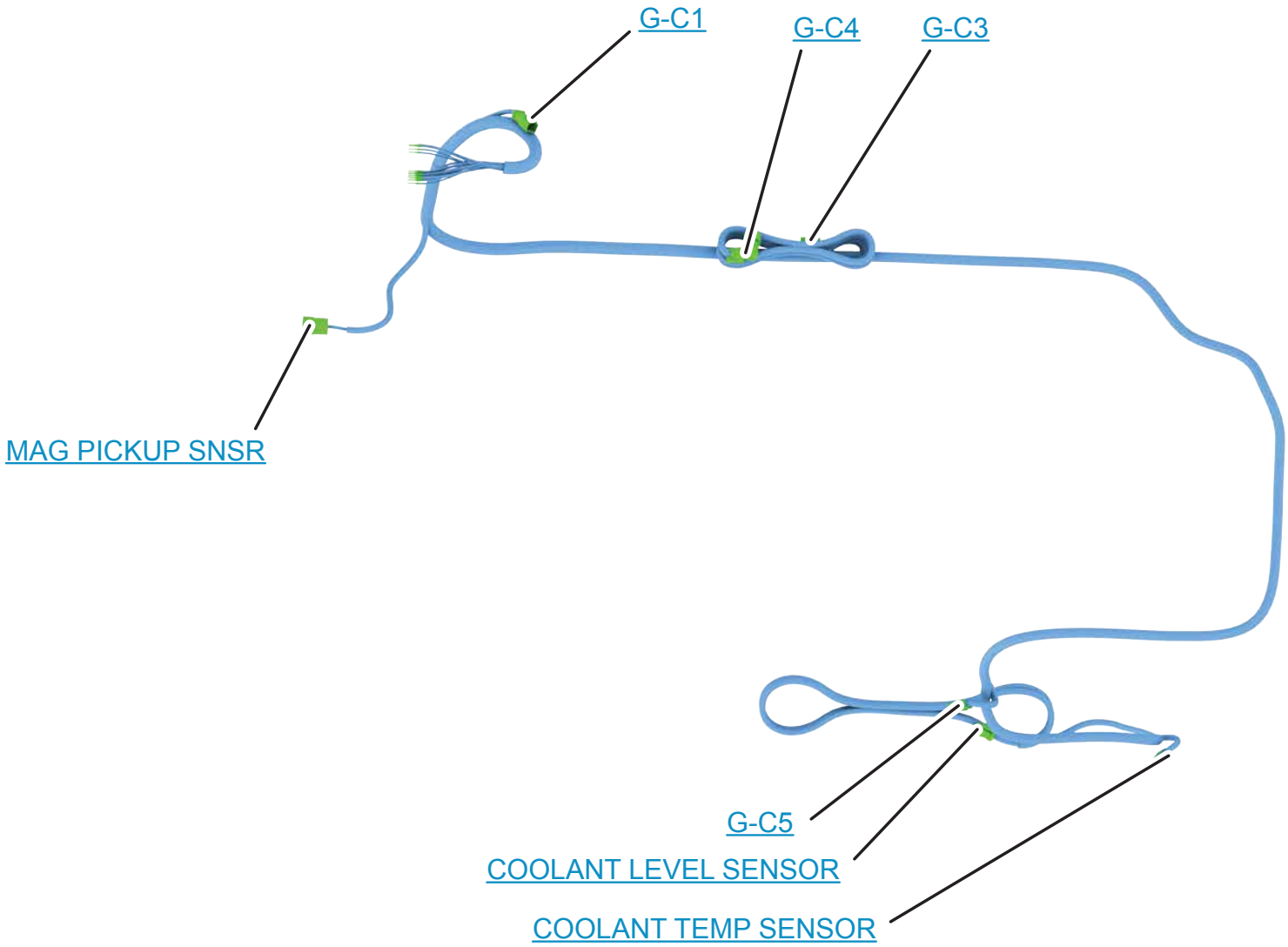
# ENGINE - TOP VIEW

VIEW ALL CALLOUTS



# G - HARNESS

VIEW ALL CALLOUTS



# PANEL BOX (EMCP 4.2)

VIEW ALL CALLOUTS