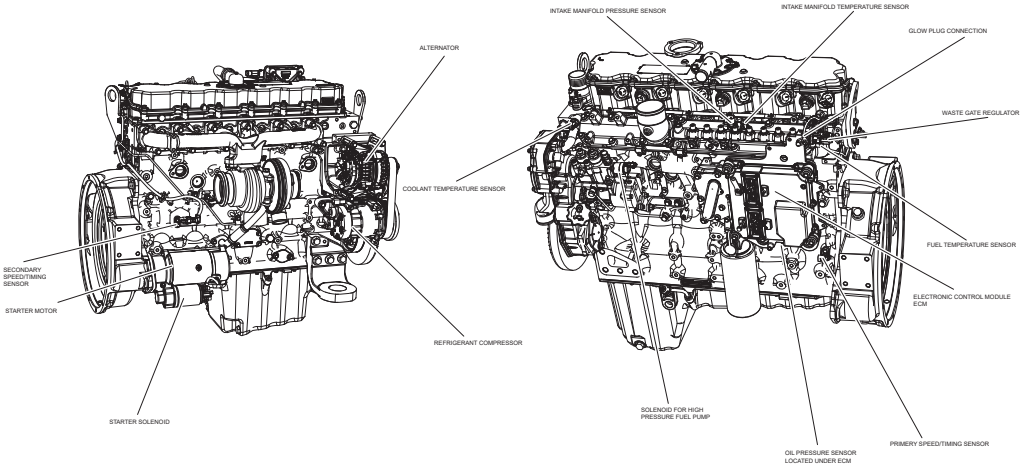



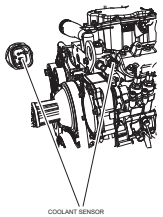

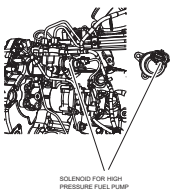

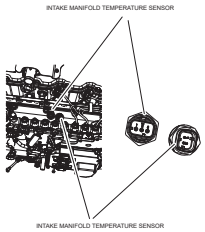

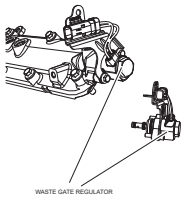

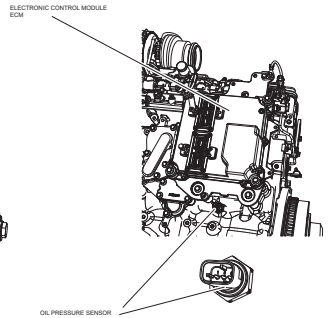

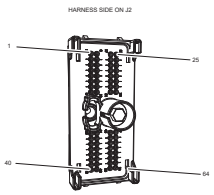

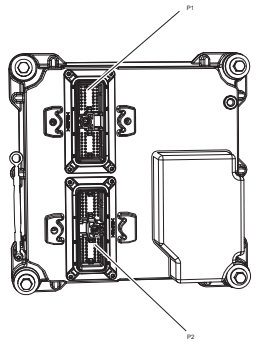

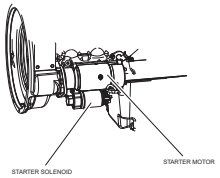

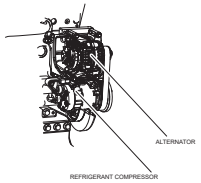

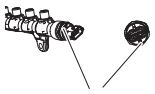

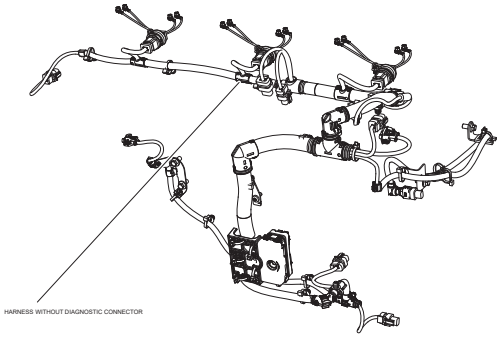

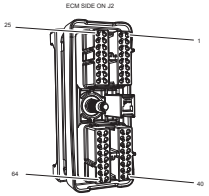

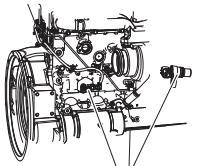

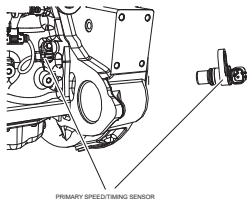

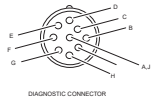

CAT

UENR0630-02
April 2025

Schematic

C7.1 Industrial Engine
Electrical System

G3R 1-UP

PUBLICATIONS.CAT.COM

Harness And Wire Electrical Schematic Symbols

Symbols

Pressure Symbol | Temperature Symbol | Level Symbol | Flow Symbol | Circuit Breaker Symbol

Symbols and Definitions

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: A magnetic latch solenoid is 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 | L-C12 3E-5179

Part Number: for Connector Plug

Plug

1 2

Receptacle
Pin or Socket Number

Part Number: for Connector Receptacle

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, ...).

Fuse (5 Amps)

9K-1123 — Component Part Number

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

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

325-AG135 PK-14

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

Wire Gauge/ Wire Color

"Wire gauge is shown in AWG (American Wire Gauge) but could also be shown in metric denoted with mm"

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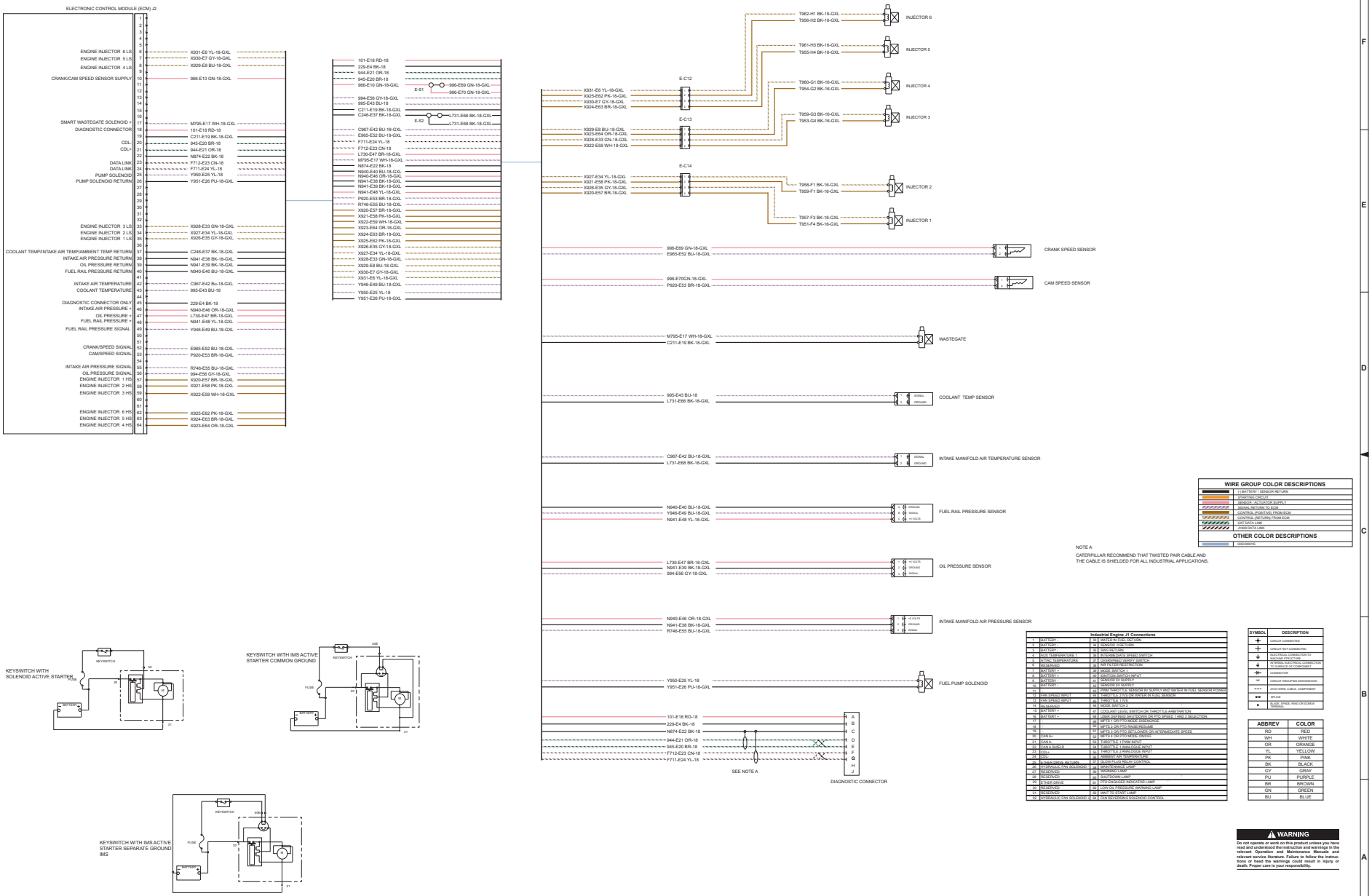
UENR0630-02
30 Page; (Dimensions: 39 inches x 28 inches)



WIRE GROUP COLOR DESCRIPTIONS

	BATTERY / SENSOR RETURN
	STARTING CIRCUIT
	SENSOR / ACTUATOR SUPPLY
	SIGNAL RETURN TO ECM
	CONTROL (POSITIVE) FROM ECM
	CONTROL (RETURN) FROM ECM
	CAT DATA LINK
	J1939 DATA LINK

OTHER COLOR DESCRIPTIONS

	HIGHWAYS

NOTE A
CATERPILLAR RECOMMEND THAT TWISTED PAIR CABLE AND THE CABLE IS SHIELDED FOR ALL INDUSTRIAL APPLICATIONS.

Industrial Engine J1 Connections

1	BATTERY -	31	KEYSWITCH (IMS) RETURN
2	BATTERY -	32	SENSOR 5 VOLTS RETURN
3	BATTERY -	33	MDE SWITCH
4	AUX. TEMPERATURE +	34	IN TRANSMISSION SPEED SWITCH
5	AUX. TEMPERATURE -	35	OUT TRANSMISSION SPEED SWITCH
6	SOLENOID	36	VSS PS (SAE PS) RETURN
7	BATTERY +	37	MDE SWITCH
8	BATTERY +	38	SENSOR SUPPLY OUT
9	BATTERY +	39	SENSOR SUPPLY
10	BATTERY -	40	SENSOR SUPPLY
11	-	41	PWM THROTTLE SENSOR 5V SUPPLY AND WATER IN FUEL SENSOR POWER
12	CAN SPEED INPUT	42	THROTTLE 2 VOLT OR WATER IN FUEL SENSOR
13	CAN SPEED INPUT	43	THROTTLE 1 VOLT
14	SOLENOID	44	MDE SWITCH
15	BATTERY +	45	COOLANT LEVEL SWITCH OR THROTTLE ASSERTATION
16	BATTERY +	46	USER DEFINED SHUTDOWN OR PTO SPEED 1 AND 2 SELECTION
17	-	47	MP10 (-) OR PTO RATE CONTROL
18	-	48	MP10 (+) OR PTO ENABLE/RESUME
19	-	49	MP10 OR PTO MODE/DECEL/SET INTERMEDIATE SPEED
20	CAN A+	50	MP10 OR PTO MODE ON/OFF
21	CAN A-	51	THROTTLE 1 PWM INPUT
22	CAN A SHIELD	52	THROTTLE 1 ANALOGUE INPUT
23	CDL+	53	THROTTLE 2 ANALOGUE INPUT
24	CDL-	54	INDUCT AIR TEMPERATURE
25	ALTHER DRIVE RETURN	55	GLOW PLUG RELAY CONTROL
26	HYDRAULIC FAN SOLENOID	56	MAINTENANCE LAMP
27	RESERVED	57	WARNING LAMP
28	RESERVED	58	SHUTDOWN LAMP
29	ALTHER DRIVE	59	PTT ENGAGED INDICATOR LAMP
30	RESERVED	60	LOW OIL PRESSURE WARNING LAMP
31	RESERVED	61	MPT 10 SWITCH LAMP
32	HYDRAULIC FAN SOLENOID	62	FAN REVERSING SOLENOID CONTROL

SYMBOL	DESCRIPTION
	CIRCUIT CONNECTED
	CIRCUIT NOT CONNECTED
	ELECTRICAL CONNECTION TO MACHINE STRUCTURE
	INTERNAL ELECTRICAL CONNECTION TO A SPECIFIC ISP COMPONENT
	CONNECTOR
	CIRCUIT GROUPING DESIGNATION
	ATCH WIRE, CABLE, COMPONENT
	SPLICE
	BLADE, SPADE, RING OR SCREW TERMINAL

ABBREV	COLOR
RD	RED
WH	WHITE
OR	ORANGE
YL	YELLOW
PK	PINK
BK	BLACK
GY	GRAY
PU	PURPLE
BR	BROWN
GN	GREEN
BU	BLUE

⚠ WARNING

Do not operate or work on this product unless you have read and understood the instruction and warnings in the relevant Operation and Maintenance Manuals and relevant service literature. Failure to follow the instructions or head the warnings could result in injury or death. Proper care is your responsibility.

THIS SCHEMATIC IS FOR THE C7.1 (G9R) INDUSTRIAL ENGINE ELECTRICAL SYSTEM
MEDIA NUMBER: UENR0630-02
Components are shown installed on a fully operable engine in a non powered state.
Refer to the appropriate Service Manual for Troubleshooting, Specifications and Systems Operations.
Refer to the Parts Manual using a specific serial number prefix in SIS before ordering parts from this schematic.