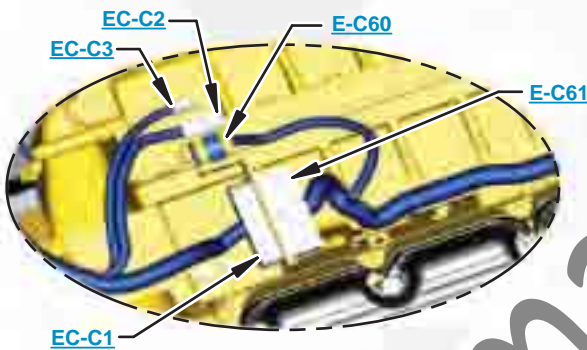




This document is best viewed at a screen resolution of 1024 X 768.

To set your screen resolution do the following:
RIGHT CLICK on the **DESKTOP**.
 Select **PROPERTIES**.
CLICK the **SETTINGS TAB**.
MOVE THE SLIDER under **SCREEN RESOLUTION** until it shows **1024 X 768**.
CLICK OK to apply the resolution.

The Bookmarks panel will allow you to quickly navigate to points of interest.



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

VIEW ALL CALLOUTS

When only one callout is showing on a machine view 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"



Schematic

950G Wheel Loader, 962G Wheel Loader, and IT62G Integrated Toolcarrier Electrical System

950G:

3JW1-2153

5FW1-1999

5MW1-1077

8JW1-406

962G:

4PW1-503

6EW1-799

6HW1-414

7BW1-623

IT62G:

AKP1-512

6PS1-UP

Machines Equipped with Pilot Hydraulics and Conventional Steering

COMPONENT LOCATION

Page 1 of 2



Component	Schematic Location	Machine Location	Component	Schematic Location	Machine Location
Actuator -Blend Door	H-11	56	Relay -Main	B-15	5
Actuator -Hood As.	A-14	1	Relay -Rear Flood	E-11	C
Actuator -Water Valve	H-11	56	Relay -Sec Steer	B-2	14
Alarm -Action	E-10	C	Relay -Sec Steering Intermediate	F-11	C
Alarm -Backup	C-15	2	Relay -Start Switch	B-14	5
Alternator	D-15	3	Resistor	G-11	56
Batteries	F-15	4	Sender - Torque Converter Oil Temp	B-14	20
Breaker -Alt	A-15	5	Sender -Fuel Level	H-2	18
Breaker -Hood	A-14	5	Sender -Hyd Temp	A-3	19
Breaker -Main	A-15	5	Sensor - Tran Intermediate Speed (1)	B-13	26
Breaker -Running Lamp	A-14	5	Sensor - Tran Intermediate Speed (2)	B-13	26
Breakers -15A	D-11	C	Sensor - Tran Output Speed 1	C-13	26
Control - Transmission Shift Lever	G-5	A	Sensor -Coolant Temp	D-15	22
Control -Cat Monitoring System	E-5	A	Sensor -Engine Speed	B-14	21
Control -Power Train ECM	I-10	57	Sensor -Input Speed	B-13	26
Control -Water Valve/Blend Door	G-11	A	Sensor -Lift Cyl Head End	D-1	23
Control -WLPCS ECM	C-4	59	Sensor -Lift Cyl Head End Press	G-1	23
Converter -Voltage	H-5	B	Sensor -Lift Position 1	I-1	24
Dimmer -Control	E-11	C	Sensor -Lift Position 2	F-1	24
Fuses	A-14	5	Sensor -Tran Output Speed 2	B-13	26
Fuses -10A	D-11	C	Sensor -Trans Oil Temp	B-13	26
Fuses -15A	D-11	C	Solenoid -4th Function (1)	E-1	31
Gauge -Quad	E-4	4	Solenoid -4th Function (2)	E-1	31
Ground - Strap Frame to Cab	G-12	8	Solenoid -A/C Clutch	B-15	27
Ground -Cab	A-8	5	Solenoid -Axle Oil Cooler Clutch Assy.	C-14	28
Ground -Cab 1	F-9	57	Solenoid -Dual HP	B-15	27
Ground -Cab 2	F-10	57	Solenoid -Ride Control 1	G-1	31
Ground -Cab 3	F-8	57	Solenoid -Ride Control 2	D-1	31
Ground -Cab 4	F-10	57	Solenoid -Shutdown	C-15	29
Ground -Left Frame Boss	E-14	6	Solenoid -Start Aid	F-14	30
Ground -Right Rear Frame	A-15	7	Solenoids -Pilot Valve Gp	F-9	46
Ground -Steer Column	E-5	A	Solenoids -Prop Valve	C-13	26
Ground -To Engine	D-15	9	Stud -Terminal	D-11	C
Ground -To Engine Block	D-14	10	Suppressor -ARC	B-2	32
Ground -To Engine Cyl Head	D-14	11	Suppressor -ARC A/C	B-15	27
Heater -Air Inlet	D-14	11	Suppressors -ARC	E-6	A
Horns -Forward	I-1, I-2, I-4, F-1, E-1	12	Switch - Bucket/Fork Select	G-7	B
Keypad -WLPCS	B-4	59	Switch - Selector AC/Heat	B-9	D
Motor - Priming Pump	B-14	13	Switch - Stop Lamp	B-3	C
Motor -Actuator	A-14	1	Switch - Temp Selector	B-9	D
Motor -Blower	G-11	56	Switch -4th Function Implement	F-7	46
Motor -Front Wiper	D-5	A	Switch -A/C Refrigerant	B-15	27
Motor -Rear Wiper	F-10	C	Switch -AIH	G-5	A
Motor -Sec Steer Pump	B-2	19	Switch -Auto Ride Control	B-5	D
Motor -Starter	D-14	15	Switch -Auto/Manual Gear Selector	B-6	D
Motors -Washers	A-3	16	Switch -Axle Oil Cooler Temp	C-14	33
Relay -AIH	B-14	17	Switch -Beacon	B-9	D
Relay -Backup Lamp	I-15	25	Switch -Blower	B-9	D
Relay -Front Flood	E-10	C	Switch -Brake Oil Pressure	H-2	34
Relay -Hood Raise Lower	A-13	5	Switch -Bucket Positioner 1	I-1	35

Machine locations are repeated for components located close together.

A = Located in the cab.

C = Located in the righthand console.

B = Located in the lefthand console.

D = Located on or near relay panel.

COMPONENT LOCATION

Page 2 of 2



Component	Schematic Location	Machine Location
Switch -Bucket Positioner 2	F-1	35
Switch -Dimmer	B-3	58
Switch -Disconnect	B-15	36
Switch -Down Shift	F-8	46
Switch -Engine Oil	C-15	37
Switch -Fork Positioner	F-1	38
Switch -Forward Horn	G-4	A
Switch -Front Axle Temp	G-1	39
Switch -Front Axle Temp	E-1	39
Switch -Front Intermittent Wiper	B-4	D
Switch -Grapple Function	F-7	46
Switch -Hazard lamp	G-8	B
Switch -Hood Actuator	A-14	40
Switch -Hyd Filter Bypass	A-3	16
Switch -Hyd Oil Level	A-3	19
Switch -Impl Detent Override	E-9	46
Switch -Key Start	D-5	A
Switch -Kickout On/Off	G-8	B
Switch -Lift Position 1	I-1	41
Switch -Lift Position 2	F-1	41
Switch -Neutralizer	B-3	C
Switch -Park Brake	H-2	A
Switch -Primary Steer Pressure	B-2	14
Switch -Rear Axle Temp	C-14	33
Switch -Rear Wiper	C-9	D
Switch -Run/Work/Panel/Tail	C-8	D
Switch -Sec Steer Test	H-8	B
Switch -Secondary Steer Pressure	B-2	14
Switch -Service Brake Pedal As.	B-3	58
Switch -Start Aid	G-5	A
Switch -Start Aid Coolant	D-15	22
Switch -Tach/Speedo/Serv Meter	G-5	A
Switch -Thermostat	G-11	56
Switch -Tran Neutralizer Override	B-5	D
Switch -Turn Signal	F-6	A
Tach/Speedometer	E-4	A
Terminal Block	A-14	5

Machine locations are repeated for components located close together.

A = Located in the cab.

C = Located in the righthand console.

B = Located in the lefthand console.

D = Located on or near relay panel.

CONNECTOR LOCATION



Connector Number	Schematic Location	Machine Location
CONN 1	A-15, H-15	53
CONN 2	A-15, H-15	43
CONN 3	C-15	54
CONN 4	I-15, C-15	55
CONN 5	I-15, F-15	44
CONN 6	I-15, F-15	5
CONN 7 Monitor Harness Code Plug	H-9, H-13	C
CONN 8	C-14	45
CONN 9	A-13	45
CONN 10	F-12	45
CONN 11	E-12	45
CONN 12	D-12	C
CONN 13	E-12	56
CONN 14 Service Tool Conn.	F-10	C
CONN 15	G-10	B
CONN 17 Service Mode Plug	H-9	A
CONN 18	G-8	A
CONN 19	F-8	D
CONN 20	F-6	46
CONN 21	B-4	45
CONN 22	G-4	58
CONN 23	E-3	A
CONN 24	E-3	A
CONN 25	B-3	51
CONN 26	B-3	52
CONN 27	A-3	47
CONN 28	F-2, I-5, I-3, I-8 I-9, G-2	47
CONN 29	D-2	48
CONN 30	C-2	49
CONN 31	D-1	49
CONN 32	E-1	50
CONN 33	E-1, F-1, G-1	49
CONN 34	G-1	49
CONN 35	G-1	50
CONN 36	I-1	C
CONN 37 Customer Data Conn.	C-4, I-2, I-4	C

The connectors shown in this chart are for harness to harness connectors. Connectors that join a harness to a component are generally located at or near the component. See the Component Location Chart.

Component identifiers (CID ¹) and Module Identifier (MID ²) for Power Train ECM (MID No. 081)	
CID	Component
0041	+8 Volts Sensor Supply
0070	Parking Brake Switch
0149	Ride Control Solenoid #2
0168	Electrical Systems Voltage
0177	Transmission Oil Temperature Sensor
0190	Engine Speed Sensor
0270	Cat Monitor Systems Harness Code
0363	Ride Control Solenoid
0367	Ride Control Switch
0368	Transmission AUTO/MAN Switch
0444	Start Relay
0562	Unable to Communicate With Cat Monitor System
0582	Transmission Output Speed Sensor 1
0617	Air Heater Relay
0621	Downshift Switch
0622	Up Shift Switch
0623	Direction Switch
0631	Transmission Clutch Solenoid #1
0632	Transmission Clutch Solenoid #2
0633	Transmission Clutch Solenoid #3
0634	Transmission Clutch Solenoid #4
0635	Transmission Clutch Solenoid #5
0636	Transmission Clutch Solenoid #6
0668	Transmission Shift Lever
0672	Torque Convert Output Speed Sensor
0673	Torque Output Speed Sensor
0674	Transmission Intermediate Speed Sensor 1
0675	Transmission Intermediate Speed Sensor 2
0688	Variable Horsepower Solenoid
0793	Primary Steering Pressure Switch
0794	Secondary Steering Pressure Switch
0795	Secondary Steering Intermediate Relay

Component identifiers (CID ¹) and Module Identifier (MID ²) for Caterpillar Monitoring System (MID No. 030)	
CID	Component
0084	Ground Speed Sensor
0096	Fuel Level Sensor
0100	Engine Oil Pressure Sensor
0110	Engine Coolant Temperature Sensor
0177	Torque Converter Oil Temperature Sensor
0248	Data Link
0263	+8 Volts Sensor Supply
0271	Action Alarm
0324	Action Lamp
0523	Engine Speed Sensor
0600	Hydraulic Oil Temperature Sensor
0601	Brake Air Pressure Sensor
0819	Display Data Link
0821	9 Volt Display Power Supply
0830	Brake Oil Temperature Sensor

¹ The CID is a diagnostic code that indicates which component is faulty.

² The MID is a diagnostic code that indicates which electronic control module diagnosed the fault.

¹ The CID is a diagnostic code that indicates which component is faulty.

² The MID is a diagnostic code that indicates which electronic control module diagnosed the fault.

Failure Mode Identifiers (FMI) ¹	
FMI No.	Failure Description
0	Data valid but above normal operational range.
1	Data valid but below normal operational range.
2	Data erratic, intermittent, or incorrect.
3	Voltage above normal or shorted high.
4	Voltage below normal or shorted low.
5	Current below normal or open circuit.
6	Current above normal or grounded circuit.
7	Mechanical system not responding properly.
8	Abnormal frequency, pulse width, or period.
9	Abnormal update.
10	Abnormal rate of change.
11	Failure mode not identifiable.
12	Bad device or component.
13	Out of calibration.
14	Parameter failures.
15	Parameter failures.
16	Parameter not available.
17	Module not responding.
18	Sensor supply fault.
19	Condition not met.
20	Parameter failures.

¹The FMI is a diagnostic code that indicates what type of failure has occurred.

Payload Control Fault Codes	
Code	Fault
16800	Battery voltage too high
16801	Battery voltage too low
25413	PCS not calibrated
35001	Position sensor out of range
35002	Loss of position sensor signal
36401	Pressure sensor out of range
36402	Loss of pressure sensor signal
76901	Pressure sensor out of range
76902	Loss of pressure sensor signal
81704	Backup battery error
81708	Real time clock not running
82002	Loss of Keypad Data Link

SPECIFICATIONS AND RELATED MANUALS



Related Electrical Service Manuals	
Title	Form Number
Alternator: 107-7977	SENR4757
Caterpillar Monitoring System	SENR1394
Electric Starting Motor: 106-8558	SENR3559
Consist: 106-8557	
Consist: 106-8559	
Payload Control System	SENR6614
Power Train ECM	SENR1380

Machine Codes	
Sales Model	Machine Code
950G	7, 13, 15, 38
962G	14, 16

Monitoring System Mode	
Mode of Operation	Mode Number
Normal	0
Harness Code	1
Parameter Display	2
Service	3
Units	4
Calibration	5, 6, 7

Resistor, Sender and Solenoid Specifications		
Part No.	Component Description	Resistance (Ohms) ¹
4W-9972	Sender: Hydraulic Oil Temperature	54.0° C (130° F) - 569 to 716 110.0° C (230° F) - 72 to 82
3E-6332	Solenoid: Valve - Start Aid	6.0
3E-8574	Solenoid: Valve - Ride Control	34.3 ± 1.7
8C-3663	Solenoid: Engine Shutdown	1.55 ± 0.15 10.3 ± 1.03
106-5122	Solenoid: A/C Clutch	17.6 ± 0.6
121-4298	Solenoid: Clutch Modulating Valves	7.75 ± 1.0
129-7707	Solenoid: Dual HP	31.1 ± 2.4
152-5409	Solenoid: Axle Oil Cooler	9.4 ± 5
9G-1950	Resistor: A/C, Heater Blower Motor	Overall 2.0 ± .1 Tap 1.0 ± .05

¹ At room temperature.

Off Machine Switch Specification				
Part No.	Function	Actuate	Deactuate	Contact Position
3E-6449	Start Aid Coolant Temperature	38 ± 3° C (100 ± 5.4° F)	27° C Min. (80.6° F Min.)	Normally Closed
3E-6450	Primary Steering Oil Pressure Secondary Steering Oil Pressure	1200 kPa MAX (175 psi MAX)	700 ± 100 kPa (100 ± 15 psi)	A-C, Normally Closed A-B, Normally Open
3E-6452	Park Brake Oil Pressure	8270 kPa MAX (1200 psi MAX)	6890 ± 345 kPa (1000 ± 50psi)	A-C, Normally Closed A-B, Normally Open
3E-7693	Service Brake Oil Pressure	10700 kPa MAX (1500 psi MAX)	8960 ± 345 kPa (1300 ± 50 psi)	A-B, Normally Open A-C, Normally Closed
114-5333	Refrigerant Pressure (AC)	275 to 1750 kpa ¹ (40 to 255 psi)	-- --	Normally Open ²
123-2993	Hydraulic Oil Level	21.0 ± 3.0° C (69.8 ± 5.4° F)	13.0° C (55.4° F)	Normally Closed
155-8998	Axle Oil Cooler Temperature	65.0° C ± 3.0 (149.0° ± 5.4 F)	58° C Min. (136.4° F) Min.	Normally Closed
155-8999	Rear Axle Temperature Front Axle Temperature	125.0° C ± 3.0 (257.0° ± 5.4 F)	117° C Min. (242.6° F) Min.	Normally Closed

¹ With increasing pressure the closed condition can be maintained up to 2800 kpa (405 psi), with decreasing pressure the closed condition can be maintained down to 170 kpa (25 psi).

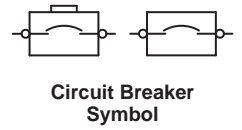
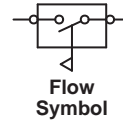
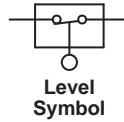
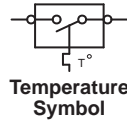
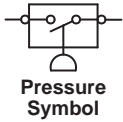
² Contact position at the contacts of the harness connector.

HARNESS and WIRE

Electrical Schematic Symbols



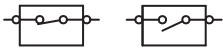
Symbols



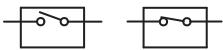
Symbols and Definitions



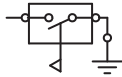
Fuse: A component in an electrical circuit that will open the circuit if too much current flows through it.



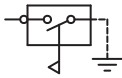
Switch (Normally Open): A switch that will close at a specified point (temp, press, etc.). The circle indicates that the component has screw terminals and a wire can be disconnected from it.



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.



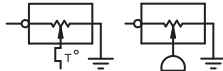
Ground (Wired): This indicates that the component is connected to a grounded wire. The grounded wire is fastened to the machine.



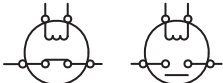
Ground (Case): This indicates that the component does not have a wire connected to ground. It is grounded by being fastened to the machine.



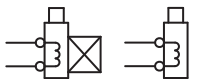
Reed Switch: A switch whose contacts are controlled by a magnet. A magnet closes the contacts of a normally open reed switch; it opens the contacts of a normally closed reed switch.



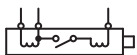
Sender: A component that is used with a temperature or pressure gauge. The sender measures the temperature or pressure. Its resistance changes to give an indication to the gauge of the temperature or pressure.



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.



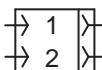
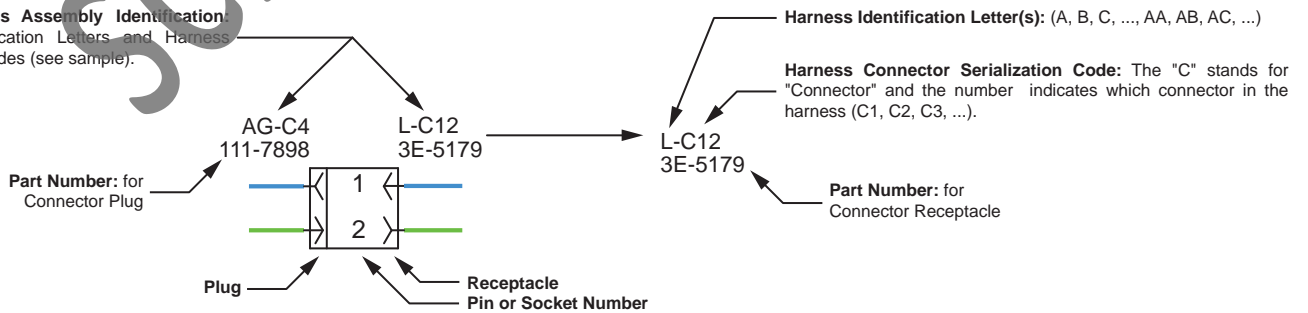
Solenoid: A solenoid is an electrical component that is activated by electricity. It has a coil that makes an electromagnet when current flows through it. The electromagnet can open or close a valve or move a piece of metal that can do work.



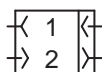
Magnetic Latch Solenoid: A magnetic latch solenoid is an electrical component that is activated by electricity and held latched by a permanent magnet. It has two coils (latch and unlatch) that make electromagnet when current flows through them. It also has an internal switch that places the latch coil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

Harness and Wire Symbols

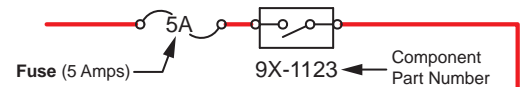
Wire, Cable, or Harness Assembly Identification: Includes Harness Identification Letters and Harness Connector Serialization Codes (see sample).



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.



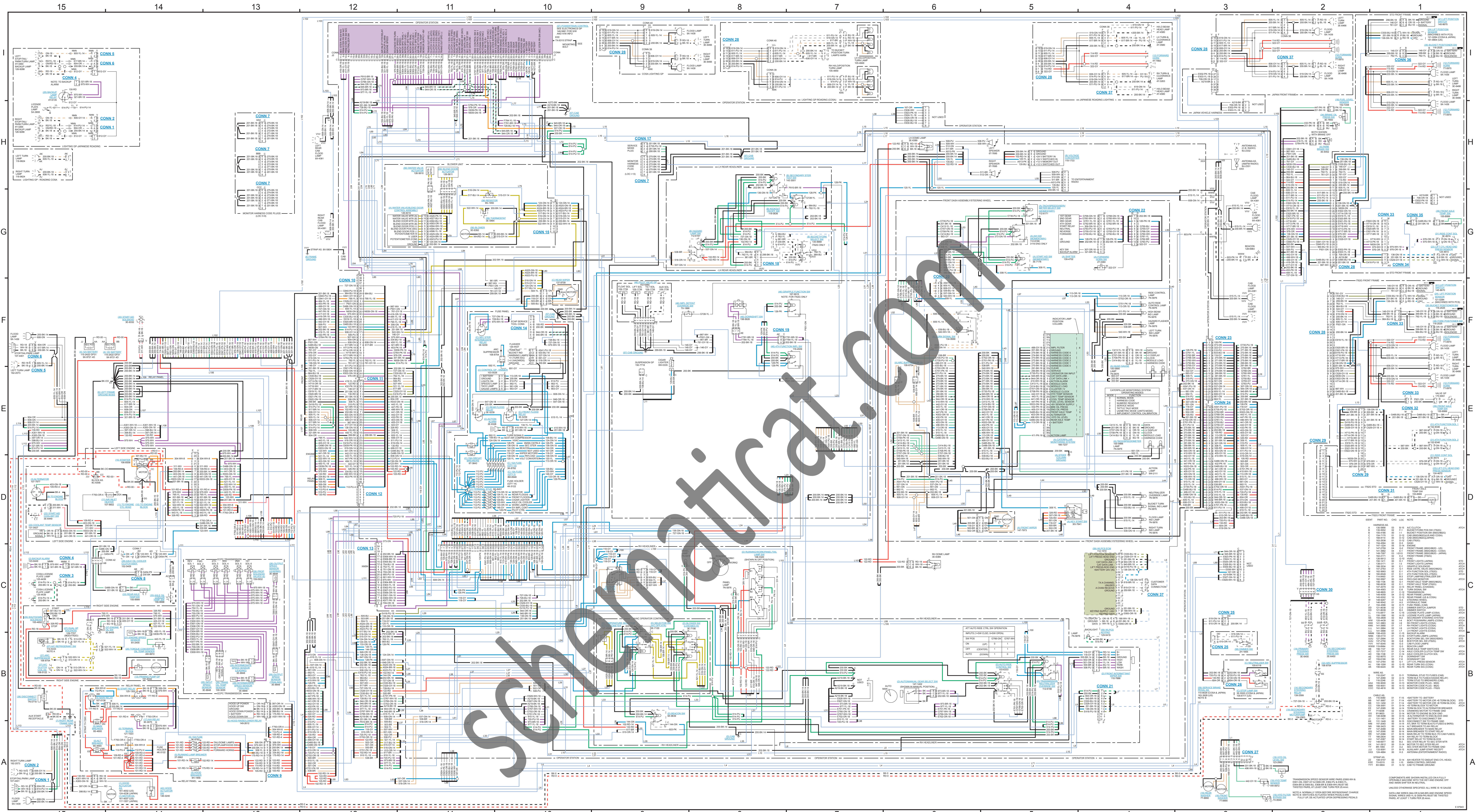
Harness identification code: This example indicates wire group 325, wire 135 in harness "AG".

325-AG135

PK-14

Wire Gauge

Wire Color



WIRE GROUP COLOR DESCRIPTIONS

—	GROUND CIRCUIT
—	WIRES THAT TAKE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS OFF
—	WIRES THAT TAKE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS ON
—	STARTING CIRCUIT
—	START AND CIRCUIT
—	MONITOR CIRCUIT
—	MONITOR CIRCUIT
—	HEATER AND AIR CONDITIONER CIRCUIT
—	TURBO DIESEL, SUPERCHARGER CIRCUIT
—	WALKER'S CAN CIRCUIT
—	CAN DATA LINK

OTHER COLOR DESCRIPTIONS

—	HIGHWAYS
---	----------

The following wire pairs must be twisted at least 1 turn per 25mm:

- 450 & G939
- 944 & 945
- E900 & E901
- E902 & E903
- E904 & E905
- E906 & E907
- E908 & E909

ABBREV	COLOR	SYMBOL	DESCRIPTION
CO	RED	—	ORIGINALLY CONNECTED
WH	WHITE	—	ORIGINALLY NOT CONNECTED
OR	ORANGE	—	ELECTRICAL CONNECTION TO
YL	YELLOW	—	ORIGINALLY CONNECTED
PK	PINK	—	TO SIGNAL OF COMMAND
BLK	BLACK	—	COMMON
GRY	GRAY	—	ORIGINALLY OPENED DISCRETELY
PU	PURPLE	—	AND WIRE CABLE COMPARTMENT
BR	BROWN	—	WIRE
GRN	GREEN	—	ORIGINALLY OPENED DISCRETELY
BLU	BLUE	—	ORIGINALLY OPENED DISCRETELY

THIS SCHEMATIC IS FOR THE 950G WHEEL LOADER, 962G WHEEL LOADER, AND TS2G INTEGRATED TRUCK CARRIER ELECTRICAL SYSTEM
 MEDIA NUMBER: SEN1933-03
 SCHEMATIC PART NUMBER: 126-7722, CHANGE: 03
 Components are shown installed on a fully operable machine with the key and engine off, transmission in the neutral and with parking brake set.
 Refer to the appropriate Service Manual for Troubleshooting, Specifications and Systems Operations.

MACHINE HARNESS CONNECTOR AND COMPONENT LOCATIONS

