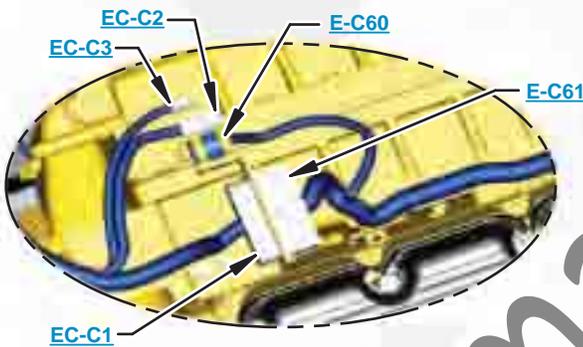


This document is best viewed at a screen resolution of 1024 X 768.

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

320B Excavators Electrical Systems

320B:

AED1-UP
3MR1-UP
4MR1-UP
4NR1-UP
5BR1-UP
6CR1-UP
9KR1-UP
1CS1-UP
8ES1-UP
9CS1-UP
4XW1-UP
5GW1-UP
2WZ1-UP

COMPONENT LOCATION

Page 1 of 2



Component	Schematic Location	Machine Location	Component	Schematic Location	Machine Location
Actuator - Engine Governor	A-9	1	Sensor - A/C Photo	F-1	A
Air Inlet Heater	C-8	2	Sensor - Air Inlet Heater Coolant Temp	C-9	21
Alarm - ATCH Travel	G-9	3	Sensor - Fuel Level	A-5	23
Alternator	B-8	4	Sensor - Pump Discharge Press	B-8	24
Antenna ATCH	C-6	5	Socket 12V	H-6	A
Assembly - Terminal Block	F-8	D	Solenoid - A/C Clutch	C-9	26
Batteries - 12VDC	I-8 , H-8	6	Solenoid - ATCH Crush	D-8	31
Breaker - Alternator	I-8	D	Solenoid - ATCH Flow Control	D-4	29
Breaker - Main	I-8	D	Solenoid - ATCH Fine Swing	E-7	28
Cable - ATCH Antenna	G-6 , I-3	5	Solenoid - Hydraulic Lock	I-1	G
Control - ATCH Power Window	C-6	15	Solenoid - Level Finish	A-7	E
Control - Engine/Pump	F-2	7	Solenoid - Swing Brake	E-7	32
Controller - Wiper/Washer	E-1	A	Solenoid - Travel Speed	A-7	E
Converter - ATCH 12V Voltage	H-6	9	Solenoid - Trenching	A-7	E
Converter ATCH	H-3	8	Switch - A/C Panel	H-5	C
Diode	A-3	18	Switch - Air Cleaner Flow	H-9	35
Diode - Main Relay	H-7	D	Switch - ATCH Refueling Start	A-4	42
Fuses	I-5	C	Switch - ATCH Refueling Stop	A-4	44
Heater - ATCH Seat with Seat Heater	F-4	43	Switch - ATCH Fine Swing Control	D-4	B
Horn	A-2	10	Switch - ATCH Hammer Pressure	H-1	G
Lamp - ATCH Cab	G-1	12	Switch - ATCH Heater Panel	H-5	C
Lamp - Chassis	A-2	13	Switch - ATCH Lower Washer	D-3	B
Lighter	E-1	A	Switch - ATCH Lower Wiper	D-3	B
Meter - Service	F-1	A	Switch - ATCH Power Window limit	B-6	A
Monitor	E-1	A	Switch - ATCH Refueling	A-4	41
Motor - ATCH Lower Washer	I-9	D	Switch - ATCH Seat Heater	D-4	B
Motor - ATCH Lower Wiper	I-1	G	Switch - ATCH Aux Hydraulic Pressure	H-1	G
Motor - Starter	A-9	14	Switch - Boom Raise Pressure	D-8	34
Motor - Washer	I-9	D	Switch - ATCH Flow Control Pressure	H-1	G
Motor - Wiper	E-1	A	Switch - Coolant Level	H-9	36
Pickup - Engine Speed	B-9	29	Switch - Crush Pressure #1	H-1	G
Pump - ATCH Auto Lubrication	H-9	16	Switch - Crush Pressure #2	G-1	G
Pump - ATCH Refueling	A-2	17	Switch - Engine Oil Press	B-9	38
Radio - ATCH 12VDC	I-3	C	Switch - Horn	I-1	C
Relay - ATCH Flow Control	E-7	D	Switch - Hydraulic Oil Filter	A-5	E
Relay - ATCH Refueling Power	A-3	18	Switch - Hydraulic Oil Level	A-5	E
Relay - ATCH Refueling Start	A-3	19	Switch - Implement Pressure	D-8	39
Relay - ATCH Refueling Stop	A-3	20	Switch - Key	F-2	B
Relay - Boom Lamp	I-7	D	Switch - Neutral Start Limit	I-1	C

Machine locations are repeated for components located close together.

A - Located in the cab.

E - Located on or near hydraulic oil tank.

B - Located in the lefthand console.

F - Located on or near pilot manifold.

C - Located in the righthand console.

G - Located on or near bottom platform.

D - Located on or near relay panel.

COMPONENT LOCATION

Page 2 of 2



Component	Schematic Location	Machine Location	Component	Schematic Location	Machine Location
Relay - Cab/Chassis Lamp	I-7	D	Switch - One Touch Low Idle	F-2	B
Relay - Demolition	E-8	D	Switch - Power Window Limit	D-3	A
Relay - Fan	I-7	D	Switch - Travel Pressure	D-8	45
Relay - Heater	E-7	D	Switch - Throttle Position	E-3	B
Relay - Horn	I-7	D	Switch - Window Limit	D-1	A
Relay - Hydraulic Lock Solenoid	I-7	D	Switch Panel	F-2	B
Relay - Main	G-7	D	Switch-Refrigerants Low Pressure	I-9	40
Relay - Neutral Start	F-7	D	Unit - A/C, Heater	H-6	21
Relay - Start	F-8	D	Unit - ATCH Heater	H-5	46
Relay - Start Cont	E-8	D	Unit - Heater Control	H-7	D
Relay - Timer	E-7	D	Valve - Pressure Reducing Solenoid	A-7	E
Resistor - Backup	I-7	D			
Sender - Coolant Temperature	B-8	22			
Sender - Hydraulic Oil Temp	A-5	E			

Machine locations are repeated for components located close together.

A - Located in the cab.

B - Located in the lefthand console.

C - Located in the righthand console.

D - Located on or near relay panel.

E - Located on or near hydraulic oil tank.

F - Located on or near pilot manifold.

G - Located on or near bottom platform.

SchematicCat.com

CONNECTOR LOCATION



Connector Number	Schematic Location	Machine Location
CONN 1	A-9	1
CONN 2	F-9	D
CONN 3	F-9	14
CONN 4	G-9	D
CONN 5	G-9	D
CONN 6	H-8	D
CONN 7	G-8	A
CONN 8	G-8	A
CONN 9	F-8	A
CONN 10	H-6	G
CONN 11	C-6	A
CONN 12	C-6	A
CONN 13	C-5	A
CONN 14	G-5	A
CONN 15	F-5	A
CONN 16	F-5	G
CONN 17	F-5	A
CONN 18	F-5	G
CONN 19	F-4	G
CONN 20	F-4	G
CONN 21	H-5	G
CONN 22	H-5	G
CONN 23	H-4	G
CONN 24	H-4	G
CONN 25	H-4	G
CONN 26	H-4	G
CONN 27	B-4	23
CONN 28	A-4	42
CONN 29	A-4	20
CONN 30	B-3	47
CONN 32	C-2	49
CONN 33	C-2	G
CONN 34	C-2	G
CONN 35	C-2	G
CONN 36	B-3	D

Real Time Error Codes	
Code	Description Of Problems
1301	Engine oil pressure too low
3102	Engine coolant temperature is too high
1303	Hydraulic oil temperature is too high
1304	Air filter is clogged
1305	Battery voltage is not normal
2201	Governor actuator feedback sensor circuit is open or shorted battery voltage
2202	Governor actuator feedback sensor is shorted to body ground
2301	Governor actuator feedback signal is not stable
2302	Governor actuator feedback signal deviates
2303	Governor actuator does not move
2304	Calibration data error
3201	Monitor RAM is not normal
4101	Electric power supply to the controller is too much(43 volts)
4102	Over-current in proportional reducing valve
4103	Proportional reducing valve circuit is open
4105	Over-current in digital output (trenching solenoid)
4106	Over-current in digital output (fine control solenoid)
4107	Over-current in digital output (Travel speed change solenoid)
4108	Over-current in digital output (travel alarm)
410A	Over-current in digital output (swing brake solenoid)
4201	Engine speed is not normal
4202	Engine coolant temperature sensor is shorted to body ground
4203	Hydraulic oil temperature sensor is shorted to body ground
4204	PWM sensor of pump delivery pressure is open in circuit
4207	PWM sensor of pump delivery pressure is open in circuit
420A	Fuel sensor is shorted to ground
420B	Fuel sensor is open or shorted to battery voltage
420C	Electric power supply is too low (below 23 volts)
420D	Electric power supply is too high (above 32 volts)
420E	Engine speed dial is not one of the specified 10
4301	Data mismatch 1 between alternator and speed sensor (alternator is abnormal)
4302	Data mismatch 2 between alternator and speed sensor (speed sensor is abnormal)
4303	Engine stalls
A201	Monitor communication is not normal
A202	Monitor takes too much time to respond to controller's signal
A203	Communication is abnormal in controller

Resistor, Sender and Solenoid Specifications		
Part No.	Component Description	Resistance (Ohms) ¹
102-8016	Resistor: Backup	47.0 ± 2.35
107-7056	Solenoid: Fine Swing	34.0 ± 0.5
111-9916	Solenoid: Engine/Pump Control	11.7 ± 1.2
121-1490	Solenoid: Level Finish Trenching	32 ± 3.2
121-1491	Solenoid: Hydraulic Lock Swing Brake Travel Speed	32 ± 3.2
122-4459	Solenoid: Flow Control	34.3 ± 1.7

¹ At room temperature.

Off Machine Switch Specification				
Part No.	Function	Actuate	Deactuate	Contact Position
106-0179	Travel Pressure Implement Pressure	1520 ± 98 kPa 220.5 ± 14 psi	1127 kPa Min 163.5 psi	Normally Open
106-0180	Boom Raise Pressure	2646 ± 196 kPa 383.8 ± 28.4 psi	2156 ± 196 kPa 312 ± 28.4 psi	Normally Open
106-0181	Flow Control Pressure Aux. Hydraulic Pressure Hammer Pressure	490 ± 49 kPa 71 ± 7.1 psi	290 kPa 42 psi	Normally Open
113-344	Refrigerant High/ Low Pressure	196 ± 1340 kPa 28.4 ± 455.4 psi	- -	Normally Open

Related Electrical Service Manuals	
Title	Form Number
Engine/Pump Control	SENR9291
Starting and Charging	RENR1007

WIRE DESCRIPTION

Page 1 of 2



Wire Number	Wire Color	Description	Wire Number	Wire Color	Description
Power Distribution Circuits			Lighting Circuits		
101	RD	Bat (+) (Not Application Specific)	578	BU	Washer -Aux
103	RD	Dome Lamp Ckt	586	BR	Aux Hyd -Close
105	RD	Key Start Sw	590	GY	Wiper SW To Intermittent Module
107	RD	Eng Shut -Down Fire Suppr	592	BU	DC/DC Converter Power Output
109	RD	Alt Output (+) Term.	A513	RD	DC/DC Converter Memory Output
111	RD	Engine Pump Control Ckt	A537	PK	Seat Heater (Resistive Element In Cushion)
112	PU	Main Power Rly Output	A579	OR	Wiper Motor +
113	OR	Opr Mon Panel VMIS B+ Switched	A580	BR	Wiper Motor -
114	RD	Warning Horn (Forward)	A581	GN	Wiper Motor Raise
115	PK	Cab / Chassis Ckt	A582	PU	Wiper Motor Stop
118	GY	Washer / Wiper Ckt	A583	YL	Power Window Interlock To Wiper Cont
120	YL	Converter Ckt	A584	BU	Front Window Limit SW To Wiper Cont
124	GN	A/C / Heater Ckt	A586	OR	Wiper SW To Wiper Cont
129	BU	Cigar Lighter Ckt	A587	YL	Power Window Cont To Safety Sol Relay
135	BU	12V 5A Output Ckt	A588	GN	Safety Sol Relay To Sol
140	BU	Lubricator Ckt	A589	OR	Power Window Up
147	PU	Fine Swing / Flow Control Ckt	A590	BU	Power Window Down
149	PU	Boom Lamp Ckt	A591	PU	Rear Window Limit SW
150	RD	Bat (+)	C468	BU	Engine Oil Level
151	GN	Hyd Lock / Neutral Start Ckt	C537	GN	Turn Signal SW To Flasher
152	BU	Lower Washer / Wiper Ckt	C538	OR	Hazard Indicator
154	RD	Neutral Start / Neutral Start Ckt	607	PK	Flood Lamp -Front
168	RD	Refueling Pump Ckt	615	YL	Cab Flood Lamp/Rops
172	RD	Engine Governor	616	BU	Bucket Flood Lamp/Boom Flood Lamp
175	RD	Fan Ckt	Control Circuits		
176	YL	Aux Ckt	763	BU	Torque Converter SW
177	RD	Main Brkr	786	GN	Eng Speed Cont -Hi Press SW
180	GN	Aux Ckt	788	YL	Eng Speed (+)
185	YL	Backup Ckt	791	PK	Eng Speed Cont -Lo Sol
189	RD	Hyd Lock Ckt	A718	PU	Start Aid Coolant Sensor Signal
191	WH	Power Window Ckt	A755	PK	Throttle SW #1
196	BU	Insp. Lamp Ckt	A756	BU	Throttle SW #2
Ground Circuits			A757	GY	Throttle SW #3
200	BK	Main Chassis	A758	BR	Throttle SW #4
201	BK	Operator Monitor Return	A761	PU	Electronic Pump Cont Throttle Ground
235	BK	Electronic Pump Ctrl Grd	A762	PU	Electronic Pump Cont Eng Speed Ground
Basic Machine Circuits			A768	BU	Pump Control Valve #1 (+)
304	WH	Starter Relay No. 1 Output	A769	GY	Pump Control Valve #2 (-)
306	GN	Starter Relay Coil To Neut Start SW Or	A770	PK	Electronic Pump Control Bypass SW To Resistor
307	OR	Key Start SW To Neutral Start SW Or	A771	PU	Float SW
308	YL	Main Power Relay Coil	877	YL	Glow Plug Magnetic SW To Glow Plug
309	GY	Alternator Regulator Term.	950	BR	Right Console Compactor SW To Relay/Diode
310	PU	Start Aid SW To Start Aid Sol	951	PK	Right Cont Handle SW To Relay/Diode
320	OR	Horn Relay Coil To SW	954	GN	Right Console Eng Throttle SW To Relay/Diode
321	BR	Backup Alarm Lamp Travel Alarm	F771	OR	Backup SW
322	GY	Warning Horn (Forward)	F772	WH	Backup SW
323	WH	Fuel Pump Power	F773	OR	Governor Accel
325	PK	Fuel Pump Relay Cut-Out	F774	WH	Governor Decel
326	PU	Key Start SW C" Term. "	G973	OR	Boom Raise Press SW to Crush Press SW
330	YL	Neutral Start Relay Coil	G974	WH	Crush Sol to Demolition Relay
329	YL	Fuel Pump To SW	G975	YL	Crush Press SW to Demolition Relay
365	YL	Fuel Pump Relay To Switch	J703	PK	Alt Pulse Sig To Anti-Start Relay (was D746 PK)

WIRE DESCRIPTION

Page 2 of 2



Wire Number	Wire Color	Description	Wire Number	Wire Color	Description
Monitoring Circuits			Control Circuits		
403	GN	Alternator (R) Term.	K904	GN	Pump Discharge -Signal
405	GY	Opr Mon Oil Press. (Low Setting)	K905	RD	Pump Discharge ++B
412	BU	Opr Mon Cool Flow/Ds2 App Spec)(Pin 26)HEUI-ADEMI	K906	GN	SW To SW (Generic)
430	BU	Opr Mon Air Filter	K907	BU	XMSN Cont Fwd SW To Gnd
487	OR	Hyd Oil Flow SW	K909	BU	XMSN Cont Rev SW To Gnd
491	PK	VMIS Hyd Oil Temp Sensor	K911	PK	XMSN Cont Speed 2 SW To Gnd
492	GY	VMIS Coolant Temp Sensor Signal	K912	GN	XMSN Cont Speed 3 SW To Gnd
495	GN	VMIS Fuel Level Signal	K915	GN	XMSN Cont Speed 4 SW To Gnd
496	WH	Opr Mon Panel Hyd Oil Level	K997	BU	XMSN Cont Neu SW To Gnd
Accessory Circuits			L908	OR	XMSN Cont Pk Brk Lever SW To Gnd
501	GN	Wiper -Front (Low)	L909	BU	Impl Cont SW To Gnd N.O.
506	PU	Washer -Front	L968	OR	Impl Cont SW To Gnd N.O.
508	PU	Radio Speaker -Left	L969	WH	XMSN Cont Speed 1 SW To Gnd
509	WH	Radio Speaker -Left (Common)	L970	GY	Injector Diode To Injector 14
511	BR	Radio Speaker -Right	L971	GN	Impl Cont Lin Proportional Sol
512	GN	Radio Speaker -Right (Common)	L972	BU	Impl Cont Lower Proportional Sol
513	OR	A/C Compressor/Refrigerant Pressure SW	L973	GN	Impl Cont Sol Return
519	PK	Thermostat To Refrigerant Press. SW	L974	GN	Impl Cont Pilot Press Sol
530	OR	Washer Right	L975	OK	Serial Data (Transmit)
			L976	GN	Serial Data (Receive)

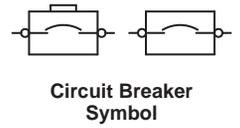
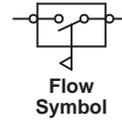
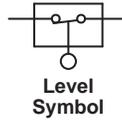
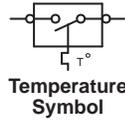
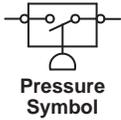
Schematic

HARNESS and WIRE

Electrical Schematic Symbols



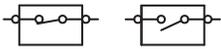
Symbols



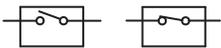
Symbols and Definitions



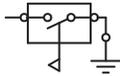
Fuse: A component in an electrical circuit that will open the circuit if too much current flows through it.



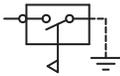
Switch (Normally Open): A switch that will close at a specified point (temp, press, etc.). The circle indicates that the component has screw terminals and a wire can be disconnected from it.



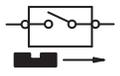
Switch (Normally Closed): A switch that will open at a specified point (temp, press, etc.). No circle indicates that the wire cannot be disconnected from the component.



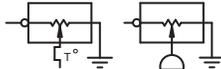
Ground (Wired): This indicates that the component is connected to a grounded wire. The grounded wire is fastened to the machine.



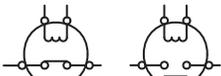
Ground (Case): This indicates that the component does not have a wire connected to ground. It is grounded by being fastened to the machine.



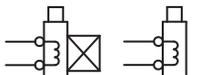
Reed Switch: A switch whose contacts are controlled by a magnet. A magnet closes the contacts of a normally open reed switch; it opens the contacts of a normally closed reed switch.



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.



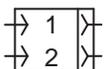
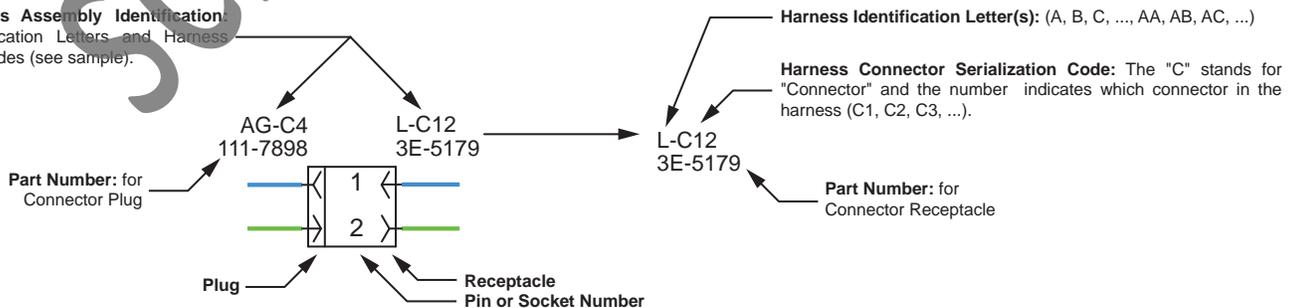
Solenoid: A solenoid is an electrical component that is activated by electricity. It has a coil that makes an electromagnet when current flows through it. The electromagnet can open or close a valve or move a piece of metal that can do work.



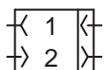
Magnetic Latch Solenoid: A magnetic latch solenoid is an electrical component that is activated by electricity and held latched by a permanent magnet. It has two coils (latch and unlatch) that make electromagnet when current flows through them. It also has an internal switch that places the latch coil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

Harness and Wire Symbols

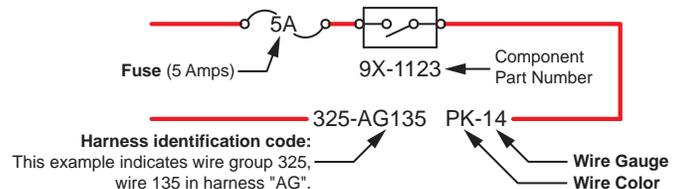
Wire, Cable, or Harness Assembly Identification: Includes Harness Identification Letters and Harness Connector Serialization Codes (see sample).

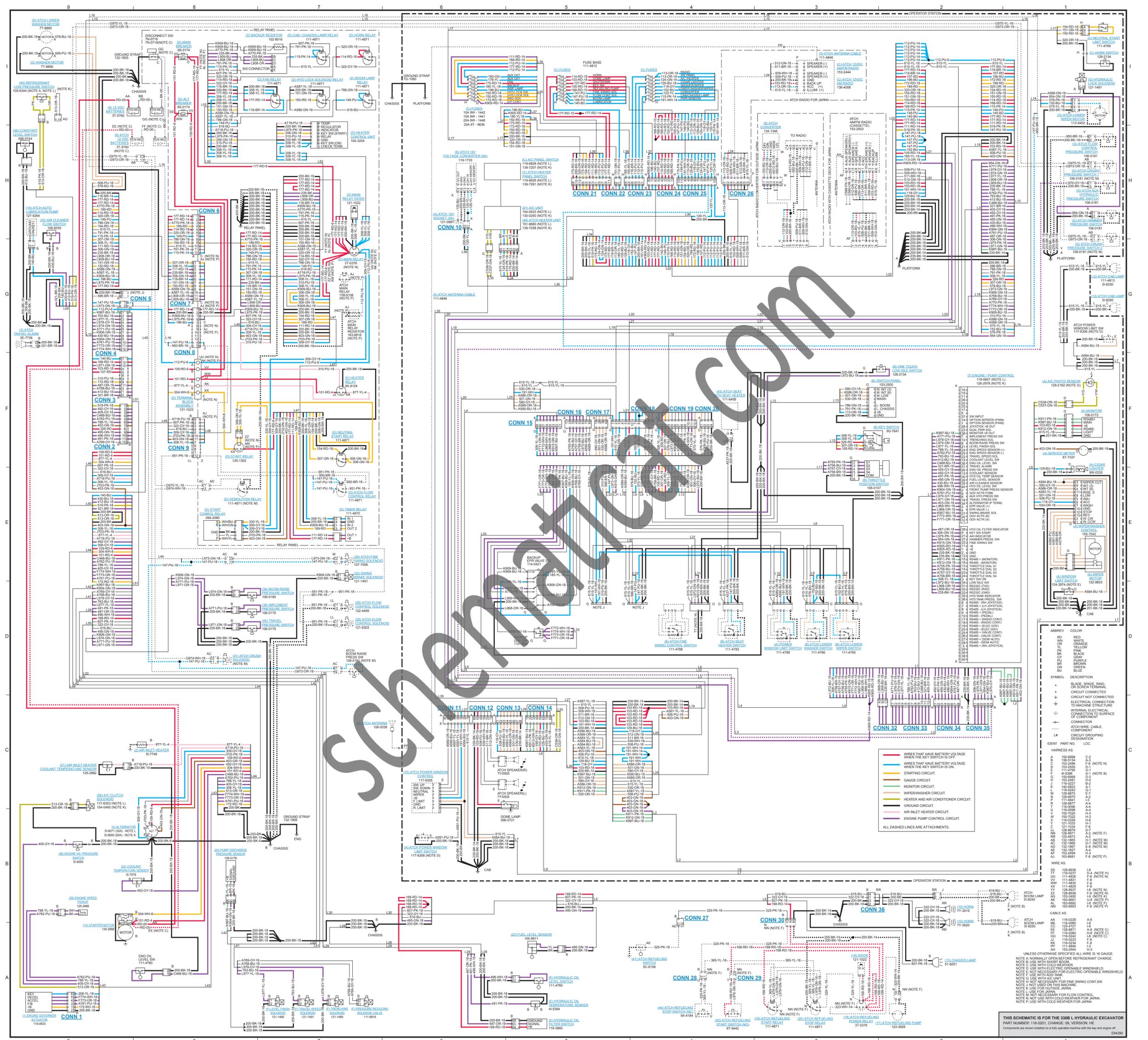


Deutsch connector: Typical representation of a Deutsch connector. The plug contains all sockets and the receptacle contains all pins.



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





- WIRES THAT HAVE BATTERY VOLTAGE
— WIRES THAT HAVE BATTERY VOLTAGE WHEN THE KEY SWITCH IS ON.
— STARTING CIRCUIT.
— GAUGE CIRCUIT.
— MONITOR CIRCUIT.
— WIPER/WASHER CIRCUIT.
— HEATER AND AIR CONDITIONER CIRCUIT.
— GROUND CIRCUIT.
— AIR INLET HEATER CIRCUIT.
— ENGINE PUMP CONTROL CIRCUIT.
 ALL DASHED LINES ARE ATTACHMENTS.

ABBREV	COLOR
RD	RED
OR	ORANGE
YL	YELLOW
PK	PINK
GY	GRAY
BR	BROWN
GN	GREEN
BU	BLUE

SYMBOL	DESCRIPTION
—	BLUE SWINGING OR TERMINAL
+	CIRCUIT CONNECTED TO MACHINE
+	ELECTRICAL CONNECTION TO INTERNAL ELECTRICAL CONNECTION TO SURFACE OF COMPONENT
—	CONNECTOR
—	ATCH WIRE CABLE COMPONENT
—	IDENT PART NO. LOC

HARNESS AS.	LOC
A	130-8998
B	138-5134
C	138-5466
D	133-2565
E	111-4776
F	453006
G	130-9999
H	133-2491
I	116-5227
J	116-5243
K	116-5277
L	128-8970
M	116-5098
N	128-8971
O	116-5098
P	128-8977
Q	116-5098
R	128-8977
S	116-5098
T	128-8977
U	116-5098
V	128-8977
W	128-8977
X	128-8977
Y	128-8977
Z	128-8977
AA	128-8977
AB	128-8977
AC	128-8977
AD	128-8977
AE	128-8977
AF	128-8977
AG	128-8977
AH	128-8977
AI	128-8977
AJ	128-8977

CABLE AS.	LOC
A	116-5098
B	116-5098
C	116-5098
D	116-5098
E	116-5098
F	116-5098
G	116-5098
H	116-5098
I	116-5098
J	116-5098
K	116-5098
L	116-5098
M	116-5098
N	116-5098
O	116-5098
P	116-5098
Q	116-5098
R	116-5098
S	116-5098
T	116-5098
U	116-5098
V	116-5098
W	116-5098
X	116-5098
Y	116-5098
Z	116-5098
AA	116-5098
AB	116-5098
AC	116-5098
AD	116-5098
AE	116-5098
AF	116-5098
AG	116-5098
AH	116-5098
AI	116-5098
AJ	116-5098

THIS SCHEMATIC IS FOR THE 330B L HYDRAULIC EXCAVATOR
 PART NUMBER: 116-0201, CHANGE: 09, VERSION: C
 Components are shown installed in a fully equipped machine with the key and engine off.
 E94290

MACHINE HARNESS CONNECTOR AND COMPONENT LOCATIONS

