Wire Description					
Wire Number	Wire Color	Description	Wire Number	Wire Color	Description
Power Circuits			**Lighting Circuits (Continued)**		
101	RD	Bat (+)	631	GY	RH & LH Fog Lamp
109	OR	Alt Output (+) Term.	635	BU	Payload Mon Rod Lamp
113	OR	Opr Mon Panel B (+) Switched	636	GN	Payload Mon Green Lamp
122	BU	Air Dryer	**Control Circuits**		
126	PK	Transmission Control	703	BU	Transmission Upshift Solenoid
149	PU	Engine Flood Lamp Switch	704	GY	Transmission Downshift Solenoid
150	OR	Battery + (Engine Control)	705	PK	Transmission Lockup Clutch Solenoid
170	YL	VIMS Service Key Switch	709	OR	Transmission Speed Sensor Supply
176	OR	Integrated Braking Control	710	GN	Transmission Speed Sensor Signal
Ground Circuits			721	BR	Transmission Gear Code 1
200	BK	Main Chassis	722	WH	Transmission Gear Code 2
201	BK	Operator Monitor Return	723	OR	Transmission Gear Code 3
202	BK	Transmission Control	724	YL	Transmission Gear Code 4
231	BK	Transmission Actual Gear Position Sensor	725	GN	Transmission Gear Code 5
A251	BK	RH Digital Payload Display	726	BU	Transmission Ground Verify
A253	BK	Not Used	767	WH	Wheel Speed Sensor Supply
A254	BK	Integrated Braking Control	769	BU	LH Wheel Speed Sensor Signal
A271	BK	Differential Oil Cooler Fan Motor	770	GN	RH Wheel Speed Sensor Signal
Basic Machine Circuits			773	GY	TCS Proportional Solenoid
306	GN	Air Start Solenoid	774	YL	TCS 4-Way Solenoid (Coil S-2)
308	YL	Main Power Relay Coil	775	BR	TCS 4-Way Solenoid (Coil S-1)
317	YL	Start Aid Relay To Start Aid Sol	777	PU	Brake Retract Motor
327	PK	Steering Bleed Control	799	WH	Sensor Power
337	WH	Prelube Pushbutton SW To Prelube Timer	A700	OR	Digital Sensor Power(+8V)
Monitoring Circuits			E709	WH	VIMS Service Lamp
403	GN	Alternator (R) Term.	E724	GY	Not Used
417	GY	Not Used	E725	BU	Not Used
419	YL	Rear Inside Brake Overstroke Switch	E729	GN	Shutter Solenoid
425	PK	Rear Differential Oil Level Switch	E750	PU	Body Position Sensor Signal
426	BR	Transmission Charge Filter Switch	E790	PK	Transmission Control Solenoid Return
428	OR	Transmission Oil Temperature Sensor	E793	BU	ATA Data Link -
429	YL	RH Rear Brake Oil Temperature Sensor	E794	YL	ATA Data Link +
447	PK	Fuel Level Gage	F702	GN	Throttle Position Sensor
450	YL	Engine Speed Sensor	F707	WH	Start Aid Hold Relay
452	PU	Torque Converter Out Speed Sensor	F708	YL	Shutter Relay
473	GY	Front Brake Overstroke SW to Rear Outside Brake Overstroke SW	F709	BU	Pre-lube Relay
474	WH	Rear Inside Brake Overstroke SW to Rear Outside Brake Overstroke SW	F710	BR	Start Aid On Relay
481	GN	Converter Temp SW To Brake Oil Temp SW	F715	PU	Shutdown Signal (NO)
496	WH	Transmission Oil Level Switch	F716	WH	Shutdown Signal (NC)
A451	WH	Steering Oil Temperature Sensor	F717	YL	Throttle Bypass Switch
A491	WH	TC Inlet Filter Switch	F720	GN	Start Aid Switch
A492	OR	Hoist Outside Screen Switch	F721	GY	User Define Shutdown
A493	YL	TC Screen Switch	F722	OR	A/C Fan Control Override Switch
C429	GY	Differential Oil Temperature Sensor	F723	PK	Timing Cal (+)
C453	YL	Ambient Air Temperature Sensor	F724	PU	Timing Cal (-)
C463	GY	Not Used	F780	PK	Parking Brake SW
C466	YL	Left Front Brake Oil Temperature Sensor	G704	YL	Body Raise Solenoid
C467	BU	Left Rear Brake Oil Temperature Sensor	G705	GN	Body Lower Solenoid
C473	GN	Differential Pump Outlet Pressure Sensor	G736	PK	Differential Oil Cooler Fan Motor
C484	YL	Differential Filter Plugged Switch	J764	BR	Switch/Sensor Return #1
F418	GN	VIMS Ground Level Serial Port	J765	BU	Switch/Sensor Return #2
F419	YL	VIMS Ground Level Serial Port	J766	PU	Switch/Sensor Return #3
F433	PU	Right Front Brake Oil Temperature Sensor	J767	GY	Switch/Sensor Return #4
F447	PU	High Steer Pressure Switch	858	GY	RH Front Strut Pressure Sensor
G427	BU	Hoist Inside Screen Switch	859	YL	LH Front Strut Pressure Sensor
H428	GY	Not Used	860	PK	RH Rear Strut Pressure Sensor
H429	BU	Not Used	861	PU	LH Rear Strut Pressure Sensor
Accessory Circuits			875	BU	VIMS RS 232 Port Trans
513	OR	A/C Compressor/Refrigerant Pressure SW	876	OR	VIMS RS 232 Port Receive
521	YL	A/C SW To Refrigerant SW	892	BR	CAT Data Link (-)
522	WH	A/C Clutch To Thermostat SW	893	GN	CAT Data Link (+)
597	PU	A/C Hi Press Cutout SW to Low Press SW	J840	WH	RH Payload Lamp (Green)
A572	PK	A/C Module to A/C Lo Press SW	J841	YL	RH Payload Lamp (Red)
E554	PK	A/C Controller to A/C Compressor Clutch	J842	BK	Digital Return
Lighting Circuits			J848	BU	VIMS Service Lamp Return
604	OR	Stop/Tail Lamp	998	BR	Ground Level Shutdown Switch
605	YL	Park/Turn Lamp - Left	C985	BU	+8V Supply
606	GY	Park/Turn Lamp - Right	E972	BU	VIMS Ground Level Serial Port
607	PK	Ladder Flood Lamp to Ladder Lamp Switch	K922	YL	Solenoid Return
608	GN	RH & LH Backup Lamp	K927	BU	Solenoid Return
611	PU	Head Lamp High Beam	K952	BR	Solenoid Return
612	GY	Backup Alarm	K983	BU	+8V Digital
614	PU	Park/Tail/Dash/Lamp	K988	WH	ARC Control Solenoid
619	GN	Head Lamp Low Beam	K989	BU	ARC Supply Solenoid
620	WH	RH/Lt Eng Flood Lamp to Flood Lamp SW	M966	GY	VIMS Aftercooler Coolant Level
622	PU	Ladder Lamp Switch	M967	OR	VIMS Jacket Coolant Level
623	BU	Ladder Lamp Switch	R971	YL	Transmission Lube Filter SW

Solenoid Specifications			
Part No.	Component Description		Resistance (Ohms)[1]
3T-0062	Solenoid	TCS Proportional	16
5T-4434	Solenoid	Air Start	1.7
9G-9988	Solenoid	TCS 4-Way	(Coil S-1) 24.9 ± 0.4 (Coil S-2) 24.9 ± 0.4
9x-9482	Solenoid	Shutter	42.4 ± 2.1
112-5874	Solenoid	Body Lower Body Raise	6.4 ± 0.4
123-8773	Solenoid	Starting Aid	3
144-6292	Solenoid	Upshift Downshift Lockup Clutch	32.6 ± 1.6
149-2658	Solenoid	Steering Bleed	32.6 ± 1.6
184-0987	Solenoid	ARC Supply	32.6 ± 1.6
198-4564	Solenoid	A/C Compressor Clutch	12.5

[1] At room temperature unless otherwise noted.

Off Machine Switch Specification				
Part No.	Function	Actuate	Deactuate	Contact Position
114-5333	A/C HIGH Pressure	275 to 1793 kPa[1] (39.9 to 253.8 psi)	-	Normally Open[2]
144-5661	Tourque Converter Inlet Filter Pressure	1377.9 ± 13.8 kPa (20.00 ± 2.00 psi)	82.7 kPa MIN (12.0 psi MIN)	Normally Closed
149-6371	A/C LOW Pressure	103.4 ± 13.8 kPa (15.00 to 2.00 psi)	34.5 ± 7.0 kPa (5.0 to 1.0 psi)	Normally Open

[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 (25psi).

[2] Contact position at the contacts of the harness connector.

Related Electrical Service Manuals	
Title	Form Number
Alternator: 9X-7803	SENR7508
Brake Control:	SENR1503
Engine Control:	SENR1128
Power Train:	SENR1502
Vital Information Management System (VIMS): System Operation	RENR2630
Vital Information Management System (VIMS): Testing and Adjusting / Troubleshooting	RENR2631

CATERPILLAR®

UENR1251
June 2012

Schematic

785C Off-Highway Truck Electrical System

APX1747-1831

Volume 1 of 4: Chassis

Printed in U.S.A.

UENR1251 VOL 1 of 4
36 Page, (Dimensions: 48 inches x 35 inches)

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).

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

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

AG-04 111-7898 | L-C12 3E-5179 → L-C12 3E-5179

Part Number: for Connector Plug

Part Number: for Connector Receptacle

Plug

Receptacle

Pin or Socket Number

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

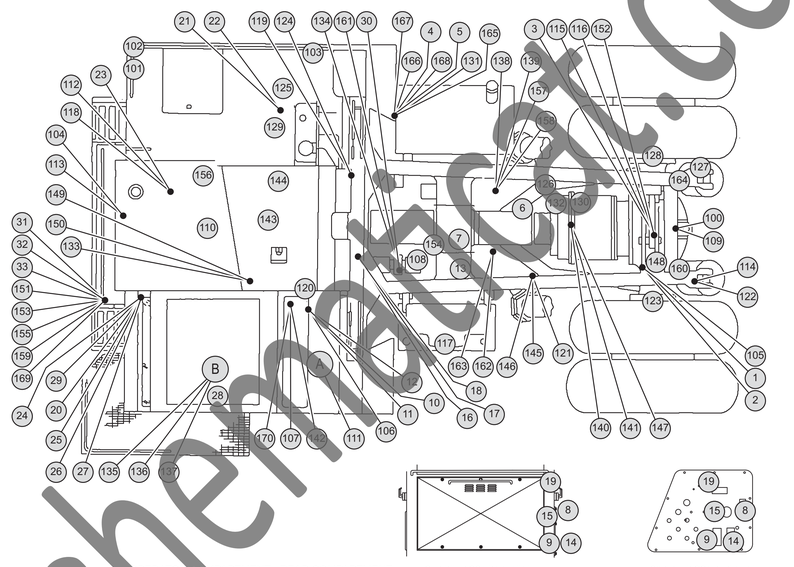
Sure-Seal connector: Typical representation of a Sure-Seal connector. The plug and receptacle contain both pins and sockets.

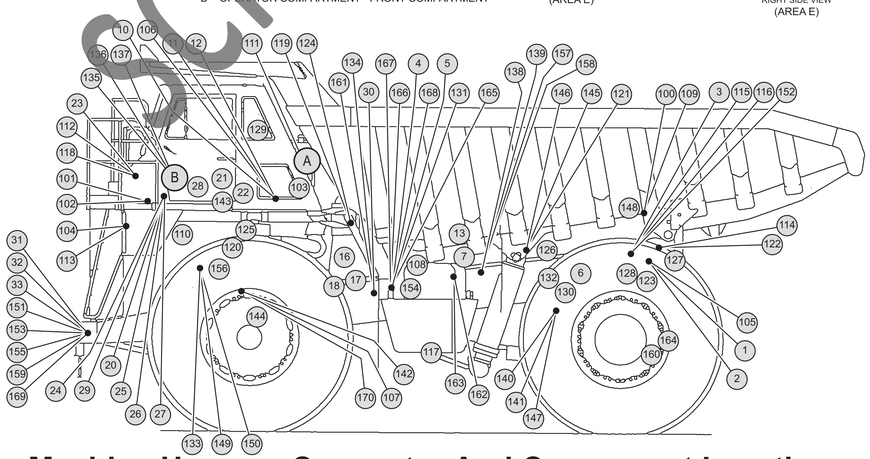
Fuse (5 Amps) — 9X-1123 — Component Part Number

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

325-AG135 PK-14

Wire Gauge
Wire Color



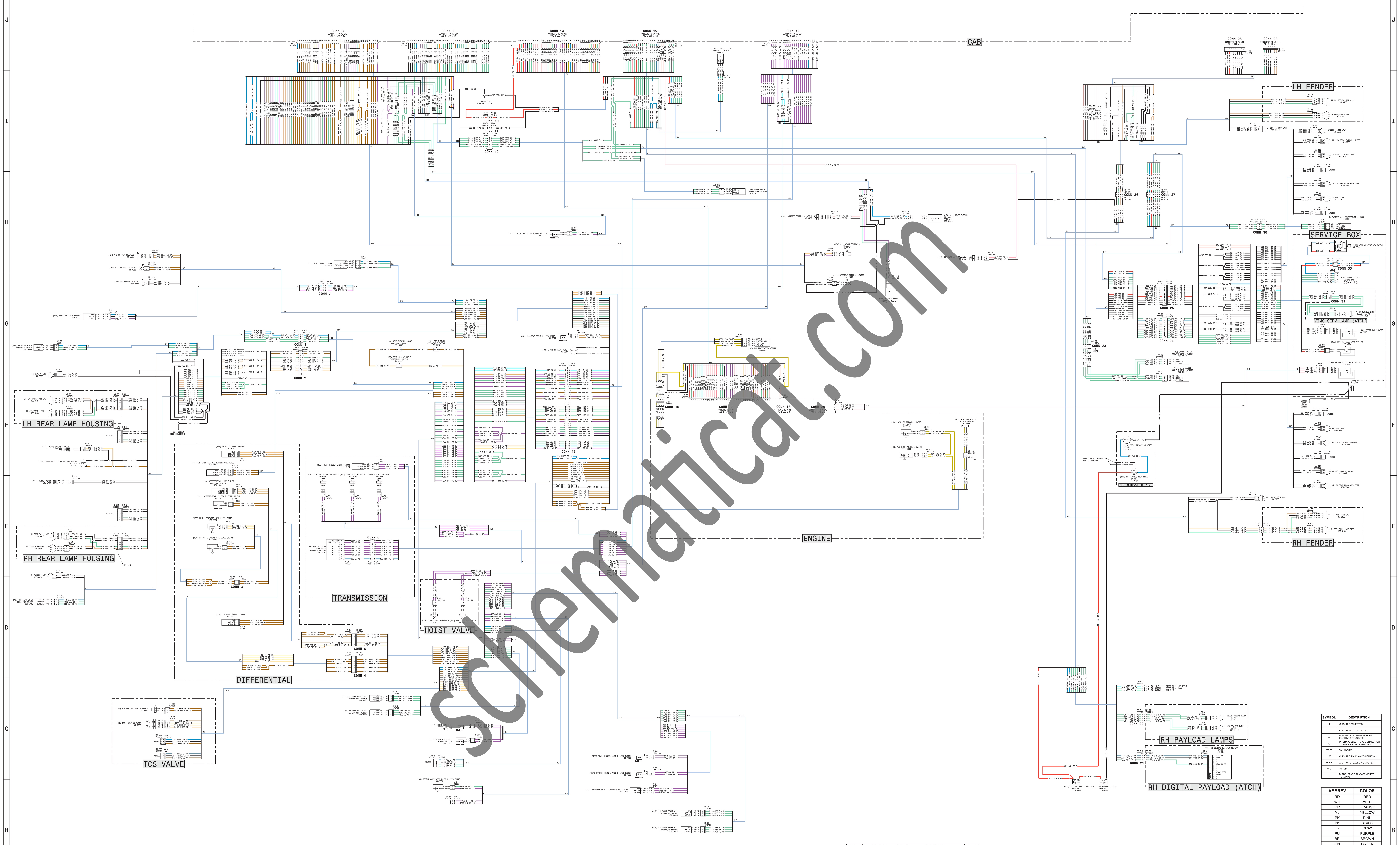


Machine Harness Connector And Component Locations

Component Location					
Component	Schematic Location	Machine Location	Component	Schematic Location	Machine Location
Alarm - Backup	E-14	100	Solenoid - ARC Control	H-13	136
Battery - 1 (LH)	B-4	101	Solenoid - ARC Supply	H-13	137
Battery - 2 (RH)	B-3	102	Solenoid - Body Lower	D-10	138
Display - RH Digital Payload (ATCH)	C-2	103	Solenoid - Body Raise	D-10	139
Ground - Battery Disconnect Switch	F-1	104	Solenoid - Downshift	E-11	140
Ground Boss - Chassis 1	F-13	105	Solenoid - Lockup Clutch	E-11	141
Ground Boss - Chassis 2	I-10	106	Solenoid - Shutter (ATCH)	H-6	142
Module - A/C Protection	G-7	107	Solenoid - Starting Aid	H-5	143
Motor - Brake Retract	G-9	108	Solenoid - Steering Bleed	G-6	144
Motor - Differential Cooling Fan (ATCH)	F-14	109	Solenoid - TCS 4 - Way	C-13	145
Motor - Pre-Lubrication (ATCH)	F-3	110	Solenoid - TCS Proportional	C-13	146
Relay - Pre-Lubrication (ATCH)	E-3	111	Solenoid - Upshift	E-11	147
Sensor - Aftercooler Coolant Level	G-3	112	Suppressor - Differential Cooling Fan	F-14	148
Sensor - Ambient Air Temperature	H-1	113	Switch - A/C High Pressure	F-5	149
Sensor - Body Position	G-14	114	Switch - A/C Low Pressure	F-5	150
Sensor - Differential Oil Temperature	F-12	115	Switch - Battery Disconnect	F-1	151
Sensor - Differential Pump Outlet Pressure	E-12	116	Switch - Differential Filter Plugged	E-12	152
Sensor - Fuel Level	H-11	117	Switch - Engine Flood Lamp	G-1	153
Sensor - Jacket Water Coolant Level	G-3	118	Switch - Front Brake Overstroke	G-10	154
Sensor - LH Front Brake Oil Temperature	B-8	119	Switch - Ground Level Shutdown	G-1	155
Sensor - LH Front Strut Pressure	J-7	120	Switch - High Steering Pressure	G-6	156
Sensor - LH Rear Brake Oil Temperature	C-11	121	Switch - Hoist (Inside) Screen	C-10	157
Sensor - LH Rear Strut Pressure	G-14	122	Switch - Hoist (Outside) Screen	C-10	158
Sensor - LH Wheel Speed	F-12	123	Switch - Ladder Lamp	G-1	159
Sensor - RH Front Brake Oil Temperature	B-8	124	Switch - LH Differential Oil Level	E-12	160
Sensor - RH Front Strut Pressure	C-3	125	Switch - Parking Brake Filter	G-9	161
Sensor - RH Rear Brake Oil Temperature	C-11	126	Switch - Rear Inside Brake Overstroke	G-11	162
Sensor - RH Rear Strut Pressure	D-14	127	Switch - Rear Outside Brake Overstroke	G-11	163
Sensor - RH Wheel Speed	D-12	128	Switch - RH Differential Oil Level	E-12	164
Sensor - Steering Oil Temperature	H-7	129	Switch - Torque Converter Inlet Filter	B-10	165
Sensor - Transmission Actual Gear Position	E-11	130	Switch - Torque Converter Screen	H-9	166
Sensor - Transmission Oil Temperature	B-8	131	Switch - Transmission Charge Filter	C-8	167
Sensor - Transmission Speed	F-11	132	Switch - Transmission Lube Filter	C-8	168
Solenoid - A/C Compressor Clutch	F-5	133	Switch - VIMS Service Key	H-1	169
Solenoid - Air Start	H-6	134	System - Air Dryer	H-5	170
Solenoid - ARC Bleed	G-13	135			

Connector Location		
Connector Number	Schematic Location	MACHINE Location
CONN 1	G-12	1
CONN 2	F-12	2
CONN 3	D-12	3
CONN 4	D-11	4
CONN 5	D-11	5
CONN 6	E-11	6
CONN 7	G-11	7
CONN 8	J-11	8
CONN 9	J-10	9
CONN 10	I-10	10
CONN 11	I-10	11
CONN 12	I-10	12
CONN 13	F-9	13
CONN 14	J-9	14
CONN 15	J-8	15
CONN 16	F-8	16
CONN 17	F-7	17
CONN 18	F-7	18
CONN 19	J-7	19
CONN 20	F-6	20
CONN 21	G-3	21
CONN 22	C-3	22
CONN 23	G-3	23
CONN 24	G-3	24
CONN 25	G-3	25
CONN 26	H-3	26
CONN 27	H-3	27
CONN 28	J-2	28
CONN 29	J-2	29
CONN 30	H-2	30
CONN 31	G-1	31
CONN 32 - VIMS Ground Level Serial Port	G-1	32
CONN 33	H-1	33

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.



IDENT	PART NUMBER	LOC	DESCRIPTION	NOTE
HARNESS AS				
F	201-1124	J-9	CAB TO ENGINE	
J	120-9288	E-11	ACTUAL GEAR SWITCH	
K	154-8313	J-7	TRANSMISSION	
M	185-2340	G-9	VIMS REAR	
N	185-2343	G-12	REAR LIGHTING	
P	185-2342	D-11	TCS/DIFFERENTIAL OIL FILTER	
V	164-3172	G-11	BODY POSITION SENSOR	
W	227-5906	H-2	VIMS AIR TEMPERATURE	
AE	185-2336	F-6	GROUND LEVEL SHUTDOWN	
AH	154-9520	D-12	REAR DIFFERENTIAL OIL LEVEL	
AJ	154-8772	E-2	RH TURN LAMP	
AK	146-5826	F-13	LH STOP/TAIL LAMPS	
AL	146-5826	E-13	RH STOP/TAIL LAMPS	
AP	185-2338	H-3	LH LADDER	
AR	227-5907	J-8	MAIN POWER	
CC	185-2341	G-3	HEADLAMP	
CK	201-1120	F-8	A/C PROTECTION MODULE	
CR	230-1481	C-3	RH DIGITAL PAYLOAD DISPLAY	ATCH
CT	228-0935	C-3	RH PAYLOAD LAMPS	ATCH
CU	133-5942	F-5	A/C COMPRESSOR	
CV	185-2339	G-12	REAR PAYLOAD	
EE	185-2337	G-4	VIMS COOLANT LEVEL	
HH	244-5602	J-10	VIMS FRONT CHASSIS	
JJ	110-6150	H-1	VIMS SERVICE KEY SWITCH	
MM	216-0101	G-1	SERVICE LAMP JUMPER	ATCH
CABLE AS				
X	119-5848	C-3	BATTERY TO DISCONNECT SWITCH	
Y	116-7156	F-1	DISCONNECT SWITCH TO GROUND	
AC	116-7161	C-1	PRE-LUBRICATION POWER	ATCH
AU	117-5883	C-4	BATTERY(-) TO BATTERY(+)	
AV	233-3796	F-3	PRE-LUBRICATION GROUND	ATCH
AY	116-7159	F-3	PRE-LUB RELAY TO MOTOR Z	ATCH

NOTE A: NORMALLY OPEN BEFORE REFRIGERANT CHARGE.
NOTE B: NOT USED ON MACHINES WITH AIR START.
NOTE C: USED ON MACHINES WITH AIR START ONLY.
NOTE C: RH & LH REAR LAMP HOUSINGS ARE IDENTICAL AND DO NOT HAVE UNIQUE WIRE IDENTS FOR TURN SIGNAL CIRCUITS, THEREFORE, 605-YL SERVES AS 606-GY IN HARNESS AL.

CALLOUTS

Callout Number (Machine Location from Component Locations Table) → (52) VALVE GP - CONTROL ← Component Name
138-1234 ← Part Number

SYMBOL	DESCRIPTION
	CIRCUIT CONNECTED
	CIRCUIT NOT CONNECTED
	ELECTRICAL CONNECTION TO MACHINE STRUCTURE
	INTERNAL ELECTRICAL CONNECTION TO SURFACE OF COMPONENT
	CONNECTOR
H#	CIRCUIT GROUPING DESIGNATION
– – –	ATCH WIRE, CABLE, COMPONENT
	SPLICE
o	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

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

892	&	893
E793	&	E794
F418	&	F419

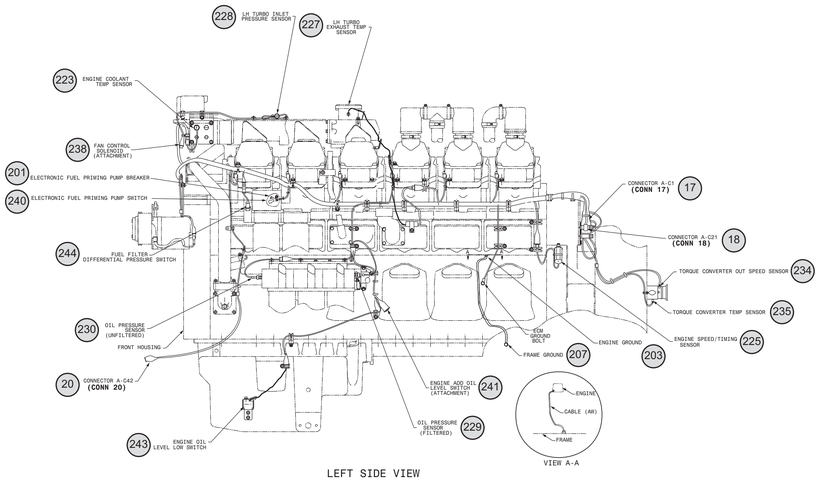
WIRE GROUP COLOR DESCRIPTIONS

- GROUND CIRCUIT
- WIRES THAT HAVE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS OFF
- WIRES THAT HAVE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS ON
- VOLTAGE CONVERTER OUTPUT CIRCUIT
- STARTING CIRCUIT
- STARTING AID CIRCUIT
- TRANSMISSION / CHASSIS CONTROL CIRCUIT
- MONITOR CIRCUIT
- INTEGRATED BRAKING CONTROL
- ENGINE CONTROL CIRCUIT
- HEATER AND AIR CONDITIONER CIRCUIT
- TURN SIGNAL / WIPER WASHER CIRCUIT

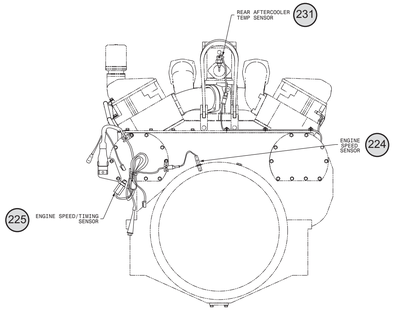
OTHER COLOR DESCRIPTIONS

- HIGHWAYS

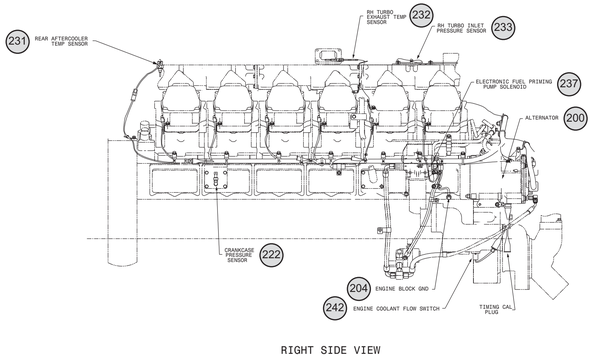
THIS SCHEMATIC IS FOR THE 785C OFF-HIGHWAY TRUCK ELECTRICAL SYSTEM
VOLUME 1 of 4: CHASSIS
MEDIA NUMBER: UENR1251
SCHEMATIC PART NUMBER: 321-6340, CHANGE: 00, VERSION: -
Components are shown installed on a fully operable machine with the key and engine off, transmission shifter in neutral and with parking brake set.
Refer to the appropriate Service Manual for Troubleshooting, Specifications and Systems Operations.



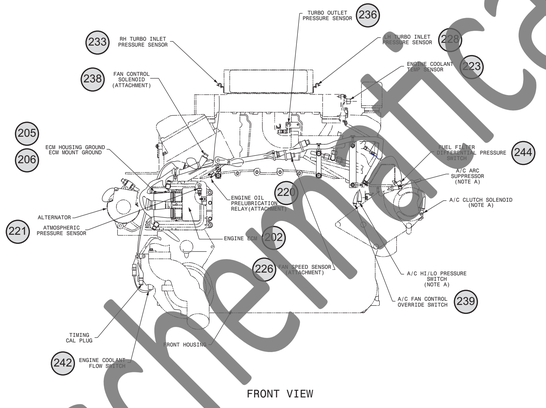
LEFT SIDE VIEW



REAR VIEW



RIGHT SIDE VIEW



FRONT VIEW

Component Location

Component	Schematic Location	Machine Location	Component	Schematic Location	Machine Location
Alternator	D-4	200	Sensor - Crankcase Pressure	D-2	222
Breaker - Electronic Fuel Priming Pump	C-9	201	Sensor - Engine Coolant Temperature	C-2	223
ECM - Engine	D-9	202	Sensor - Engine Speed	E-9	224
Ground - Engine	A-4	203	Sensor - Engine Speed/Timing	D-2	225
Ground - Engine Block	D-4	204	Sensor - Fan Speed (ATCH)	E-2	226
Ground - Engine Block ECM ***NOT SHOWN**	D-7	245	Sensor - LH Turbo Exhaust Temperature	C-2	227
Ground - Engine ECM Housing	A-9	205	Sensor - LH Turbo Inlet Pressure	C-2	228
Ground - Engine ECM Mount	A-9	206	Sensor - Oil Pressure (Filtered)	D-2	229
Ground - Frame	A-4	207	Sensor - Oil Pressure (Unfiltered)	D-2	230
Injector - 1 ***NOT SHOWN**	A-5	208	Sensor - Rear Aftercooler Temperature	B-2	231
Injector - 2 ***NOT SHOWN**	B-5	209	Sensor - RH Turbo Exhaust Temperature	C-2	232
Injector - 3 ***NOT SHOWN**	A-5	210	Sensor - RH Turbo Inlet Pressure	B-2	233
Injector - 4 ***NOT SHOWN**	B-5	211	Sensor - Torque Converter Out Speed	E-9	234
Injector - 5 ***NOT SHOWN**	A-6	212	Sensor - Torque Converter Temperature	D-9	235
Injector - 6 ***NOT SHOWN**	B-6	213	Sensor - Turbo Outlet Pressure	C-2	236
Injector - 7 ***NOT SHOWN**	A-6	214	Solenoid - Electronic Fuel Priming Pump	C-6	237
Injector - 8 ***NOT SHOWN**	B-6	215	Solenoid - Fan Control (ATCH)	C-4	238
Injector - 9 ***NOT SHOWN**	A-6	216	Switch - A/C Fan Control Override	D-4	239
Injector - 10 ***NOT SHOWN**	B-6	217	Switch - Electronic Fuel Priming Pump	D-6	240
Injector - 11 ***NOT SHOWN**	A-7	218	Switch - Engine Add Oil Level (ATCH)	B-2	241
Injector - 12 ***NOT SHOWN**	B-7	219	Switch - Engine Coolant Flow	A-2	242
Relay - Pre Lubrication (ATCH)	D-4	220	Switch - Engine Oil Level Low	A-2	243
Sensor - Atmospheric Pressure	D-2	221	Switch - Fuel Filter Differential Pressure	B-2	244

Connector Location

Connector Number	Schematic Location	Engine Location
CONN 17	E-6	17
CONN 18	E-6	18
CONN 20	E-5	20

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.

CATERPILLAR®

UENR1251
June 2012

Schematic

785C Off-Highway Truck Electrical System

APX1747-1831

Volume 2 of 4: Engine

Printed in U.S.A.

Event Codes Engine Control

Event Code	Condition
E017	High Engine Coolant Temperature Warning
E021	High Exhaust Temperature Derate
E035	Loss of Coolant Flow Warning
E038	Low Engine Coolant Temperature Warning
E072	Oil Level Low Mark
E073	Oil Filter Differential Pressure High
E074	Oil Filter Differential Pressure Very High
E092	Boost Pressure Above Normal (793 HA Only)
E093	Boost Pressure Below Normal (793 HA Only)
E095	Fuel Filter Restriction Warning
E098	Engine Prelube Override
E100	Low Engine Oil Pressure Warning
E101	High Crankcase Pressure Warning
E190	Engine Overspeed Warning
E265	User Defined Shutdown
E272	Inlet Air Restriction Warning

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.

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

Related Electrical Service Manuals

Title	Form Number
Alternator: 9X-7803	SENR7508
Engine Control:	SENR1128

Component Identifiers (CID[1]) Module Identifier (MID[2]) Engine Control (MID No. 036)

CID	Component
0001	Cylinder 1 Injector Solenoid
0002	Cylinder 2 Injector Solenoid
0003	Cylinder 3 Injector Solenoid
0004	Cylinder 4 Injector Solenoid
0005	Cylinder 5 Injector Solenoid
0006	Cylinder 6 Injector Solenoid
0007	Cylinder 7 Injector Solenoid
0008	Cylinder 8 Injector Solenoid
0009	Cylinder 9 Injector Solenoid
0010	Cylinder 10 Injector Solenoid
0011	Cylinder 11 Injector Solenoid
0012	Cylinder 12 Injector Solenoid
0013	Cylinder 13 Injector Solenoid
0014	Cylinder 14 Injector Solenoid
0015	Cylinder 15 Injector Solenoid
0016	Cylinder 16 Injector Solenoid
0091	Throttle Position Signal
0100	Engine Oil Pressure
0101	Crankcase Pressure Signal
0102	Boost Pressure
0110	Coolant Temperature
0168	System Voltage
0190	Engine Speed Signal
0248	CAT Data Link
0253	Personality Module
0254	Engine ECM
0261	Timing Calibration
0262	Analog Sensor Supply
0263	Digital Sensor Supply
0267	Shutdown Inputs
0268	System Parameters
0273	Turbocharger Outlet Pressure
0274	Atmospheric Pressure
0275	Right Turbocharger Inlet Pressure
0276	Left Turbocharger Inlet Pressure
0291	Engine Cooling Fan Solenoid
0296	Unable to Communicate withTransmission ECM
0338	Prelube Pump Relay
0526	Wastegate Solenoid
0542	Unfiltered Oil Pressure Signal
0543	Filtered Oil Pressure
0544	Engine Fan Speed Sensor Signal
0545	Start Aid Relay
0546	Start Aid Hold Relay
0562	Unable to Communicate with Caterpillar Monitoring System
0569	Oil Renewal Solenoid
0771	Shutter Relay
0799	Service Tool
0800	Unable to Communicates with VIMS
0827	Left Exhaust Temp Signal
0828	Right Exhaust Temp Signal
0829	Rear Aftercooler Coolant Temperature Signal
0830	Brake Oil Temperature

[1] The CID is a diagnostic code that indicates which circuit is faulty.

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

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).

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, ...).

AG-C4 111-7898 — **Part Number:** for Connector Plug

L-C12 3E-5179 — **Part Number:** for Connector Receptacle

Plug — **Receptacle Pin or Socket 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.

Fuse (5 Amps) — 9X-1123 Component Part Number

Harness identification code: This example indicates wire group 325, wire 135 in harness "AG". — 325-AG135 PK-14 — **Wire Gauge** / **Wire Color**

Wire Description

Wire Number	Wire Color	Description	Wire Number	Wire Color	Description
		Power Circuits			**Control Circuits (Continued)**
109	OR	Alt Output (+) Term.	E799	BR	Fan Control Solenoid Return
113	OR	Key SW On	F700	BU	Fan Control Solenoid
150	OR	Battery + (Engine Control)	F701	BR	Oil Renewal Solenoid
		Ground Circuits	F702	GN	Throttle Position Sensor
200	BK	Main Chassis	F703	GY	LH Turbo Exhaust Temperature Sensor
229	BK	Bat - (Engine Control)	F704	OR	RH Turbo Exhaust Temperature Sensor
		Basic Machine Circuits	F705	PK	Not Used
317	YL	Start Aid Relay To Start Aid Sol	F707	WH	Start Aid Hold Relay
323	WH	EFPP SW to EFPP Breaker	F708	YL	Shutter Relay
329	WH	EFPP SW to EFPP Solenoid	F709	BU	Pre-lube Relay
337	WH	Prelube Pushbutton SW To Prelube Timer	F710	BR	Start Aid On Relay
		Monitoring Circuits	F713	OR	Left Turbo Inlet Pressure Sensor
403	GN	Alternator (R) Term.	F714	PK	Right Turbo Inlet Pressure Sensor
412	BU	Engine Control to Engine Coolant Flow SW	F715	PU	Shutdown Signal (N/O)
450	YL	Engine Speed Sensor	F716	WH	Shutdown Signal (N/C)
452	PU	Torque Converter Out Speed Sensor	F717	YL	Throttle Bypass SW
481	GN	Converter Temp SW To Brake Oil Temp SW	F718	BU	Engine Add Oil Level SW
		Accessory Circuits	F719	BR	Engine Low Oil Level SW
513	OR	A/C Compressor/Refrigerant Pressure SW	F720	GN	Start Aid SW
521	YL	A/C SW To Refrigerant SW	F721	GY	User Def Shutdown
522	WH	A/C Clutch To Thermostat SW	F722	OR	A/C Fan Control Override SW
		Control Circuits	F723	PK	Timing Cal (+)
799	WH	Sensor Power	F724	PU	Timing Cal (-)
A700	OR	Digital Sensor Power(+8V)	F725	WH	Fuel Filter Differential Press SW
A701	GY	Injector #1	F726	YL	Injector Common 1 & 3
A702	PU	Injector #2	F727	BU	Injector Common 2 & 4
A703	BR	Injector #3	F728	BR	Injector Common 5 & 7
A704	GN	Injector #4	F729	GN	Injector Common 6 & 8
A705	BU	Injector #5	F730	GY	Injector Common 9 & 11
A706	GY	Injector #6	F731	OR	Injector Common 10 & 12
A707	PU	Injector #7	F732	PK	Fan Speed Sensor
A708	BR	Injector #8	F780	PK	Parking Brake SW
A709	OR	Injector #9	J765	BU	Engine Speed Sensor
A710	GY	Injector #10	892	BR	CAT Data Link (-)
A711	PU	Injector #11	893	GN	CAT Data Link (+)
A712	BR	Injector #12	993	BR	Analog Sensor Common
A746	PK	Turbo Outlet Pressure Sensor	994	GY	Oil Pressure Sensor (Filtered)
A747	GY	Atmospheric Pressure Sensor	995	BU	Engine Coolant Temperature Sensor
A751	YL	Rear After Cooler Temperature Sensor	996	GN	Engine Speed Timing Sensor
E793	BU	ATA Data Link (-)	997	OR	Analog Sensor Power (+ 5V)
E794	YL	ATA Data Link (+)	998	BR	Digital Sensor Return
E795	YL	Crankcase Pressure Sensor	999	WH	Engine Speed Timing Sensor
E796	GN	Oil Pressure Sensor (Unfiltered)	E976	GN	Air Intake Temperature Sensor

Solenoid Specifications

Part No.	Component Description	Resistance (Ohms)[1]
124-3497	Solenoid: Fan Control	2.8 ± 0.3

[1] At room temperature unless otherwise noted.

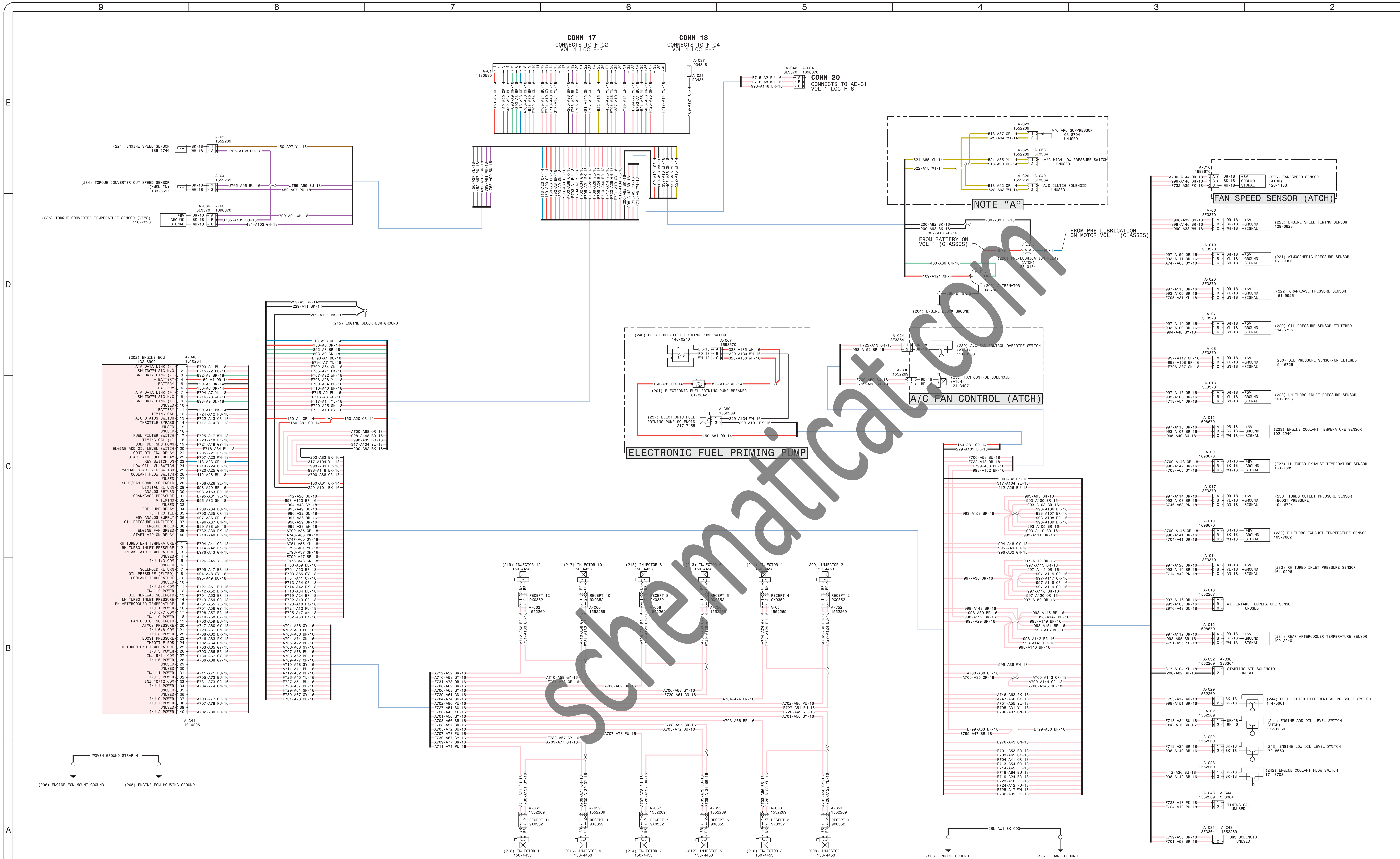
Off Machine Switch Specification

Part No.	Function	Actuate	Deactuate	Contact Position
144-5661	Fuel Filter Differential Pressure	137.9 ± 13.8 kPa (20.00 ± 2.00 psi)	82.7 kPa MIN (12.0 psi MIN)	Normally Closed
171-8708	Engine Coolant Flow	362 ± 29 mN (1.3 ± 0.1 oz) at point X	303 mN MIN (1.1 oz MIN) at point X	Normally Open

UENR1251 VOL 2 of 4

20 Page, (Dimensions: 39 inches x 24 inches)

UENR1251 VOL 2 of 4
20 Page, (Dimensions: 39 inches x 24 inches)



IDENT	PART NUMBER	LOC	DESCRIPTION	NOTE
HARNESS AS				
A	223-9125	D-8	MAIN ENGINE	STD
CABLE AS				
E	153-7485	D-4	ALTERNATOR GROUND	STD
AW	116-7156	A-4	ENG TO FRAME GROUND	STD
STRAP AS				
H	7X-6315	A-9	ADEM II GROUND	STD

NOTE A: THESE CONNECTORS ARE NOT USED ON THIS MACHINE. SEE VOL 1 (CHASSIS) PROPER A/C HARNESS CONNECTIONS AND COMPONENTS.

NOTE B: THESE WIRES ARE NOT USED ON THIS MACHINE AND ARE TO BE TIED BACK TO HARNESS.

CALLOUTS

Callout Number (Machine Location from Component Locations Table) → (52) VALVE GP - CONTROL ← Component Name
138-1234 ← Part Number

SYMBOL	DESCRIPTION
(dot)	CIRCUIT CONNECTED
(cross)	CIRCUIT NOT CONNECTED
(ground)	ELECTRICAL CONNECTION TO MACHINE STRUCTURE
(dashed ground)	INTERNAL ELECTRICAL CONNECTION TO SURFACE OF COMPONENT
→)⟩—	CONNECTOR
H#	CIRCUIT GROUPING DESIGNATION
– – –	ATCH WIRE, CABLE, COMPONENT
○–○	SPLICE
○	BLADE, SPADE, RING OR SCREW TERMINAL

The following wire pairs must be twisted at least 1 turn per 25mm:		
892	&	893
E793	&	E794
F723	&	F724

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

WIRE GROUP COLOR DESCRIPTIONS	
(black)	GROUND CIRCUIT
(red)	WIRES THAT HAVE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS OFF
(blue)	WIRES THAT HAVE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS ON
(light blue)	VOLTAGE CONVERTER OUTPUT CIRCUIT
(orange)	STARTING CIRCUIT
(salmon)	STARTING AID CIRCUIT
(purple)	TRANSMISSION / CHASSIS CONTROL CIRCUIT
(green)	MONITOR CIRCUIT
(brown)	INTEGRATED BRAKING CONTROL
(pink)	ENGINE CONTROL CIRCUIT
(olive)	HEATER AND AIR CONDITIONER CIRCUIT
(tan)	TURN SIGNAL / WIPER WASHER CIRCUIT
OTHER COLOR DESCRIPTIONS	
(grey-blue)	HIGHWAYS

THIS SCHEMATIC IS FOR THE 785C OFF-HIGHWAY TRUCK ELECTRICAL SYSTEM
VOLUME 2 of 4: ENGINE
MEDIA NUMBER: UENR1251
SCHEMATIC PART NUMBER: 235-3404, CHANGE: 01, VERSION: -
Components are shown installed on a fully operable machine with the key and engine off, transmission shifter in neutral and with parking brake set.
Refer to the appropriate Service Manual for Troubleshooting, Specifications and Systems Operations.

CATERPILLAR®

UENR1251
June 2012

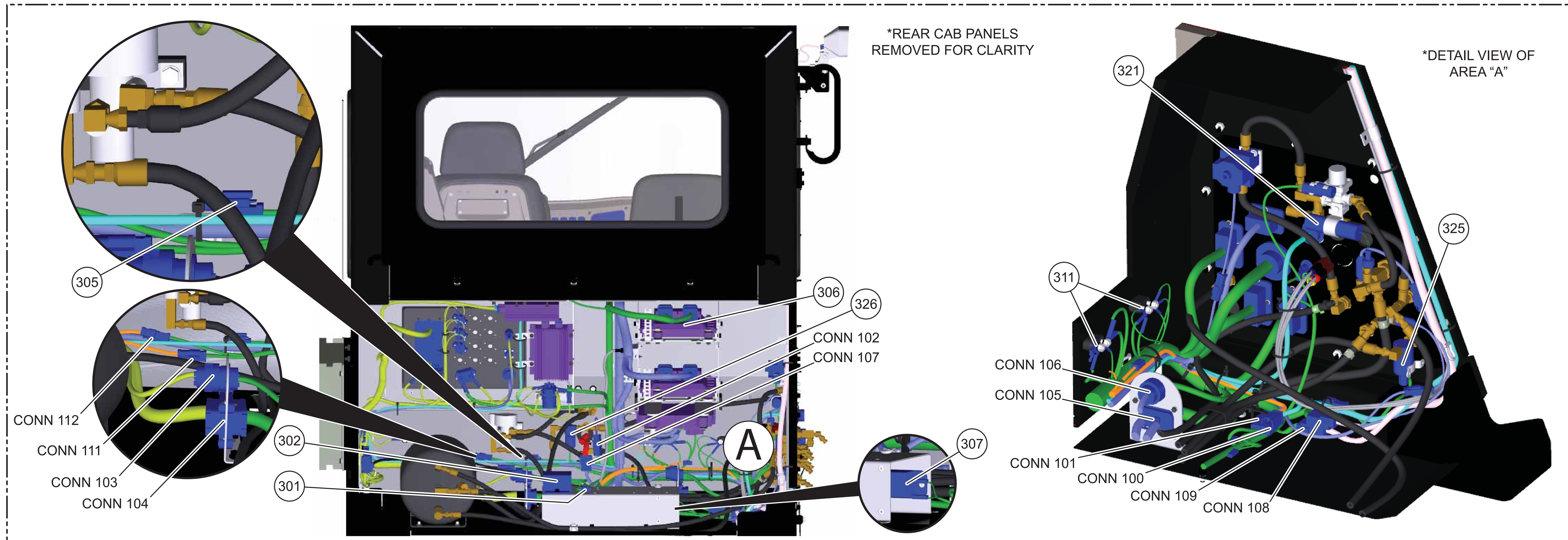
Schematic

785C Off-Highway Truck Electrical System

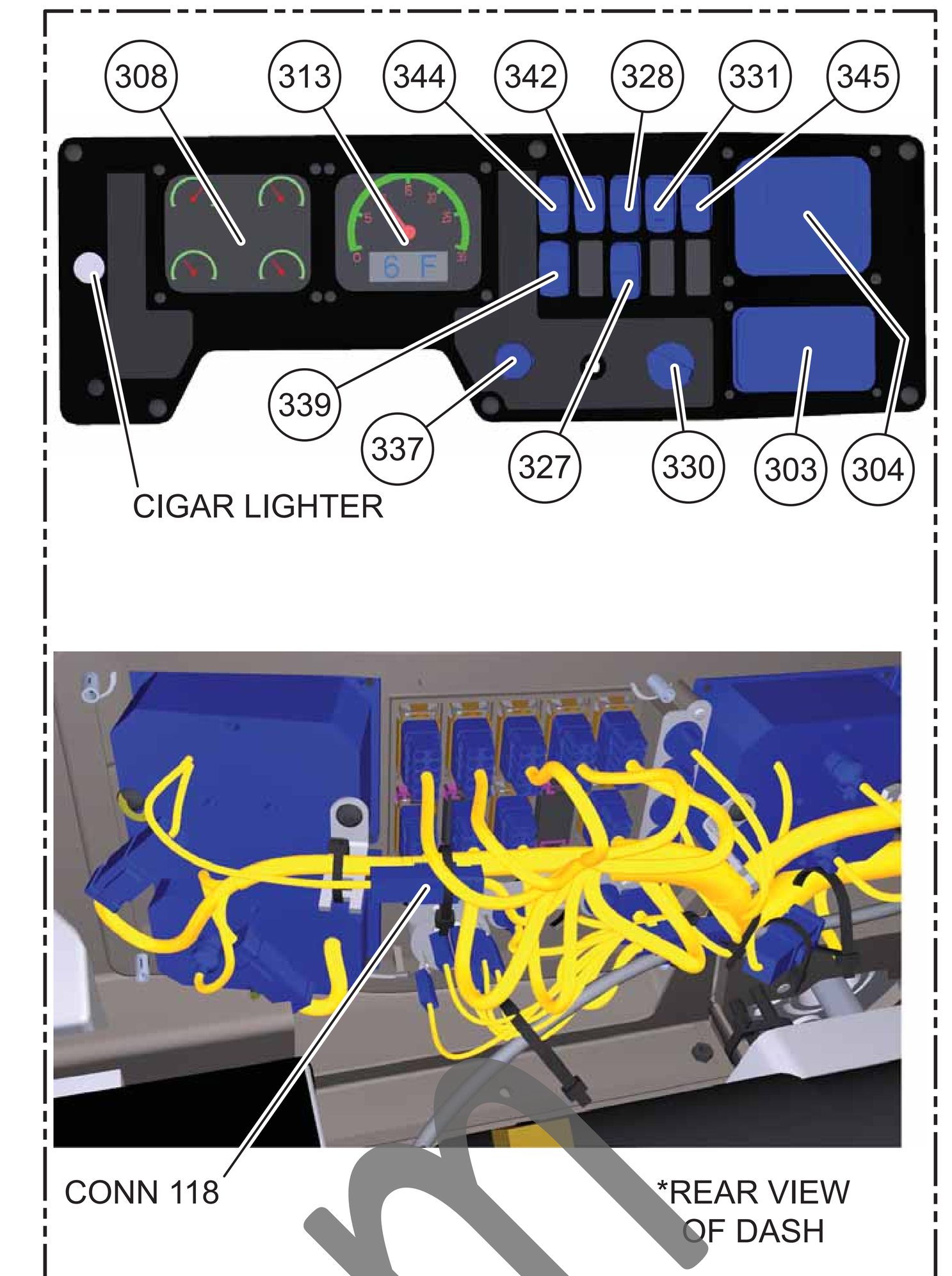
APX1747-1831

Volume 3 of 4: Cab (Interior and Brake Control)

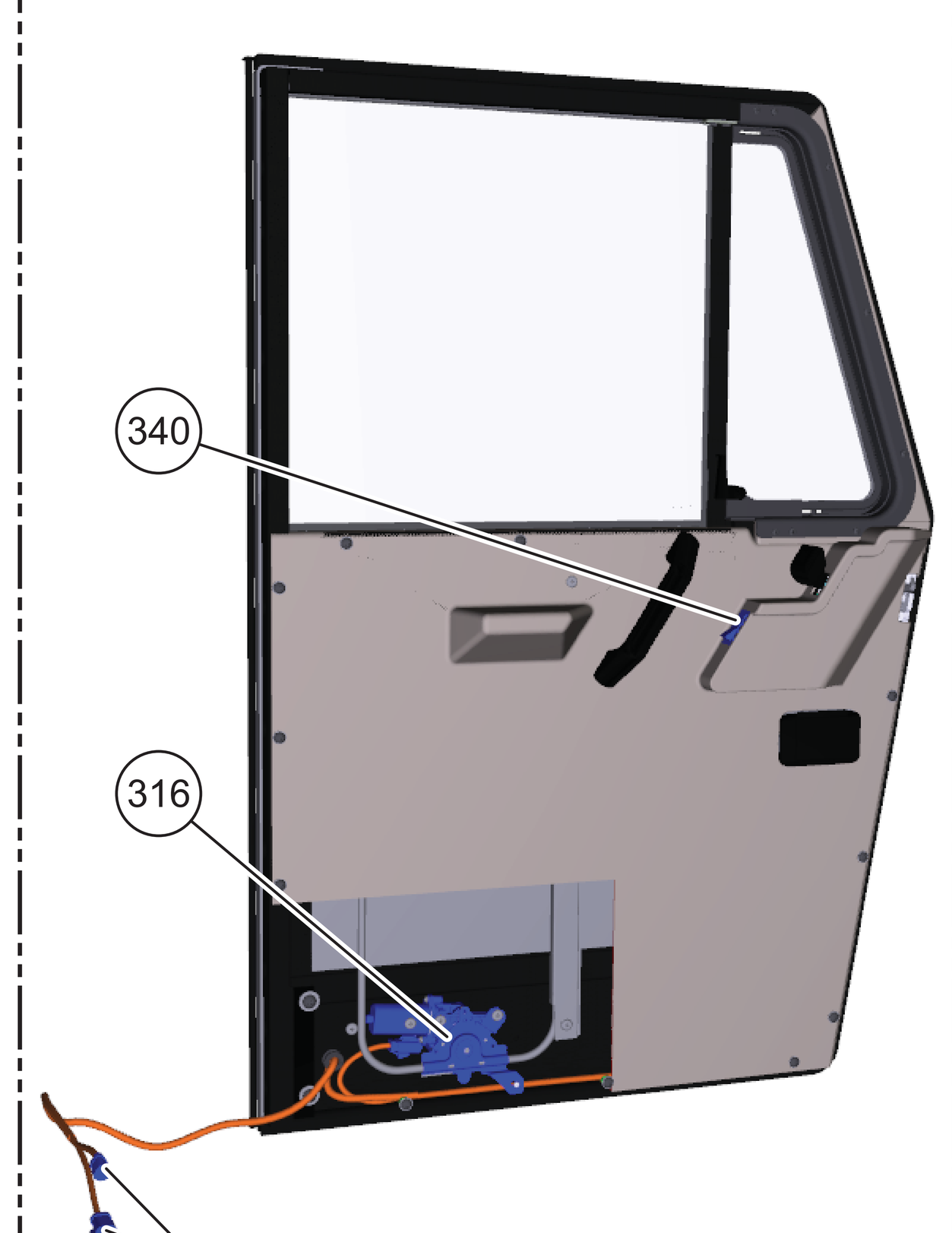
Printed in U.S.A.



REAR CAB COMPARTMENT



DASH



DRIVERS DOOR

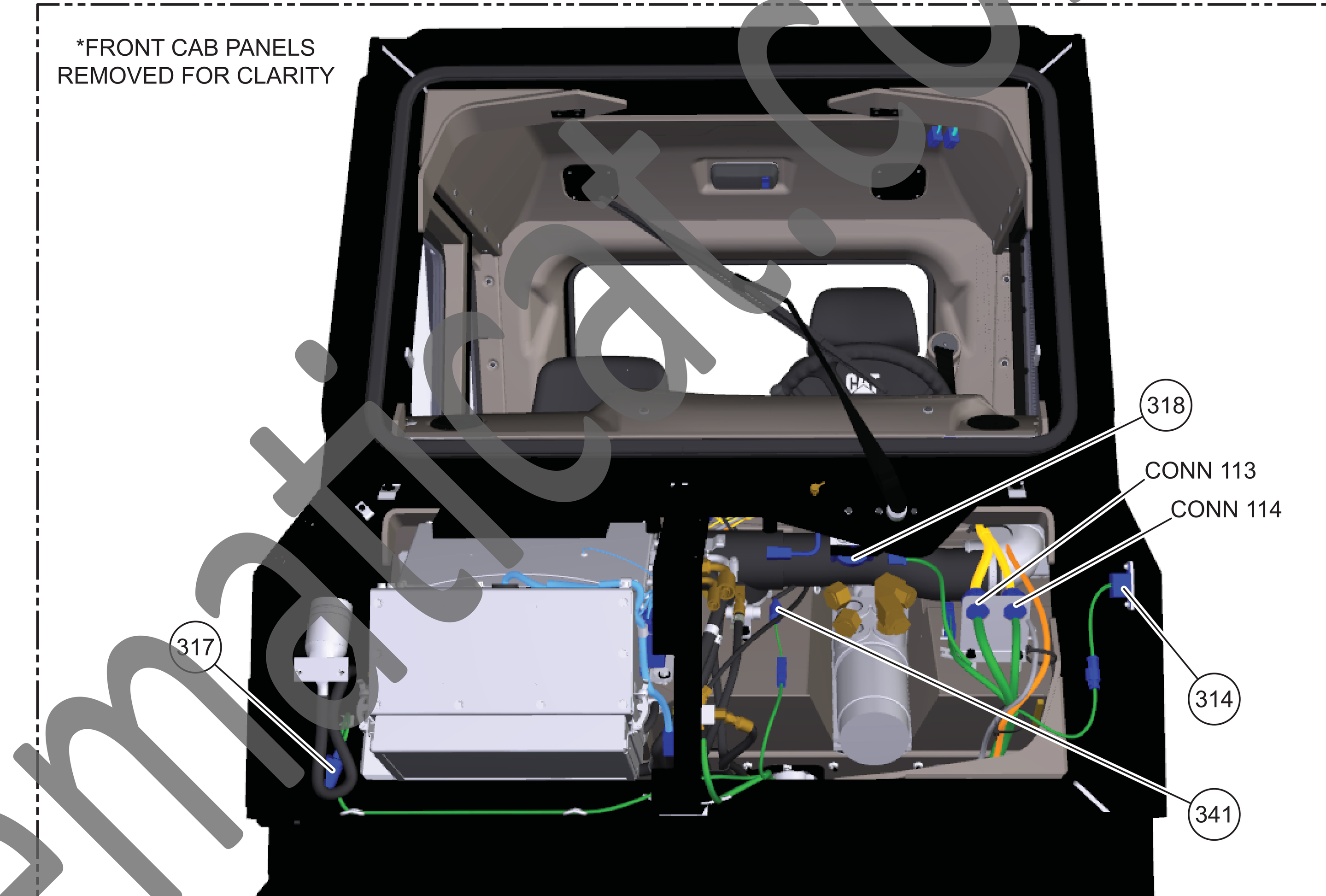
Resistor, and Solenoid Specifications		
Part No.	Component Description	Resistance (Ohms)[1]
125-9740	Resistor Blower	A - C 2 (Ohms) ± 5% B - C 1 (Ohms) ± 5% C - D 0.36 (Ohms) ± 5%
185-0008	Solenoid Horn	71.9 (Ohms) ± 2 (Ohms)
188-2461	Solenoid Front Brake Cooling Diverter	42.4 (Ohms) ± 2.1 (Ohms)

[1] At room temperature unless otherwise noted.

Off-Machine Switch Specification				
Part No.	Function	Actuate	Deactuate	Contact Position
103-4977	Retarder Pressure	60 kPa MAX (8.70 psi)	28 kPa ± 15 kPa (4.06 psi ± 2.18 psi)	Normally Open Below Deactuation Pressure

Related Electrical Service Manuals	
Title	Form Number
Cross Reference for Electrical Connectors:	REHS0970
Brake Control:	SENR1503

Component Location					
Component	Schematic Location	Machine Location	Component	Schematic Location	Machine Location
Alarm - VIMS Action	D-5	300	Sensor - Transmission Lever Position	A-7	324
Control - Rear Axle Pump	H-16	301	Solenoid - Front Brake Cooling Diverter	E-16	325
Control - Steering Bleed	H-16	302	Solenoid - Horn	F-11	326
Control - VIMS Keypad	C-3	303	Switch - A/C Enable	F-1	327
Control - VIMS Message Center	C-3	304	Switch - ARC	D-1	328
Diode - Horn Solenoid	F-11	305	Switch - Backup Lamp	D-5	329
ECM - Brake	D-12	306	Switch - Blower	F-1	330
Flasher AS	G-16	307	Switch - Brake Retract	E-1	331
Gauge Cluster	H-2	308	Switch - Dome Lamp	D-7	332
Ground - Cab	A-16	309	Switch - Fog Lamp	C-5	333
Ground - Chassis	A-16	310	Switch - Hazard Lamp	B-5	334
Ground Boss - Rear Cab	H-10	311	Switch - Head Lamp	C-5	335
Ground Strap AS	A-1	312	Switch - Horn	I-1	336
Module - Speedometer / Tachometer	G-2	313	Switch - Key	F-1	337
Module - Wiper Delay	I-1	314	Switch - Ladder Lamp	D-5	338
Motor - Blower	B-3	315	Switch - Panel Dimmer	C-1	339
Motor - Power Window	I-3	316	Switch - Power Window	J-3	340
Motor - Washer	H-1	317	Switch - Retarder Pressure	J-1	341
Motor - Wiper	I-1	318	Switch - Starting Aid	D-1	342
Outlet - 24V Power	A-11	319	Switch - Steering Column	H-1	343
Resistor - Blower	B-3	320	Switch - Throttle Backup / Lock	D-1	344
Sensor - Brake Air Pressure	E-16	321	Switch - Traction Control System Test	E-1	345
Sensor - Hoist Lever Position	B-7	322	Thermostat - HVAC	B-3	346
Sensor - Throttle Position	B-2	323			



FRONT CAB COMPARTMENT

Component Identifiers (CID[1]) Module Identifier (MID[2]) Brake ECM (MID 116[3])	
CID	Component
0084	Speed Sensor (Machine Ground Speed)
0091	Position Sensor (Throttle)
0168	Electrical System Voltage
0190	Speed Sensor (Engine)
0248	CAT Data Link
0269	Sensor Power Supply
0291	Solenoid Valve (Engine Cooling Fan)
0296	Electronic Control Module (Transmission/Chassis ECM)
0541	Pressure Sensor (Differential Oil)
0544	Speed Sensor (Engine Cooling Fan)
0590	Electronic Control Module (Engine)
0607	Speed Sensor (Left Wheel)
0608	Speed Sensor (Right Wheel)
0689	Solenoid Valve (Left Rear Traction Control)
0690	Solenoid Valve (Right Rear Traction Control)
0700	Position Sensor (Transmission Gear)
0701	Speed Sensor (Transmission Output)
0702	Position Sensor (Transmission Shift Lever)
0704	Pressure Switch (Service Brake)
0710	Solenoid Valve (Auto Retarder Supply)
0711	Solenoid Valve (Auto Retarder Control)
0712	Indicator Lamp (Retarder)
0713	Rocker Switch (Auto Retarder)
0714	Pressure Switch (Auto Retarder)
0715	Pressure Switch (Retarder)
0719	Proportional Solenoid Valve (Traction Control)
0742	Relay (Brake Lamp)
0796	Solenoid (Differential Fan)
0800	Vital Information Monitoring System (VIMS)
0835	Temperature Sensor (Differential Oil)
0849	Pressure Sensor (Air System)
0966	Indicator Lamp (Traction Control)
0967	Machine Application
1225	Pressure Sensor (Left Parking Brake Oil)
1226	Pressure Sensor (Right Parking Brake Oil)
1229	Speed Sensor (Brake Cooling Pump)
1230	Solenoid (Brake Cooling Pump)
1231	Solenoid (Front Brake Cooling Diverter)
1232	Solenoid (Rear Axle Diverter)
1326	Incorrect Location Code
1437	Solenoid (Rear Axle Supply)

[1] The CID is a diagnostic code that indicates which circuit is faulty.

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

[3] For the Brake ECM, the MID is 116. This chart pertains only to diagnostic codes with a MID of 116.

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.

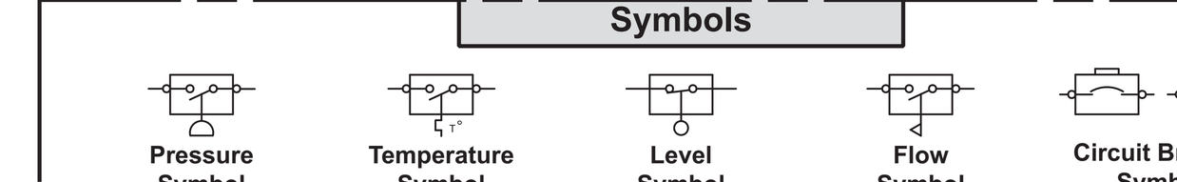
[1] The FMI is a diagnostic code that indicates what type of failure has occurred.

Connector Location	
Connector Number	Schematic Location
CONN 8	A-15
CONN 9	A-14
CONN 14	A-13
CONN 15	A-12
CONN 28	A-5
CONN 29	A-4
CONN 100	I-16
CONN 101	H-16
CONN 102	D-15
CONN 103	J-14
CONN 104	I-14
CONN 105	F-14
CONN 106	E-14
CONN 107	B-9
CONN 108	C-8
CONN 109	B-8
CONN 110 - To +12V Power Port 1	B-7
CONN 111	J-6
CONN 112	I-6
CONN 113	G-4
CONN 114	F-4
CONN 115 - COMM Radio	F-4
CONN 116	B-4
CONN 117 - To +12V Power Port 2	B-3
CONN 118 - To Message Center Backlight	C-3

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.

Harness And Wire Electrical Schematic Symbols

Symbols



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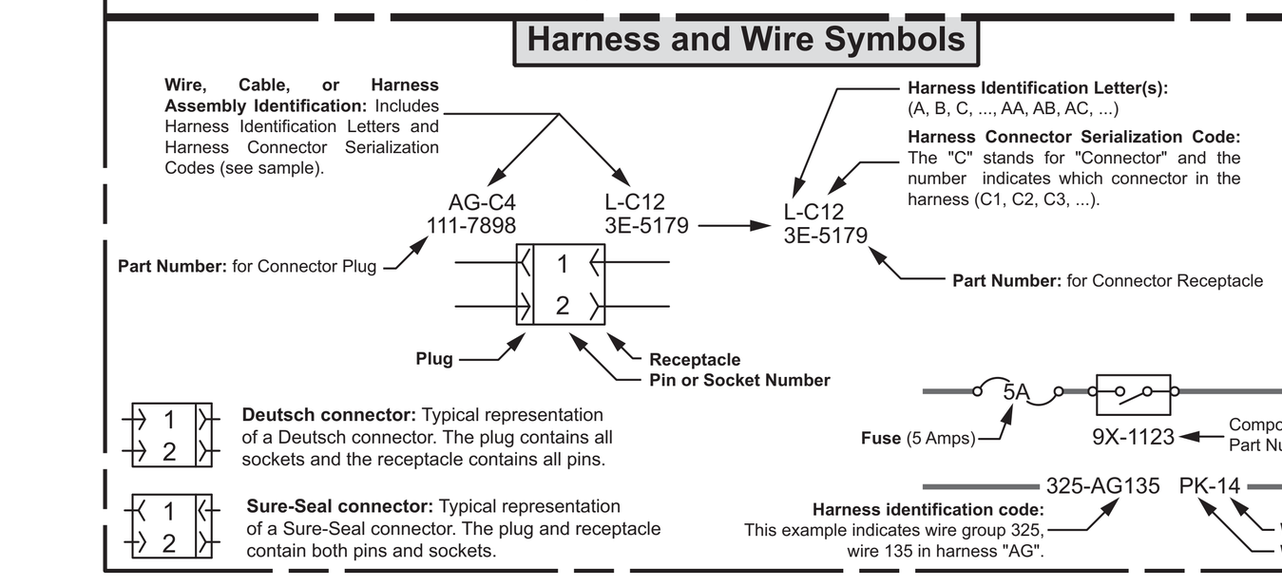
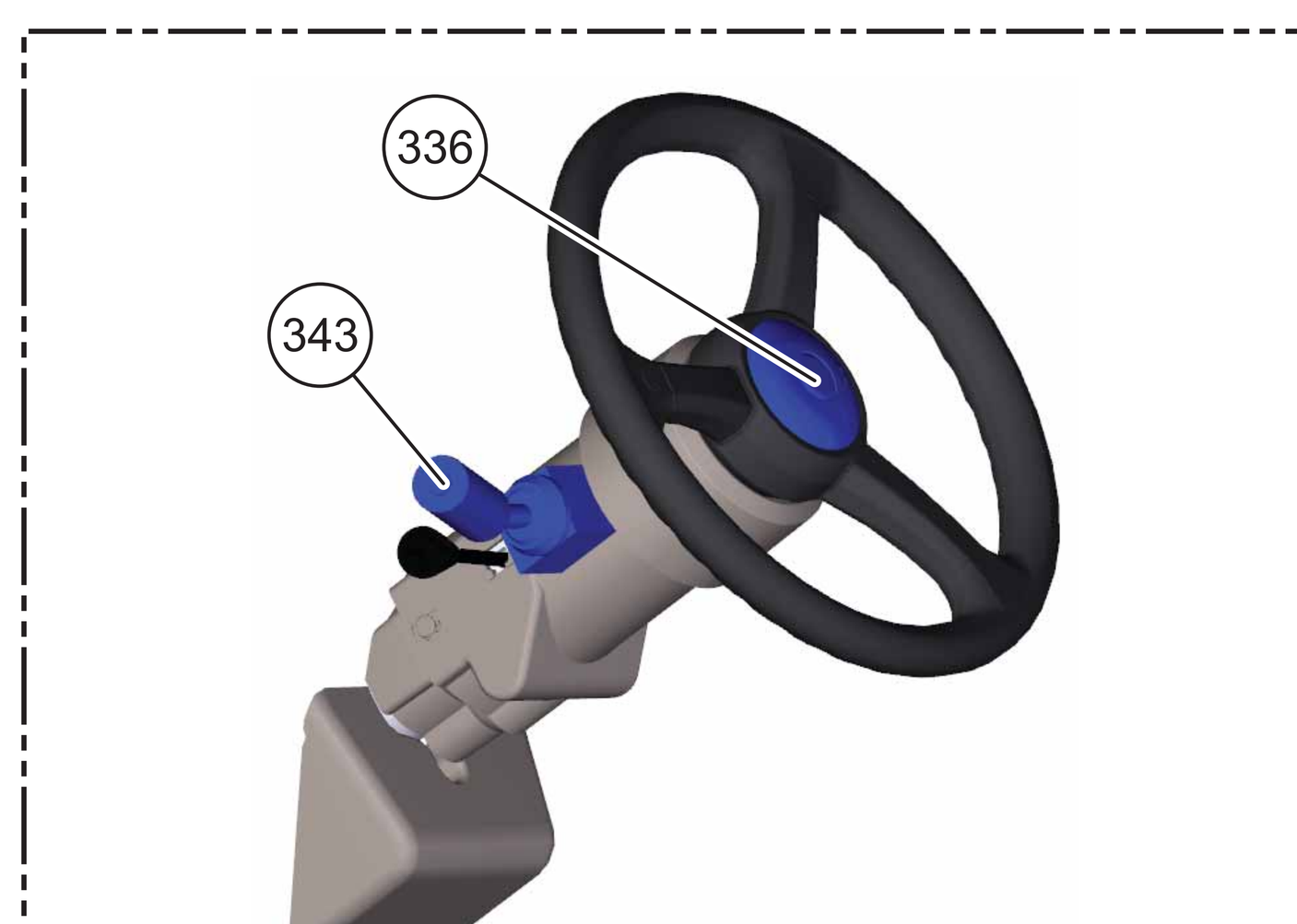
Harness and Wire Symbols

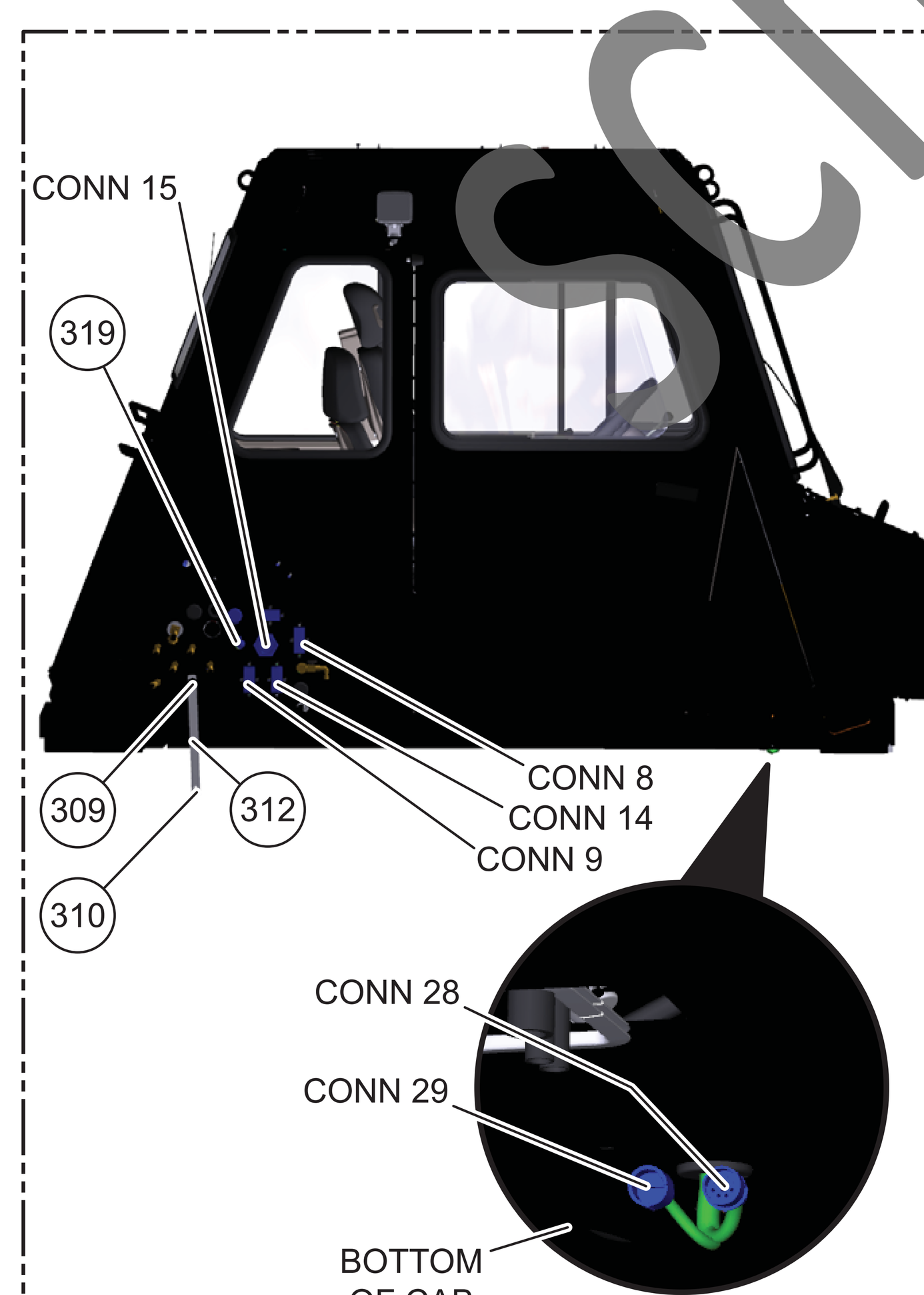


CENTER CONSOLE AND SEATS

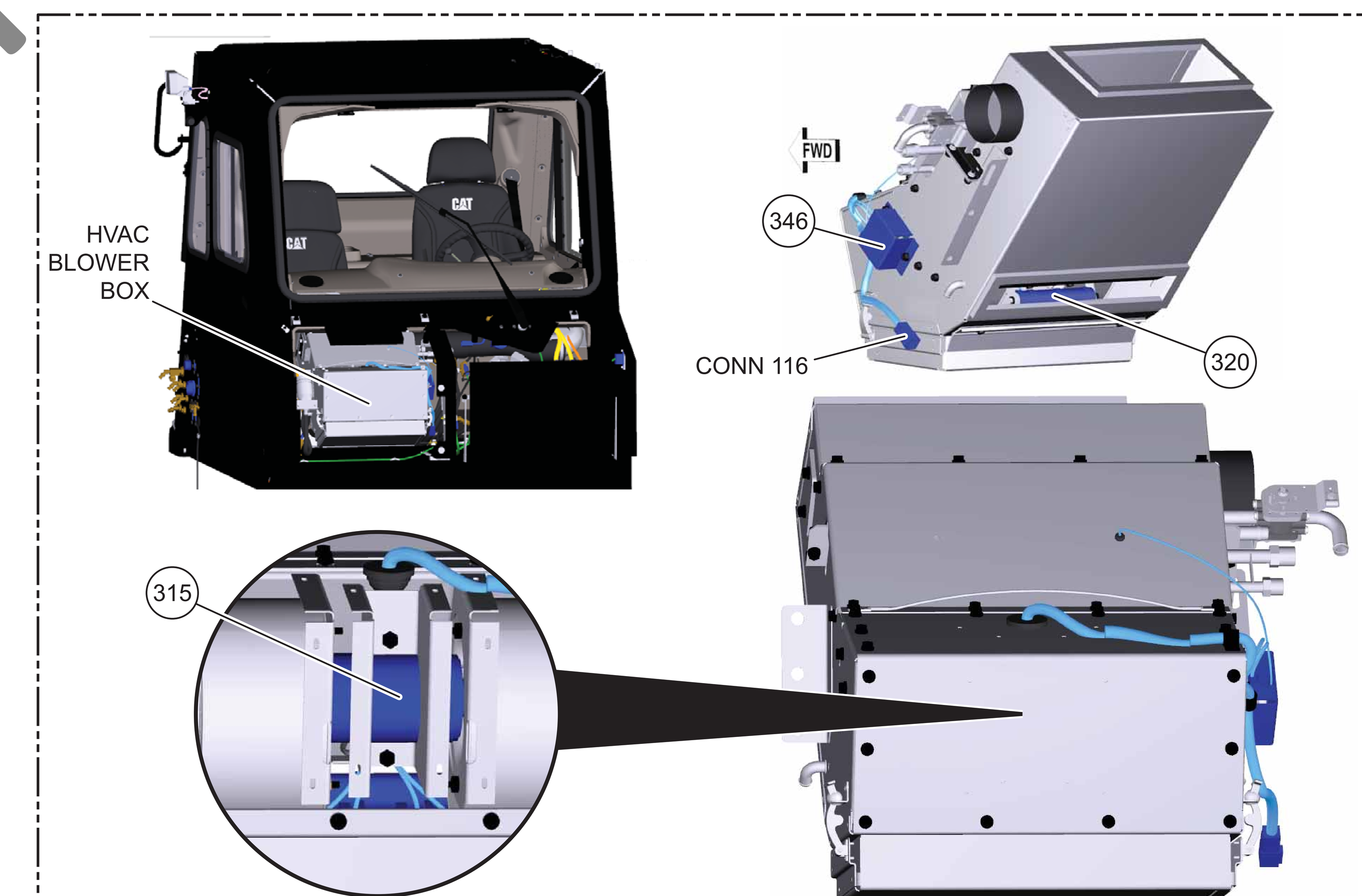


STEERING WHEEL

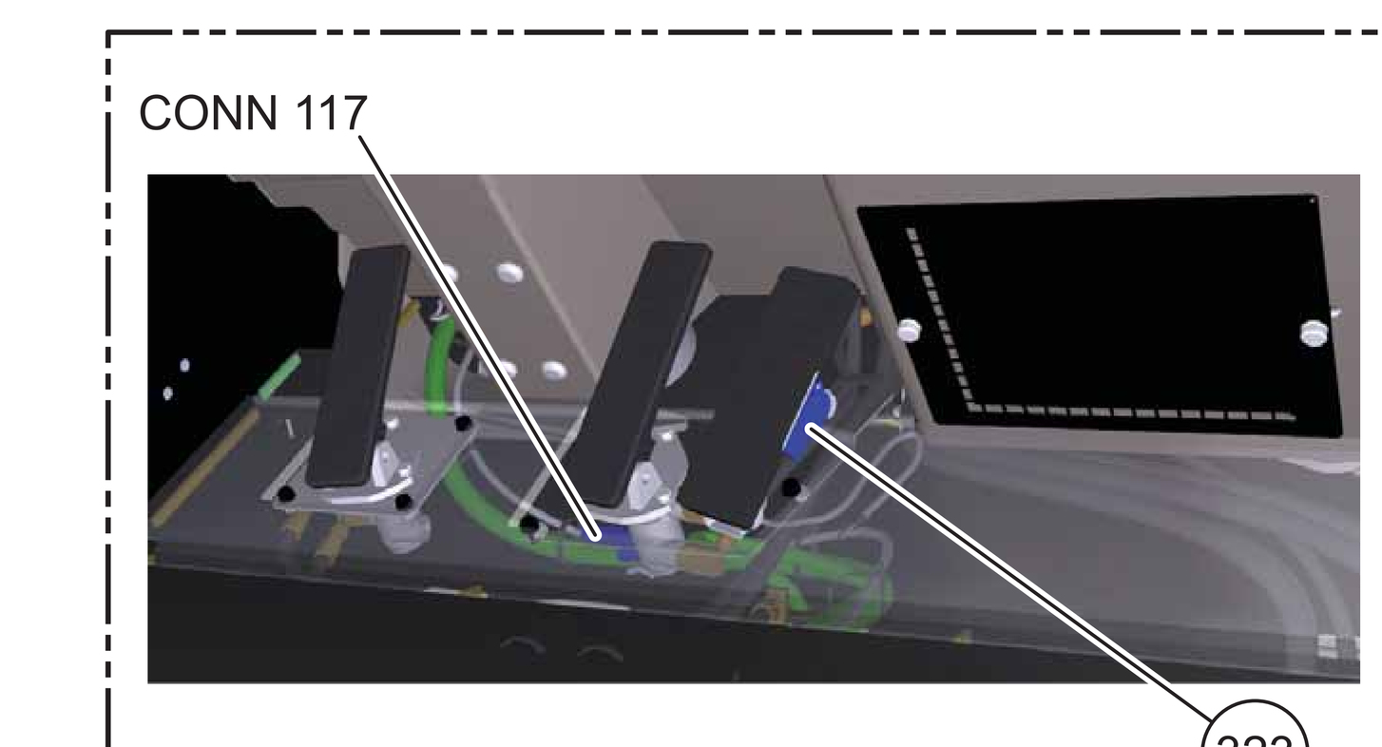
COMM RADIO CONNECTION



CAB TO CHASSIS CONNECTIONS



HVAC BLOWER BOX



PEDALS

HEADLINER

UENR1251 VOL 3 of 4

42 Page, (Dimensions: 56 inches x 35 inches)

IDENT	PART NUMBER	CHANGE	LOC	DESCRIPTION	NOTE
HARNESS AS					
A	140-1391	3	B-4	HVAC	
AG	351-4426	1	G-14	MAIN CAB	
AM	160-5073	1	B-9	CENTER CONSOLE	
AN	351-4427	1	H-4	DASH	
CA	164-5393	1	D-15	RAC JUMPER	
UU	346-4855	1	C-8	HEADLINER	
YY	346-4853	1	J-6	POWER WINDOW	

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

892 &	893	
E793 &	E794	
F418 &	F419	
C413 &	C414 &	E708
C413 &	E708 &	E972

CALLOUTS

Callout Number (Machine Location from Component Locations Table) → (52) VALVE GP - CONTROL ← Component Name
138-1234 ← Part Number

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

SYMBOL	DESCRIPTION
	CIRCUIT CONNECTED
	CIRCUIT NOT CONNECTED
	ELECTRICAL CONNECTION TO MACHINE STRUCTURE
	INTERNAL ELECTRICAL CONNECTION TO SURFACE OF COMPONENT
	CONNECTOR
H#	CIRCUIT GROUPING DESIGNATION
	ATCH WIRE, CABLE, COMPONENT
	SPLICE
	BLADE, SPADE, RING OR SCREW TERMINAL

NOTE A: NORMALLY OPEN WHEN DOOR IS CLOSED

NOTE B: DO NOT ADD ADDITIONAL CURRENT LOAD TO THIS SWITCH.

NOTE C: AVAILABLE ON 789C ONLY

WIRE GROUP COLOR DESCRIPTIONS

(black)	GROUND CIRCUIT
(red)	WIRES THAT HAVE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS OFF
(blue)	WIRES THAT HAVE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS ON
(light blue)	VOLTAGE CONVERTER OUTPUT CIRCUIT
(orange)	STARTING CIRCUIT
(pink)	STARTING AID CIRCUIT
(purple)	TRANSMISSION / CHASSIS CONTROL CIRCUIT
(green)	MONITOR CIRCUIT
(brown)	INTEGRATED BRAKING CONTROL CIRCUIT
(light pink)	ENGINE CONTROL CIRCUIT
(yellow)	HEATER AND AIR CONDITIONER CIRCUIT
(tan)	TURN SIGNAL / WIPER WASHER CIRCUIT

OTHER COLOR DESCRIPTIONS

(light blue)	HIGHWAYS

THIS SCHEMATIC IS FOR THE 785C OFF-HIGHWAY TRUCK ELECTRICAL SYSTEM
VOLUME 3 of 4: CAB (INTERIOR and BRAKE CONTROL)

MEDIA NUMBER: UENR1251

SCHEMATIC PART NUMBER: 321-6340, CHANGE: 00, VERSION: -

Components are shown installed on a fully operable machine with the key and engine off, transmission shifter in neutral and with parking brake set.

Refer to the appropriate Service Manual for Troubleshooting, Specifications and Systems Operations.

CATERPILLAR®

UENR1251
June 2012

UENR1251 VOL 4 of 4
36 Page, (Dimensions: 48 inches x 35 inches)

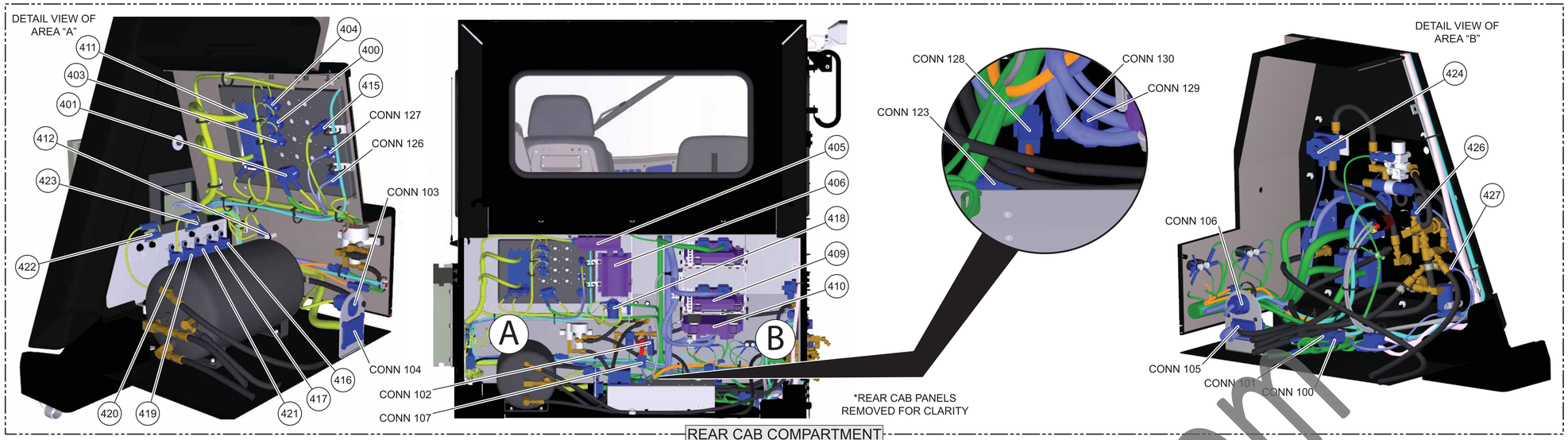
Schematic

785C Off-Highway Truck Electrical System

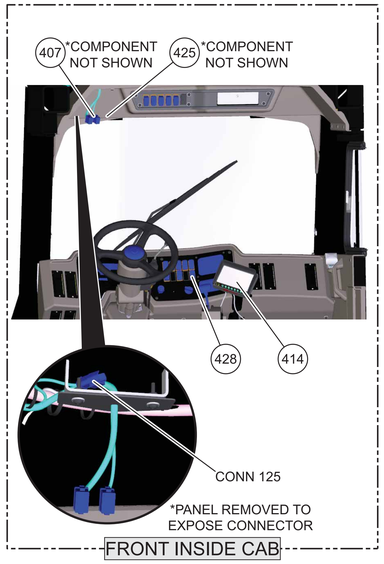
APX1747-1831

Volume 4 of 4: Cab (Transmission / Chassis Control and Relay / Breaker Panel)

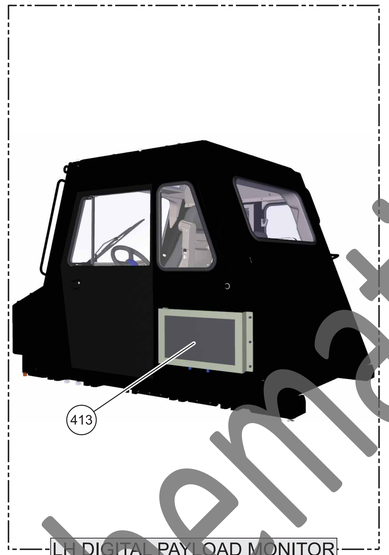
Printed in U.S.A.



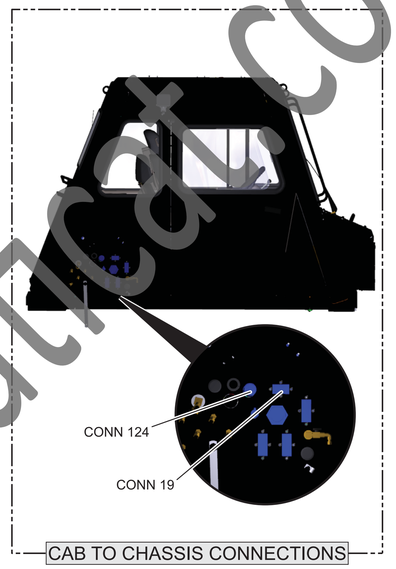
REAR CAB COMPARTMENT



FRONT INSIDE CAB



LH DIGITAL PAYLOAD MONITOR



CAB TO CHASSIS CONNECTIONS

Component Identifiers (CID*) Module Identifier (MID*) VIMS ECM (MID No. 049)	
0041	Sensor Power Supply (+8 Volt)
0075	Steering Oil Temperature Sensor
0096	Fuel Level Sensor
0171	Ambient Air Temperature Sensor
0248	Cat Data Link
0267	Remote Shutdown Input
0271	Action Alarm
0279	Front Aftercooler Coolant Temperature Sensor
0296	Transmission Electronic Control Module
0324	Lamp (Action)
0379	Auto Lube Pressure Sensor
0431	Steering Oil Level Sensor
0533	Auto Retarder Electronic Control Module
0590	Engine Electronic Control Module
0654	Trailer Right Brake Oil Temperature Sensor
0655	Trailer Left Brake Oil Temperature Sensor
0656	Trailer Brake Cooler Inlet Temperature Sensor
0657	Trailer Brake Cooler Outlet Temperature Sensor
0658	Trailer Right Strut Pressure Sensor
0659	Trailer Left Strut Pressure Sensor
0703	Trailer Door Position Sensor
0809	Speedometer/Tachometer Module (No. 1)
0810	Speedometer/Tachometer Module (No. 2)
0811	Gauge Cluster (No. 1)
0812	Gauge Cluster (No. 2)
0813	Gauge Cluster (No. 3)
0814	Gauge Cluster (No. 4)
0815	Message Center (No. 1)
0816	Message Center (No. 2)
0817	ECM Backup Battery
0819	Display Data Link
0820	Keypad Data Link
0821	Display Power Supply (12 Volts)
0823	Lamp (Service Indicator)
0824	Lamp (Truck Payload) (Green)
0825	Lamp (Truck Payload) (Red)
0833	Rear Brake Oil Temperature Sensor
0838	Left Front Suspension Cylinder Pressure Sensor
0839	Right Front Suspension Cylinder Pressure Sensor
0840	Left Rear Suspension Cylinder Pressure Sensor
0841	Right Rear Suspension Cylinder Pressure Sensor
0852	Right Front Brake Oil Temperature Sensor
0853	Left Front Brake Oil Temperature Sensor
0854	Right Rear Brake Oil Temperature Sensor
0855	Left Rear Brake Oil Temperature Sensor
0890	Telemetry Data Link
1421	Rear Engine Electronic Control Module
1422	Front Engine Electronic Control Module

Transmission / Chassis ECM (MID No. 030)	
CID	Component
0168	Electrical System
0177	Temperature Sensor (Transmission Oil)
0190	Speed Sensor (Engine)
0248	CAT Data Link
0269	Sensor Power Supply
0378	Solenoid Valve (Automatic lubrication)
0444	Start Relay
0585	Speed Sensor (Transmission Output 1)
0590	Electronic Control Module (Engine)
0627	Brake Switch (Parking)
0672	Speed Sensor (Torque Converter Output)
0673	Speed Sensor (Transmission Output 2)
0681	Solenoid Valve (Parking Brake)
0700	Sensor (Transmission Gear)
0701	Speed Sensor (Transmission Output)
0702	Position Sensor (Shift Lever)
0704	Pressure Switch (Service Brake)
0707	Solenoid Valve (Upshift)
0708	Solenoid Valve (Downshift)
0709	Solenoid Valve (Lockup Clutch)
0718	Transmission System
0724	Solenoid Valve (Body Raise)
0725	Solenoid Valve (Body Lower)
0773	Rotary Position Sensor (Hoist Lever)
0800	Vital Information Management System (VIMS)
0828	Temperature Sensor (Torque Converter Oil)
0967	Machine Application
1175	Body Position Sensor
1236	Lamp (Body Up Indicator)
1326	Location Code
1427	Lamp (Machine Lockout)

* The CID is a diagnostic code that indicates which circuit is faulty.
* The MID is a diagnostic code that indicates which electronic control module diagnosed the fault.

Failure Mode Identifiers (FMI)†	
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.

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

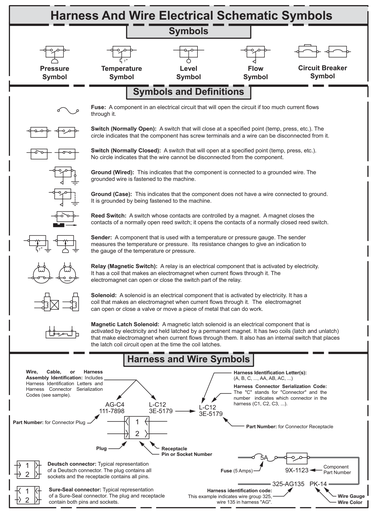
Component Location					
Component	Schematic Location	Machine Location	Component	Schematic Location	Machine Location
Breaker - A/C	B-13	400	Outlet - 12V Power	C-13	415
Breaker - Alternator	D-13	401	Relay - Brake Retract	H-14	416
Breaker - CIDDS *NOT SHOWN*	G-9	402	Relay - High Beam	I-14	417
Breaker - Converter	C-13	403	Relay - Main Power	H-13	418
Breaker - Differential Fan	B-13	404	Relay - Window 1	J-14	419
Converter - 20A 1	I-14	405	Relay - Window 2	J-14	420
Converter - 20A 2	G-8	406	Relay - Wiper	I-14	421
ECM - CIDDS	H-6	407	Resistor - Start Aid 1	G-13	422
ECM - RAC *NOT SHOWN*	A-9	408	Resistor - Start Aid 2	G-13	423
ECM - Transmission / Chassis	E-3	409	Solenoid - Autotube	B-3	424
ECM - VIMS	J-4	410	Switch - CIDDS	F-6	425
Fuse Block A5	F-13	411	Switch - Parking Brake Pressure	F-3	426
Ground Boss - Fuse Block	G-10	412	Switch - Service Brake Pressure	E-3	427
Monitor - LH Digital Payload	J-5	413	Switch - WAVS	J-7	428
Monitor - Rear Vision	I-7	414			

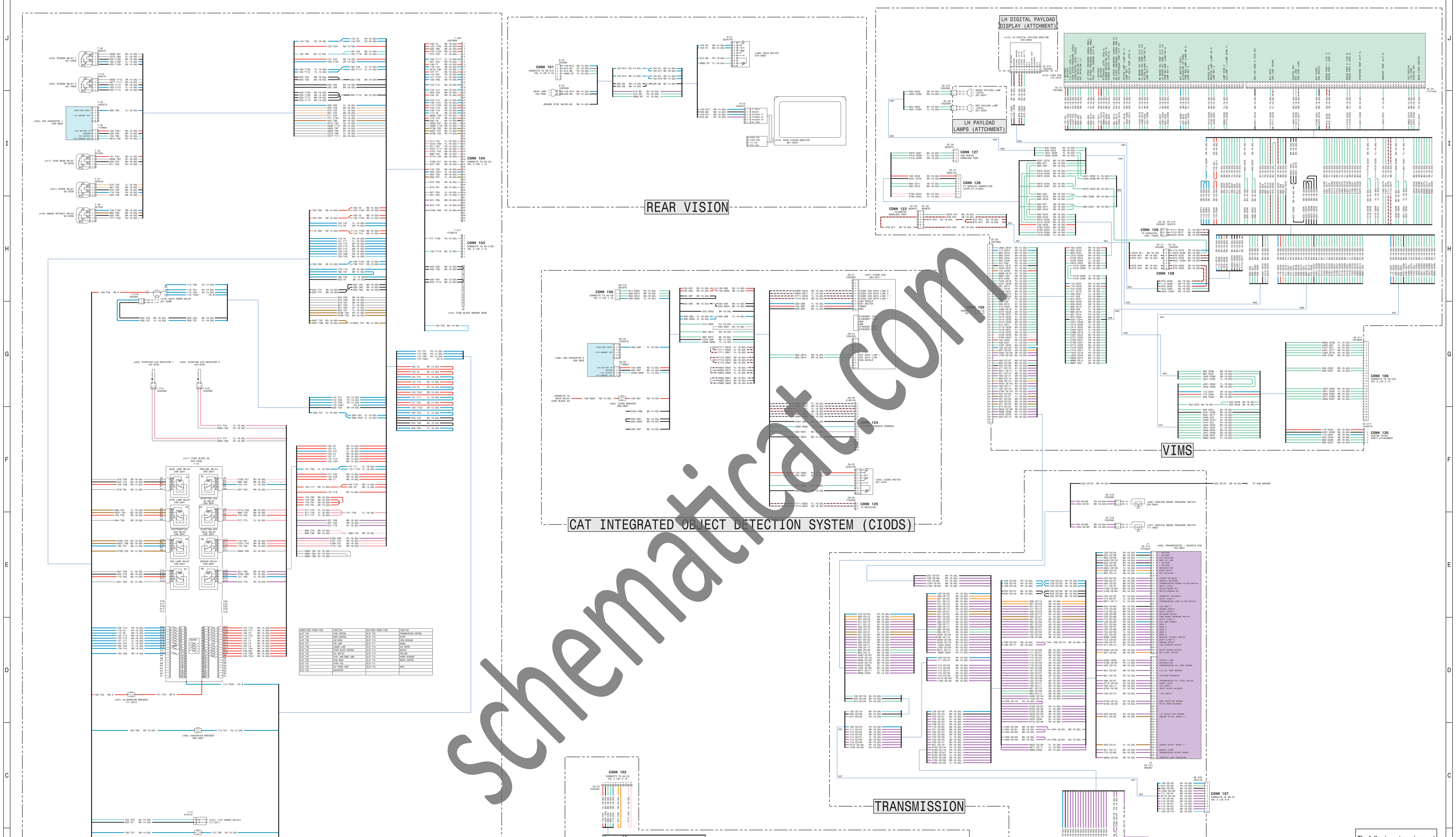
Connector Location	
Connector Number	Schematic Location
CONN 19	A-4
CONN 100	H-9
CONN 101	J-9
CONN 102	C-9
CONN 103	H-10
CONN 104	I-10
CONN 105	G-9
CONN 106	G-1
CONN 107	C-9
CONN 123 - Telemetry Download Port	H-6
CONN 124 - To CIDDS Chassis Harness	F-6
CONN 125 - To Resistor	F-6
CONN 126 - ET Service Connection	I-5
CONN 127 - Cab Serial Download Port	I-5
CONN 128	H-3
CONN 129 - To Minestar, XIM , TC900	H-3
CONN 130 - Custom Third Party Attach.	F-1

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.

Related Electrical Service Manuals	
Title	Form Number
Cross Reference for Electrical Connectors:	REHS0970
VIMS Control:	RENR2631
Transmission/ Chassis Control:	SENR1102

Off-Machine Switch Specification				
Part No.	Function	Actuate	Deactuate	Contact Position
111-9563	Service Brake Pressure	80 kPa MAX (11.60 psi)	55 kPa ± 20 kPa (7.98 psi ± 2.90 psi)	Normally Closed Below Deactuation Pressure
242-8903	Parking Brake Pressure	517 kPa ± 35 kPa (74.98 psi)	448 kPa ± 35 kPa (64.98 psi ± 5.08 psi)	Normally Open





SYMBOL	DESCRIPTION
┼•	CIRCUIT CONNECTED
┼	CIRCUIT NOT CONNECTED
⏚	ELECTRICAL CONNECTION TO MACHINE STRUCTURE
⏚	INTERNAL ELECTRICAL CONNECTION TO SURFACE OF COMPONENT
→)—	CONNECTOR
H#	CIRCUIT GROUPING DESIGNATION
- - -	ATCH WIRE, CABLE, COMPONENT
o—o	SPLICE
o	BLADE, SPADE, RING OR SCREW TERMINAL

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

892	&	893		
C415	&	E972		
E793	&	E794		
F418	&	F419		
C413	&	C414	&	E708

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

WIRE GROUP COLOR DESCRIPTIONS

- GROUND CIRCUIT
- WIRES THAT HAVE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS OFF
- WIRES THAT HAVE SYSTEM VOLTAGE WHEN THE KEY SWITCH IS ON
- VOLTAGE CONVERTER OUTPUT CIRCUIT
- STARTING CIRCUIT
- STARTING AID CIRCUIT
- TRANSMISSION / CHASSIS CONTROL CIRCUIT
- MONITOR CIRCUIT
- INTEGRATED BRAKING CONTROL CIRCUIT
- ENGINE CONTROL CIRCUIT
- TURN SIGNAL / WIPER WASHER CIRCUIT
- RS-232 DATA LINK
- CIODS CAN DATA LINK 1
- CIODS CAN DATA LINK 2

OTHER COLOR DESCRIPTIONS

- HIGHWAYS

IDENT	PART NUMBER	CHANGE	LOC	DESCRIPTION	NOTE
HARNESS AS					
T	351-4428	1	J-10	FUSEBLOCK	
AF	230-9202	0	H-6	VIMS TELEMETRY	
CE	351-4429	1	J-4	ECM	
CH	192-7413	1	B-9	ROAD ANALYSIS CONTROL(NOTE C)	ATCH
CM	349-1159	1	H-6	CIODS	ATCH
W	346-4857	0	J-9	WAVS	ATCH

CALLOUTS

Callout Number (Machine Location from Component Locations Table) → (52) VALVE GP - CONTROL ← Component Name
138-1234 ← Part Number

THIS SCHEMATIC IS FOR THE 785C OFF-HIGHWAY TRUCK ELECTRICAL SYSTEM
VOLUME 4 of 4: CAB (TRANSMISSION / CHASSIS CONTROL and RELAY / BREAKER PANEL)

MEDIA NUMBER: UENR1251

SCHEMATIC PART NUMBER: 321-6340, CHANGE: 00, VERSION: -

Components are shown installed on a fully operable machine with the key and engine off, transmission shifter in neutral and with parking brake set.

Refer to the appropriate Service Manual for Troubleshooting, Specifications and Systems Operations.