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i02345903

Exhaust Manifold (In Chassis) - Remove and Install

SMCS - 1059-010

S/N - AMC1-UP

S/N - ANB1-UP

S/N - BBC1-UP

S/N - BBL1-UP

S/N - BCN1-UP

S/N - BDC1-UP

S/N - BDE1-UP

S/N - BEA1-UP

S/N - BEF1-UP

S/N - BER1-UP

S/N - BGB1-UP

S/N - BKK1-UP

S/N - BPR1-UP

S/N - BRX1-UP

S/N - CLM1-UP

S/N - CLZ1-UP

Removal Procedure

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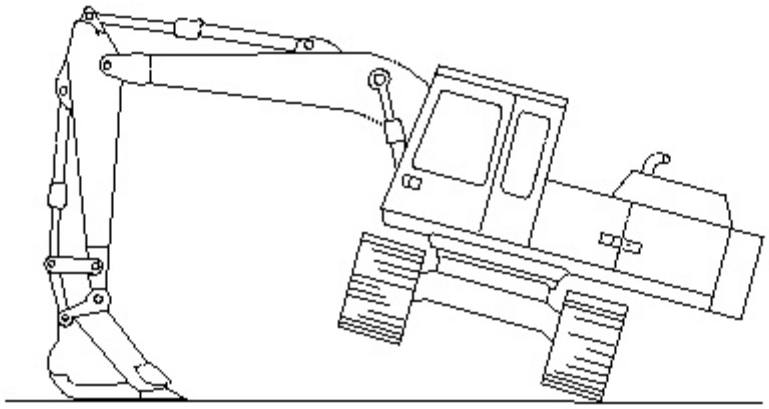


Illustration 1 g00297292

1. Start the engine.
2. Position the machine on level ground.
3. Increase the hydraulic oil temperature to 55° ± 5°C (131° ± 9°F).
4. Raise a track off the ground. Refer to Illustration 1.
5. Put a mark on a shoe of the raised track.
6. Place the machine controls at the following settings: Engine speed dial "10" and AEC switch OFF.
7. Place the travel speed control switch in HIGH position.
8. Move the travel lever of the raised track to full travel position.
9. Measure the time that is required for the raised track to make three complete revolutions. Measure the time that is required in each direction.
10. Place the travel speed control switch in the LOW position and repeat Steps 8 through 9.

Table 2

320C Time For Three Revolutions (time in seconds)				
Travel Speed		**New**	**Rebuild**	**Service Limit**
HIGH	Forward	17.0 or less	18.0 or less	19.0 or less
	Reverse			
LOW	Forward	27.5 or less	28.5 or less	30.5 or less
	Reverse			

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(3) Pressure tap (power shift pressure)

3. Attach a 60000 kPa (8700 psi) pressure gauge to pressure tap (1) .
4. Start the engine.
5. Place the machine controls at the following settings: engine speed dial "10" and AEC switch OFF. Refer to Testing and Adjusting, "Engine Performance - Test" for engine rpm settings.
6. Increase the hydraulic oil temperature to 55° ± 5°C (131° ± 9°F).
7. Open the bucket until the bucket cylinder rod is at the full retraction.
8. Check the main relief valve pressure setting at pressure tap (1) .
9. Return the joystick for the bucket to the NEUTRAL position.
10. The main relief valve pressure setting should be 34300 ± 490 kPa (4950 ± 72 psi). If the main relief valve pressure setting is not within the specification, adjust the main relief valve pressure setting.

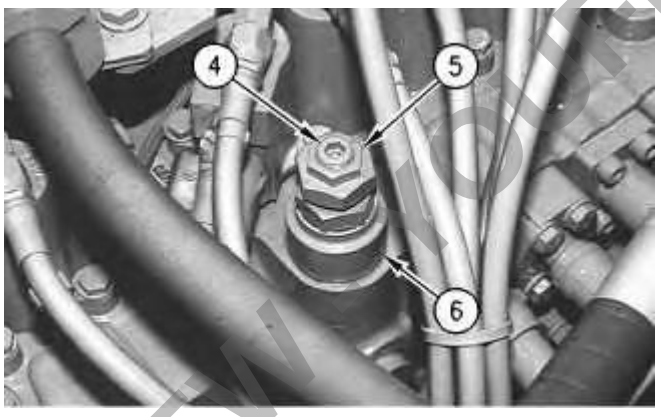


Illustration 2 g00666196

(4) Adjustment screw

(5) Locknut

(6) Main relief valve

11. In order to adjust the main relief valve, loosen locknut (5) and turn adjustment screw (4) until the pressure gauge reading at pressure tap (1) is 34300 ± 490 kPa (4950 ± 72 psi).

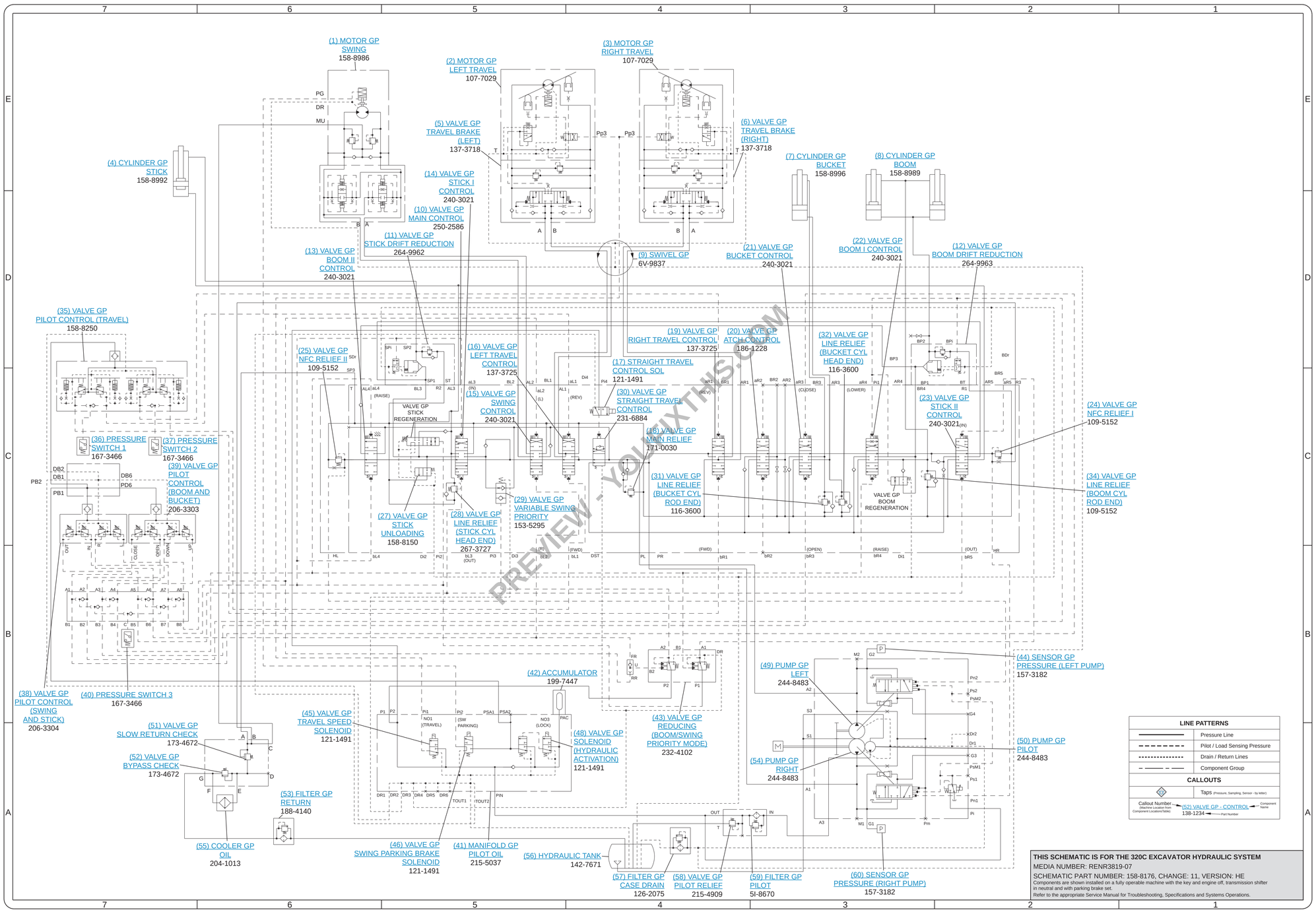
    Note: Turning adjustment screw (4) clockwise increases the pressure. Turning adjustment screw (4) counterclockwise decreases the pressure.

    Note: Always make final pressure adjustments on pressure rise.

12. Tighten locknut (5) to a torque of 50 ± 10 N·m (37 ± 7 lb ft).

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Connector Location

Connector Number	Schematic Location	Machine Location
CONN 1 ET Connector	J-11	E
CONN 2	G-9	E
CONN 3	G-9	E
CONN 4	G-9	E
CONN 5	G-9	E
CONN 6	G-8	E
CONN 7	G-8	E
CONN 8	G-7	E
CONN 9	G-7	E
CONN 10	G-7	E
CONN 11	G-7	E
CONN 12	E-7	35
CONN 13	J-6	D
CONN 14	F-5	A
CONN 15	F-5	D
CONN 16	F-5	A
CONN 17	F-5	A
CONN 18	F-5	A
CONN 19	F-4	A
CONN 20	F-4	A
CONN 21	F-3	A
CONN 22	G-5	D
CONN 23	B-3	36
CONN 24	B-3	37
CONN 25	A-3	13
CONN 26	A-3	13
CONN 27	B-2	7
CONN 28	C-2	6
CONN 29	F-2	A
CONN 30	F-2	5
CONN 31	F-2	33
CONN 32	H-2	D
CONN 33	H-2	D
CONN 34	H-2	35
CONN 35	J-2	D
CONN 36	J-2	27
CONN 37	H-1	35

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.

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.

Component Identifiers (CID[1]) Module Identifier (MID[2]) Engine and Pump Control (MID No. 069)

CID	Component
91	Throttle Position Signal
96	Fuel Level Sensor
110	Engine Coolant Temperature Sensor
167	Alternator
168	Voltage of the Power Supply (Key Switch)
190	Speed Sensor
248	Cat Data Link
286	Signal for Low Engine Oil Pressure
374	Swing Brake Solenoid
376	Travel Alarm
581	Proportional Reducing Valve for the Power Shift Pressure
586	Engine Speed Dial
587	Feedback Sensor for the Governor Actuator
590	Engine Controller
598	Travel Speed Solenoid
600	Hydraulic Oil Temperature Sensor
1161	Pump Delivery Pressure Sensor (1)
1162	Pump Delivery Pressure Sensor (2)
1525	Straight Travel Solenoid
2002	Action Alarm

Tool Control System (MID No. 06A)

CID	Component
1522	Variable Relief (1) Solenoid Valve
1523	Variable Relief (2) Solenoid Valve
1524	Flow Control Solenoid Valve
2004	ATT Stem1 Modulation
2005	ATT Stem2 Modulation
2006	ATT Stem3 Modulation
2012	1Way/2Way Change Solenoid Valve
2016	ATT Stem1 Extended Solenoid Valve
2017	ATT Stem1 Extended Solenoid Valve
2018	ATT Stem2 Extended Solenoid Valve
2019	ATT Stem2 Extended Solenoid Valve
2020	ATT Stem3 Extended Solenoid Valve
2021	ATT Stem3 Extended Solenoid Valve

[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.

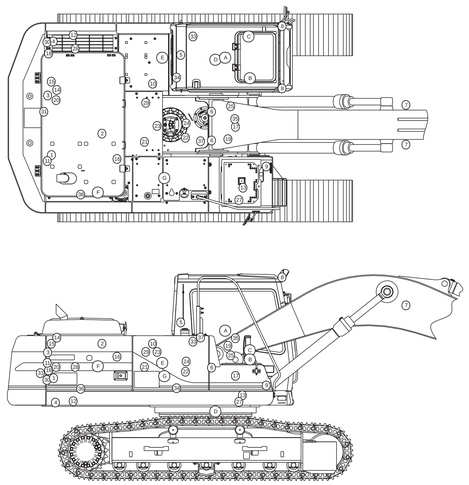
Related Electrical Service Manuals

Title	Form Number
Engine and Pump Control	RENR3814
Tool Control System	RENR3823

Event Identifiers (EID[1])

EID	Event
17	Coolant Overheat
43	Battery Voltage Too Low
50	Battery Voltage Too High
59	Low Coolant Level
95	Fuel Filter is Clogged
100	Engine Oil Pressure is Low
119	Fuel Level is Low
171	Engine Oil Level is Low
179	Abnormal Battery Charge
232	Water Separator Draining Demand
235	Hydraulic Oil Level is Low
236	Hydraulic Oil Filter is Clogged
237	Overload Warning
272	Air Filter is Clogged
600	Hydraulic Oil Overheat
862	Special Filter is Clogged
863	Automatic Greasing Failure

[1] The EID is a code that indicates diagnostic events.



Machine Harness Connector and Component Locations

Component Location

Component	Schematic Location	Machine Location
Actuator - Eng. Governor	A-12	1
Air Heater	A-10	2
Alarm - Action	D-1	A
Alternator	B-12	3
Batteries	J-12	4
Block Terminal	G-8	E
Breaker - Alternator	G-10	E
Buzzer Assembly - Quick Coupler	F-2	5
Control - Attachment Valve	D-9	E
Control - Eng. Pump	F-9	E
Converter - 12V 7A	E-6	D
Converter - 12V 7A	E-6	D
Diode - Chassis Lamp Relay	J-11	G
Diode - Main Relay	J-8	G
Diode - Start Relay	H-7	E
Fuse Block	J-10	E
Horns	B-2	6
Joystick	J-2	C
Joystick	G-1	B
Lamp - Boom	C-2	7
Lamp - Cab	F-1	8
Lamp - Chassis	B-2	9
Lamp - Dome	D-6	A
Meter - Service	D-1	A
Monitor	F-1	A
Motor - Condenser Fan	H-12	10
Motor - Starter	B-12	11
Motor - Washer	J-12	12
Motor - Wiper	J-1	A
Product Link	J-12	A
Pump - Refueling	A-3	13
Relay - Beacon Lamp	H-11	E
Relay - Boom Float Disable	G-11	E
Relay - Boom Lamp	J-11	E
Relay - Cab Lamp	J-11	E
Relay - Chassis Lamp	J-11	E
Relay - Heater	J-8	E
Relay - Horn	H-11	E
Relay - Hyd. Lock Solenoid	H-11	E
Relay - Main	J-7	E
Relay - Neutral Start	H-11	E
Relay - QC Safety Lever ON	J-8	E
Relay - QC Safety Lever Priority	J-9	E
Relay - QC Safety Lock (1)	J-8	E
Relay - QC Safety Lock (2)	J-8	E
Relay - Refueling Power	A-2	9
Relay - Refueling Start	A-3	13
Relay - Refueling Stop	A-2	13
Relay - Smart Boom Down	J-9	E
Relay - Smart Boom Up/Down	J-9	E
Relay - Start	G-7	E
Relay - Start Control	J-10	E
Relay - Timer	J-10	E
Resistor - Back Up	J-8	E
Sender - Eng. Coolant Temp.	C-12	14
Sender - Fuel Level	A-6	G
Sender - Hyd. Oil Temp.	A-6	G
Sensor - A/C Photo	E-1	A
Sensor - A/H Coolant Temp.	C-12	15
Sensor - Eng. Speed	A-10	16
Sensor - Negative Control Pressure (1)	A-9	F
Sensor - Negative Control Pressure (2)	A-9	F
Sensor - OLWD Pressure	B-2	17
Sensor - Pump Discharge #1	B-7	F
Sensor - Pump Discharge #2	B-7	F
Solenoid - Water Separator Level	J-12	18
Socket - 12V 7A	D-5	A
Socket - 12V 7A	D-5	A
Solenoid - 1 Way / 2 Way Control	A-4	19
Solenoid - A/C Clutch	B-12	20
Solenoid - Anti Drift	H-2	D
Solenoid - Boom Down Line Cutoff	D-12	21
Solenoid - Fine Swing	E-12	22
Solenoid - Flow Limit	B-9	F
Solenoid - Hyd. Lock	E-12	23
Solenoid - Power Shift Control	B-8	F
Solenoid - Primary NFC	B-9	F
Solenoid - Pump Flow Cont (1)	A-9	F
Solenoid - Pump Flow Cont (2)	A-9	F
Solenoid - QC High Pressure (A1)	C-2	24
Solenoid - QC High Pressure (A2)	C-2	24
Solenoid - QC Low Pressure	B-2	24
Solenoid - Relief 1	A-4	25
Solenoid - Relief Check 1	A-4	25
Solenoid - Separate Valve	C-12	23
Solenoid - Smart Boom Selector Valve	A-5	24
Solenoid - Stem 2 Control (A)	D-11	F
Solenoid - Stem 2 Control (B)	D-12	F
Solenoid - Stem 3 Control (A)	D-11	F
Solenoid - Stem 3 Control (B)	D-12	F
Solenoid - Swing Brake	E-12	23
Solenoid - Travel Speed	E-12	23
Solenoid - Travel Straight	E-12	27
Switch - A/C Control	D-3	A
Switch - Air Cleaner	J-11	28
Switch - Backup EPR Valve	G-2	B
Switch - Backup Governor	G-2	B
Switch - Beacon Lamp	D-4	B
Switch - Boom Down Pressure	D-12	29
Switch - Boom Float Exchange	D-4	B
Switch - Coolant Level	J-12	30
Switch - Disconnect	G-11	E
Switch - Engine Oil Level	A-12	31
Switch - Engine Oil Press.	A-12	31
Switch - Fine Swing Control	D-3	A
Switch - Hammer Press.	J-1	D
Switch - Heater Control	D-3	A
Switch - Horn	J-2	C
Switch - Hyd. Oil Filter	A-6	G
Switch - Hyd. Oil Level	A-6	G
Switch - Joystick Press.	J-3	D
Switch - Key	G-1	B
Switch - Neutral Start Limit	J-2	D
Switch - OLWD Alarm Cancel	D-4	B
Switch - One Touch Low Idle	H-1	B
Switch - Refueling Start	A-2	13
Switch - Refueling Stop	A-2	13
Switch - Rotary (Quick Coupler)	F-2	33
Switch - Seat Heater	D-5	A
Switch - Smart Boom High Pressure	A-5	24
Switch - Straight Travel Press.	H-1	D
Switch - Throttle Position	G-1	B
Switch - Travel Left Press.	J-1	D
Switch - Travel Right Press.	J-1	D
Switch - Window Limit	F-1	A
Switch Panel	D-2	A
Unit - Air Conditioner	F-6	34
Unit - Heater Control	J-7	E
Unit - Indicator	G-1	B
Unit - Wiper Control	D-2	A

Machine locations are repeated for components located close together.

A = Located inside of cab.
B = Located inside of right console.
C = Located inside of left console.
D = Located under platform.
E = Located around relay panel.
F = Located around pilot manifold.
G = Located around Hydraulic Tank and Fuel Tank.

Wire Description

Wire Number	Wire Color	Description
		Power Circuits
101	RD	Bat (+)
103	RD	Dome Lamp / Memory
105	RD	Key Start Sw
109	RD	Alt Output (+) Term.
110	RD	Timer Relay
112	PU	Main Power Relay Output
113	OR	Opr Mon Panel B (+) Switched
114	RD	Warning Horn (Forward)
115	RD	Cab Lamp
118	GY	Wiper / Washer
120	YL	12V 7A Converter 1
123	WH	Seat Heater
124	GN	A/C
125	RD	A/C Condenser Fan
129	BU	Cigar Lighter
130	RD	Atch Valve Control
135	BU	12V 7A Converter to Socket
139	OR	+ 12V Memory Out
143	BR	Boom Float Disable
147	PU	Atch. Fine Swing Control Sw.
149	RD	Boom Lamp
150	OR	Bat (+)
151	GN	Hyd. Lock Cancel Sw.
152	BU	Lower Wiper / Washer
154	RD	Neutral Start Limit Sw. to Neutral Start Relay
160	PU	Chassis Lamp
168	RD	Refueling Pump
169	PK	Backup/Monitor Control
172	GN	Product Link
175	RD	A/C Blower
179	BU	12V 7A Converter
180	GN	Aux Ckt
184	RD	Eng/Pump Control
189	RD	Start Aid Ckt.
191	WH	Power Window
196	BU	Inspection Lamp
199	OR	Beacon Lamp
		Ground Circuits
200	BK	Main Chassis
201	BK	Operator Monitor Return
210	BK	12V 7A Converter Output Ground
211	BK	12V 7A Converter Output Ground
235	BK	Electronic Pump Ctrl Gnd
		Basic Machine Circuits
304	WH	Starter Relay No. 1 Output
306	GN	Starter Relay Coil To Neut.Start SW Or
307	OR	Key Start SW To Neutral Start SW Or
308	YL	Main Power Relay Coil
309	GY	Alternator Regulator
310	PU	Start Aid SW To Start Aid Sol
320	RD	Horn Relay Coil To SW
322	GY	Warning Horn (Forward)
323	WH	Refueling Pump +
325	PK	Refueling Stop Switch
326	RD	Key SW "C" Term
329	YL	Refueling Power Relay Coil
330	YL	Neutral Start Relay Coil
365	YL	Refueling Stop Relay Coil
		Monitoring Circuits
403	GN	Alternator (R) Term.
405	GY	Opr Mon Oil Press. (Low Setting)
410	WH	Action Alarm
412	BU	Operator Monitor Cool Flow
430	BU	Operator Monitor Air Filter
487	OR	Hydraulic Filter SW
491	PK	Hydraulic Oil Temp Sensor
492	GY	Coolant Temp Sensor Signal
495	GN	Fuel Level
496	WH	Hyd Oil Level Switch
C468	BU	Engine Oil Level
E469	YL	Tool Press Sensor
E470	BR	Negative Cont Press Sensor 1
E471	BU	Negative Cont Press Sensor 2
E472	GN	12V Supply
E473	GY	Att Stem1 Modulation
E474	OR	Left Joystick Thumbwheel
E475	PK	Att Stem3 Modulation
E476	PU	Att Stem4 Modulation
E480	WH	OLWD Alarm Cancel Switch
E480	WH	OLWD Alarm Cancel Switch
H465	GN	Travel Alarm Cancel Indicator
H466	BU	AEC Mode Indicator
H467	WH	Travel Mode Indicator
H473	BR	Travel Straight Pressure Switch
H474	GN	Travel Right Pressure Switch
H475	BU	Travel Left Pressure Switch
H476	WH	Joystick Pressure Switch
		Accessory Circuits
501	GN	Wiper - Front Low
506	PU	Washer - Front
508	PU	Radio Speaker - Left
509	WH	Radio Speaker - Left (Common)
511	BR	Radio Speaker - Right
512	GN	Radio Speaker - Right (Common)
514	PU	A/C Unit
530	OR	Washer Right
586	BR	Aux Hydraulic - Close
590	GY	Wiper Sw To Intermittent Module
A537	PK	Seat Heater

Wire Number	Wire Color	Description
		Accessory Circuits (Continued)
A579	OR	Wiper Motor +
A580	GN	Wiper Motor
A584	BU	Window Limit SW To Wiper Cont
A586	OR	Wiper SW To Wiper Cont
A588	GN	Safety Sol Relay To Sol
C506	WH	A/C Unit
C537	GN	A/C Photo Sensor (+ Sig)
C538	OR	A/C Photo Sensor (- Sig)
C569	YL	Atch 12V 7A Socket
E554	PK	A/C Clutch Solenoid
E562	PU	QC Safety Lock 1 Relay
E564	PK	QC Safety Lock 1 Relay Coil
E565	BU	QC Safety Lock 2 Relay
		Lighting Circuits
607	PK	Flood Lamps - Front
615	YL	Cab Flood Lamp/Rops
616	BU	Boom Flood Lamp
638	WH	Beacon Lamp
645	RD	Boom Lamp Relay
646	RD	Chassis Lamp Relay
A623	BU	Chassis Lamp Relay
		Control Circuits
763	BU	Torque Converter Sw
779	WH	Quick Couple Solenoid
780	PU	Atch Quick Coupler
788	YL	Engine Speed (+)
A718	PU	Start Aid Coolant Sensor Signal
A755	PK	Throttle Sw #1
A756	BU	Throttle Sw #2
A757	GY	Throttle Sw #3
A758	BR	Throttle Sw #4
A761	PU	Electronic Pump Cont Throttle Ground
A762	PU	Elec Pump Cont Eng Speed Ground
A768	BU	Pump Control Valve #1 (+)
A769	GY	Pump Control Valve #2 (-)
A770	PK	Elec Pump Cont Bypass Sw
F773	OR	Governor Accel
F774	WH	Governor Decel
K776	GN	Start Cont Relay
M734	BR	Travel Mode SW
M736	BU	Governor Command/Backup SW
M737	WH	Flow Limit Pressure PRV
M738	OR	Primary NFC Pressure PRV
M739	YL	PRV Return (2)
M740	PK	Travel Straight Solenoid
M741	GY	Travel Alarm Cancel Switch
M742	PU	AEC Mode Switch
M743	GN	Boom Float Disable Relay Coil
M744	PK	Boom Float Exchange Switch
M746	YL	Boom Float Exchange Switch
M747	PU	Boom Float Exchange Switch
M748	OR	Boom Down Pressure Switch
M749	WH	Smart Boom High Pressure Switch
877	YL	Air Heater to Air Heater Relay
892	BR	Cat Data Link (-)
893	GN	Cat Data Link (+)
8630	BU	Beacon Lamp Relay Coil
K843	GN	Stem3 Extend SW
K844	GY	Stem4 Extend SW
K847	PU	Stem3 Retract SW
K848	WH	Stem4 Retract SW
K849	YL	Atch Stem1 Swing Cancel
K850	BR	Atch Stem2 Swing Cancel
K851	BU	Atch Stem3 Swing Cancel
K852	GN	Atch Stem4 Swing Cancel
K853	GY	Pump1 F1 Flow Cont PRV
K854	OR	Pump2 F1 Flow Cont PRV
K855	PK	Separator Valve PRV
K856	PU	ATT Stem1 Cont PRV (A)
K857	WH	ATT Stem1 Cont PRV (A)
K858	YL	ATT Stem3 Cont PRV (A)
K859	BR	ATT Stem4 Cont PRV (A)
K860	BU	ATT Stem1 Cont PRV (B)
K861	GN	ATT Stem2 Cont PRV (B)
K862	GY	ATT Stem3 Cont PRV (B)
K863	OR	ATT Stem4 Cont PRV (B)
K864	PK	ATT1 Relief PRV
4865	PU	ATT2 Relief PRV
K866	WH	1Way/2Way Cont Sol
K867	YL	PRV Return (1)
K868	BR	Sol Gnd2
K869	BU	Sol Gnd3
K870	GN	Sol Gnd4
K874	BR	Variable Relief 1 Check Solenoid
K875	BU	Variable Relief 2 Check Solenoid
K876	BR	Relief Check 3 Solenoid
C987	RD	+ Battery (Valve Controller)
G976	BU	Water Separator Level SW
K904	GN	Pump Discharge - Signal
K906	GN	Swing Brake Sol - Signal
K907	BU	Swing Brake Sol - +B
L968	OR	Electronic Pump Control Ps Valve (-)
L969	WH	Electronic Pump Control Ps Valve (+)
L972	BU	Low Idle SW
L973	GN	Fine Swing Cont Relay To Sol Valve
L975	PK	Start Aid Cont Lamp 1 Output
L976	GN	Refueling Start Switch
T967	YL	Pump Discharge(2) Press Sensor

CATERPILLAR®

RENR3822-02
May 2006

Schematic

320C Excavator Electrical System

BEA1-UP
BDE1-UP
BBL1-UP
BCN1-UP
JPL1-UP

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Real Time Error Codes

Code	Description of Problems
1301	Engine oil pressure is too low.
1302	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 to battery voltage.
2202	Governor actuator feedback sensor circuit 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.
4104	Monitor power supply (digital output) over current.
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).
4109	Spare solenoid 1 (digital output) over current.
410A	Over-current in digital output (swing brake solenoid).
410b	Spare solenoid 2 (digital output) over current.
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 shorted to body ground.
4205	Spare PWM sensor 1 is shorted to body ground.
4206	Spare PWM sensor 2 is shorted to body ground.
4207	PWM sensor of pump delivery pressure is open in circuit.
420A	Fuel sensor is shorted to body ground
420b	Fuel sensor is open or shorted to battery voltage.
420C	Electric power supply is to low (below 23 volts).
420d	Electric power supply is to high (above 32 volts).
420E	Engine speed dial is not in one of the 10 specified positions.
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.
A20d	ADEM communication disconnect.

Off Machine Switch Specification

Part No.	Function	Actuate	Deactuate	Contact Position
167-3466	Joystick Pressure Straight Travel Pressure Travel Left Pressure Travel Right Pressure	490.00 ± 10% kPa (71.07 ± 7.11 psi)	290.00 kPa MIN (42.06 psi MIN)	Normally Open
168-7557	Smart Boom Pressure	13780 kPa Max (2000 psi Max)	10335 ± 689 kPa (1500 ± 100 psi)	Normally Closed

Resistor, Sender and Solenoid Specifications

Part No.	Component Description		Resistance (Ohms)[1]
4I-5394	Sender:	Hydraulic Oil Temperature	20824-25451 @ 0 °C (32 °F) 6134-7496 @ 25 °C (77 °F) 3989-4875 @ 35 °C (95 °F) 2224-2718 @ 50 °C (122 °F) 973-1189 @ 75 °C (167 °F) 475-522 @ 100 °C (212 °F) 221-269 @ 125 °C (257 °F)
102-8016	Resistor:	Backup	47.0 ± 2.35
107-7056	Solenoid:	Fine Swing	34.0 ± 0.5 @ 20 °C (68 °F)
111-9916	Solenoid:	Power Shift Control Stem 2 Control (A) Stem 2 Control (B) Stem 3 Control (A) Stem 3 Control (B)	11.7 ± 1.2 @ 20 °C (68 °F)
112-0090	Solenoid:	Relief 1 Relief 2	19.5 ± 2.0 @ 20 °C (68 °F)
121-1491	Solenoid:	Hyd. Lock Swing Brake Travel Speed Travel Straight	32.0 ± 3.2 @ 20 °C (68 °F)
163-6700	Sender:	Fuel Level	Full: 8.0 +1.0 or -0.5 Empty: 83.5 ± 1.5
171-0314	Solenoid:	Primary NFC	11.7 ± 1.2 @ 20 °C (68 °F)
171-0188	Solenoid:	Flow Limit	11.5 ± 0.5 @ 20 °C (68 °F)
196-5804	Solenoid:	Smart Boom Selector Valve	24.4 ± 1.6 @ -40 °C (-40 °F) 32.6 ± 1.6 @ 25 °C (77 °F) 53.1 ± 1.6 @ 121 °C (250 °F)

[1] At room temperature unless otherwise noted.

Electrical Schematic Symbols And Definitions

Pressure Symbol
Temperature Symbol
Level Symbol
Flow Symbol

Normally open switch that will close with an increase of a specific condition (temp-press-etc.).

Normally open switch that is closed due to an applied condition, and will open again with a specific decrease in that condition.

Normally closed switch that will open with an increase of a specific condition.

Normally closed switch that is open due to an applied condition, and will close again with a specific decrease in that condition.

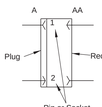
The circle indicates that the component has screw terminals and a wire can be disconnected from it.

No circle indicates that the wire cannot be disconnected from the component.

This indicates that the component has a wire connected to it that is connected to ground.

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

Harness And Wire Electrical Schematic Symbols

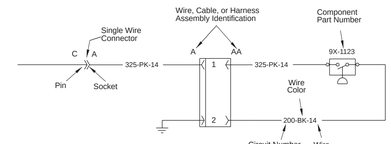




Typical representation of a Deutsch connector. The plug contains all sockets and the receptacle contains all pins.



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



Electrical Schematic Symbols And Definitions

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

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.

CIRCUIT BREAKER (C/B) - A component in an electrical circuit that will open the circuit if too much current flows through it. This does not destroy the circuit breaker and it can be reset to become part of the circuit again.

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 latch 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.

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