CASE

REPAIR MANUAL

Crawler Excavator

CX160

7-29871

MidWestTech | Case CX160 Crawler Excavator Service Manual | Publication 7-29871

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CX160 Crawler Excavators
Table of Contents

DIVISION/SECTION		SECTION N°	REFERENCE N°
1	**GENERAL INFORMATION**		
	Safety, general information and standard torque data	1001	7-27690GB
	General specifications and special torque setting	1002	7-27712GB
2	**ENGINE**		
	Removal and installation of the engine	2000	7-28220GB
	Radiator and oil-cooler	2001	7-28040GB
	Engine specifications	*	
	Disassembly and assembly of the engine	*	
3	**FUEL SYSTEM**		
	Fuel tank	3001	7-27970GB
	Fuel engine system	*	
4	**ELECTRICAL SYSTEM**		
	Electrical system, electrical and electronic troubleshooting	4001	7-27721GB
	Inspection and maintenance of batteries and connecting a booster battery	4002	7-27921GB
	Main and engine electronic control boxes	4003	7-27931GB
5	**UNDERCARRIAGE**		
	Removal and installation of tracks	5001	7-27750GB
	Rollers	5003	7-27770GB
	Sprocket	5004	7-27781GB
	Idler wheel and tension shock absorber	5005	7-27801GB
6	**DRIVE TRAIN**		
	Drive motor and final drive transmission removal and installation	6001	7-27841GB
	Drive motor and final drive transmission disassembly and assembly	6002	7-29860GB
	Swing reduction gear, removal and installation	6003	7-29900GB
	Swing reduction gear, disassembly and assembly	6004	7-28370GB
7	**UNDERCARRIAGE HYDRAULICS**		
8	**UPPERSTRUCTURE HYDRAULICS**		
	Depressurising and decontaminating the hydraulic system, use of the vacuum pump and bleeding the components	8000	7-27951GB
	Specifications, troubleshooting, checks and hydraulic pressure settings	8001	7-27701GB
	Hydraulic reservoir removal and installation	8002	7-27990GB
	Main and pilot pumps, removal and installation	8003	7-27870GB
	Main hydraulic control valve, removal and installation	8004	7-27880GB
	Attachment cylinders, removal and installation	8005	7-27791GB
	Hydraulic swivel, removal and installation	8006	7-27811GB
	Pilot blocs, removal and installation	8007	7-28100GB
	Swing motor, removal and installation	8008	7-29890GB
	Main hydraulic pump, disassembly and assembly	8010	7-29770FR
	Main hydraulic control valve, disassembly and assembly	8011	7-28200FR
	Attachment cylinders, disassembly and assembly	8012	7-27900GB
	Hand control levers, disassembly and assembly	8013	7-28110GB
	Foot control levers, disassembly and assembly	8014	7-28300FR
	Six-solenoid valves, disassembly and assembly	8015	7-27910GB
	Caution valve, disassembly and assembly	8016	7-27940GB
	Safety vave	8017	7-29630GB
	Hydraulic swivel, disassembly and assembly	8018	7-28080GB
	Swing motor, disassembly and assembly	8019	7-28010GB
	Hydraulic functions	8020	7-28480GB

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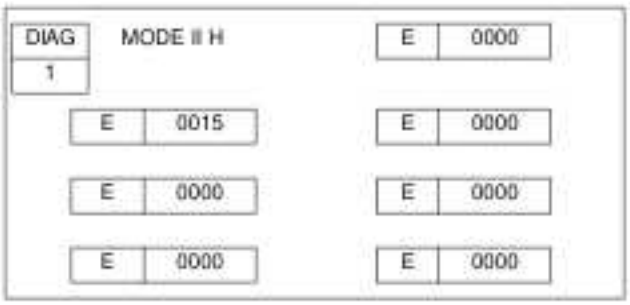
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Diagnostic code

1. Detection of engine failures DIAG1



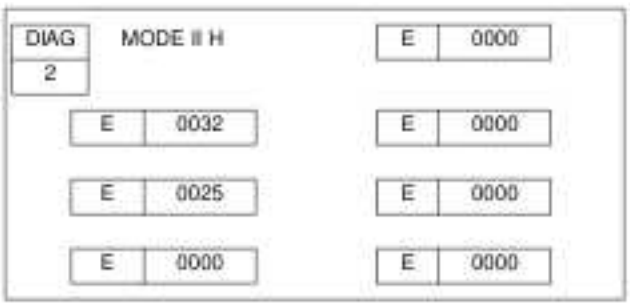
E: Failure code

Failure code

E0000: No defect
E0015: Coolant temperature sensor
E0025: Fuel flow adjustment resistor
E0031: Linear motor control circuit in electronic regulator
E0032: Electronic regulator rack position detector
E0041: Electronic regulator engine rpm receiver
E0042: Engine rpm sensor

Example: In the screen above, there is a defect in the coolant temperature sensor.

2. Previous failures in the engine DIAG2



E: Failure code

Example: The screen above shows that there is a defect in the electronic regulator rack position detector (0032) and in the fuel flow adjustment resistor (0025).

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High Speed Travel Circuit

There are two flows of oil which supply the travel motors.

In high speed the travel motors are in low displacement position.

The travel motors have an internal circuit which enables them to change from low to high displacement when supply pressure exceeds a certain level. If the pressure drops once more, the motors automatically revert to high speed.

Oil from the A1 pump outlet enters the PR port on the control valve, whereas oil from the A2 pump outlet enters PL. One flow goes directly to the left-hand travel spool and the other goes to the right-hand travel spool.

The calculator sends a current to the cylinder displacement change electrovalve for high speed to be selected. The 565 psi pilot pressure coming from the high speed electrovalve passes through the hydraulic swivel and goes to pilot the travel motor cylinder displacement change spools (D inlets).

C1. 2 stage travel (Red band)
C3. Power boost (Yellow band)
C5. Swing shut off (Green band)
4a1/4A1. LH forward travel
4b1/4B1. LH reverse travel
5a1/5A1. RH forward travel
5b1/5B1. RH reverse travel
1. Travel speed switch
2. Controller
3. Work mode switch

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NOTE: *The numbers in brackets in the following steps refer to the schematic on page 10.*

STEP 8

Install a lifting ring on the counterweight (1). Connect suitable lifting equipment to the lifting rings. Take up any slack in the lifting equipment to ensure that the counterweight is fully supported before releasing the retaining screws.

NOTE: *Refer to specifications on page 2 for the weight of the counterweight.*

STEP 9

Remove the four screws (3) and the flat washers (4) which attach the counterweight (1) to the chassis frame.

STEP 10

Raise the counterweight (1) and remove it from the machine. Place it on flat ground. Remove the lifting device.

STEP 11

Remove the shims (5) from the chassis frame anchorage points.

NOTE: *Count the number of shims (5), as you remove them from each anchorage point. Keep each set of shims (5) to facilitate reassembly.*

STEP 12

Check the condition of the insulating material (6) installed on the counterweight. Change the insulating material if it is damaged.

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CX130 - CX160 - CX180 EXCAVATOR
HYDRAULIC / ELECTRIC SCHEMATIC

ITEM	DESCRIPTION	PRESSURE SETTING
A =	MAIN RELIEF (STANDARD)	34.3 MPa / 343 bar / 4977 psi
A =	MAIN RELIEF (BOOST)	36.3 MPa / 363 bar / 5267 psi
B =	BOOM RAISING PORT SECONDARY RELIEF	38.3 MPa / 383 bar / 5558 psi
B1/B2 =	RELIEF ON BOOM HBCV	38.3 MPa / 383 bar / 5558 psi
C =	BOOM LOWERING PORT SECONDARY RELIEF	38.3 MPa / 383 bar / 5558 psi
D =	DIPPER OUT PORT SECONDARY RELIEF	38.3 MPa / 383 bar / 5558 psi
D1 =	RELIEF ON DIPPER HBCV	38.3 MPa / 383 bar / 5558 psi
E =	DIPPER IN PORT SECONDARY RELIEF	38.3 MPa / 383 bar / 5558 psi
F =	BUCKET OPEN PORT SECONDARY RELIEF	38.3 MPa / 383 bar / 5558 psi
G =	BUCKET CLOSE PORT SECONDARY RELIEF	38.3 MPa / 383 bar / 5558 psi
H =	PILOT PRESSURE RELIEF	3.92 MPa / 39.2 bar / 568 psi
I =	RIGHTHAND SWING PORT SECONDARY RELIEF	29.7 MPa / 279 bar / 4048 psi
J =	LEFTHAND SWING PORT SECONDARY RELIEF	29.7 MPa / 279 bar / 4048 psi
K1/K2 =	TRAVEL REVERSE PORT SECONDARY RELIEF	37.3 MPa / 373 bar / 5410 psi
L1/L2 =	TRAVEL FORWARD PORT SECONDARY RELIEF	37.3 MPa / 373 bar / 5410 psi
M1/M2 =	NEGATIVE CONTROL RELIEF	2.55 MPa / 25.5 bar / 370 psi
G/P =	SECONDARY RELIEF (2pmx OPTION)	23.5 MPa / 235 bar / 3410 psi
R =	MAIN RELIEF (2pmx OPTION)	20.6 MPa / 206 bar / 2989 psi
U =	ACCUMULATOR PRECHARGE	1.5 MPa / 15 bar / 217 psi

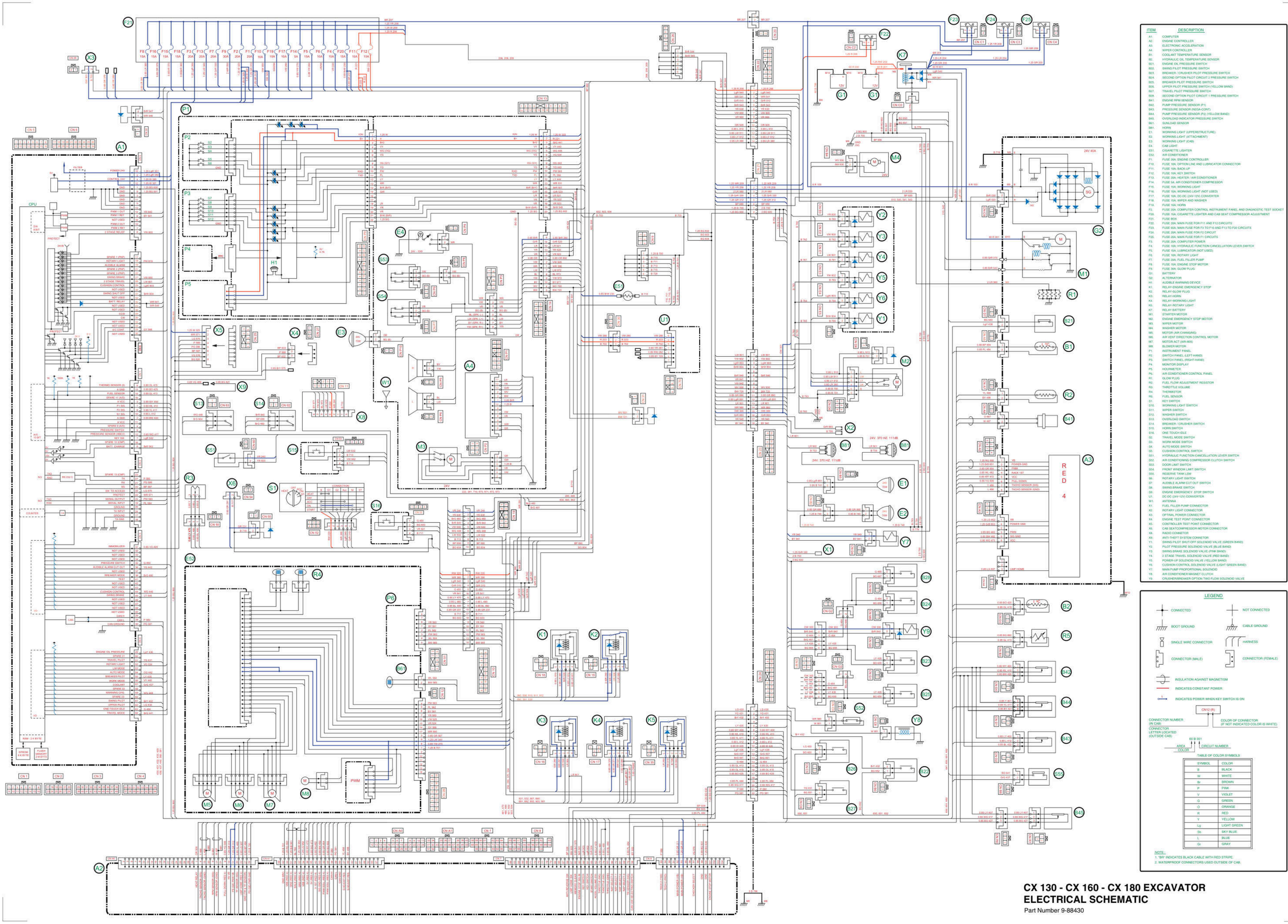
ITEM	DESCRIPTION
1.	HYDRAULIC RESERVOIR
2.	BREATHER
4.	BY-PASS VALVE
5.	SCREEN FILTER
6.	RETURN FILTER
10.	MAIN HYDRAULIC PUMP
15.	MAIN CONTROL VALVE
16.	HYDRAULIC SWIVEL
21.	TRAVEL MOTOR
22.	SWING MOTOR
23.	TRAVEL MOTOR BRAKE
25.	RIGHT BOOM CYLINDER
26.	LEFT BOOM CYLINDER
27.	DIPPER CYLINDER
28.	BUCKET CYLINDER
29.	BOOM SAFETY VALVE
30.	DIPPER SAFETY VALVE
31.	DIPPER LOAD HOLDING VALVE
32.	BOOM LOAD HOLDING VALVE
41.	FILTER (ULTRA CLEAN)
42.	OIL COOLER
43.	RETURN MANIFOLD
44.	OIL COOLER BY-PASS VALVE
45.	NON RETURN CHECK VALVE
51.	ACCUMULATOR
52.	4 SOLENOID VALVE BANK
53.	BOOM & BUCKET CONTROL LEVER
54.	SWING & DIPPER CONTROL LEVER
55.	TRAVEL CONTROL PEDAL
56.	DIPPER CONTROL SHOCK ABSORBER
57.	BOOM & DIPPER CONTROL SHOCK ABSORBER
58.	PILOT AND RETURN SYSTEM MANIFOLD
59.	FILTER
60.	PILOT SYSTEM MANIFOLD
65.	CALIBRATED ORIFICE
71.	SECOND OPTION PEDAL
72.	CONTROL PEDAL (OPTIONAL)
73.	SECOND OPTION CONTROL VALVE
74.	SWING PRIORITY BLOCK
75.	FLOW RE-INJECTION BLOCK (OPTIONAL)
76.	3-WAY SELECTOR (OPTIONAL)
77.	SAFETY VALVE RETURN SYSTEM MANIFOLD (OPTIONAL)
78.	RETURN FILTER (OPTIONAL)
79.	CONTROL SHUTTLE BLOCK (OPTIONAL)
81.	SWING SHUTTLE BLOCK
82.	PILOT CIRCUIT FILTER
83.	SHUT-OFF VALVE (OPTIONAL)
85.	HANDIFOOT CONTROL PILOT FILTER
86.	PILOT FILTER BY-PASS VALVE
90.	HYDRAULIC BREAKER VERSION PLUG
92.	ORIFICE CALIBRE (CX160)
106.	ANTI-PENDULUM VALVE
107.	TWO STAGE TRAVEL VALVE
108.	STRAIGHT TRAVEL VALVE
109.	SWING PRIORITY VALVE
B22.	SWING PILOT PRESSURE SWITCH
B23.	BREAKER / CRUSHER PILOT PRESSURE SWITCH
B24.	SECOND OPTION PILOT CIRCUIT 2 PRESSURE SWITCH
B25.	BREAKER PILOT PRESSURE SWITCH
B26.	UPPER PILOT PRESSURE SWITCH (YELLOW BAND)
B27.	TRAVEL PILOT PRESSURE SWITCH
B28.	SECOND OPTION PILOT CIRCUIT 1 PRESSURE SWITCH
B42.	PUMP PRESSURE SENSOR (P1)
B43.	PRESSURE SENSOR (MEGA-CONT)
B44.	PUMP PRESSURE SENSOR (P2) (YELLOW BAND)
B45.	OVERLOAD INDICATOR PRESSURE SWITCH
M3.	PRESSURE TEST POINT
Y1.	SWING PILOT SHUT-OFF SOLENOID VALVE (GREEN BAND)
Y2.	PILOT PRESSURE SOLENOID VALVE (BLUE BAND)
Y3.	SWING BRAKE SOLENOID VALVE (PINK BAND)
Y4.	2 STAGE TRAVEL SOLENOID VALVE (RED BAND)
Y5.	POWER-UP SOLENOID VALVE (YELLOW BAND)
Y6.	CUSHION CONTROL SOLENOID VALVE (LIGHT GREEN BAND)
Y7.	MAIN PUMP PROPORTIONAL SOLENOID
Y9.	CRUSHER/BREAKER OPTION TWO FLOW SOLENOID VALVE
Y11.	TWO SPEED TO ENGINE UP

LEGEND

- P1 PUMP
- P2 PUMP
- PILOT SYSTEM PUMP
- RETURN TO RESERVOIR
- LEAK-OFF RETURN
- SUPPLY CIRCUIT
- PILOT SYSTEM CIRCUIT
- COMPONENT BOUNDARY
- HOSE
- PIPING CONNECTION
- PIPING CROSS-OVER
- 41 COMPONENT ITEM NO.
- 9 / a1 COMPONENT NUMBER / CONNECTION ITEM NO.
- ★ OPTIONAL ITEM NO.

CX130 (DCH13B0544 →) - CX160 (DCH16B0199 →) - CX180 EXCAVATOR
HYDRAULIC SCHEMATIC
Number 9-88380

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ITEM	DESCRIPTION
A1.	COMPUTER
A2.	ENGINE CONTROLLER
A3.	ELECTRONIC ACCELERATION
A4.	WIPER CONTROLLER
B1.	COOLANT TEMPERATURE SENSOR
B2.	HYDRAULIC OIL TEMPERATURE SENSOR
B21.	ENGINE OIL PRESSURE SWITCH
B22.	SWING PILOT PRESSURE SWITCH
B23.	BREAKER / CRUSHER PILOT PRESSURE SWITCH
B24.	SECOND OPTION PILOT CIRCUIT 2 PRESSURE SWITCH
B25.	BREAKER PILOT PRESSURE SWITCH
B26.	UPPER PILOT PRESSURE SWITCH (YELLOW BAND)
B27.	TRAVEL PILOT PRESSURE SWITCH
B28.	SECOND OPTION PILOT CIRCUIT 1 PRESSURE SWITCH
B41.	ENGINE RPM SENSOR
B42.	PUMP PRESSURE SENSOR (P1)
B43.	PRESSURE SENSOR (NEGA-CONT)
B44.	PUMP PRESSURE SENSOR (P2) (YELLOW BAND)
B45.	OVERLOAD INDICATOR PRESSURE SWITCH
B61.	SUNLOAD SENSOR
B81.	HORN
E1.	WORKING LIGHT (UPPERSTRUCTURE)
E2.	WORKING LIGHT (ATTACHMENT)
E3.	WORKING LIGHT (CAB)
E4.	CAB LIGHT
E51.	CIGARETTE LIGHTER
E52.	AIR CONDITIONER
F1.	FUSE 20A: ENGINE CONTROLLER
F10.	FUSE 10A: OPTION LINE AND LUBRICATOR CONNECTOR
F11.	FUSE 10A: BACK-UP
F12.	FUSE 15A: KEY SWITCH
F13.	FUSE 20A: HEATER / AIR CONDITIONER
F14.	FUSE 5A: AIR CONDITIONER COMPRESSOR
F15.	FUSE 15A: WORKING LIGHT
F16.	FUSE 15A: WORKING LIGHT (NOT USED)
F17.	FUSE 10A: DC-DC (24V-12V) CONVERTER
F18.	FUSE 15A: WIPER AND WASHER
F19.	FUSE 10A: HORN
F2.	FUSE 20A: COMPUTER CONTROL INSTRUMENT PANEL AND DIAGNOSTIC TEST SOCKET
F20.	FUSE 10A: CIGARETTE LIGHTER AND CAB SEAT COMPRESSOR ADJUSTMENT
F21.	FUSE BOX
F22.	FUSE 20A: MAIN FUSE FOR F11 AND F12 CIRCUITS
F23.	FUSE 40A: MAIN FUSE FOR F3 TO F10 AND F13 TO F20 CIRCUITS
F24.	FUSE 20A: MAIN FUSE FOR F2 CIRCUIT
F25.	FUSE 20A: MAIN FUSE FOR F1 CIRCUITS
F3.	FUSE 20A: COMPUTER POWER
F4.	FUSE 10A: HYDRAULIC FUNCTION CANCELLATION LEVER SWITCH
F5.	FUSE 15A: LUBRICATOR (NOT USED)
F6.	FUSE 10A: ROTARY LIGHT
F7.	FUSE 20A: FUEL FILLER PUMP
F8.	FUSE 15A: ENGINE STOP MOTOR
F9.	FUSE 30A: GLOW PLUG
G1.	BATTERY
G2.	ALTERNATOR
H1.	AUDIBLE WARNING DEVICE
K1.	RELAY-ENGINE EMERGENCY STOP
K2.	RELAY-GLOW PLUG
K3.	RELAY-HORN
K4.	RELAY-WORKING LIGHT
K5.	RELAY-ROTARY LIGHT
K7.	RELAY BATTERY
M1.	STARTER MOTOR
M2.	ENGINE EMERGENCY STOP MOTOR
M3.	WIPER MOTOR
M4.	WASHER MOTOR
M5.	MOTOR (AIR CHANGING)
M6.	AIR VENT DIRECTION CONTROL MOTOR
M7.	MOTOR ACT (AIR-MIX)
M8.	BLOWER MOTOR
P1.	INSTRUMENT PANEL
P2.	SWITCH PANEL (LEFT-HAND)
P3.	SWITCH PANEL (RIGHT-HAND)
P4.	MONITOR DISPLAY
P5.	HOURMETER
P6.	AIR CONDITIONER CONTROL PANEL
R1.	GLOW PLUG
R2.	FUEL FLOW ADJUSTMENT RESISTOR
R3.	THROTTLE VOLUME
R4.	THERMISTOR
R6.	FUEL SENSOR
S1.	KEY SWITCH
S10.	WORKING LIGHT SWITCH
S11.	WIPER SWITCH
S12.	WASHER SWITCH
S13.	OVERLOAD SWITCH
S14.	BREAKER / CRUSHER SWITCH
S15.	HORN SWITCH
S16.	ONE TOUCH IDLE
S2.	TRAVEL MODE SWITCH
S3.	WORK MODE SWITCH
S4.	AUTO MODE SWITCH
S5.	CUSHION CONTROL SWITCH
S51.	HYDRAULIC FUNCTION CANCELLATION LEVER SWITCH
S52.	AIR CONDITIONING COMPRESSOR CLUTCH SWITCH
S53.	DOOR LIMIT SWITCH
S54.	FRONT WINDOW LIMIT SWITCH
S55.	RESERVE TANK LSW
S6.	ROTARY LIGHT SWITCH
S7.	AUDIBLE ALARM CUT OUT SWITCH
S8.	SWING BRAKE SWITCH
S9.	ENGINE EMERGENCY STOP SWITCH
U1.	DC-DC (24V-12V) CONVERTER
W1.	ANTENNA
X1.	FUEL FILLER PUMP CONNECTOR
X2.	ROTARY LIGHT CONNECTOR
X3.	OPTINAL POWER CONNECTOR
X4.	ENGINE TEST POINT CONNECTOR
X5.	CONTROLLER TEST POINT CONNECTOR
X6.	CAB SEAT(COMPRESSOR) MOTOR CONNECTOR
X8.	RADIO CONNETOR
X9.	ANTI-THEFT SYSTEM CONNETOR
Y1.	SWING PILOT SHUT-OFF SOLENOID VALVE (GREEN BAND)
Y2.	PILOT PRESSURE SOLENOID VALVE (BLUE BAND)
Y3.	SWING BRAKE SOLENOID VALVE (PINK BAND)
Y4.	2 STAGE TRAVEL SOLENOID VALVE (RED BAND)
Y5.	POWER-UP SOLENOID VALVE (YELLOW BAND)
Y6.	CUSHION CONTROL SOLENOID VALVE (LIGHT GREEN BAND)
Y7.	MAIN PUMP PROPORTIONAL SOLENOID
Y8.	AIR CONDITIONER MAGNET CLUTCH
Y9.	CRUSHER/BREAKER OPTION TWO FLOW SOLENOID VALVE

LEGEND

- CONNECTED
- NOT CONNECTED
- BOOT GROUND
- CABLE GROUND
- SINGLE WIRE CONNECTOR
- HARNESS
- CONNECTOR (MALE)
- CONNECTOR (FEMALE)
- INSULATION AGAINST MAGNETISM
- INDICATES CONSTANT POWER
- INDICATES POWER WHEN KEY SWITCH IS ON

CONNECTOR NUMBER (IN CAB) — CN32 (R) — COLOR OF CONNECTOR (IF NOT INDICATED COLOR IS WHITE)

CONNECTOR LETTER LOCATED (OUTSIDE CAB) — 60 B 203 — AREA / COLOR — CIRCUIT NUMBER

TABLE OF COLOR SYMBOLS

SYMBOL	COLOR
B	BLACK
W	WHITE
Br	BROWN
P	PINK
V	VIOLET
G	GREEN
O	ORANGE
R	RED
Y	YELLOW
Lg	LIGHT GREEN
Sb	SKY BLUE
L	BLUE
Gr	GRAY

NOTE :
1. "BR" INDICATES BLACK CABLE WITH RED STRIPE.
2. WATERPROOF CONNECTORS USED OUTSIDE OF CAB.

CX 130 - CX 160 - CX 180 EXCAVATOR ELECTRICAL SCHEMATIC

Part Number 9-88430

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