CASE

REPAIR MANUAL

Crawler Excavator

CX210
CX230
CX240

9-93541

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CX210 - CX230 - CX240 Crawler Excavators
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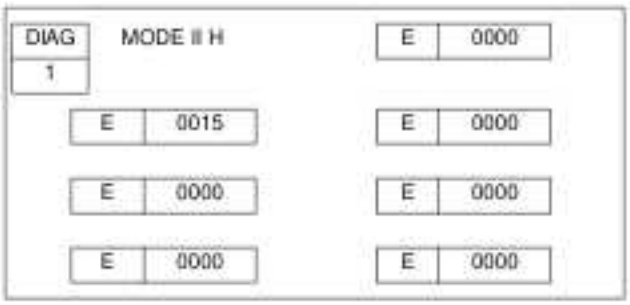
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Diagnostic code

1. Detection of engine failures DIAG1



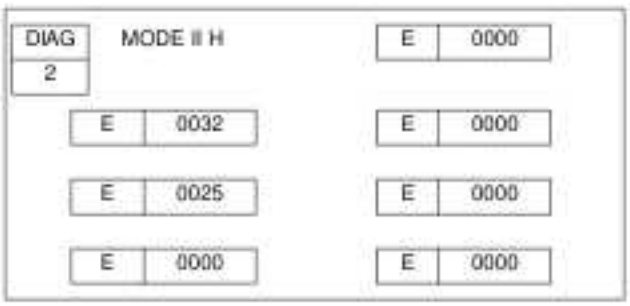
E: Failure code

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

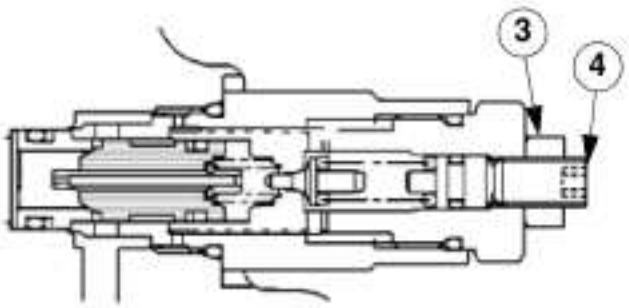
Example: The screen above shows that there is a defect in the electronic regulator rack position detector (0032) and in the fuel flow adjustment resistor (0025).

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8. Read the pressure on the diagnostic screen, the pressure should be:

Function	CX130/CX160/ CX180		CX210/CX230/ CX240	
Boom raising	P1	383±5 bar (38.3±0.5 MPa)	P2	392±5 bar (39.2±0.5 MPa)
Boom lowering	P1	383±5 bar (38.3±0.5 MPa)	P2	392±5 bar (39.2±0.5 MPa)
Dipper retracting	P2	383±5 bar (38.3±0.5 MPa)	P1	392±5 bar (39.2±0.5 MPa)
Dipper extending	P2	383±5 bar (38.3±0.5 MPa)	P1	392±5 bar (39.2±0.5 MPa)
Bucket opening	P1	383±5 bar (38.3±0.5 MPa)	P2	392±5 bar (39.2±0.5 MPa)
Bucket closing	P1	383±5 bar (38.3±0.5 MPa)	P2	392±5 bar (39.2±0.5 MPa)

9. Carry out steps 10 to 14 only if one of the secondary attachment relief valves needs to be tared. Otherwise go to step 15.



CI00ES08

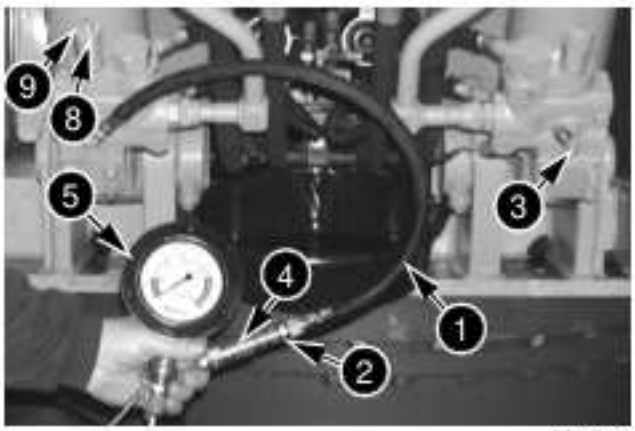
10. Using a key, hold the adjusting screw (4) of the corresponding secondary relief valve in position and loosen the lock nut (3).
11. Operate and hold in position the corresponding attachment control (against the cylinder stops).
12. Turn the adjusting screw (4) of the corresponding secondary relief valve until the correct pressure is obtained.
13. Using a key, hold the adjusting screw (4) in position and tighten the lock nut (3).
14. Check the pressure once again. If the desired value is not obtained, repeat steps 10 to 14.
15. Using a key, hold the adjusting screw (1) of the main relief valve in position and tighten the lock nut (2).
16. Operate and hold in position the dipper retracting control (against cylinder stops).
17. Turn the adjusting screw (1) until the correct value of the main relief valve standard pressure is obtained.

NOTE: *Tighten the screw (1) to increase the pressure. Loosen the screw (1) to reduce the pressure.*

18. Using a key, hold the adjusting screw (1) in position and tighten the lock nut (2).
19. Check that the standard pressure of the main relief valve is correct, if not repeat steps 15 to 19.
20. Shut down the engine.
21. Reconnect the 2-stage relief level pilot hose to the main relief valve.

Secondary relief valves of the boom safety valves (B1 and B2)

Checking and setting right-hand side



CD01B008

Disconnect the balancing hose (1). Assemble on the hose a male coupling joint equipped with its union (2). Plug the elbow union (3). Connect to the hose (1) a female coupling joint equipped with a pressure detector (4). Connect the Multi-Handy tester or a 0-600 bar pressure gauge (5) to the pressure detector (4).

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Disassembly

NOTE: *The numbers within brackets in the following steps refer to the schematic on page 3.*

STEP 1

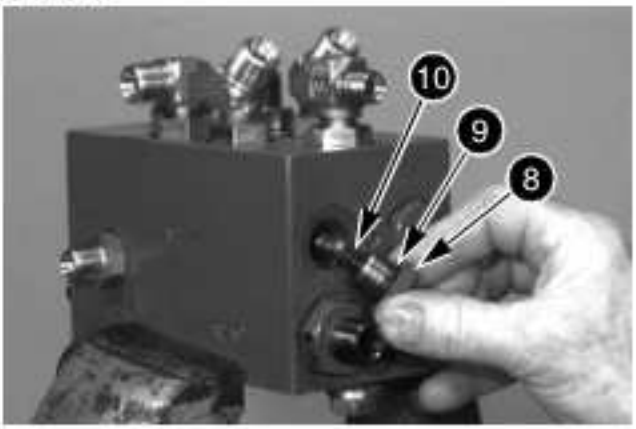


JD00548A

If the cushion control valve has to be replaced, remove the adaptors and elbow unions and install them on the new control valve. Do not remove the four flow restriction adapters (7) installed in the sides of the valve.

NOTE: *Mark parts to ensure correct assembly in same valve bore as removed from.*

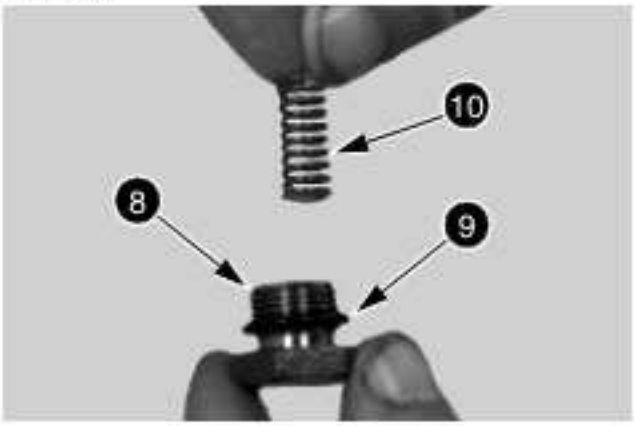
STEP 2



JD00550A

Remove the plug (8) with the O-ring (9) and the spring (10).

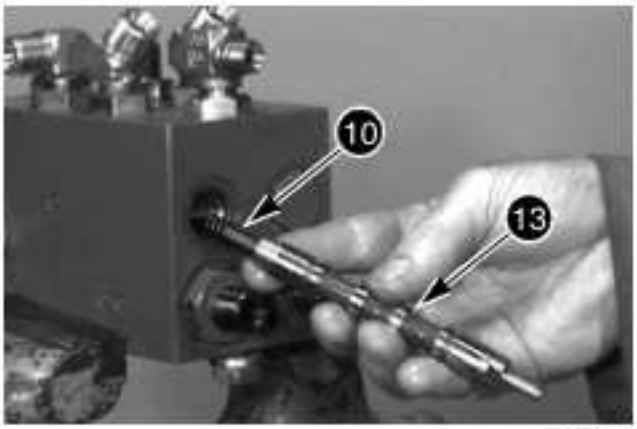
STEP 3



JD00551A

Remove the spring (10) and the O-ring (9) from the plug (8). Scrap the O-ring.

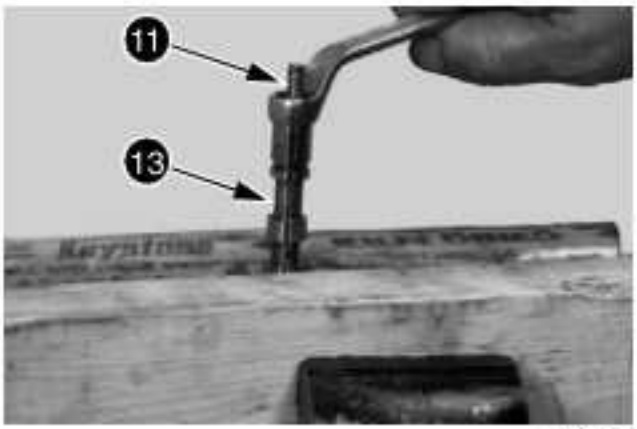
STEP 4



JD00552A

Remove the spool (13) and the spring (10) from the control valve.

STEP 5

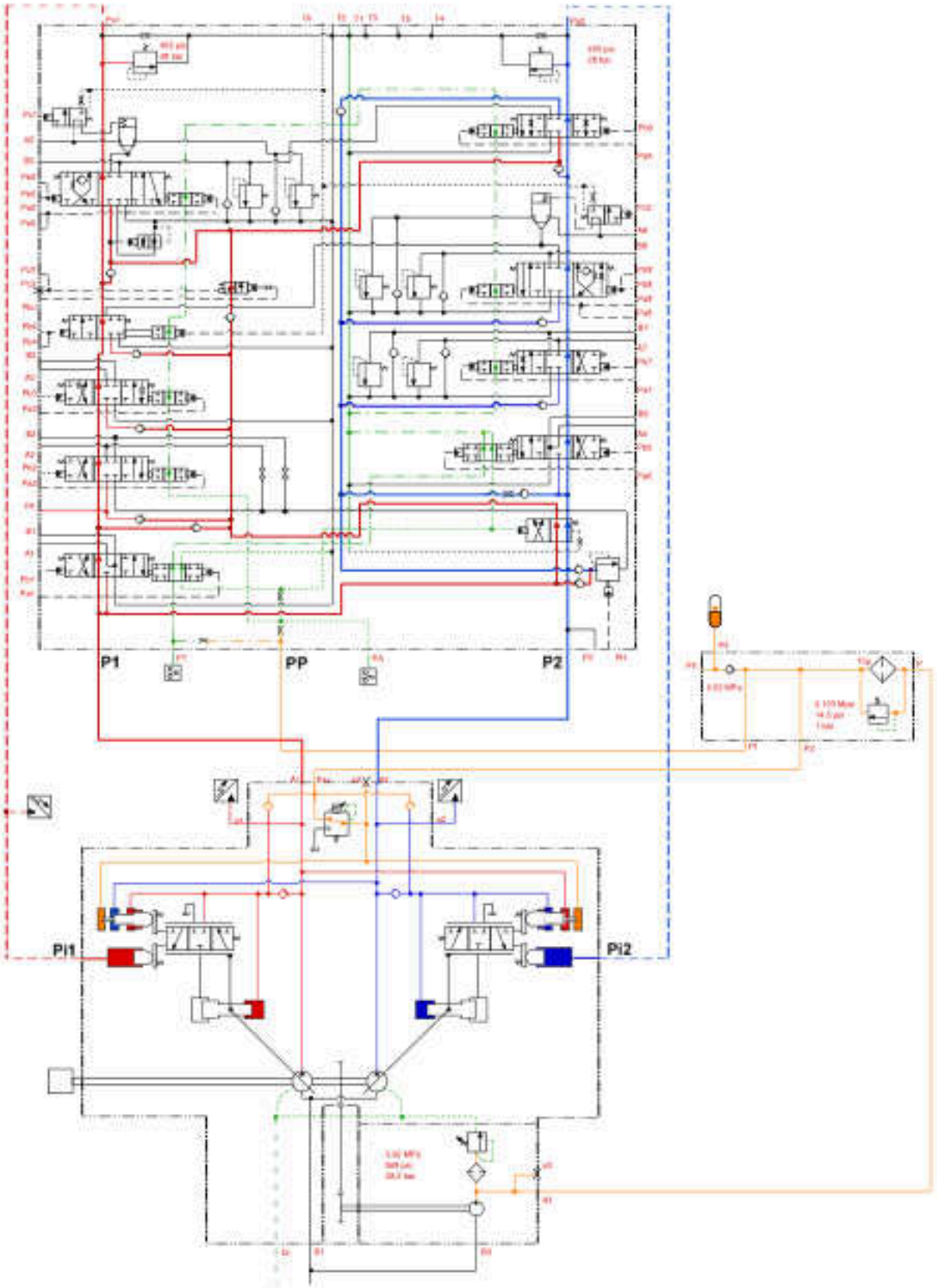


JD00553A

NOTE: *Removal to be carried out in case of a leak between the spool (13) and the spring guide (11).*

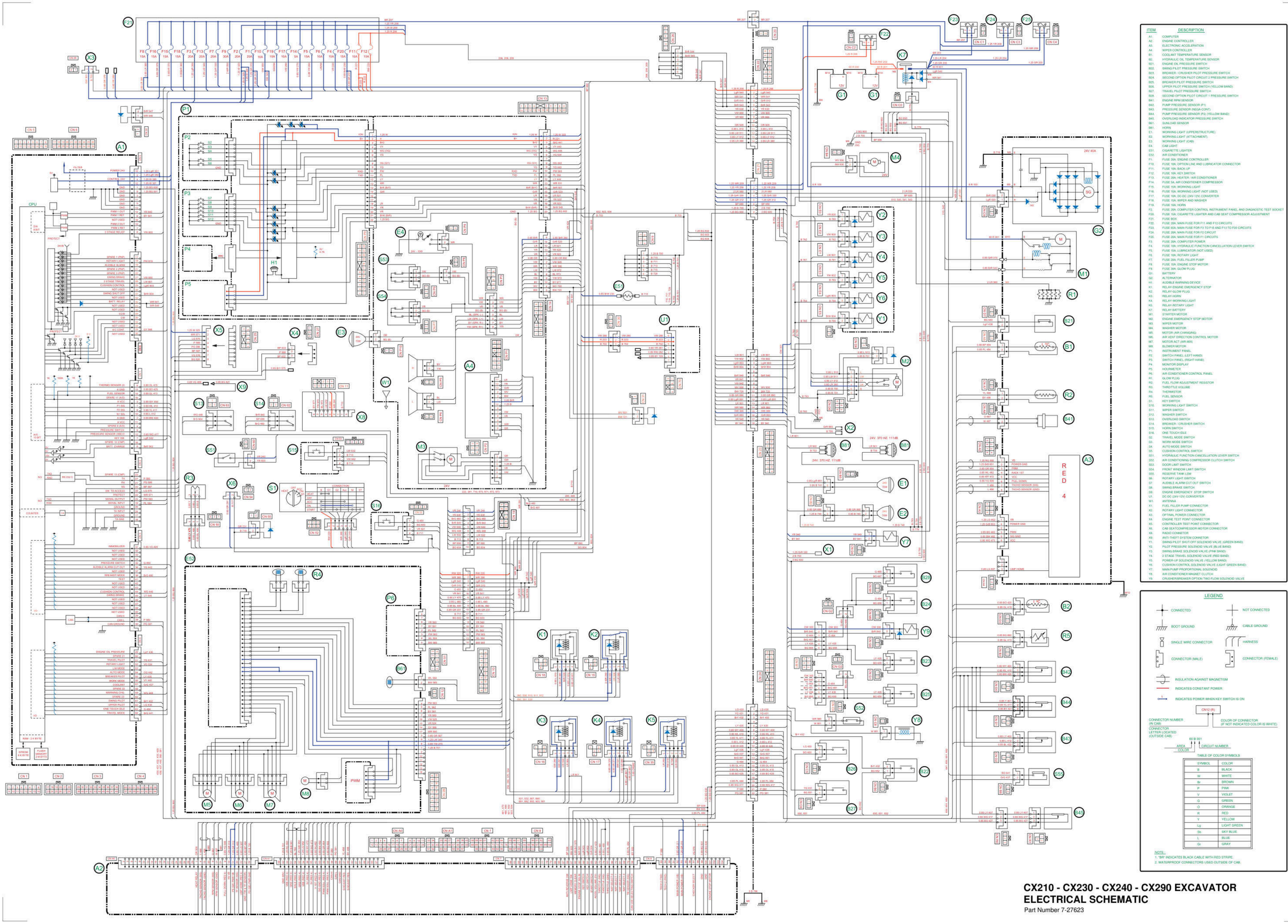
Put the spool (13) in a vice using wooden shims to protect the spool. Remove the spring guide (11) from the spool (13).

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CM008K028

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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 3 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 30A: 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 10A: 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 60A: 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 25A: COMPUTER POWER
F4.	FUSE 10A: HYDRAULIC FUNCTION CANCELLATION LEVER SWITCH
F5.	FUSE 15A: LUBRICATOR (NOT USED)
F6.	FUSE 15A: 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
R5.	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.

CX210 - CX230 - CX240 - CX290 EXCAVATOR ELECTRICAL SCHEMATIC

Part Number 7-27623

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