UEN00084-07

Shop Manual

KOMATSU

PC210-8
PC210LC-8
PC210NLC-8
PC230NHD-8
PC240LC-8
PC240NLC-8

SERIAL NUMBERS	PC210-	K50001	and up
	PC210LC-	K50001	
	PC210NLC-	K50001	
	PC230NHD-	K50001	
	PC240LC-	K50001	
	PC240NLC-	K50001	

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Information in troubleshooting table

★ The following information is summarized in the troubleshooting table and the related electrical circuit diagram. Before carrying out troubleshooting, understand that information fully.

User code	Failure code	Trouble	
Display on machine monitor	**Display on machine monitor**	Trouble	**Trouble name displayed in abnormality record machine monitor**
Contents of trouble	**Contents of trouble detected by machine monitor or controller**		
Action of machine monitor or controller	**Action taken by machine monitor or controller to protect system or devices when engine controller detects trouble**		
Problem that appears on machine	**Problem that appears on machine as result of action taken by machine monitor or controller (shown above)**		
Related information	**Information related to detected trouble or troubleshooting**		

	Cause		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1 2 3 4	Possible causes of trouble (Given numbers are reference numbers, which do not indicate priority)	**<Contents of description>** **• Standard value in normal state to judge possible causes** **• Remarks on judgment** **<Troubles in wiring harness>** **• Disconnection** **Connector is connected imperfectly or wiring harness is broken.** **• Ground fault** **Wiring harness which is not connected to chassis ground circuit is in contact with chassis ground circuit.** **• Hot short** **Wiring harness which is not connected to power source (24 V) circuit is in contact with power source (24 V) circuit.** **• Short circuit** **Independent wiring harnesses are in contact with each other abnormally.** **<Precautions for troubleshooting>** **(1) Method of indicating connector No. and handling of T-adapter** **Insert or connect T-adapter as explained below for troubleshooting, unless otherwise specified.** **• If connector No. has no marks of "male" and "female", disconnect connector and insert T-adapters in both male side and female side.** **• If connector No. has marks of "male" and "female", disconnect connector and connect T-adapter to only male side or female side.** **(2) Entry order of pin Nos. and handling of tester leads** **Connect positive (+) lead and negative (–) lead of tester as explained below for troubleshooting, unless otherwise specified.** **• Connect positive (+) lead to pin No. or wiring harness entered on front side.** **• Connect negative (–) lead to pin No. or harness entered on rear side.**

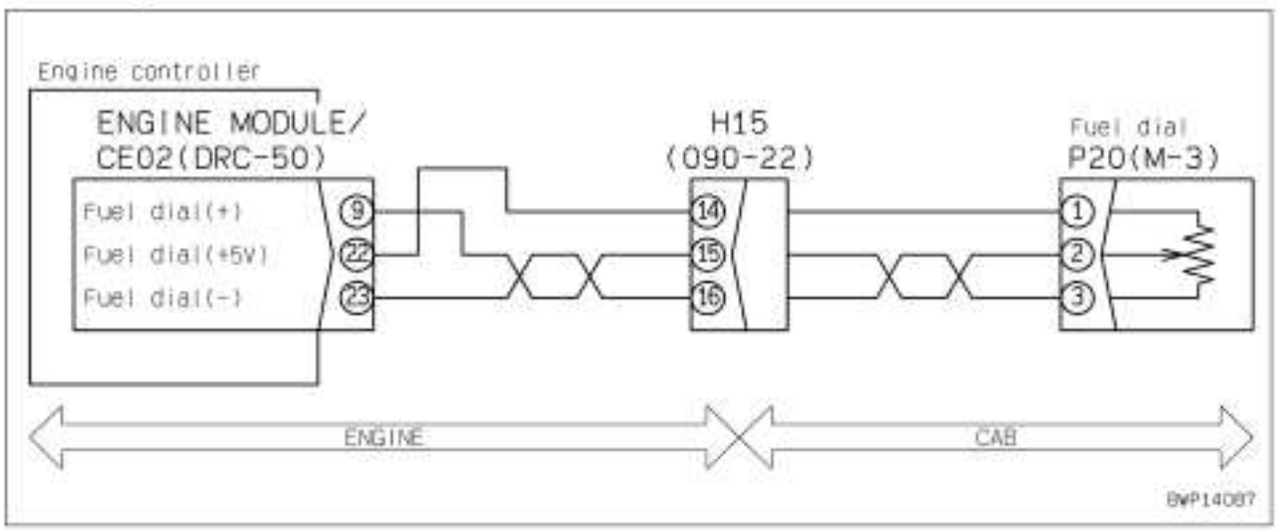
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Failure code [CA2185] Throt Sens Sup Volt High Error

User code	Failure code	Trouble	Throttle sensor supply voltage high error (Engine controller system)
E14	CA2185		
Contents of trouble	• High voltage (5.25 V or higher) was detected in throttle sensor power supply circuit.		
Action of controller	• If trouble occurs while starting switch is in ON position, controller fixes voltage value to level just before detection of trouble and continues operation. • If starting switch is turned ON while voltage is abnormally high, controller continues operation with voltage at 100% value.		
Problem that appears on machine	• Engine speed cannot be controlled with fuel control dial.		
Related information	• Method of reproducing failure code: Turn starting switch ON.		

		Cause	Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
	1	Short circuit in wiring harness (with another wiring harness)	Wiring harness between CE02 (female) (22) – each of CE02 (female) pins (With P20 disconnected)	Resistance	Min. 100 kΩ
			Wiring harness between CE02 (female) (22) – CE03 (female) (3) (With P20 disconnected)	Resistance	Min. 100 kΩ
	2	Defective wiring harness connector	Connecting parts between fuel control dial – machine wiring harness – engine controller may be defective. Check them directly. • Looseness of connector, breakage of lock, or breakage of seal • Corrosion, bend, breakage, push-in, or expansion of pin • Moisture or dirt in connector or defective insulation		
	3	Defective engine controller	If causes 1 – 2 are not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)		

Circuit diagram related to fuel control dial



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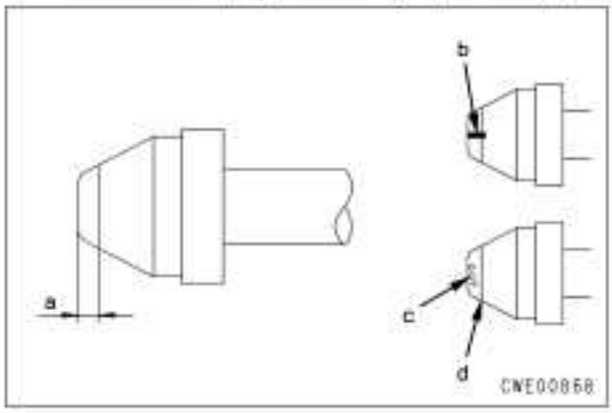
[*7], [*8], [*9], [*10], [*11]

- **High-pressure pipes and common rail**

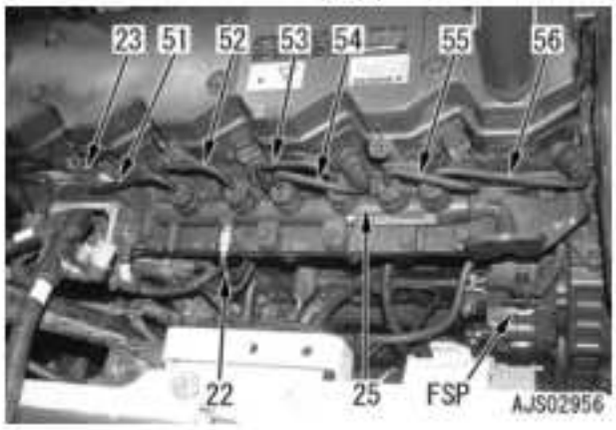
⚠ **Do not use high-pressure pipes with bending modification.**

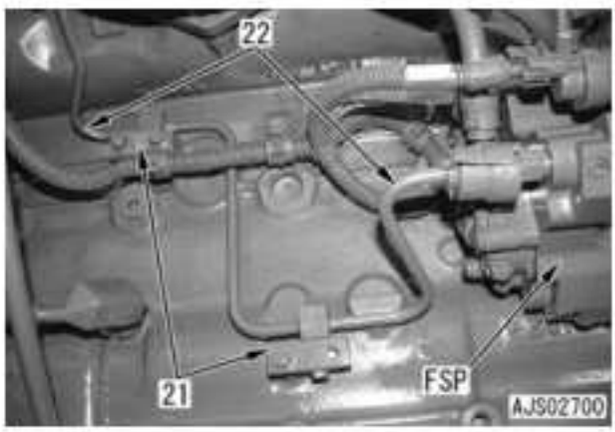
⚠ **Be sure to use a genuine high-pressure pipe fixing clamp and observe strictly the tightening torque.**

★ A high-pressure pipe which has depressions such as visible vertical slit scar (b), patchy scars (c) etc. on the taper seal section of its connector ((a) part: within 2mm from the tip), or a high-pressure pipe whose (d) part (end of the taper seal section: 2mm from the tip) catches on a finger nail due to fatigue, may cause fuel leakage. In these cases, replace the high-pressure pipe.



3) Assemble common rail (25) and high-pressure pipes (51) -(56) temporarily.
   Sleeve nut and mounting bolt:
   0.2 – 0.8 Nm {0.02 – 0.08 kgm}
4) Tighten high-pressure pipes (51) - (56) according to the following procedure.
   Sleeve nut:
   35 ± 3.5 Nm {3.6 ± 0.4 kgm}
   1] Head side of high-pressure pipes (51) and (56)
   2] Common rail (25) side of high-pressure pipes (51) and (56)
   3] Head side of high-pressure pipes (52), (53), (54) and (55)
   4] Common rail (25) side of high-pressure pipes (52), (53), (54) and (55)
5) Tighten the sleeve nut of high-pressure pipe (22) temporarily.
6) Tighten high-pressure pipe (22) in the order of firstly pump (FSP) side, then common rail (25) side.
   Sleeve nut:
   35 ± 3.5 Nm {3.6 ± 0.4 kgm}
7) Tighten clamp (21) of high-pressure pipe (22).
   Mounting bolt:
   24 ± 4 Nm {2.4 ± 0.4 kgm}
8) Tighten common rail (25) with four bolts.
   ★ Coat the two bolt threads on the inner side of the engine with sealant (LG-7).
   Mounting bolt:
   24 ± 4 Nm {2.4 ± 0.4 kgm}
9) Install bellows (23) to each high-pressure pipe. (14 pieces)
   ★ Set the slits of each bellows out and down.
   ★ The bellows are installed so that fuel will not spout over the hot parts of the engine and catch fire when it leaks for some reason.
   ★ FSP: Fuel supply pump





[*12]
Blow-by duct mounting bolt:
10 ± 2 Nm {1.0 ± 0.2 kgm}

[*13]
Head cover mounting nut:
24 ± 4 Nm {2.4 ± 0.4 kgm}

[*14]
★ Harness installation position

Harness color	Cylinder No.
White	1, 3, 5
Black	2, 4, 6

Harness mounting nut:
1.5 ± 0.25 Nm {0.15 ± 0.03 kgm}

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Measuring and adjusting quick coupler control valve output pressure - For PC210 K50001 - K53423, PC230 K50001 - K50286 and PC240 K50001 - K51093

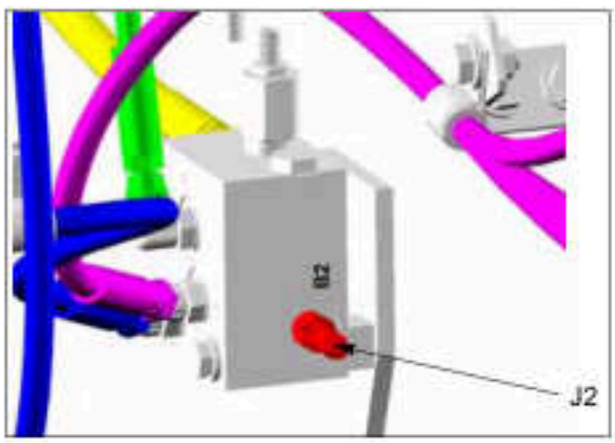
★ Measuring and adjusting tools for oil pressure in quick coupler circuit.

Symbol		Part No.	Part name
J	1	799-101-5002	Hydraulic tester
		790-261-1204	Digital hydraulic tester
	2	799-101-5220	Nipple (10 × 1.25 mm)
		07002-11023	O-ring

⚠ **Stop the machine on a level ground and lower the work equipment to the ground. Then, release the residual pressure from the hydraulic circuit. For details, see "Releasing residual pressure from hydraulic circuit".**

Measuring

- Measure quick coupler control valve output pressure after checking that work equipment, swing and travel circuit pressures are normal.
- Fit nipple J2 to port B2 and connect it to oil pressure gauge of hydraulic tester.



- Use an oil pressure gauge with the capacity of 59MPa (600kg/cm²)
- Start the engine. In order to raise the pressure to the set pressure of the pressure regulating valve it will be necessary to operate one of the main control circuits. Set the swing lock to ON and operate the swing lever.

NOTE: When delivered from the factory the regulated pressure is set to 4MPa (41kg/cm².

Adjustment

If the regulated pressure is not suitable for the quick coupler to be installed adjust the pressure of the regulating valve as follows:

1. Loosen the locknut (1a). (using a 17mm spanner).



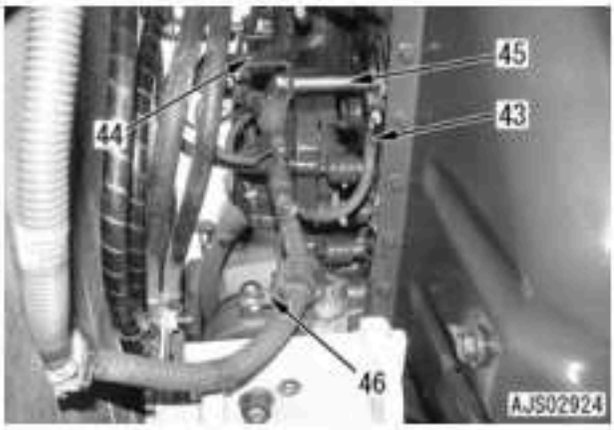
2. Turn the adjustment screw (1b) to adjust the pressure. (Using a 5mm hexagon key).
   - If the screw is turned to the right the pressure increases.
   - If the screw is turned to the left the pressure reduces.
   - Quantity of adjustment per turn of the screw: Approx 5.5MPa.



3. After required pressure is achieved, hold adjustment screw (1b) and tighten the lock nut (1a). (Torque of lock nut (1a) 12+/-2Nm)

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41. Disconnect engine controller ground T12 (43).
42. Disconnect bracket (44) and remove spacer (45).
43. Disconnect clamp (46).



44. Disconnect terminal (46) from the starter ST.
45. Disconnect connector E10 (47).
    ★ Connector at the starting motor side:T13
46. Disconnect connectors E08 (48) and P44 (49).
47. Disconnect clamp (50).



48. Disconnect clamp (51). (PC240-8 only)
49. Remove filter and bracket assembly (52).
    ★ Put it on hose bracket (HB).

PC210/230-8



PC240-8

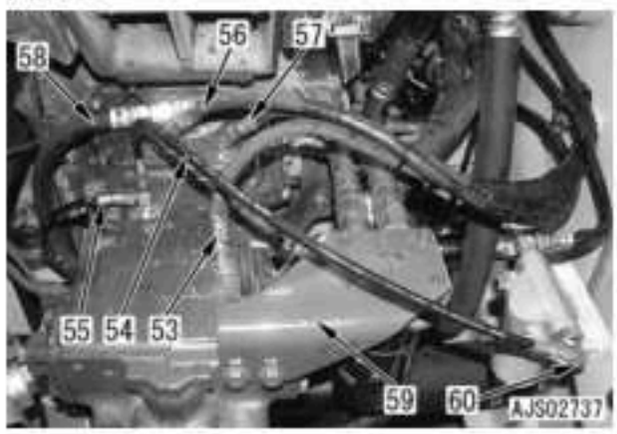


50. Disconnect six hoses.
    - (53): Rear load pressure input port hose (Color band: No color)
    - (54), (55): EPC basic pressure port hose (Color band: No color)
    - (56): Pump pressure input port hose (Color band: blue)
    - (57): Front load pressure input port hose (Color band: red)
    - (58): Drain port hose
51. Disconnect bracket (59).
52. Turn elbow (60) downward.
    ★ To be not obstructive in removing the engine.

PC210/230-8



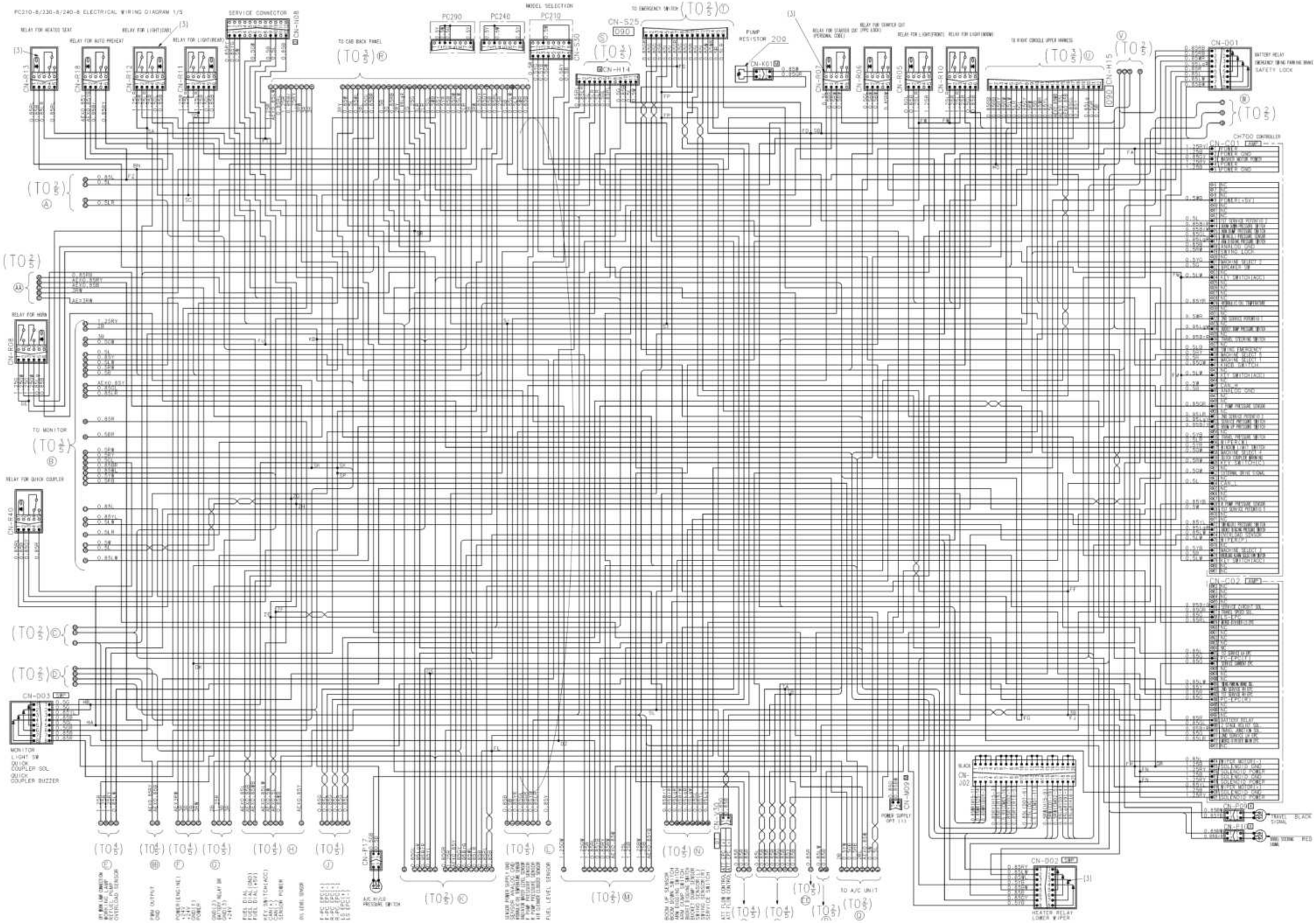
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Electrical diagrams and drawings (For PC210 K51095 ~ K52292, PC230 K50114 ~ K50200 and PC240 K50304 ~ K50595)

Electrical circuit diagram (1/5)



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