DIMENSIONS

Fixed gauge specification

	Item	Unit	PC400-7	PC400LC-7	PC450-7	PC450LC-7
A	Overall length	mm	11,940	11,940	12,040	12,040
B	Overall height	mm	3,635	3,635	3,660	3,660
C	Overall width	mm	3,340	3,440	3,340	3,340
D	Track shoe width	mm	600	700	600	600
E	Height of machine cab	mm	3,265	3,265	3,265	3,265
F	Tail swing radius	mm	3,645	3,645	3,645	3,645
G	Track overall length	mm	5,055	5,355	5,055	5,355
H	Length of track on ground	mm	4,020	4,350	4,020	4,350
	Min. ground clearance	mm	555	550	555	550

Variable gauge specification

	Item	Unit	PC400-7	PC400LC-7	PC450-7	PC450LC-7
A	Overall length	mm	11,940	11,940	12,040	12,040
B	Overall height	mm	3,635	3,635	3,660	3,660
C	Overall width	mm	3,490	3,490	3,490	3,490
D	Track shoe width	mm	600	600	600	600
E	Height of machine cab	mm	3,265	3,265	3,265	3,265
F	Tail swing radius	mm	3,645	3,645	3,645	3,645
G	Track overall length	mm	5,055	5,355	5,055	5,355
H	Length of track on ground	mm	4,020	4,350	4,020	4,350
	Min. ground clearance	mm	685	685	685	685

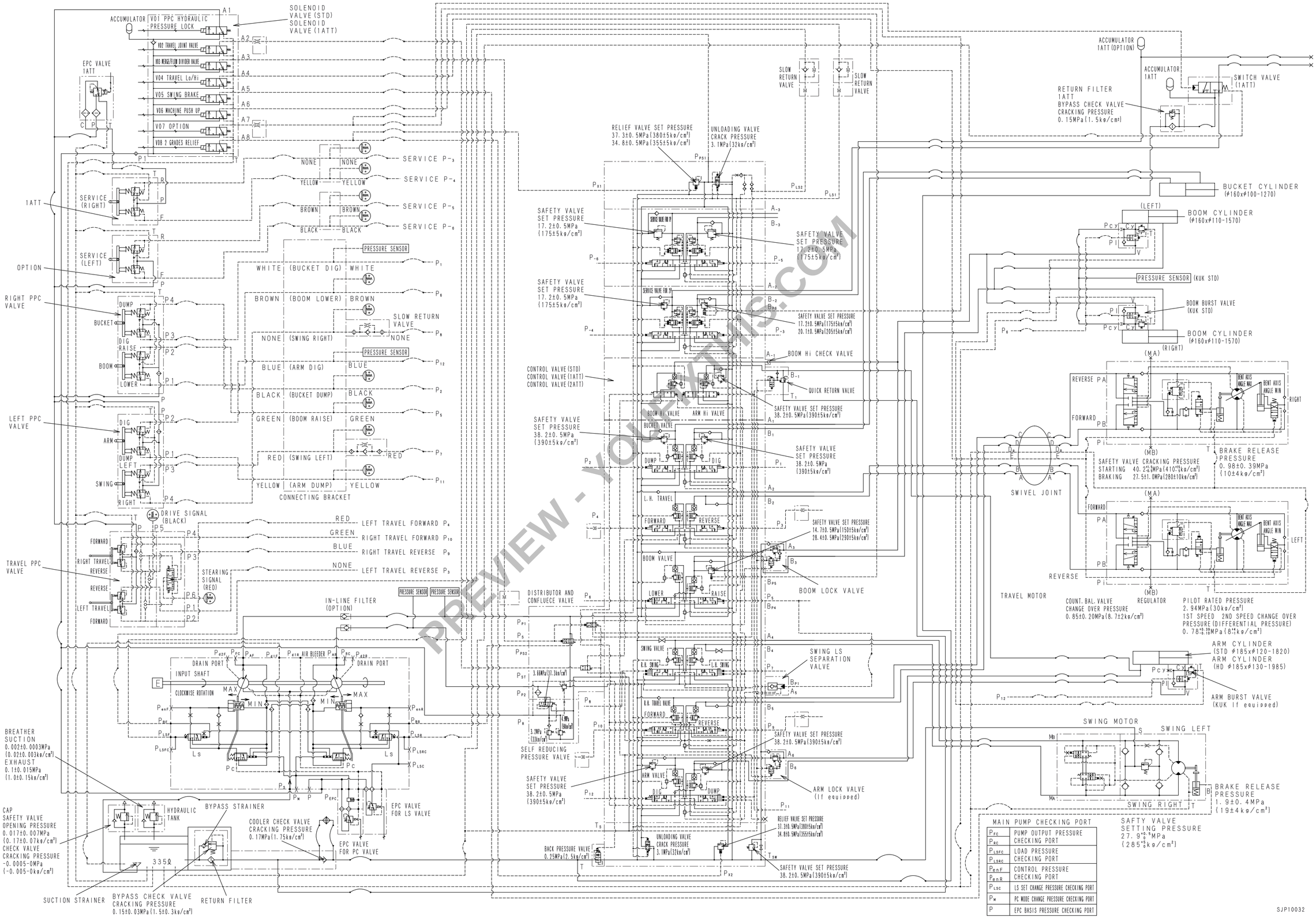
WORKING RANGES

	Working range	Unit	PC400-7	PC400LC-7	PC450-7	PC450LC-7
A	Max. digging reach	mm	12,025	12,025	12,005	12,005
B	Max. digging depth	mm	7,820	7,820	7,790	7,790
C	Max. digging height	mm	10,915	10,915	10,925	10,925
D	Max. vertical wall depth	mm	6,870	6,870	6,600	6,600
E	Max. dumping height	mm	7,565	7,565	7,625	7,625
F	Min. dumping height	mm	—	—	—	—
G	Max. reach at ground level	mm	11,820	11,820	11,800	11,800

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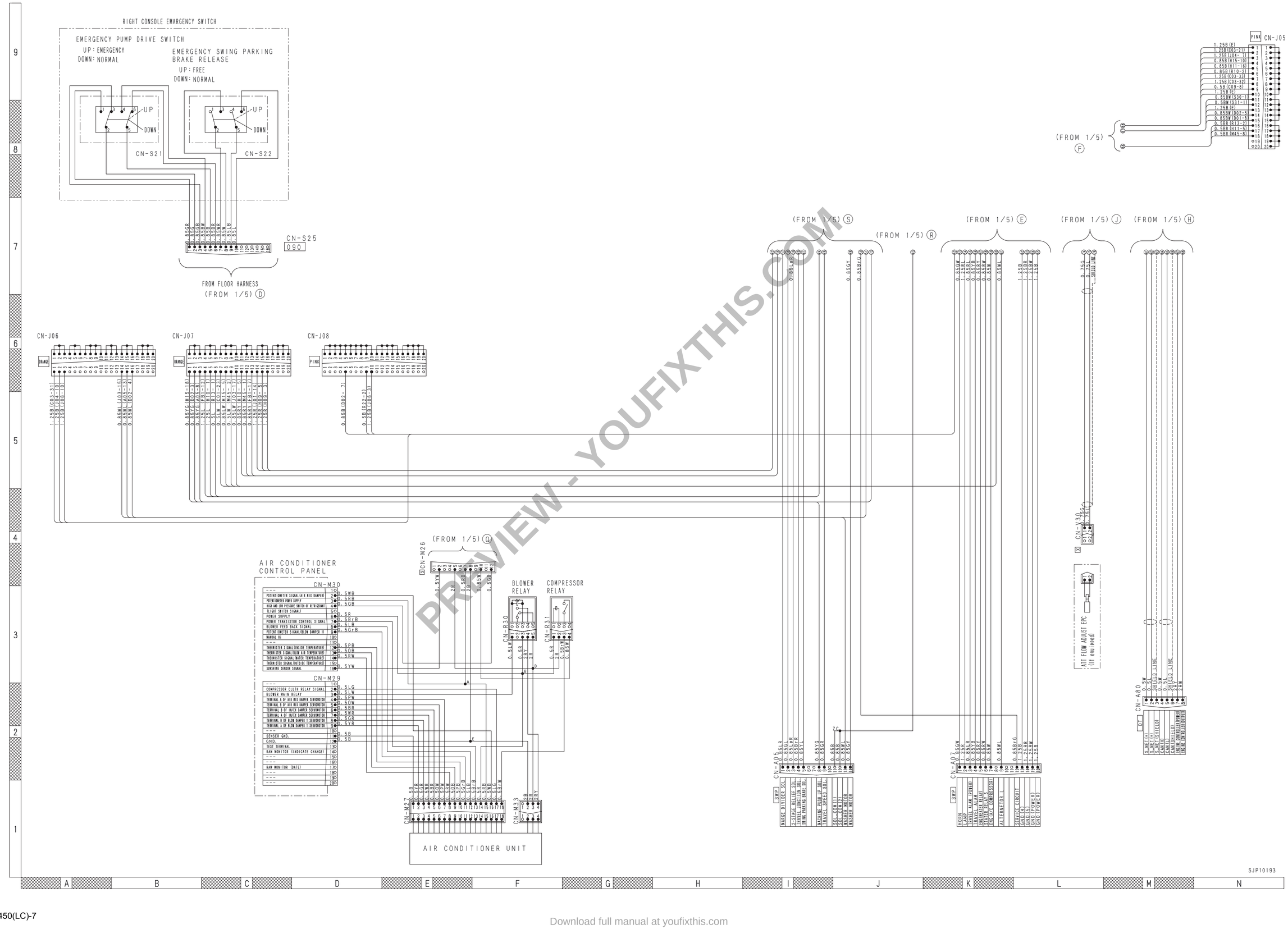
HYDRAULIC CIRCUIT DIAGRAM (1/2)



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ELECTRICAL CIRCUIT DIAGRAM (2/5)



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REMOVAL AND INSTALLATION OF CYLINDER HEAD ASSEMBLY

SPECIAL TOOLS

Symbol		Part No.	Part Name	Necessity	Q'ty	New/Remodel	Sketch
A	1	795-799-1170	Puller	■	1		
	2	790-331-1110	Wrench	●	1		

REMOVAL

⚠ Disconnect the cable from the negative (–) terminal of the battery.

1. Remove 2 engine undercovers (1).



2. Drain the coolant.

Coolant: **Approx. 35 ℓ**

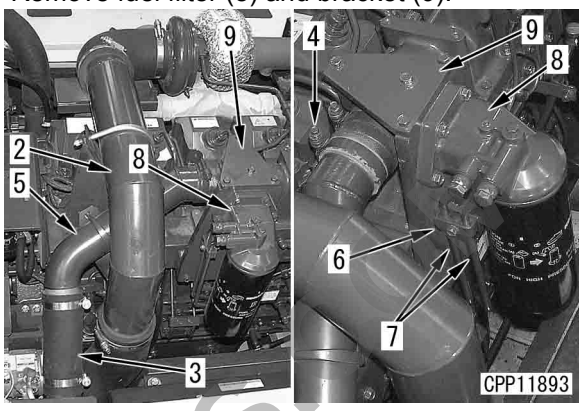
3. Open the engine hood.

4. Remove tube (2). [*1]
★ Remove the tube and bracket together.

5. Remove clamp (4) and disconnect the bracket and pipe (5) together. [*2]
★ Fix hose (3) and pipe (5) with cords, etc. apart from the engine.

6. Remove 2 clamps (6) and 2 tubes (7). [*3]

7. Remove fuel filter (8) and bracket (9).

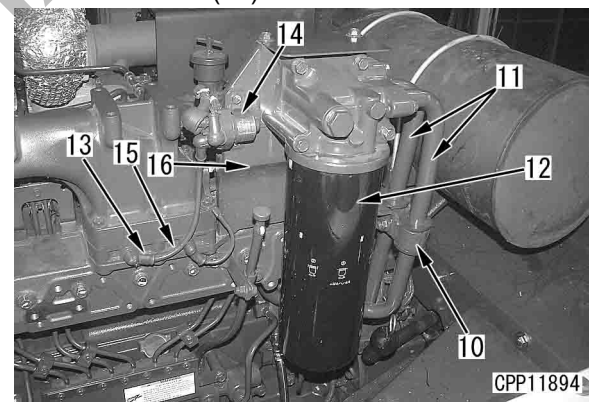


8. Remove clamp (10), 2 tubes (11), and filter (12).

9. Remove cap (13) and disconnect wire (15).

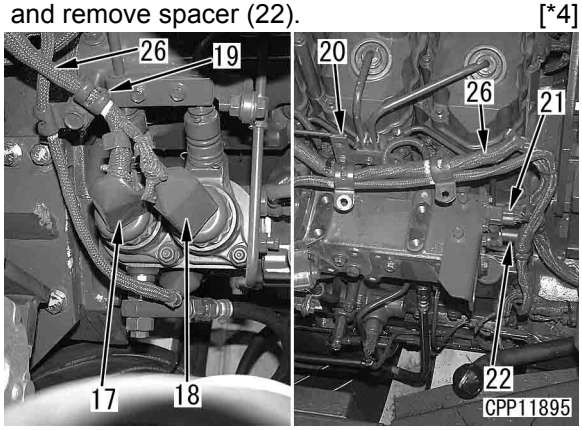
10. Disconnect heater switch (14).

11. Remove the 2 clips on the back side and remove bracket (16).



12. Disconnect fuel supply pump wiring connectors PCV1 (17) and PCV2 (18) and remove 2 clips (19).

13. Disconnect bracket (20) and connector PIM (21) and remove spacer (22). [*4]



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TROUBLESHOOTING

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Table for Error and Failure Code Nos.

User code	Error code		Failure code			History division
	Code	Contents	Code	Component	Trouble	
—	E112	Wiper Drive (For) S/C	DY2DKB	Wiper motor (Forward)	Short Circuit	Electrical system
—	E113	Wiper Drive (Rev) S/C	DYDEKB	Wiper Motor (Reverse)	Short Circuit	
—	E114	Washer Drive S/C	DY2CKB	Windshield Washer Motor	Short Circuit	
—	E115	Wiper Working Abnormality	DY20KA	Wiper Motor	Disconnection	
—	E116	Wiper Parking Abnormality	DY20MA	Wiper Motor	Malfunction	
—	E117	Eng. Controller S-NET Comm Err.	DAC0KR	Engine Controller	Defective communication (Abnormality in related component)	
—	E118	Pump Controller S-NET Comm Err.	DAB0KR	Pump Controller	Defective communication (Abnormality in related component)	
E0E	E128	Monitor Comm. Abnormality	DAFRMC	Monitor CAN Communication	Defective Operation	
—	E201	Travel Junction Sol. S/C	DW91KB	Travel Neutral Solenoid Valve	Short Circuit	
E03	E203	Swing Brake Sol. S/C	DW45KB	Swing Holding Brake Solenoid Valve	Short Circuit	
—	E204	Merge-divider Sol. S/C	DWJ0KB	Pump Merge-divider Solenoid Valve	Short Circuit	
—	E205	2-stage Relief Sol. S/C	DWK0KB	2-stage Relief Solenoid Valve	Short Circuit	
—	E206	Travel Speed Sol. S/C	DW43KB	Travel Speed Hi/Lo Selector Solenoid Valve	Short Circuit	
—	E211	Travel Junction Sol. Disc.	DW91KA	Travel Neutral Solenoid Valve	Disconnection	
E03	E213	Swing Brake Sol. Disc.	DW45KA	Swing Holding Brake Solenoid Valve	Disconnection	
—	E214	Merge-divider Sol. Disc.	DWJ0KA	Pump Merge-divider Solenoid Valve	Disconnection	
—	E215	2-stage Relief Sol. Disc.	DWK0KA	2-stage Relief Solenoid Valve	Disconnection	
—	E216	Travel Speed Sol. Disc.	DW43KA	Travel Speed Hi/Lo Selector Solenoid Valve	Disconnection	
—	E217	Model Selection Abnormality	DA2SKQ	Pump Controller Model Selection Wiring Harness	Disagreement of Model Selection Signals	
E0E	E218	S-Net Comm. Disc.	DA2SKA	Pump Controller S-NET Communication	Disconnection	
—	E222	LS-EPC Sol. S/C	DXE0KB	LS-EPC Solenoid Valve	Short Circuit	
—	E223	LS-EPC Sol. Disc.	DXE0KA	LS-EPC Solenoid Valve	Disconnection	
—	E224	F Pump P. Sensor Abnormality	DHPAMA	F Pump Pressure Sensor	Malfunction	
—	E225	R Pump P. Sensor Abnormality	DHPBMA	R Pump Pressure Sensor	Malfunction	
—	E226	Press. Sensor Power Abnormality	DA25KP	Pump Controller Power Supply Output	Lowering of Output Voltage	
—	E227	Engine Speed Sensor Abnormality	DLE2MA	Engine Speed Sensor	Malfunction	
—	E228	Service Return Relay S/C	D196KB	ATT Selector Relay	Short Circuit	
E02	E232	PC-EPC Sol. S/C	DXA0KB	TVC Solenoid Valve	Short Circuit	

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STANDARD TIGHTENING TORQUE

STANDARD TIGHTENING TORQUE TABLE (WHEN USING TORQUE WRENCH)

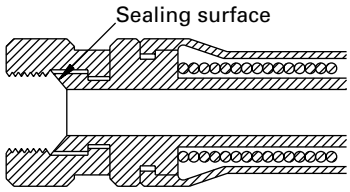
★ In the case of metric nuts and bolts for which there is no special instruction, tighten to the torque given in the table below.

Thread diameter of bolt	Width across flats	Tightening torque	
		 CDL00372	
mm	mm	Nm	kgm
6	10	11.8 – 14.7	1.2 – 1.5
8	13	27 – 34	2.8 – 3.5
10	17	59 – 74	6 – 7.5
12	19	98 – 123	10 – 12.5
14	22	153 – 190	15.5 – 19.5
16	24	235 – 285	23.5 – 29.5
18	27	320 – 400	33 – 41
20	30	455 – 565	46.5 – 58
22	32	610 – 765	62.5 – 78
24	36	785 – 980	80 – 100
27	41	1150 – 1440	118 – 147
30	46	1520 – 1910	155 – 195
33	50	1960 – 2450	200 – 250
36	55	2450 – 3040	250 – 310
39	60	2890 – 3630	295 – 370

Thread diameter of bolt	Width across flats	Tightening torque  CDL00373	
mm	mm	Nm	kgm
6	10	5.9 – 9.8	0.6 – 1.0
8	13	13.7 – 23.5	1.4 – 2.4
10	14	34.3 – 46.1	3.5 – 4.7
12	27	74.5 – 90.2	7.6 – 9.2

TABLE OF TIGHTENING TORQUES FOR FLARED NUTS

★ In the case of flared nuts for which there is no special instruction, tighten to the torque given in the table below.



SAD00483

Thread diameter	Width across flat	Tightening torque	
mm	mm	Nm	kgm
14	19	24.5 ± 4.9	2.5 ± 0.5
18	24	49 ± 19.6	5 ± 2
22	27	78.5 ± 19.6	8 ± 2
24	32	137.3 ± 29.4	14 ± 3
30	36	176.5 ± 29.4	18 ± 3
33	41	196.1 ± 49	20 ± 5
36	46	245.2 ± 49	25 ± 5
42	55	294.2 ± 49	30 ± 5

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Mark	Indication	Action required
○	Page to be newly added	Add
●	Page to be replaced	Replace
( )	Page to be deleted	Discard

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SAFETY
SAFETY NOTICE

IMPORTANT SAFETY NOTICE

Proper service and repair is extremely important for safe machine operation. The service and repair techniques recommended by Komatsu and described in this manual are both effective and safe. Some of these techniques require the use of tools specially designed by Komatsu for the specific purpose.

To prevent injury to workers, the symbol ⚠ is used to mark safety precautions in this manual. The cautions accompanying these symbols should always be followed carefully. If any dangerous situation arises or may possibly arise, first consider safety, and take the necessary actions to deal with the situation.

GENERAL PRECAUTIONS

Mistakes in operation are extremely dangerous. Read the Operation and Maintenance Manual carefully BEFORE operating the machine.

1. Before carrying out any greasing or repairs, read all the precautions given on the decals which are fixed to the machine.
2. When carrying out any operation, always wear safety shoes and helmet. Do not wear loose work clothes, or clothes with buttons missing.
   - Always wear safety glasses when hitting parts with a hammer.
   - Always wear safety glasses when grinding parts with a grinder, etc.
3. If welding repairs are needed, always have a trained, experienced welder carry out the work. When carrying out welding work, always wear welding gloves, apron, hand shield, cap and other clothes suited for welding work.
4. When carrying out any operation with two or more workers, always agree on the operating procedure before starting. Always inform your fellow workers before starting any step of the operation. Before starting work, hang UNDER REPAIR signs on the controls in the operator's compartment.
5. Keep all tools in good condition and learn the correct way to use them.
6. Decide a place in the repair workshop to keep tools and removed parts. Always keep the tools and parts in their correct places. Always keep the work area clean and make sure that there is no dirt or oil on the floor. Smoke only in the areas provided for smoking. Never smoke while working.

PREPARATIONS FOR WORK

7. Before adding oil or making any repairs, park the machine on hard, level ground, and block the wheels or tracks to prevent the machine from moving.
8. Before starting work, lower blade, ripper, bucket or any other work equipment to the ground. If this is not possible, insert the safety pin or use blocks to prevent the work equipment from falling. In addition, be sure to lock all the control levers and hang warning signs on them.
9. When disassembling or assembling, support the machine with blocks, jacks or stands before starting work.
10. Remove all mud and oil from the steps or other places used to get on and off the machine. Always use the handrails, ladders or steps when getting on or off the machine. Never jump on or off the machine. If it is impossible to use the handrails, ladders or steps, use a stand to provide safe footing.

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Standard shoe

Item \ Model	PC400-7	PC400LC-7	PC450-7	PC450LC-7
Shoe width	600 mm	700 mm	600 mm	600 mm
Link pitch	228 mm	228 mm	228 mm	228 mm
No. on track (one side)	46 (Pieces)	46 (Pieces)	49 (Pieces)	49 (Pieces)

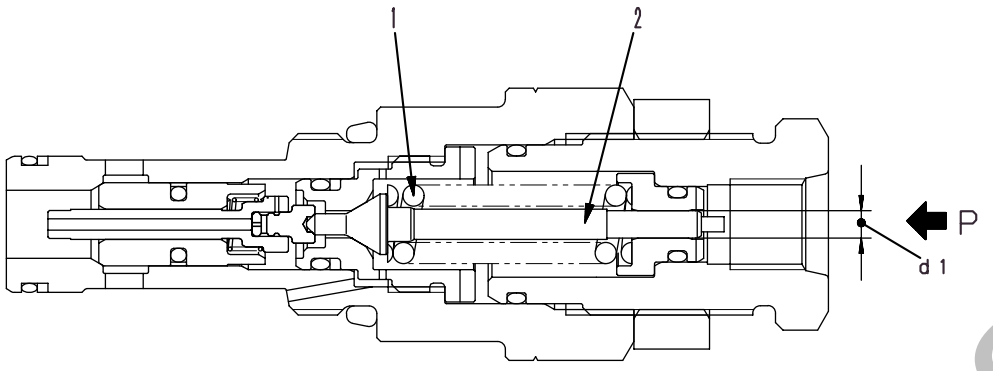
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Unit: mm

No.	Check item	Criteria				Remedy
10	Vertical width of idler guide		Standard size	Tolerance	Repair limit	Rebuild or replace
		Track frame	123	+2 −1	127	
		Idler support	120	±0.5	118	
11	Horizontal width of idler guide	Track frame	266	+3 −1	271	
		Idler support	261	—	259	
12	Recoil spring	Standard size			Repair limit	Replace
		Free length × OD	Installation length	Installation load	Free length	Installation load
		795 × 241	648	173.3 kN {17,680 kg}	—	138.56 kN {14,140 kg}

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MAIN RELIEF VALVE



SJP09020

1. Spring
2. Poppet

Function

- The relief valve set pressure is set to 2 stages. When power is needed, pilot pressure P is turned ON and the pressure is set to high pressure.

Operation

- The relief valve set pressure is determined by the installed load of spring (1). (First stage)
- It is unnecessary to set the first and second stage individually. The second stage is set when the first stage is set.

1. When pilot pressure P is OFF: Low-pressure setting
   The set pressure is determined by the installed load of spring (1).
2. When pilot pressure P is ON: High-pressure setting
   In addition to the installed load of spring (1), pilot pressure P is applied to poppet diameter (d1) so the set pressure becomes higher.

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BOOM HYDRAULIC DRIFT PREVENTION VALVE

Function

- When the boom lever is not being operated, these valves act to prevent the oil at the boom bottom from leaking from spool (1) and prevent the boom from moving down.

Operation

1. **Boom RAISE**
   When the boom RAISE is operated, the main pressure oil acts in the left direction on ring-shaped area **A** (= Area of ød1 – Area of ød2) because of the difference in the outside diameter **d1** of poppet (5) and seat diameter **d2**. When it overcomes the force of spring (4), poppet (5) moves to the left.
   In addition, the main pressure oil acts in the right direction on seat diameter **d3** of valve (6). When it overcomes the force of spring (4), valve (6) moves to the right.
   As a result, the main pressure oil prom the control valve passes through the opening of poppet (5) and flows to the bottom end of the boom cylinder.

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1) Auto-warm-up function

- After the engine is started, if the engine coolant temperature is low, the engine speed is automatically raised to warm the engine.

Operating condition (All)	→	Operated
Coolant temperature: Below 30°C. Engine speed: Max. 1,200 rpm		Engine speed: Max. 1,200 rpm

↓

Resetting condition (Any one)		→	Reset
Auto	Coolant temperature: Above 30°C		Engine speed: Any level
	Auto-warm-up operation time: Min. 10 minutes		
Manual	Fuel control dial: Kept at 70% of full level for 3 sec. or longer		

2) Overheat prevention function

- If the engine coolant temperature rises too high during work, the pump load and engine speed are reduced to prevent overheating.
- This function is turned on when the coolant temperature rises above 95°C.

Operating condition	→	Operation/Remedy	→	Resetting condition
Coolant temperature: Above 105°C		Work mode: Any mode Engine speed: Low idle Monitor alarm lamp: Lights up Alarm buzzer: Sounds		Coolant temperature: Below 105°C Fuel control dial: Return to low idle position once. • Under above condition, controller is set to condition before operation of function. (Manual reset)

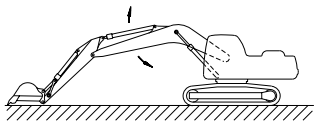
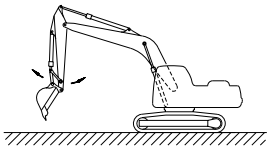
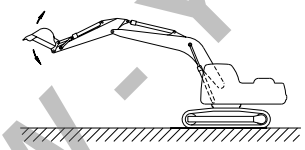
Operating condition	→	Operation/Remedy	→	Resetting condition
Coolant temperature: Above 102°C		Work mode: Mode A, E, OR B Engine speed: Keep as is. Monitor alarm lamp: Lights up. Lower pump discharge.		Coolant temperature: Below 102°C • Under above condition, controller is set to condition before operation of function. (Automatic reset)

Operating condition	→	Operation/Remedy	→	Resetting condition
Coolant temperature: Above 100°C		Work mode: Mode A Engine speed: Keep as is. Lower pump discharge.		Coolant temperature: Below 100°C • Under above condition, controller is set to condition before operation of function. (Automatic reset)

Operating condition	→	Operation/Remedy	→	Resetting condition
Coolant temperature: Above 95°C		Work mode: Travel Engine speed: Keep as is. Lower travel speed.		Coolant temperature: Below 95°C • Under above condition, controller is set to condition before operation of function. (Automatic reset)

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Applicable model						PC400, 400LC-7 PC450, 450LC-7	
Cate-gory	Item		Measurement conditions		Unit	Standard value for new machine	Service limit value
Work equipment	Work equipment speed	Boom	 9JF00665 • Hydraulic oil temperature: Within operation range • Engine at high idling • Working mode: A mode • Time required from raise stroke end till bucket touches ground	RAISE	sec.	PC400: 4.0 ± 0.4 PC450: 4.2 ± 0.4	PC400: Max. 4.8 PC450: Max. 5.0
				LOWER		PC400: 2.9 ± 0.3 PC450: 2.8 ± 0.3	PC400: Max. 3.4 PC450: Max. 3.3
		Arm	 9JF00666 • Hydraulic oil temperature: Within operation range • Engine at high idling • Working mode: A mode • Time required from dumping stroke end to digging stroke end	CURL		PC400: 4.3 ± 0.4 PC450: 4.7 ± 0.5	PC400: Max. 5.0 PC450: Max. 5.4
				DUMP		3.6 ± 0.4	Max. 4.3
		Bucket	 9JF00667 • Hydraulic oil temperature: Within operation range • Engine at high idling • Working mode: A mode • Time required from dumping stroke end to digging stroke end	CURL		3.6 ± 0.4	Max. 4.3
				DUMP		2.9 ± 0.3	Max. 3.5

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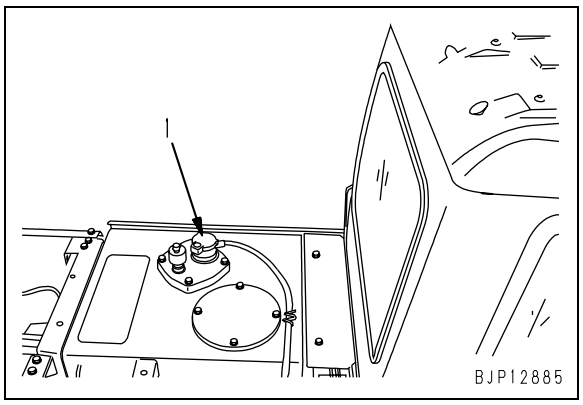
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RELEASING RESIDUAL PRESSURE IN HYDRAULIC CIRCUIT

1. Releasing residual pressure in hydraulic tank

⚠ Since the hydraulic tank is enclosed and pressurized, release the residual pressure in it when removing a hose or a plug connected to it.

1) Lower the work equipment to the ground in a stable position and stop the engine.
2) Loosen oil filler cap (1) of the hydraulic tank gradually to release the air in the tank.



2. Releasing residual pressure in hydraulic cylinder circuit

⚠ When disconnecting a pipe between a hydraulic cylinder and the control valve, release the residual pressure in the piping according to the following procedure.

1) Release the residual pressure in the hydraulic tank. For details, see RELEASING RESIDUAL PRESSURE IN HYDRAULIC TANK.
   ★ Keep the oil filler cap of the hydraulic tank removed.
2) Turn the starting switch ON and set the safety lock lever in the FREE position, then operate the work equipment control levers on both sides forward, backward, to the right, and to the left.
   ★ The control valve is operated by the pressure in the accumulator. However, the accumulator pressure is released after the control valve is operated 2 – 3 times.
3) Run the engine at low idling for 5 seconds to heighten the pressure in the accumulator.
   ★ When starting engine, set the safety lock lever in the LOCK position.
4) Repeat steps 2) and 3) above 2 – 3 times, and the residual pressure in the piping is released.

3. Releasing residual pressure in swing motor circuit

★ The residual pressure in the swing motor circuit can be released by performing the operation for RELEASING RESIDUAL PRESSURE IN HYDRAULIC CYLINDER CIRCUIT. (Operate the control lever in the swing direction only.)

4. Releasing residual pressure in travel motor circuit

★ Since the control valve spool of the travel motor circuit is open, the pressure in this circuit can be released by performing RELEASING RESIDUAL PRESSURE IN HYDRAULIC TANK.

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7. Function of setting installation of attachment [16]

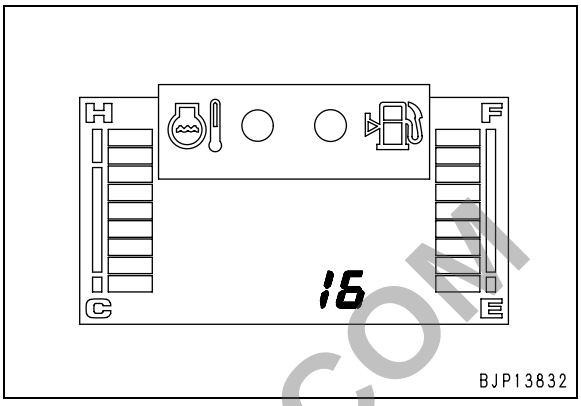
With this function, you can set installation of attachment.

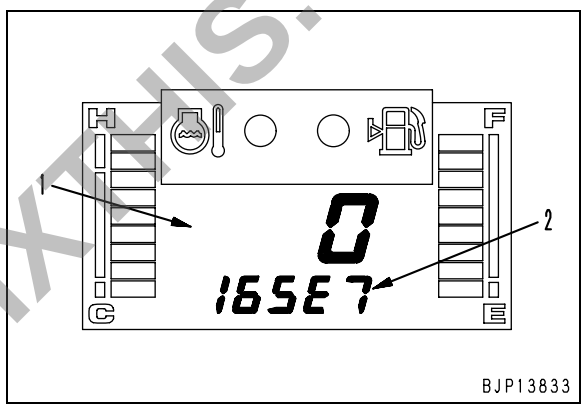
★ When an attachment is installed, if INSTALLED is not set with this function, the B-mode function (automatic single/double operation selecting function) cannot be used.

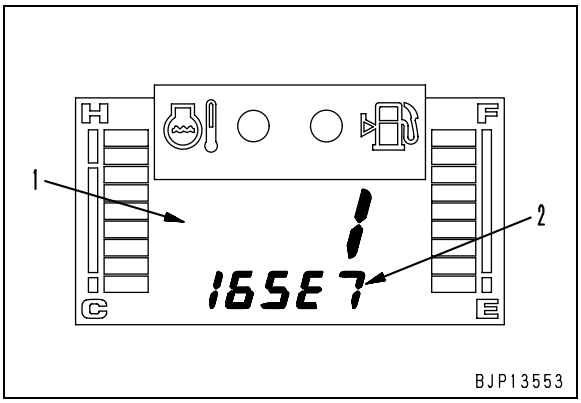
1) Selecting and executing function
   i) Select menu No. [16] in the menu selection mode.
   ii) Press set switch (5) to execute this function.
   ★ While this function is executed, [16SET] is displayed in the service meter section (2) and [0] or [1] is displayed in display section (1).

2) Selecting installation of attachment
   i) The current setting is displayed in service meter section (1). Check the actual installation of attachment and setting.
      • [0]: Attachment is not installed.
      • [1]: Attachment is installed.
   ii) While holding caution buzzer stop switch (3), operate working mode selector switches (7) and (8) to select [0] or [1].
      • UP switch (7): [1] is selected.
      • DOWN switch (8): [0] is selected.

3) Settling installation of attachment
   Press set switch (5) to settle the selected setting of installation of attachment.

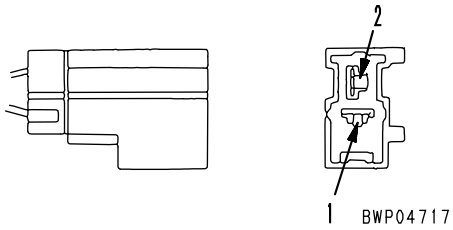
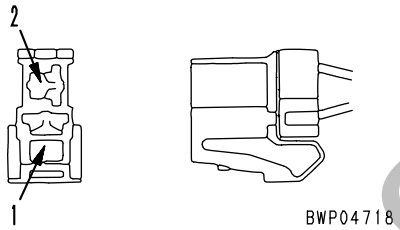
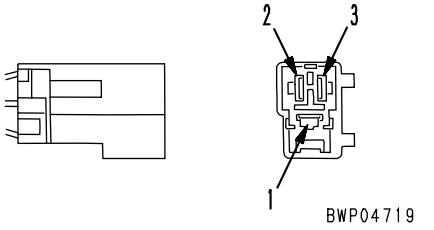
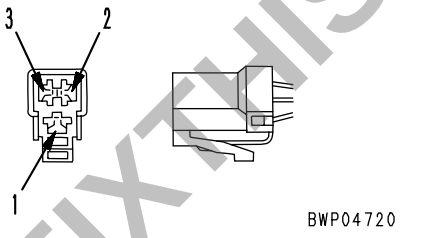
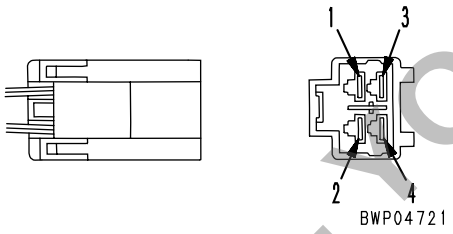
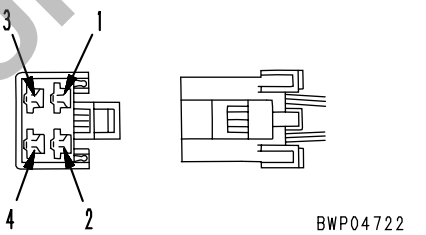
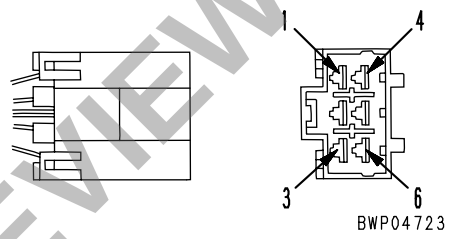
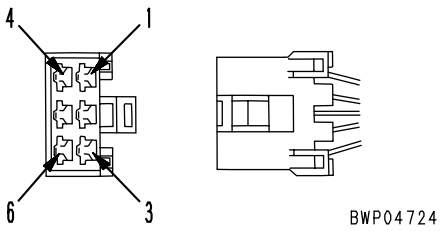
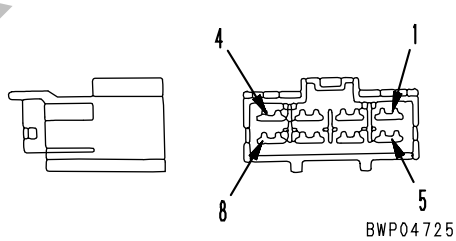
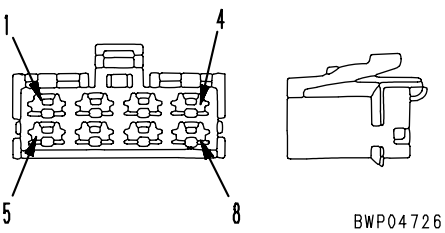






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No.of pins	M type connector		
	Male (female housing)	Female (male housing)	T-adapter Part No.
1	Part No.: 08056-00171	Part No.: 08056-00181	799-601-7080
2			799-601-7090
	Part No.: 08056-00271	Part No.: 08056-00281	
3			799-601-7110
	Part No.: 08056-00371	Part No.: 08056-00381	
4			799-601-7120
	Part No.: 08056-00471	Part No.: 08056-00481	
6			799-601-7130
	Part No.: 08056-00671	Part No.: 08056-00681	
8			799-601-7340
	Part No.: 08056-00871	Part No.: 08056-00881	

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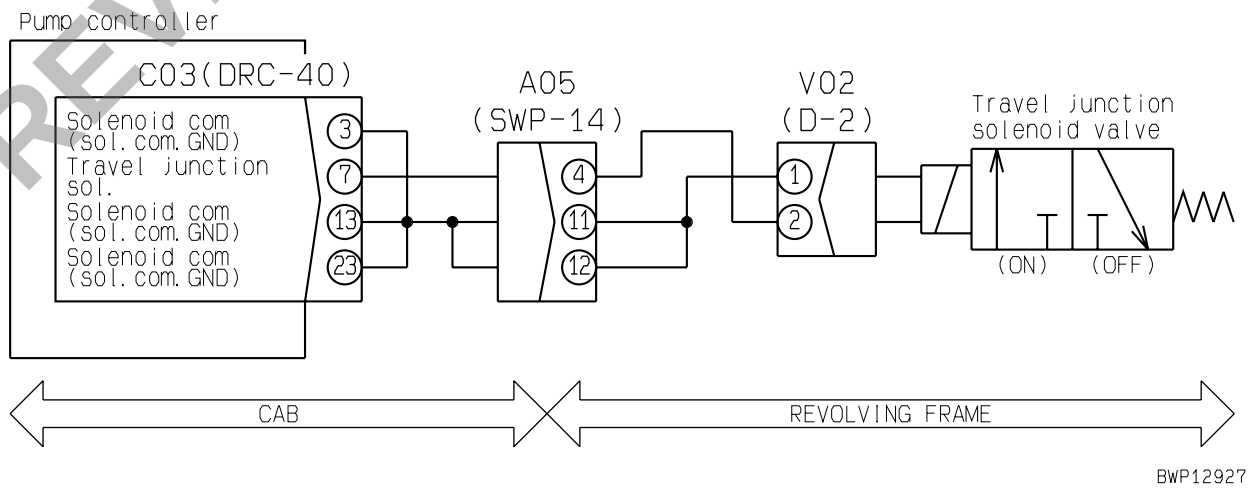
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Error Code in Electrical System [E211] (Disconnection in travel interlocking solenoid)

User Code	Error Code	Failure Code	Failure phenomenon	Disconnection in travel interlocking solenoid (Pump controller system)
—	**E211**	**DW91KA**		
Failure content	• No current flows to the travel interlocking solenoid circuit, when power is supplied to the circuit.			
Response from controller	• None in particular (The solenoid does not function as there is current flowing to it) • When the failure cause disappears of itself, the machine operation returns to normalcy.			
Phenomenon occurring on machine	• It is difficult to steer the machine while traveling. (L.H. and R.H. travel circuits cannot be disconnected.)			
Relative information	• Operation of the travel interlocking solenoid (ON or OFF) can be checked in the monitoring function. (Code No.: 02300 Solenoid 1) • The controller detects disconnection, when solenoid power is ON. Hence be sure to check it with power ON after the repairs. (For how to turn power ON or OFF, refer to the troubleshooting under Error Code [E201].)			

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Travel interlocking solenoid defective (Internal disconnection)	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			V02 (male)	Resistance value		
			Between (1) and (2)	20 – 60 Ω		
	2	Disconnection of wiring harness (Disconnection or defective contact with connector)	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Wiring harness from C03 (female) (7) to V02 (female) (2)	Resistance value	Below 1 Ω	
			Wiring harness between C03 (female) (3), (13), (23) and V02 (female) (1)	Resistance value	Below 1 Ω	
	3	Short-circuiting of wiring harness (Contact with 24 V circuit)	★ Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.			
			Wiring harness from C03 (female) (7) to V02 (female) (2) and grounding	Voltage	Below 1 V	
	4	Pump controller defective	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			C03 (female)	Resistance value		
			Between (7) and (3), (13), (23)	20 – 60 Ω		

Electrical Circuit Diagram for Travel Interlocking Solenoid



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Error Code in Electrical System [E93D] (Engine fuel temp. sensor error)

User Code	Error Code	Failure Code	Failure phenomenon	Engine fuel temp. sensor error (Engine controller system)
E15	**E93D**	**DGE4KX**		
Failure content	• The signal voltage from the fuel temperature sensor is above 4.5 V.			
Response from controller	• None in particular. • When the failure cause disappears of itself, the machine operation returns to normalcy.			
Phenomenon occurring on machine	• The engine does not start easily when temperature is low. • The overheat protection function does not operate. • If the controller is also defective, the engine does not stop.			
Relative information	• Input from the fuel temperature sensor (voltage) can be checked in the monitoring function. (Code No. 14201: Fuel temperature sensor voltage)			

	Cause		Standard value in normalcy and references for troubleshooting			
Presumed cause and standard value in normalcy	1	Fuel temperature sensor defective (Internal disconnection or short-circuiting)	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			THL (male)	Resistance value		
			Between (1) and (2)	0.3 k – 9 kΩ		
			Between (1), (2) and grounding	Above 1 MΩ		
	2	Disconnection of wiring harness (Disconnection or defective contact with connector)	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Wiring harness between E12 (female) (17) and THL (female) (1)	Resistance value	Below 1 Ω	
			Wiring harness between E12 (female) (29), (39) and THL (female) (2)	Resistance value	Below 1 Ω	
	3	Grounding fault of wiring harness (Contact with grounding circuit)	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Between wiring harness between E12 (female) (17) and THL (female) (A) and grounding	Resistance value	Above 1 MΩ	
	4	Engine controller defective	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			CB2	Resistance value		
			Between (17), (29) and (39)	0.3 k – 9 kΩ		
			Between (17) and (29), (39) and grounding	Above 1 MΩ		

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TROUBLESHOOTING OF ELECTRICAL SYSTEM (E MODE)

INFORMATION CONTAINED IN TROUBLESHOOTING TABLE 20-503
E-1 The engine does not start (The engine does not rotate) 20-504
E-2 Preheater does not operate 20-508
E-3 Auto engine warm-up device does not work 20-510
E-4 Auto-decelerator does not operate 20-511
E-5 All work equipment, swing and travel do not move 20-512
E-6 One-touch power max. function does not operate 20-514
E-7 Machine push-up function does not operate normally 20-515
E-8 Attachment circuit does not change 20-517
E-9 No display in monitor panel at all 20-519
E-10 Part of display on monitor panel is missing 20-520
E-11 Monitor panel displays contents irrelevant to the model 20-520
E-12 Fuel level monitor red lamp lights up while engine is running 20-521
E-13 Engine water temperature gauge does not display correctly 20-522
E-14 Hydraulic oil temperature gauge does not display correctly 20-524
E-15 Fuel gauge does not display correctly 20-525
E-16 Swing lock monitor does not display correctly 20-526
E-17 When monitor switch is operated, nothing is displayed 20-528
E-18 Windshield wiper and window washer do not work 20-530
E-19 Alarm buzzer cannot be cancelled 20-534
E-20 “Boom RAISE” is not correctly displayed in monitor function 20-535
E-21 “Boom LOWER” is not correctly displayed in monitor function 20-536
E-22 “Arm IN” is not displayed normally in monitoring function 20-537
E-23 “Arm DUMPING” is not correctly displayed in monitor function 20-538
E-24 “Bucket CURL” is not displayed normally in monitoring function 20-539
E-25 “Bucket DUMPING” is not correctly displayed in monitor function 20-540
E-26 “Swing” is not displayed normally in monitoring function 20-542
E-27 “TRAVEL” is not correctly displayed in monitor function 20-544
E-28 “Travel Differential Pressure” is not correctly displayed in monitor function 20-546
E-29 “Service” is not correctly displayed in monitor function 20-548
E-30 Travel alarm does not sound or does not stop sounding 20-550
E-32 TROUBLESHOOTING FOR AIR CONDITIONER SYSTEM 20-552

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E-32 TROUBLESHOOTING FOR AIR CONDITIONER SYSTEM

Troubleshooting procedure for air conditioner system

★ The control panel of the air conditioner constantly monitors the sensors and other devices in the system . When it detects any abnormality, “Self-diagnosis notice” is displayed by operating switches specially.

★ If you feel any abnormality in the air conditioner system, check the “Self-diagnosis notice” first according to the procedure for “Troubleshooting by self-diagnosis notice”, and then;

- If the “Self-diagnosis notice” is displayed, continue the “Troubleshooting by self-diagnosis notice”.
- If the “Self-diagnosis notice” is not displayed, carry out the “Troubleshooting by failure phenomenon”.

Troubleshooting by self-diagnosis notice

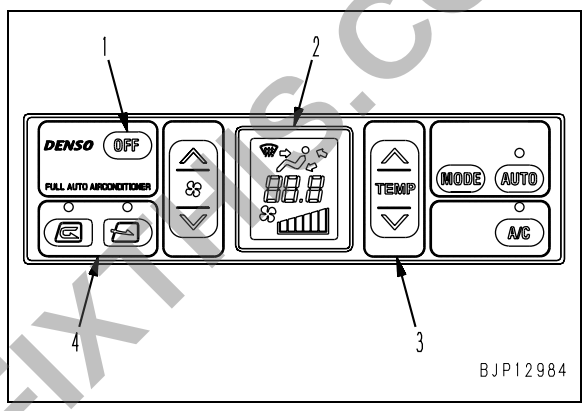
★ Check the “Self-diagnosis notice” on the control panel according to the following procedure.

- How to display “Self-diagnosis notice”
  1) Turn the starting switch ON.
  2) Press OFF switch (1) and check that anything is not displayed on display monitor (2).
  3) Hold the UP switch (∧) and DOWN switch (∨) of temperature setting switch (3) simultaneously for 3 seconds or more.
  4) Check the “Self-diagnosis notice” displayed on display monitor (2).

- How to select “Self-diagnosis notice”
  If multiple “Self-diagnosis notices” are recorded, press the UP switch (∧) or DOWN switch (∨) of temperature setting switch (3) to select another notice.

- How to delete “Self-diagnosis notice”
  When reproducing the “Self-diagnosis notices” or after removing the cause of a failure, press the switches on both sides of recirc/fresh air selector switch (4) simultaneously for 3 seconds or more, and all the “Self-diagnosis notices” are deleted.

- Finishing display of “Self-diagnosis notice”
  To finish display of the “Self-diagnosis notice”, press OFF switch (1) or turn the starting switch OFF.



Self-diagnosis notice	Failure mode
E--	No failures
E11	Disconnection in recirculated air sensor
E12	Short-circuit in recirculated air sensor
E15	Disconnection in water temperature sensor
E16	Short-circuit in water temperature sensor
E18	Short-circuit in daylight sensor
E43	Abnormality in air outlet damper
E44	Abnormality in air mix damper
E45	Abnormality in recirculated and fresh air damper

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S-5 Engine does not rotate smoothly (hunting)

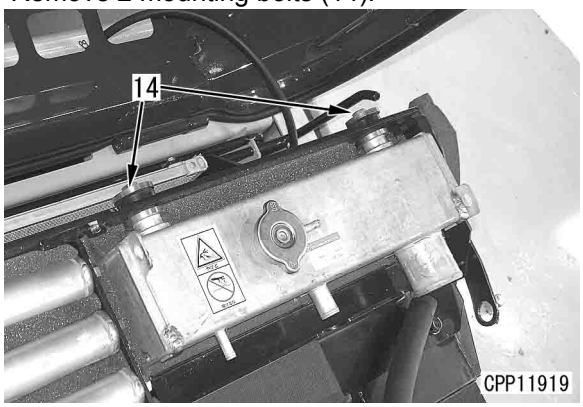
General causes why engine does not rotate smoothly
- Air in fuel system
- Speed sensor is not normal
  (abnormality not big enough to generate error display)

			Causes									
			Low idling speed is too low	Insufficient fuel in tank	Clogged air breather hole in fuel tank	Leakage, clogging, air in fuel piping	Clogged fuel feed pump strainer	Clogged fuel filter, strainer	Defective actuation of fuel flow damper (excessive leak from injector)	Clogged fuel injector, defective spray (dirt caught)	Defective Ne revolution sensor, defective wiring harness	Defective G revolution sensor, defective wiring harness
Questions	Confirm recent repair history											
	Degree of use of machine	Operated for long period					△	△				
	Condition of hunting	Occurs at a certain speed range	○								○	○
		Occurs at low idling	◎			○	○	○	○	○	○	○
		Occurs even when speed is raised			○						○	○
		Occurs on slopes		◎							○	○
	Replacement of filters has not been carried out according to Operation Manual						◎	◎				
	Fuel tank is found to be empty			◎								
Check items	Air breather hole in fuel tank cap is clogged				◎							
	Rust and water are found when fuel tank is drained						○	○				
	There is leakage from fuel piping					◎						
	When fuel priming pump is operated, there is no response, or operation is too heavy					◎	○	○				
Troubleshooting	When air is bled from fuel line, air comes out					●						
	Check fuel feed pump strainer directly						●					
	Check fuel filter, strainer directly							●				
	Engine speed does not change when operation of certain cylinders is stopped in reduced cylinder mode								●	●		
	Carry out troubleshooting for code "E91B".										●	
	Carry out troubleshooting for code "E91C".											●
		Remedy	Correct	Add	Clean	Replace	Replace	Replace	Replace	Correct	Correct	Correct

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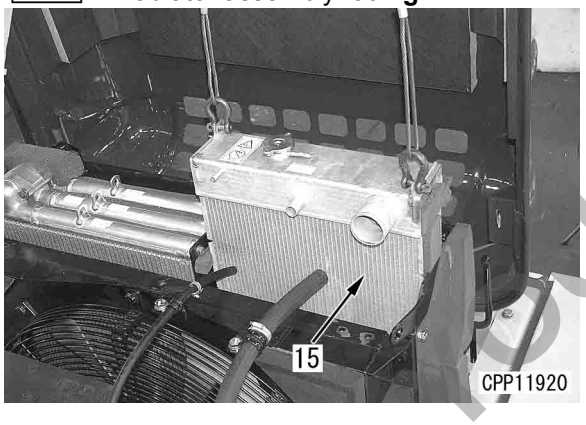
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9. Remove 2 mounting bolts (14).



10. Lift off radiator assembly (15).

Radiator assembly: **30 kg**



INSTALLATION

- Carry out installation in the reverse order to removal.

- **Refilling with coolant**
  Add coolant through the coolant filler to the specified level. Run the engine to circulate the coolant through the system. Then, check the coolant level again.

Coolant: **Approx. 35 ℓ**

[*1]

Radiator hose clamps
(7): **3.3 ± 0.49 Nm {0.3 ± 0.05 kgm}**
(8): **4.4 ± 0.49 Nm {0.49 ± 0.05 kgm}**
(9), (13): **8.8 ± 0.5 Nm {0.9 ± 0.05 kgm}**

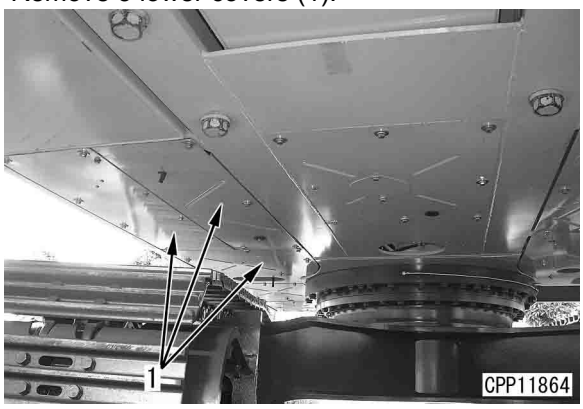
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REMOVAL AND INSTALLATION OF HYDRAULIC TANK ASSEMBLY

REMOVAL

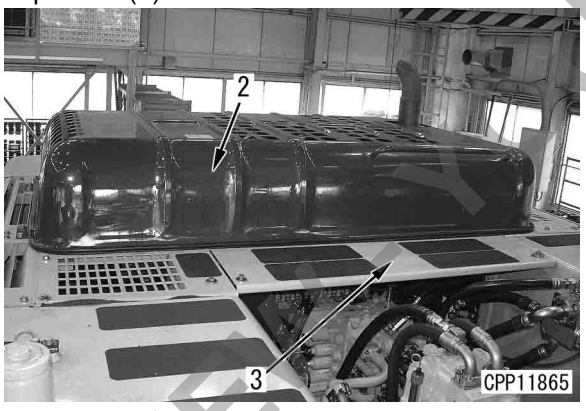
1. Remove 3 lower covers (1).



2. Drain the oil from the hydraulic tank.

Capacity of hydraulic tank: **Approx. 335 ℓ**

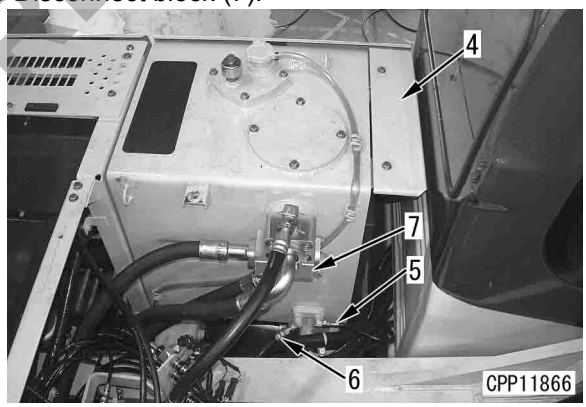
3. Open engine hood (2) and remove control valve top cover (3).



4. Remove cover (4).

5. Disconnect drain hoses (5) and (6).

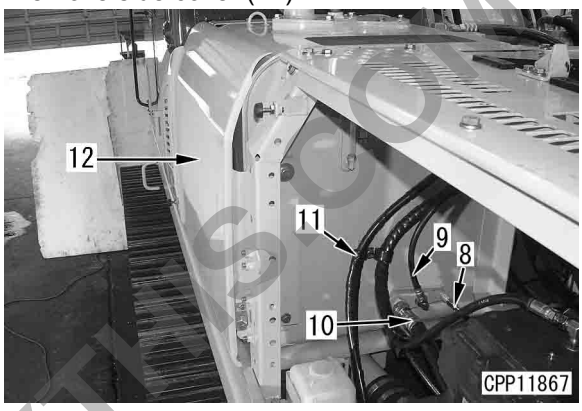
6. Disconnect block (7).



7. Disconnect drain hoses (8), (9), and (10).

8. Disconnect 2 clamps (11).

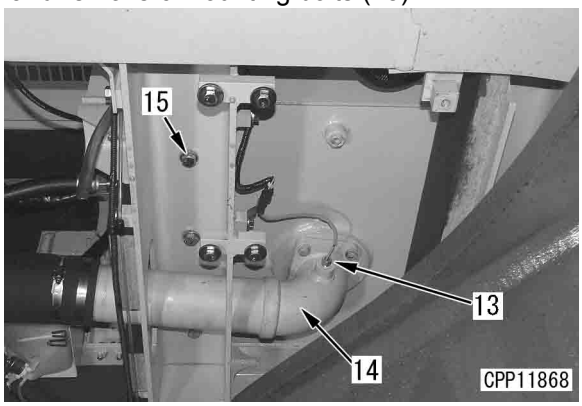
9. Remove side cover (12).



10. Remove sensor (13).

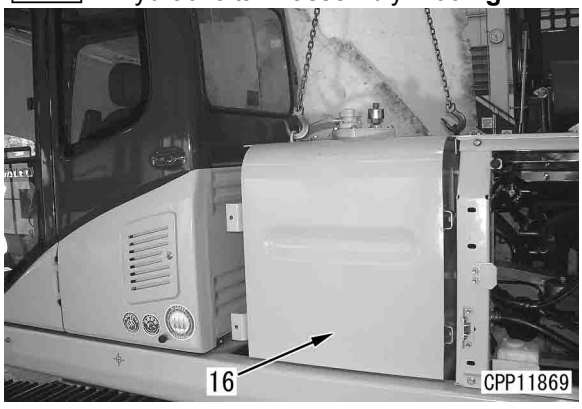
11. Disconnect suction tube (14).

12. Sling the hydraulic tank assembly temporarily and remove 6 mounting bolts (15).



13. Lift off hydraulic tank assembly (16).

Hydraulic tank assembly: **200 kg**



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