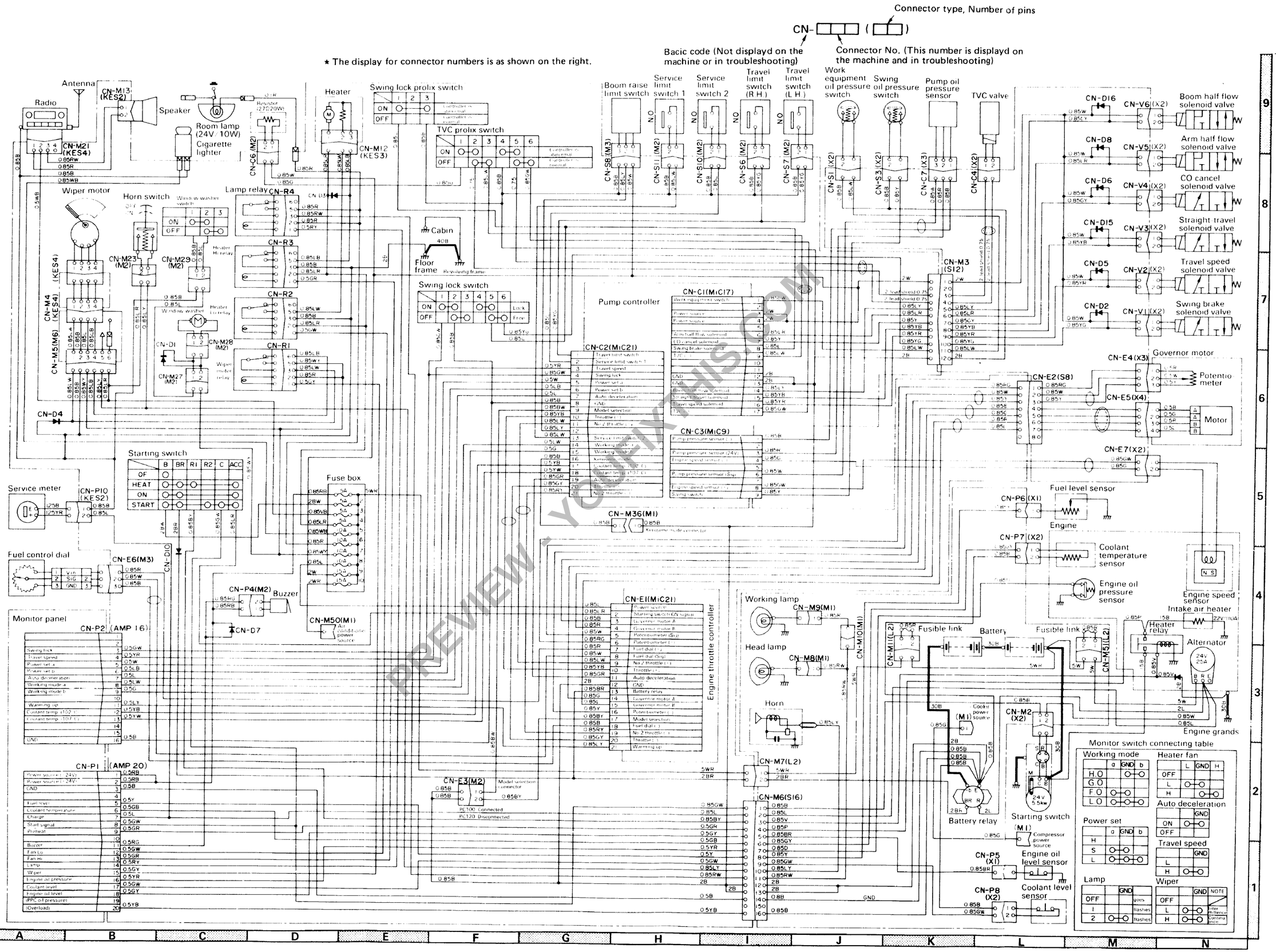


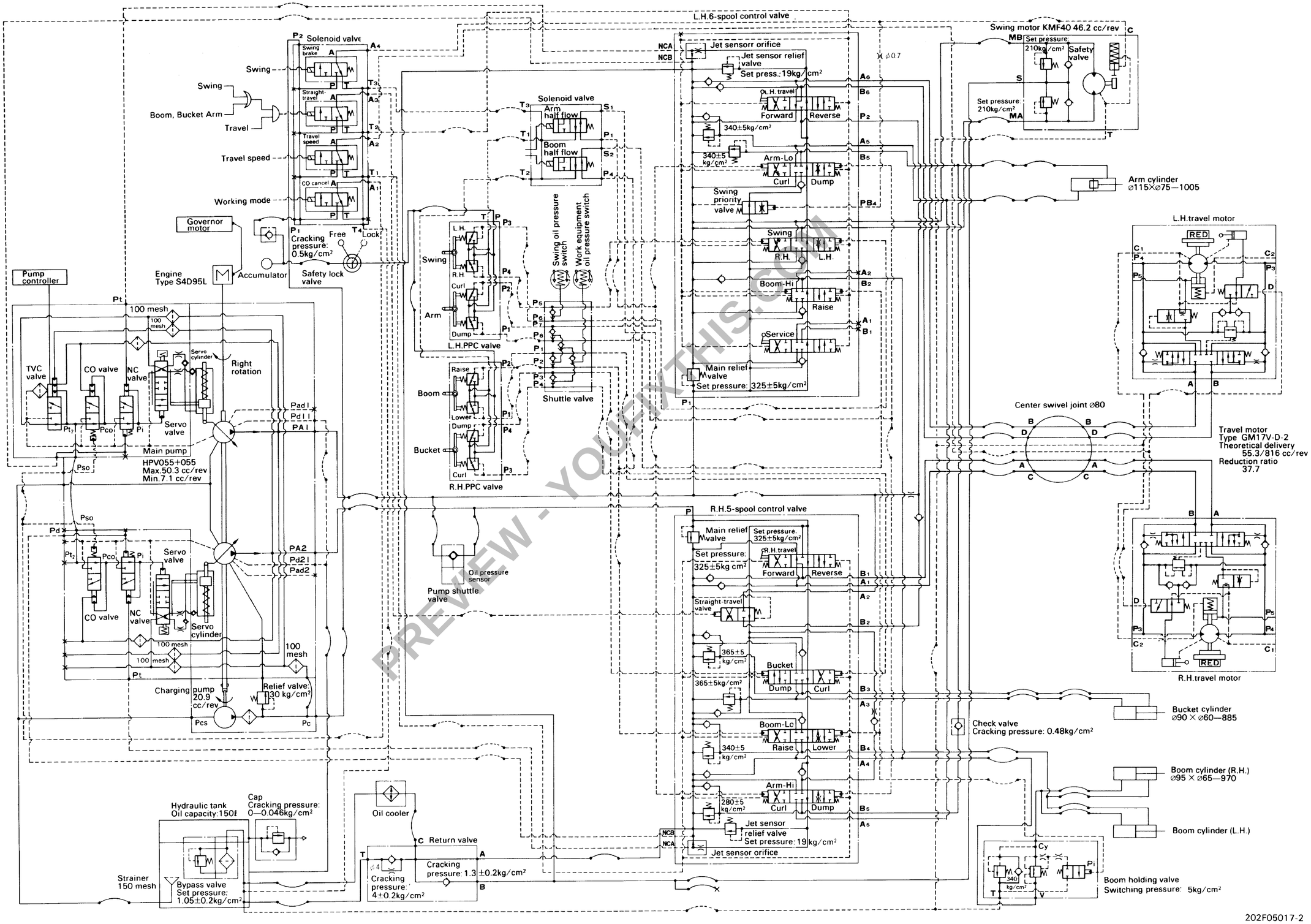
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HYDRAULIC CIRCUIT DIAGRAM

PC100-5 Serial No.: 28001—29992



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kgm

STANDARD TIGHTENING TORQUE

1. STANDARD TIGHTENING TORQUE OF BOLTS AND NUTS

The following charts give the standard tightening torques of bolts and nuts. Exceptions are given in sections of "**Disassembly and Assembly**".

Thread diameter of bolt (mm)	Width across flat (mm)	(T)	(H)
		kgm	Nm
6	10	1.35±0.15	13.2±1.4
8	13	3.2±0.3	31.4±2.9
10	17	6.7±0.7	65.7±6.8
12	19	11.5±1.0	112±9.8
14	22	18.0±2.0	177±19
16	24	28.5±3	279±29
18	27	39±4	383±39
20	30	56±6	549±58
22	32	76±8	745±78
24	36	94.5±10	927±98
27	41	135±15	1320±140
30	46	175±20	1720±190
33	50	225±25	2210±240
36	55	280±30	2750±290
39	60	335±35	3280±340

This torque table does not apply to the bolts with which nylon packings or other non-ferrous metal washers are to be used, or which require tightening to otherwise specified torque.

★ **Nm (newton meter): 1Nm ≒ 0.1 kgm**

2. TIGHTENING TORQUE OF SPLIT FLANGE BOLTS

Use these torques for split flange bolts.

Thread diameter of bolt (mm)	Width across flats (mm)	Tightening torque	
		kgm	Nm
10	14	6.7±0.7	65.7±6.8
12	17	11.5±1	112±9.8
16	22	28.5±3	279±29

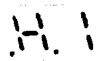
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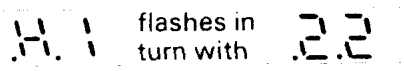
4) Self-diagnostic display function (abnormal display)

- If there is any abnormality in the controller output signal system and sensor system, the abnormal display and operation mode display are shown alternately.
  - ★ If two or more abnormalities occur at the same time, all of the abnormality displays and operation mode display are shown in turn.
- If 01 – 09, 25 are displayed, there is danger that the controller may be broken, so the controller automatically stops the output to the system where the abnormality has occurred.
- Once the starting switch is turned OFF, the abnormal display is reset, so check with the starting switch ON.
  - ★ If the starting switch is turned OFF, re-enact the abnormal display as follows.
    - ■ System
      Turn the starting switch ON.
    - System
      Turn starting switch ON (Engine stopped) and operate the control lever.
    - System
      Start the engine and operate the control lever
- If no signal comes from the engine speed sensor (engine stopped, defective clearance at sensor, etc.), the central decimal point does not flash.
  - Example of display

    a) H.0 and H mode when normal

    b) Same as a) but "throttle signal system abnormal"

Name of system with abnormality	Code	Display	Re-enact
Short circuit in straight-travel solenoid system	01	0.1	△
Short circuit in boom half flow solenoid system (PC100-5 Serial No. 28001–32401, PC120-5 Serial No. 30001–36600)	02	0.2	□
Short circuit in arm half flow solenoid system	03	0.3	□
Short circuit in swing brake solenoid system	04	0.4	△
Short circuit in travel speed solenoid system	05	0.5	□
Short circuit in CO cancel solenoid system	07	0.7	□
Short circuit in TVC solenoid system (1)	08	0.8	■
Short circuit in TVC solenoid system (2)	09	0.9	■
Disconnection in straight-travel solenoid system	11	1.1	■
Disconnection in boom half flow solenoid system (PC100-5 Serial No. 28001–32401, PC120-5 Serial No. 30001–36600)	12	1.2	■
Disconnection in arm half flow solenoid system	13	1.3	■
Disconnection in swing brake solenoid system	14	1.4	■
Disconnection in travel speed solenoid system	15	1.5	■
Disconnection in CO cancel solenoid system	17	1.7	■
Disconnection in TVC solenoid system	18	1.8	■
No. 2 throttle system	21	2.1	■
Throttle signal system	22	2.2	■
Pump pressure sensor system	23	2.3	■
Pump pressure sensor power source system	25	2.5	■
Engine speed sensor system	26	2.6	■
Auto-deceleration output system	28	2.8	△
Overheat signal system	29	2.9	■
Controller	Dot only	.	■
Power source system	All OFF		■

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REMOVAL OF STARTING MOTOR ASEMBLY

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

1. Disconnect wiring (1). (See F1)
2. Disconnect wiring connector (2). (See F1)
3. Disconnect control rod (3). (See F1)
   ★ Mark the clevis pin hole.
4. Disconnect wiring connector (4). (See F1)
5. Remove starting motor assembly (5). (See F1)

INSTALLATION OF STARTING MOTOR ASSEMBLY

- Carry out installation in the reverse order to removal.

REMOVAL OF ALTERNATOR ASEMBLY

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

1. Disconnect intake hose (1). (See F2)
2. Disconnect wiring (2). (See F2)
3. Loosen adjustment bolt (3). (See F2)
   ★ Loosen mounting bolt and nut (4).
4. Removal fan belt (5). (See F2) [※1]
5. Remove mounting bolt and nut (4). (See F2)
6. Remove alternator assembly (6). (See F2)

INSTALLATION OF ALTERNATOR ASSEMBLY

- Carry out installation in the reverse order to removal.

[※1]

- Adjust the fan belt tension.
  For details, see Table of Judgement Standard Value.

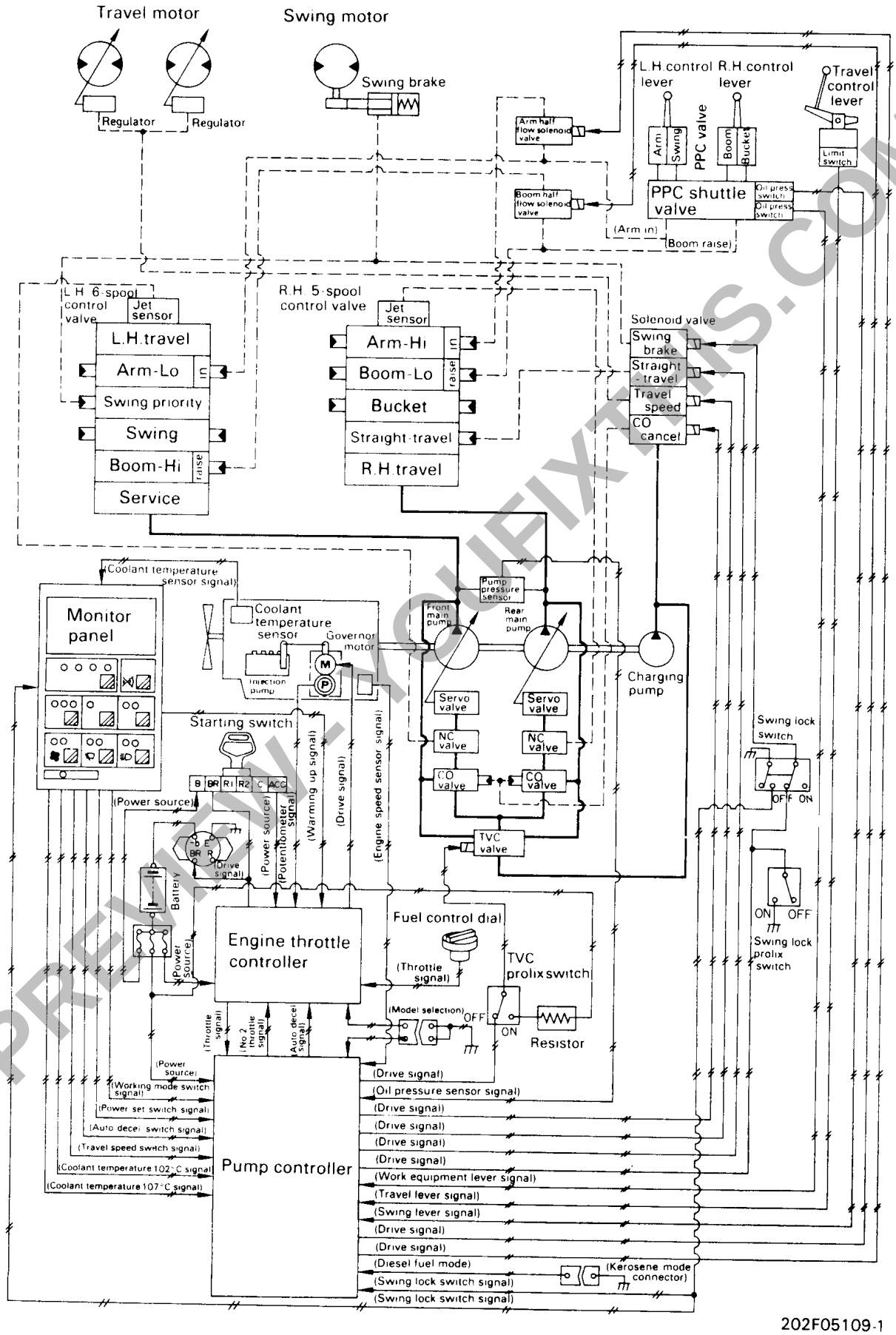
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TOTAL SYSTEM DIAGRAM

PC100-5 Serial No.: 28001 — 32401
PC120-5 Serial No.: 30001 — 36600



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METHOD OF USING JUDGEMENT TABLE

This judgement table is a tool to determine if the problem with the machine is caused by an abnormality in the electrical system or by an abnormality in the hydraulic or mechanical system. The symptoms are then used to decide which troubleshooting table (E-○○, C-○○, H-○○) matches the symptoms. The presence of any self-diagnostic display given in the judgement table indicates which troubleshooting table to use.

★ The abnormality display (warning) given by the monitor panel leads directly to troubleshooting of the vehicle monitor (P-○○).
(See the contents for troubleshooting of the vehicle monitor system.)

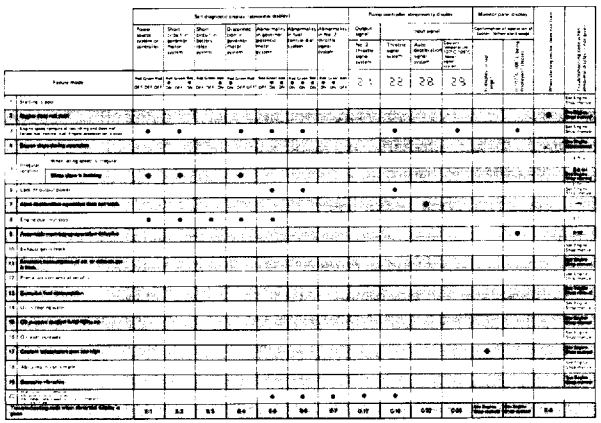
1. Judgement table for engine throttle controller, engine related parts

- If the self-diagnostic display gives an abnormal display, go to the troubleshooting code (E-○) given on the bottom line of the judgement table.
(There is a ● given in the column where the failure mode and self-diagnostic display, go to the troubleshooting code (E-○ or engine shop manual) given in the column on the right of the judgement table for that failure mode.

<Example> Failure mode "Engine does not start"

[Procedure]
Check the three LEDs on the side face of the controller to see if their ON/OFF combination gives an abnormal display for the self-diagnostic display.

ENGINE THROTTLE CONTROLLER OR IN ENGINE RELATED PARTS



[Judgement]
If there is an abnormal display (for example, ● ○ ●) on the self-diagnostic display:
Go to troubleshooting E-2 of the electrical system
If there is no abnormal display on the self-diagnostic display:

- Check that the starting motor rotates
  - Starting motor rotates: ..... Go to troubleshooting of mechanical system (see engine shop manual)
  - Starting motor does not rotate: ..... Go to troubleshooting E-8 of electrical system

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ELECTRIC

ELECTRIC WIRE CODE

In the wiring diagrams, various colors and symbols are employed to indicate the thickness of wires.
This wire code table will help you understand WIRING DIAGRAMS.
Example: 5WB indicates a cable having a nominal number 5 and white coating with black stripe.

CLASSIFICATION BY THICKNESS

Nominal number	Copper wire			Cable O.D. (mm)	Current rating (A)	Applicable circuit
	Number strands	Dia. of strands (mm)	Cross section (mm^2)			
0.85	11	0.32	0.88	2.4	12	Starting, lighting, signal etc.
2	26	0.32	2.09	3.1	20	Lighting, signal etc.
5	65	0.32	5.23	4.6	37	Charging and signal
15	84	0.45	13.36	7.0	59	Starting (Glow plug)
40	85	0.80	42.73	11.4	135	Starting
60	127	0.80	63.84	13.6	178	Starting
100	217	0.80	109.1	17.6	230	Starting

CLASSIFICATION BY COLOR AND CODE

Priority	Classification \ Circuits		Charging	Ground	Starting	Lighting	Instrument	Signal	Other
1	Primary	Code	W	B	B	R	Y	G	L
		Color	White	Black	Black	Red	Yellow	Green	Blue
2	Auxiliary	Code	WR	–	BW	RW	YR	GW	LW
		Color	White & Red	–	Black & White	Red & White	Yellow & Red	Green & White	Blue & White
3		Code	WB	–	BY	RB	YB	GR	LR
		Color	White & Black	–	Black & Yellow	Red & Black	Yellow & Black	Green & Red	Blue & Red
4		Code	WL	–	BR	RY	YG	GY	LY
		Color	White & Blue	–	Black & Red	Red & Yellow	Yellow & Green	Green & Yellow	Blue & Yellow
5		Code	WG	–	–	RG	YL	(GB)	(LB)
		Color	White & Green	–	–	Red & Green	Yellow & Blue	(Green & Black)	(Blue & Black)
6		Code	–	–	–	RL	YW	(GL)	–
		Color	–	–	–	Red & Blue	Yellow & White	(Green & Blue)	–

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LIST OF LUBRICANT AND WATER

RESERVOIR	KIND OF FLUID	AMBIENT TEMPERATURE -22 -4 14 32 50 68 86 104 122°F / -30 -20 -10 0 10 20 30 40 50°C	CAPACITY (ℓ) Specified	Refill
Engine oil pan	Engine oil	SAE30; SAE10W; SAE 10W-30; SAE 15W-40	12	11
Swing machinery case	Engine oil	SAE 30	4	4
Final drive case (each)	Engine oil	SAE 30	PC100:3 PC120:4[3]	PC100:3 PC120:4[3]
PTO gear case	Engine oil	SAE 30	0.75	0.75
Idler (each)	Engine oil	SAE 30	0.09	—
Track roller (each)	Engine oil	SAE 30	0.100–0.115	—
Carrier roller (each)	Engine oil	SAE 30	0.072	—
Hydraulic system	Engine oil	SAE10W; SAE 10W-30; SAE 15W-40	150	100
Fuel tank	Diesel fuel	ASTM D975 No. 2; ※	250	—
Cooling system	Water	Add antifreeze	14	—

★ [ ] : PC120-5 Serial NO.: 32651 and up
PC120-5 MIGHTY

※ ASTM D975 No.1

ASTM: American Society of Testing and Material
SAE: Society of Automotive Engineers
API: American Petroleum Institute

Specified capacity: Total amount of oil including oil for components and oil in piping.
Refill capacity: Amount of oil needed to refill system during normal inspection and maintenance.

NOTE:

(1) When fuel sulphur content is less than 0.5%, change oil in the oil pan every periodic maintenance hours described in this manual.
Change oil according to the following table if fuel sulphur content is above 0.5%.

Fuel sulphur content	Change interval of oil in engine oil pan
0.5 to 1.0%	1/2 of regular interval
Above 1.0%	1/4 of regular interval

(2) When starting the engine in an atmospheric temperature of lower than 0°C, be sure to use engine oil of SAE10W, SAE10W-30 and SAE 15W-40, even though an atmospheric temperature goes up to 10°C more or less in the day time.

(3) Use API classification CD as engine oil and if API classification CC, reduce the engine oil change interval to half.

(4) There is no problem if single grade oil is mixed with multigrade oil (SAE10W-30, 15W-40), but be sure to add single grade oil that matches the temperature in the table on the left.

(5) We recommend Komatsu genuine oil which has been specifically formulated and approved for use in engine and hydraulic work equipment applications.

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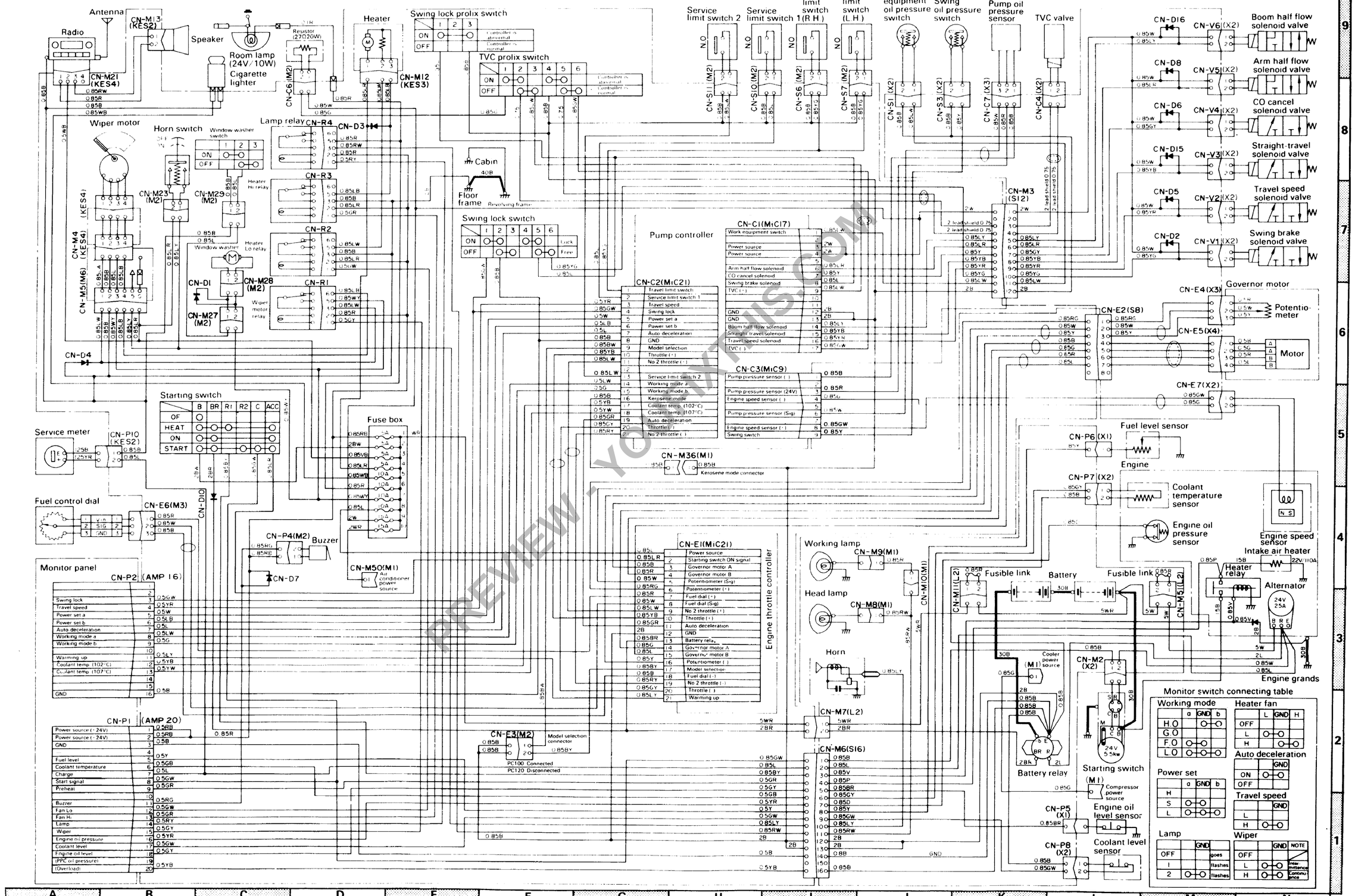
Connector type, Number of pins

CN- □□□ (□□)

Bacic code (Not displayd on the machine or in troubleshooting)

Connector No. (This number is displayd on the machine and in troubleshooting)

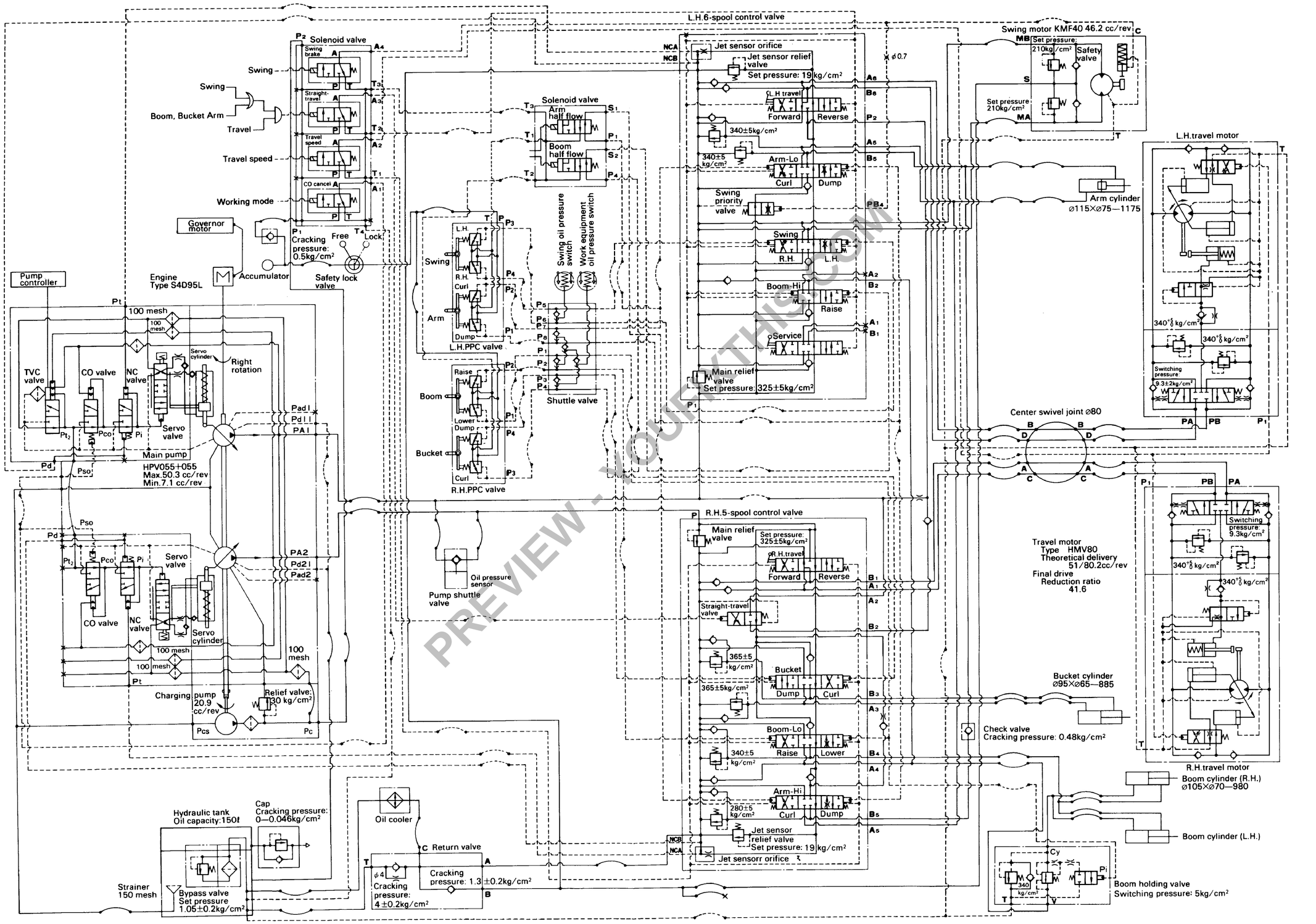
★ The display for connector numbers is as shown on the right.



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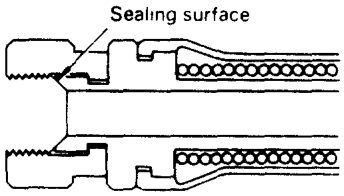
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3. TIGHTENING TORQUE FOR NUTS OF FLARED

Use these torques for nut part of flared.



FS0068

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

COATING MATERIALS

The recommended coating materials prescribed in Komatsu Shop Manuals are listed below.

Nomenclature	Komatsu code	Applications
Adhesives	LT-1A	Used to apply rubber pads, rubber gaskets, and cork plugs.
	LT-1B	Used to apply resin, rubber, metallic and non-metallic parts when a fast, strong seal is needed.
	LT-2*	Preventing bolts, nuts and plugs from loosening and leaking oil.
	LT-3	Provides an airtight, electrically insulating seal. Used for aluminum surfaces.
	LT-4	Used to coat plugs (plate shaped, bowl shaped) and holes, and mating portion of shaft.
Sealant gasket	LG-1	Used with gaskets and packings to increase sealing effect.
	LG-3	Heat-resistant gasket for precombustion chambers and exhaust piping.
	LG-4	Used by itself on mounting surfaces on the final drive and transmission cases. (Thickness after tightening: 0.07 – 0.08 mm)
	LG-5	Used by itself to seal grease fittings, tapered screw fittings and tapered screw fittings in hydraulic circuits of less than 50 mm in diameter.
	LG-6	Silicon base type used in combination with LG-1 and LG-4.
	LG-7	Has a shorter curing time than LG-6, and is easier to peel off.
Antifriction compound (Lubricant including molybdenum disulfide)	LM-P	Applied to bearings and taper shafts to facilitate press-fitting and to prevent sticking, burning or rusting.
Grease (Lithium grease)	G2-LI	Applied to bearings, sliding parts and oil seals for lubrication, rust prevention and facilitation of assembling work.
Vaseline	—	Used for protecting battery electrode terminals from corrosion.

*LT-2 is also called LOCTITE in the shop manuals.

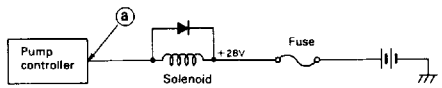
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Pump controller system

PC100-5 Serial No. 28001—32401
PC120-5 Serial No. 30001—36600

★ This table shows how the controller reacts and what symptoms the machine displays if any abnormality should occur in the sensors or actuators. (For those who have good understanding of mechatronics, troubleshooting can be carried out using this table.)

Display code	System with abnormality	Details of abnormality	Condition when normal (voltage, current, resistance values)	Action of controller when abnormality is detected	Symptoms shown by machine when there is abnormality
01	Straight-travel solenoid	Short circuit inside solenoid or between solenoid pins (1) and (2). (When resistance inside solenoid is extremely low) (Excessive current flows)	Resistance value of solenoid: 50 – 100Ω	It makes the current to the solenoid 0. However, the abnormality is temporary (momentary short circuit, etc.), so if the system returns to normal, the drive current is output again when all control levers are returned to neutral. ★ However, the display does not disappear (it disappears when the power is turned OFF). ★ The above automatic reset is repeated up to three times.	The straight-travel solenoid is not actuated, so the machine deviates during simultaneous operations.
02	Boom half flow solenoid		Resistance value of solenoid: 10 – 35Ω		In F.O mode, the acceleration (Hi) circuit is not cut, so the fine control is poor. (The digging speed is the same as in G.O mode.)
03	Arm half flow solenoid				Arm (IN) is the same as above.
04	Swing brake solenoid		Resistance value of solenoid: 50 – 100Ω		During swing operations, the motor brake is not released, so the machine does not swing.
05	Travel speed solenoid				Travel speed does not change (stays in Lo) when travel speed switch is operated.
07	CO cancel solenoid				Action of CO valve does not stop when using the H.O mode, so the pump discharge amount is minimum. Therefore, the speed is low in this pressure range.
08	TVC solenoid	TVC (+) line in contact with ground (Excessive current flows)	Resistance value of solenoid: 10 – 22Ω		Current does not flow to the TVC solenoid. Therefore, when the load is high, the engine speed drops excessively, and the engine may even stall. (All of H, S, and L modes)
09		Short circuit or contact with ground inside TVC solenoid (Excessive current flows)			
11	Straight-travel solenoid	1) Disconnection inside solenoid (When resistance inside solenoid is extremely high) 2) Disconnection in wiring harness between solenoid pin (2) and controller. 3) Contact with ground at pin (2) of solenoid	Resistance value of solenoid: 50 – 100Ω	1. In cases 1) and 2), current stops flowing to the solenoid, so no particular action is carried out. Therefore, if abnormal places are reset by the vibration of the machine, they again become normal. ★ However, the display does not disappear (disappears when power is turned OFF.) 2. In case 3), electric current continues to flow to the solenoid, but the controller does not carry out any action. Therefore, if the abnormal places are reset, they return to normal. ★ However, the display does not disappear (disappears when power is turned OFF.) ★ When the controller sends the command to turn the solenoid current OFF, the voltage at portion (a) should be 20 – 30V; if there is any disconnection or contact with the ground, the voltage at portion (a) is low (almost 0V), so it can be judged that there is an abnormality.  202F05350	1. In cases 1) and 2), it is the same as display 01. 2. In the case of 3), the solenoid stays actuated, so the work equipment or travel speed is slow during simultaneous operations.
12	Boom half flow solenoid		Resistance value of solenoid: 10 – 35Ω		1. In cases 1) and 2), it is the same as display 02. 2. In the case of 3), the acceleration (Hi) circuit remains cut, so the speed is low, except for F.O mode.
13	Arm half flow solenoid				Same as above.
14	Swing brake solenoid		Resistance value of solenoid: 50 – 100Ω		1. In cases 1) and 2), it is the same as display 04. 2. In the case of 3), the brake stays released, so the brake has no effect even when the lever is returned to neutral. (The upper structure will swing on slopes.)
15	Travel speed solenoid				1. In cases 1) and 2), it is the same as display 05. 2. In the case of 3), the solenoid continues to be actuated and stays at Hi.
17	CO cancel solenoid				1. In cases 1) and 2), it is the same as display 07.
18	TVC solenoid	1) Disconnection inside solenoid or disconnection in wiring harness between controller C1(9), (17) and TVC solenoid. 2) Contact of wiring harness between controller C1(17) and TVC solenoid C4(2) with ground.	Resistance value of solenoid: 10 – 22Ω Value of current <table><tr><th></th><th>PC100</th><th>PC120</th></tr><tr><td>H mode</td><td>0.10–0.25A</td><td>0.10–0.25A</td></tr><tr><td>S mode</td><td>0.61–0.86A</td><td>0.58–0.83A</td></tr><tr><td>L mode</td><td>0.79–1.03A</td><td>0.75–1.0A</td></tr></table> Engine at High idling, H.O mode (Auto-deceleration OFF, levers at neutral)	1. In the case of 1), it is the same as above Item 1. 2. In the case of 2), current continues to flow as it is (approx. 1A) to the solenoid. 3. Other items are the same as above Item 2.	1. In the case of 1), it is the same as display 08, 09. 2. In the case of 2), the same current (approx. 1A) continues to flow to the TVC solenoid, so the TVC valve output pressure drops and the total speed becomes slower. (There is no change even when the power set is switched between H, S, and L.)
21	No.2 throttle signal	Wiring harness between controller C2(11) and engine throttle controller E1(9) in contact with ground.	1. Voltage between C2(21) and (11): 0.8 – 4.2V	There is an abnormal display, but no particular action is taken. Therefore, if the places in contact with the ground are reset by the vibration of the machine, the condition returns to normal. ★ However, the display does not disappear (disappears when power is	Even when the fuel control dial is set to MAX and the auto-deceleration is canceled, the high idling speed of the engine does not change for H.O and H mode or G.O and S mode.

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REMOVAL OF ENGINE OIL COOLER ASSEMBLY

1. Drain cooling water.
2. Disconnect lubrication tube (1). (See F1)
3. Remove oil level gauge guide (2). (See F1)
4. Remove oil cooler assembly (3). (See F1)

INSTALLATION OF ENGINE OIL COOLER ASSEMBLY

- Carry out installation in the reverse order to removal.
- Refilling with water.
  ★ Refill water to the specified level and run the engine to circulate the water through the system. Then check the water level again.

REMOVAL OF FUEL INJECTION PUMP ASSEMBLY

1. Disconnect wiring connector (1). (See F2)
2. Disconnect fuel injection pipe (2). (See F2) [※1]
3. Disconnect control rod (3). (See F2)
   ★ Mark the clevis pin mounting hole.
4. Disconnect spill hose (4). (See F2)
5. Disconnect fuel hose (5). (See F2)
6. Disconnect lubrication tube (6). (See F2)
7. Remove bracket (7). (See F2)
8. Remove fuel injection pump assembly (8). (See F2) [※2]
   ★ Remove 5 mounting bolts at the front, and 1 mounting bolt at the pump end.

INSTALLATION OF FUEL INJECTION PUMP ASSEMBLY

- Carry out installation in the reverse order to removal.

[※1]

2.5 kgm Sleeve nut: For details, see *Tightening Torques and Standard Values Table.*

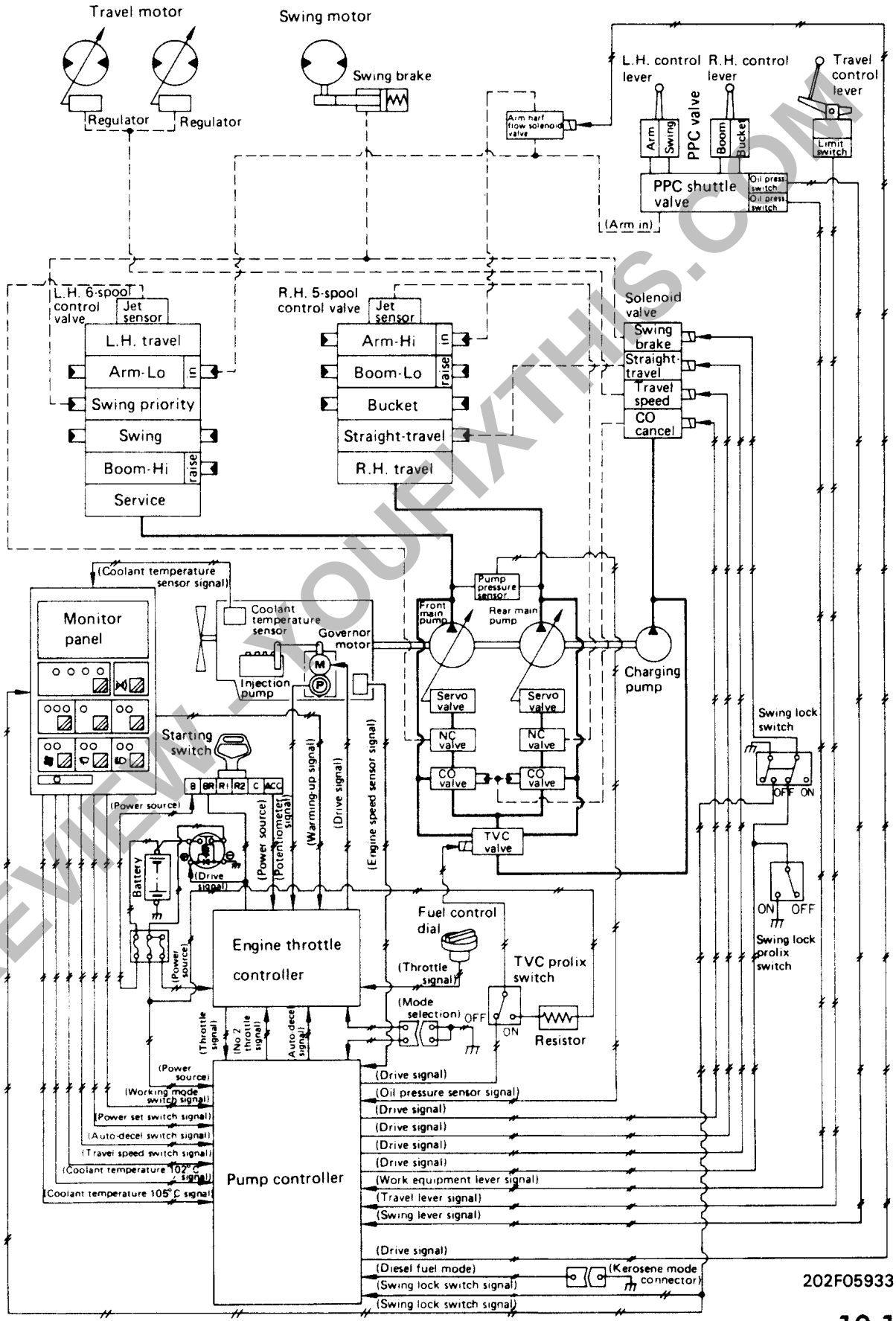
[※2]

- Install the fuel injection pump as follows.
  1) Set No. 1 cylinder at compression top dead center.
     ★ Rotate the crankshaft in the normal direction and align the pointer with the 1.4 TOP line on the crankshaft pulley.
     If the match mark on the idler gear cannot be seen, rotate the crankshaft one more turn. (See F3)
  2) Replace with bolt ① and fix drive gear (9) in position. (See F4)
  3) Injection pump assembly
     ★ Insert pin ② (ϕ4.0 — 4.5mm, length: approx. 100mm) through cover mounting bolt hole **a**, and check that the pin enters the casting hole in the drive gear smoothly. (See F5)
  4) Remove bolt ①, and replace it with a standard bolt.
- Adjust the fuel injection timing and bleed the air from the fuel system.
  For details, see TESTING AND ADJUSTING.

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PC100-5 Serial No.: 32402 and up
PC120-5 Serial No.: 36601 and up
PC120-5 MIGHTY



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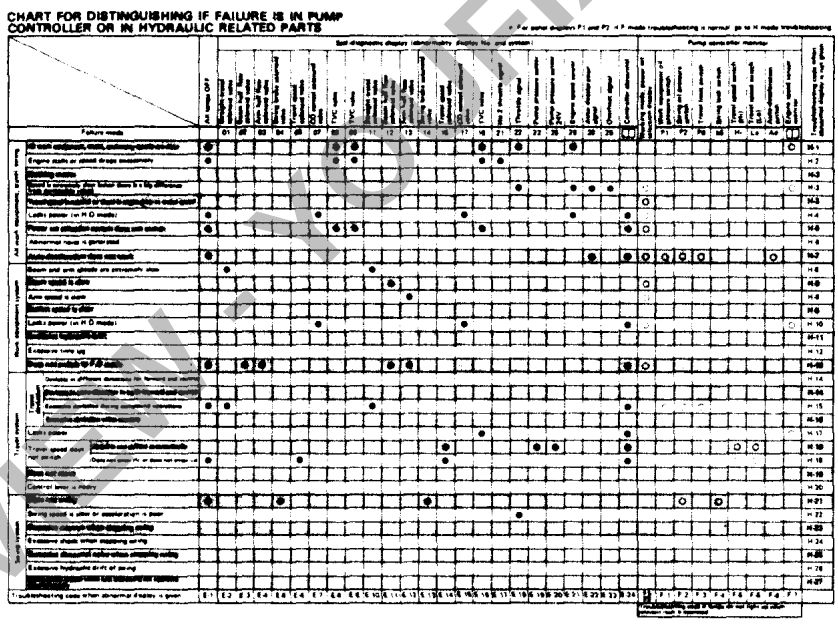
2. Judgement table for pump controller, hydraulic related parts

- If the self-diagnostic display gives an abnormal display, go to the troubleshooting code (C-○○) given on the bottom line of the judgement table.
  (There is a ● given in the column where the failure mode and self-diagnostic display come together.)
- For any problem where there is no abnormal display given by the self-diagnostic display, check the chart for the place where the failure mode and input signal display come together (place marked ○).
  If the display is normal, go to the troubleshooting code (H-○○) given in the column on the right of the judgement table.
  If the input signal is not displayed, go to the troubleshooting code (F-○○) given on the bottom line.

<Examlple> Failure mode "Auto-deceleration does not work"

[Procedure]
Check if an abnormal display is given by the self-diagnostic display, or if the numbers on the side face of the controller are flashing.

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[Judgement]
If there is an abnormal display (for example, 28) on the self-diagnostic display:
Go to troubleshooting C-21 of the electrical system.
If there is no abnormal display on the self-diagnostic display, and the auto-deceleration does not work:

- Check the monitor for the pump controller input signal
  - Display given: ..... Go to troubleshooting of Hydraulic system H-7
  - No display given: ..... Go to troubleshooting of electrical system F1, 2, 3 or 6

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1. Rod side bushing
2. Piston rod
3. Cylinder head
4. Rod packing
5. Buffer ring
6. Wear ring
7. Cylinder
8. Head side tube
9. Casting ring
10. Piston ring
11. Wear ring
12. Piston
13. Piston nut
14. Bottom side tube
15. Bottom side tube
16. Bottom side cushion plunger
17. Ball
18. Collar
19. Head side cushion plunger

SPECIFICATIONS

Unit: mm

Item \ Cylinder	Boom		Arm		Bucket	
	PC100	PC120	PC100	PC120	PC100	PC120
Rod outside diameter	65	70	75	75	60	65
Cylinder inside diameter	95	105	115	115	90	95
Stroke	970	980	1,005	1,175	885	885
Maximum length	2,460	2,480	2,537	2,877	2,208	2,208
Minimum length	1,490	1,500	1,532	1,702	1,323	1,323
Piston nut width across flats	70	80	85	85	65	70

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LUBRICANT AND COOLANT TABLE

Unit: ℓ

Machine model	PC100-5	PC120-5	Remarks
Serial No.	28001 and up	30001 and up	
Engine cooling water	10.3	10.3	
Engine oil pan	11	11	
PTO gear case	0.75	0.75	
Swing machinery case	4	4	
Final drive case	3	4	Each side
Hydraulic tank	100	100	

Note: The values for oil volumes are the values for normal oil changes during inspection and maintenance.

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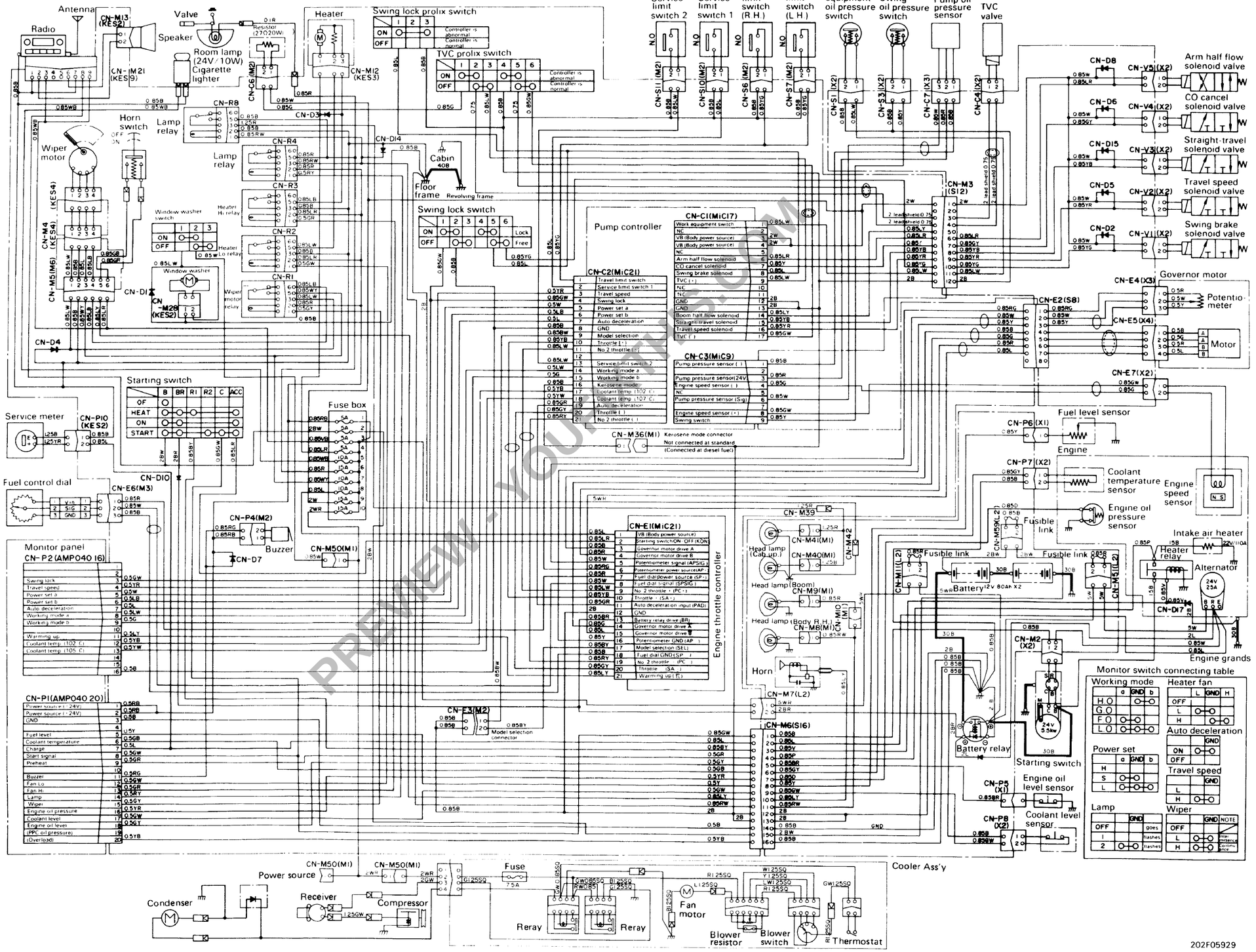
★ The display for connector numbers is as shown on the right.

CN- ☐☐☐ (☐☐)

Basic code (Not displayd on the machine or in troubleshooting)

Connector type, Number of pins

Connector No. (This number is displayd on the machine and in troubleshooting)

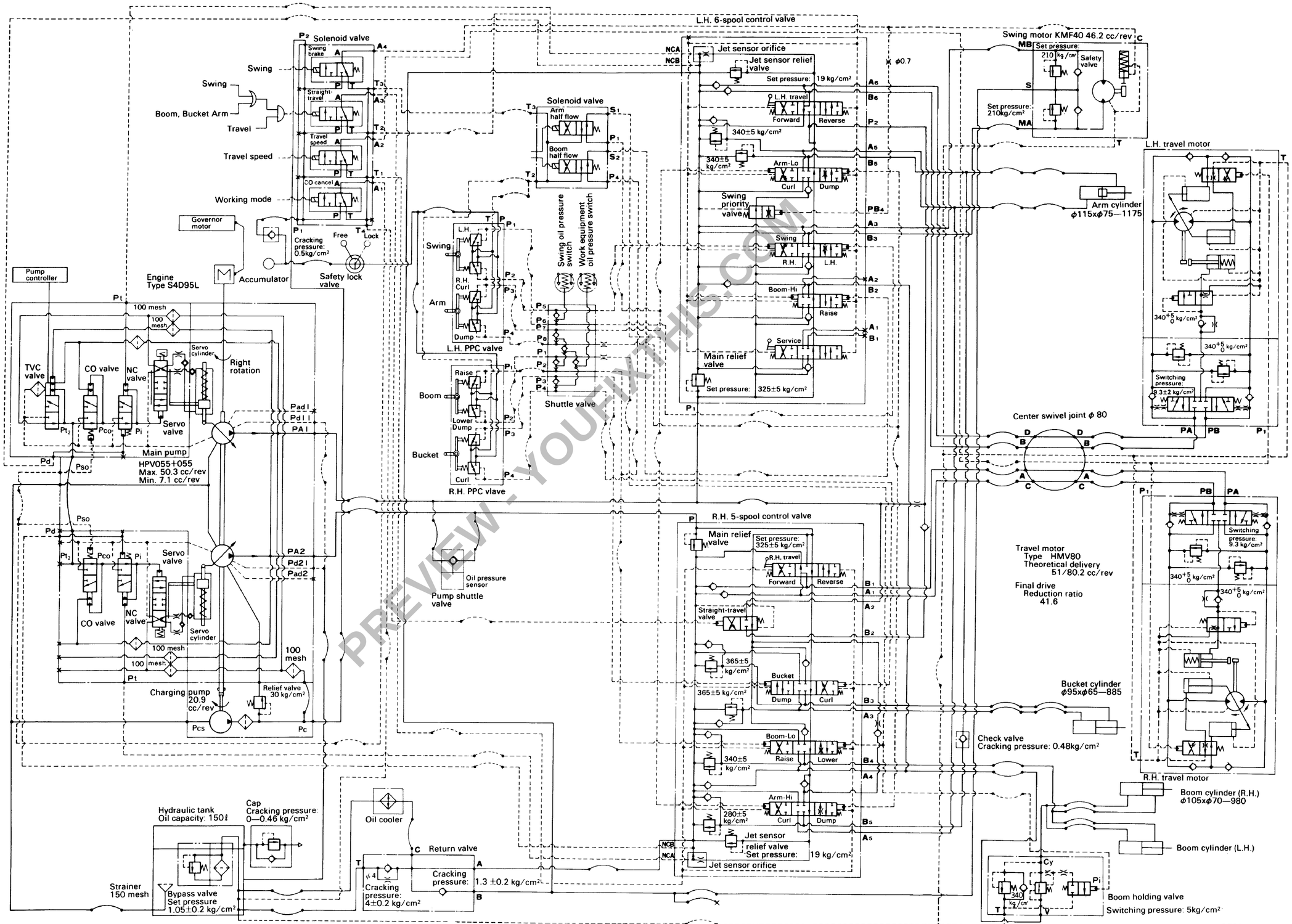


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TIGHTENING TORQUES AND STANDARD VALUES TABLE

Component		Item	Unit	Machine model	
				PC100-5	PC120-5
Engine	1	Head cover mounting bolt	kgm	0.9 ± 0.1	0.9 ± 0.1
	2	Rocker arm mounting bolt, nut		2.5 ± 0.5	2.5 ± 0.5
	3	Rocker arm locknut		4.5 ± 0.5	4.5 ± 0.5
	4	Cylinder head mounting bolt			
		1st step		7 ± 1	7 ± 1
		2nd step		11 ± 0.5	11 ± 0.5
		3rd step	°	90 $^{+30}_{0}$	90 $^{+30}_{0}$
	5	Rear seal assembly 1) Flywheel mounting bolt			
		1st step	kgm	9 ± 3	9 ± 3
		2nd step		18 ± 2	18 ± 2
		2) Face runout, radial runout of flywheel	mm	0.35	0.35
	6	Engine mounting bolt	kgm	28.5 ± 3	28.5 ± 3
Power train	1	Final drive assembly 1) Cage mounting bolt	kgm	–	5.5 ± 2
		2) Gear coupling mounting bolt		–	28.25 ± 3.25
		3) Starting torque		–	10 – 28
		4) Gear mounting bolt of No.2 carrier		–	11.25 ± 1.25
		5) End play of bearing	mm	–	0.02 – 0.12
		6) Gear mounting bolt of No.1 carrier	kgm	–	6.75 ± 0.75
		7) End play of bearing	mm	–	0.01 – 0.11
		8) Cover mounting bolt	kgm	–	18 ± 2
	2	Swing machineryassembly 1) Pinion gear mounting bolt	kgm	56 ± 6	56 ± 6
		2) Cover mounting bolt		18 ± 2	18 ± 2
		3) Cover mounting bolt		11.25 ± 1.25	11.25 ± 1.25
		4) Swing machinery assembly mounting bolt		28 ± 3	28 ± 3
	3	Revolving frame assembly mounting bolt		28.5 ± 3	28.5 ± 3
Undercarriage	1	Recoil spring assembly 1) Installed load of spring	kg	7,470	7,470
		2) Free length of spring	mm	505	505
		3) Installed length of spring		390	390

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REMOVAL OF WATER PUMP ASSEMBLY

1. Drain cooling water.
2. Disconnect wiring connector (1). (See F1)
3. Disconnect hose (2). (See F1)
4. Remove fan (3). (See F1)
5. Remove fan belt (4). (See F1) [※1]
   ★ Loosen the mounting bolt and nut of the alternator assembly, then remove the adjustment bolt, and move the alternator assembly towards the block.
6. Remove pulley (5). (See F1)
7. Disconnect plate (6). (See F1)
8. Remove water pump assembly (7). (See F1)

INSTALLATION OF WATER PUMP ASSEMBLY

- Carry out installation in the reverse order to removal.

[※1]

- Adjust the fan belt tension.
  For details, see Table of Judgement Standard Value.

- Refilling with water.
  ★ Refill water to the specified level and run the engine to circulate the water through the system. Then check the water level again.

REMOVAL OF NOZZLE HOLDER ASSEMBLY

1. Disconnect fuel injection pipe (1). (See F2) [※1]
2. Disconnect spill hose (2). (See F2)
3. Remove holder (3). (See F2) [※2]
4. Remove nozzle holder assembly (4). (See F2) [※3]
   ★ When removing the nozzle holder assembly, be careful not to let any dirt or dust get into the nozzle mount.

INSTALLATION OF NOZZLE HOLDER ASSEMBLY

- Carry out installation in the reverse order to removal.

[※1]

kgm Sleeve nut: For details, see Tightening Torques and Standard Values Table.

[※2]

kgm Mounting bolt: For details, see Tightening Torques and Standard Values Table.

[※3]

★ When installing the nozzle holder assembly, check the nozzle mount, then clean it, and install the nozzle holder assembly.

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METHOD OF USING TROUBLESHOOTING CHARTS

1. Category of troubleshooting code number

Troubleshooting Code No.	Component
E-○○	Troubleshooting of engine throttle controller system
C-○○	Troubleshooting of pump controller system
F-○○	Troubleshooting of pump controller input signal system
H-○○	Troubleshooting of hydraulic, mechanical system
P-○○	Troubleshooting of monitor system

2. Method of using troubleshooting table

① *Troubleshooting code number and problem*
The top left of the troubleshooting chart gives the troubleshooting code number and the problem with the machine.

② Distinguishing condition
Even with the same problem the method of troubleshooting may differ according to the model, component, or problem. In such cases, the troubleshooting chart is further divided into sections marked with small letters (for example, a)), so go to the appropriate section to carry out troubleshooting.
If the troubleshooting table is not divided into sections, start troubleshooting from the first check item.

③ Method of following troubleshooting chart

- Check or measure the item inside the box, and according to the answer follow either the YES line or the NO line to go to the next box. (Note: The number written at the top right corner of the box is an index number; it does not indicate the order to follow.)
- Following the YES or NO lines according to the results of the check or measurement will lead finally to the Cause column. Check the cause and take the action given in the Remedy column on the right.
- Below the box there are the methods for inspection or measurement, and the judgement values. If the judgement values below the box are correct or the answer to the question inside the box is YES, follow the YES line; if the judgement value is not correct, or the answer to the question is NO, follow the NO line.
- Below the box is given the preparatory work needed for inspection and measurement, and the judgement values. If this preparatory work is neglected, or the method of operation or handling is mistaken, there is danger that it may cause mistaken judgement, or the equipment may be damaged. Therefore, before starting inspection or measurement, always read the instructions carefully, and start the work in order from Item 1).

④ General precautions
When using the troubleshooting chart, precautions that apply to all items are given at the top of the page and marked with ★. The precautions marked ★ are not given in the box, but must always be followed when carrying out the check inside the box.

⑤ Troubleshooting tools
When carrying out the troubleshooting, prepare the necessary troubleshooting tools. For details, see TOOLS FOR TESTING, ADJUSTING, AND TROUBLESHOOTING.

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TABLE OF JUDGEMENT STANDARD VALUE

• FOR ENGINE

Machine model			PC100-5		PC120-5	
Engine			S4D95L-1		S4D95L-1	
Item	Measurement conditions	Unit	Standard value	Permissible value	Standard value	Permissible value
Engine speed	High idling Low idling Rated speed	rpm rpm rpm	$2{,}300^{+60}_{-100}$ 900 ± 50 2,100	– – –	$2{,}400^{+60}_{-100}$ 900 ± 50 2,200	– – –
Exhaust gas color	At sudden acceleration	Bosch index	Max. 5.5	7.5	Max. 5.5	7.5
	At high idling	Bosch index	Max. 1.0	2.0	1.0	2.0
Valve clearance (normal temperature)	Intake valve Exhaust valve	mm mm	0.35 0.50	– –	0.35 0.50	– –
Compression pressure (SAE 30 oil)	Oil temperature: 40~60°C (Engine speed)	kg/cm² (rpm)	Min. 30 (320 – 360)	21 (320 – 360)	Min. 30 (320 – 360)	22 (320 – 360)
Blowby pressure (SAE oil)	(Coolant temperature: Operating range) At rated output	mmH_2O	Max. 50	100	Max. 50	100
Oil pressure	(Coolant temperature: Operating range) At high idling At low idling (SAE30) At low idling (SAE10W)	 kg/cm² kg/cm² kg/cm²	 3.5 – 7.0 Min. 1.0 Min. 0.8	 2.7 0.7 0.7	 3.5 – 7.0 Min 1.0 Min 0.8	 2.7 0.7 0.7
Oil temperature	Whole speed range (inside oil pan)	°C	80 – 110	120	80 – 110	120
Fuel injection timing	B.T.D.C.	°	18 ± 1	18 ± 1	18 ± 1	18 ± 1
Belt tension (alternator)	Deflection when pressed with finger force of approx. 6 kg.	mm	8	6 – 10	8	6 – 10

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