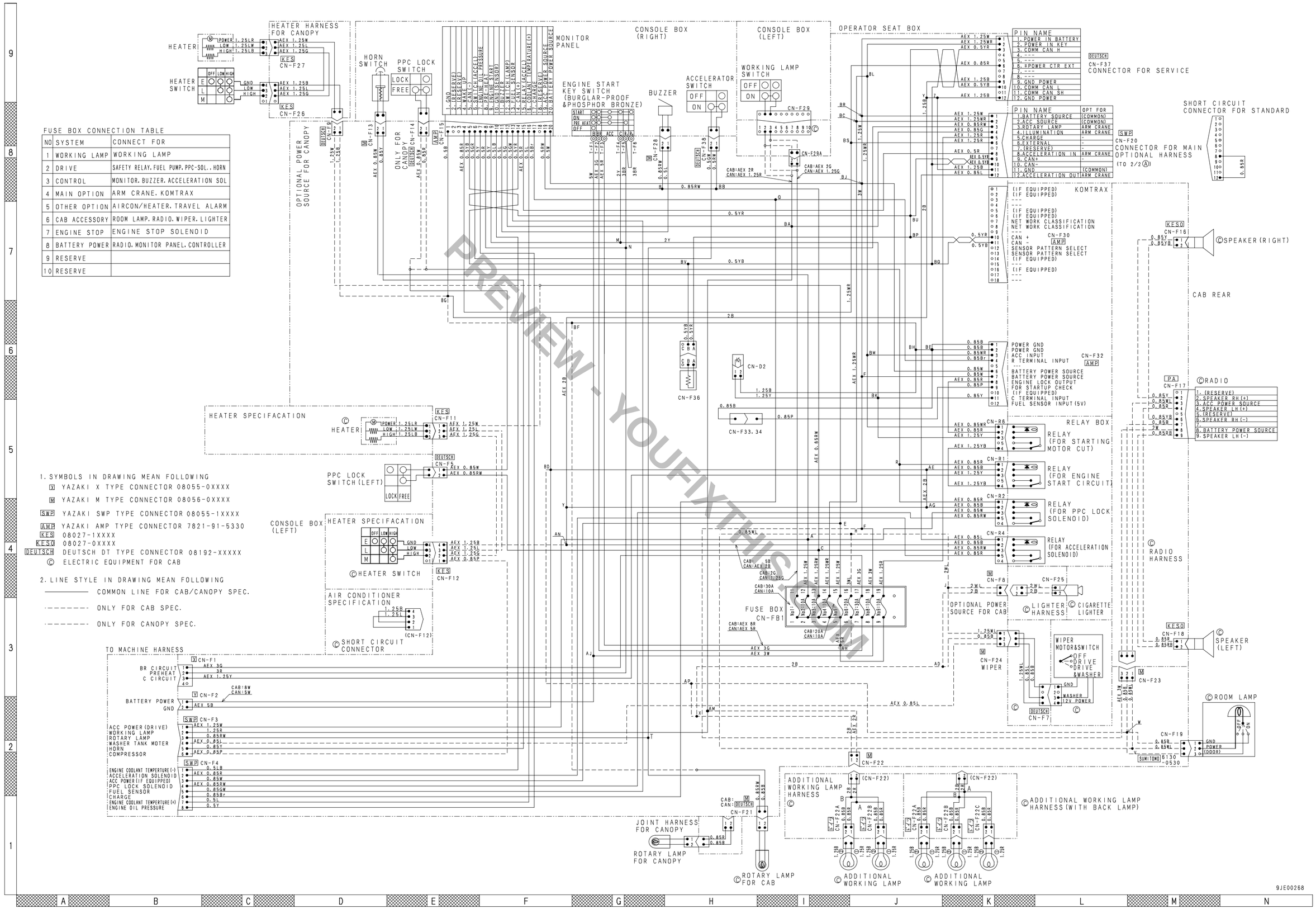
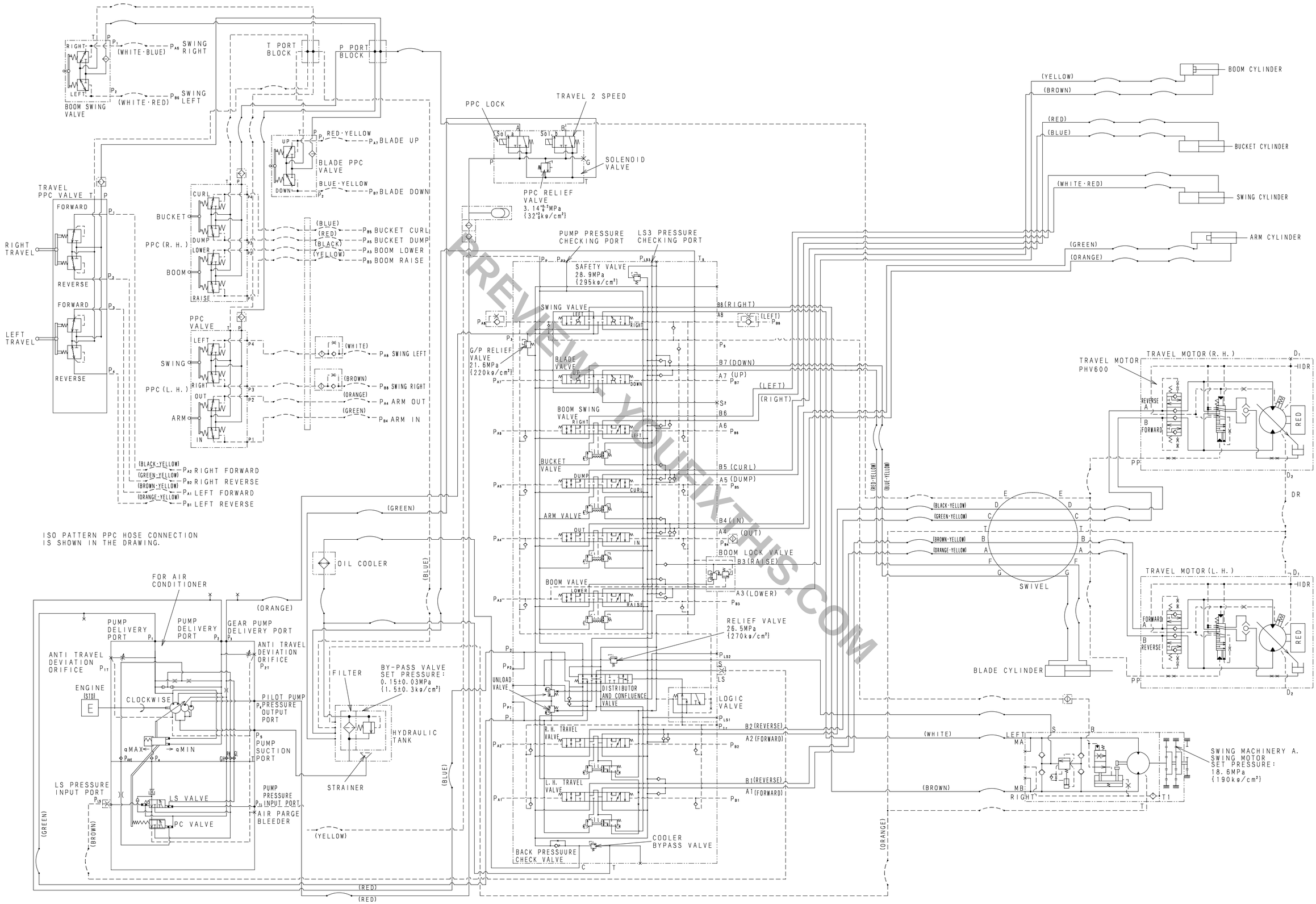
Electrical circuit diagram (1/2)



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Hydraulic circuit diagram (1/2)



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9JE00276

Standard tightening torque table

1. Table of tightening torques for bolts and nuts

★ Unless there are special instructions, tighten metric nuts and bolts to the torque below.

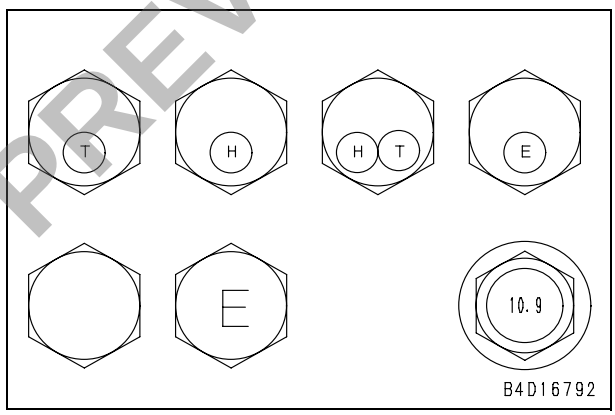
★ The following table corresponds to the bolts in Fig. A.

Thread diameter of bolt	Width across flats	Tightening torque	
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	6.0 – 7.5
12	19	98 – 123	10.0 – 12.5
14	22	157 – 196	16 – 20
16	24	245 – 309	25 – 31.5
18	27	343 – 427	35 – 43.5
20	30	490 – 608	50 – 62
22	32	662 – 829	67.5 – 84.5
24	36	824 – 1,030	84 – 105
27	41	1,180 – 1,470	120 – 150
30	46	1,520 – 1,910	155 – 195
33	50	1,960 – 2,450	200 – 250
36	55	2,450 – 3,040	250 – 310
39	60	2,890 – 3,630	295 – 370

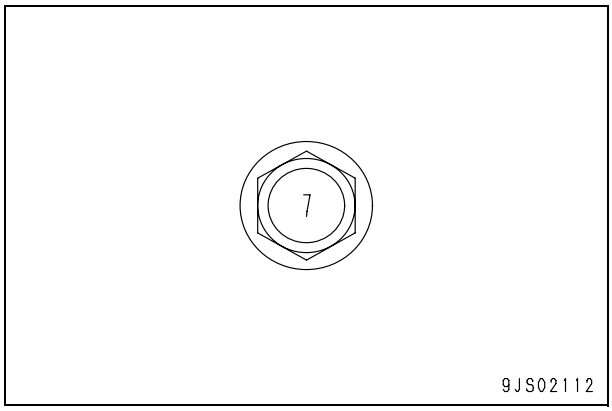
★ The following table corresponds to the bolts in Fig. B.

Thread diameter of bolt	Width across flats	Tightening torque	
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

★ Fig. A



★ Fig. B



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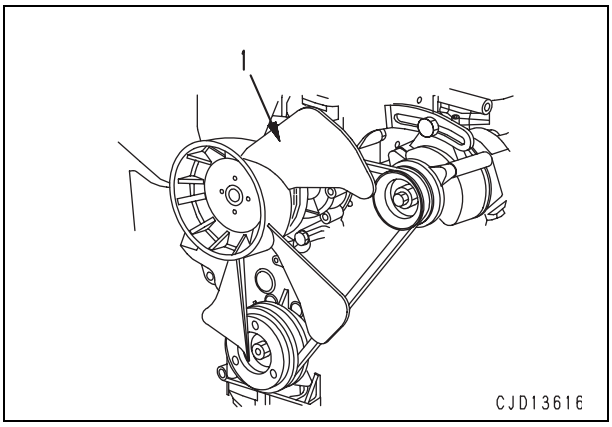
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Removal and installation of fuel injection pump assembly

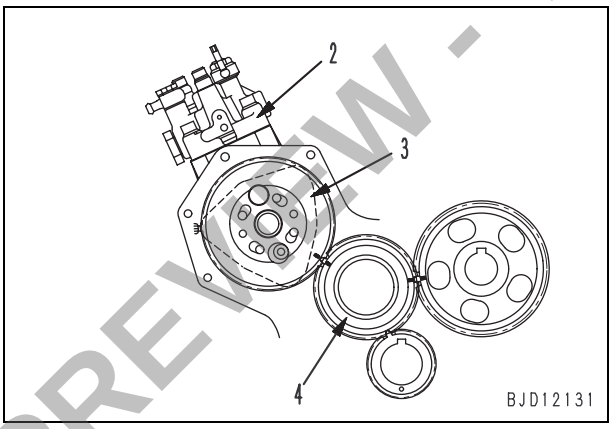
Removal

1. Tilt up the floor frame.
   For details, see Testing and adjusting, “How to open and close (tilt) floor”.

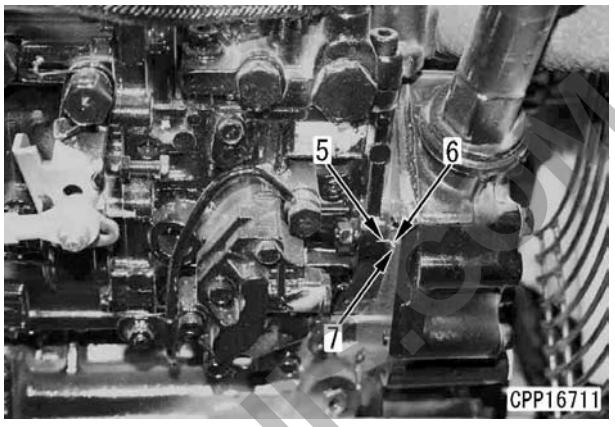
2. Loosen the fan belt and remove fan (1). [*1]
   ★ Before removing fan (1), make a match mark on it and mounting part.



3. Before removing fuel injection pump (2), remove the front cover of the timing gear case and make match marks with paint on the meshing parts of pump drive gear (3) and idle gear (4).



4. Make mark (7) on the gear case to record the relative position of stamp line (5) of the fuel injection pump body to stamp line (6) of the gear.

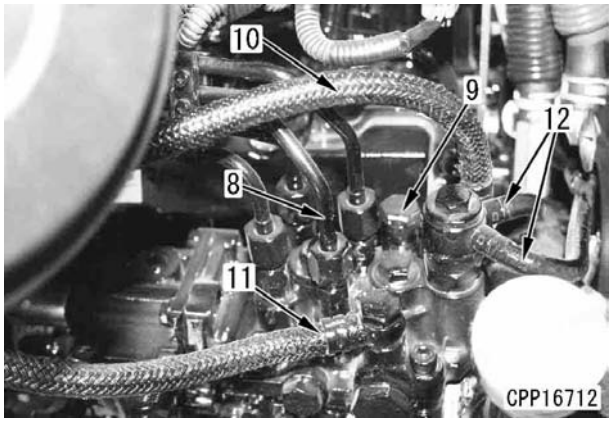


5. Remove 4 fuel tubes (8). [*2]
   ★ Check the installed position of the fuel tube.

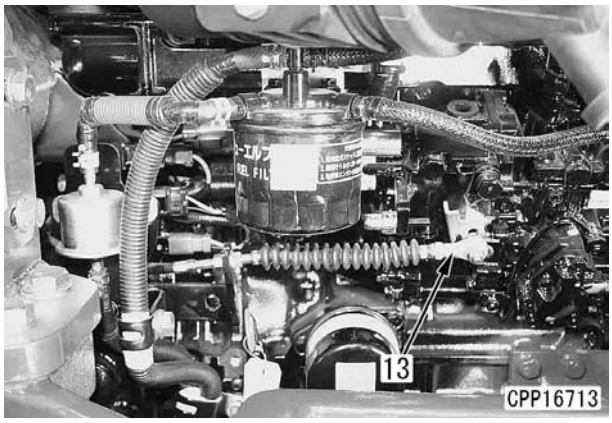
6. Disconnect fuel return hose (9).

7. Disconnect fuel hoses (10) and (11) and engine stop solenoid connector.

8. Disconnect cooling hoses (12).



9. Disconnect fuel control cable (13) from the fuel injection pump.



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E-1 Engine does not start

1) Engine does not start (Starting motor does not rotat)

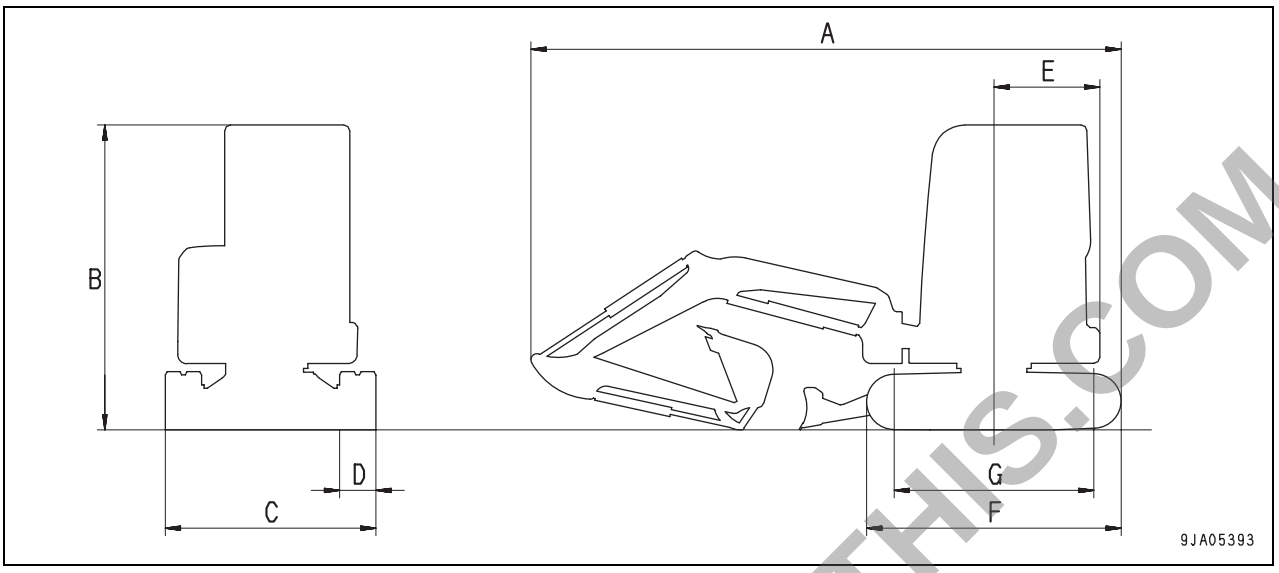
Failure information	• Engine does not start (Starting motor does not rotat).
Relative information	• Since the engine starting circuit has a locking function, the engine cannot start if the PPC lock lever (lock lever) is not in the LOCK position. • The lock lever is installed to the right and left side of the canopy specification and to the left side of the cab specification.

<table>
<tr><td rowspan="20">Presumed cause and standard value in normalcy</td><td colspan="2">Cause</td><td colspan="3">Standard value in normalcy and references for troubleshooting</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Insufficient battery capacity</td><td>Battery voltage</td><td colspan="2">Electrolyte specific gravity</td></tr>
<tr><td>Min. 12 V</td><td colspan="2">Min. 1.26</td></tr>
<tr><td>2</td><td>Defective 45-A fusible link or fuse (2) – (12) or (3) – (13)</td><td colspan="3">If the fusible link or fuse is broken, the circuit probably has a grounding fault.</td></tr>
<tr><td rowspan="5">3</td><td rowspan="5">Defective starting switch (Internal defective contact)</td><td colspan="3">1) Turn starting switch OFF.
2) Disconnect negative (–) terminal of battery.</td></tr>
<tr><td>Starting switch</td><td>Position</td><td>Resistance</td></tr>
<tr><td rowspan="2">Between (T-F1) terminal B and (T-F4) terminal C</td><td>OFF</td><td>Min. 1 MΩ</td></tr>
<tr><td>START</td><td>Max. 1 Ω</td></tr>
<tr><td rowspan="2">Between (T-F1) terminal B and (T-F3) terminal ACC</td><td>OFF</td><td>Min. 1 MΩ</td></tr>
<tr><td>ON</td><td>Max. 1Ω</td></tr>
<tr><td rowspan="4">4</td><td rowspan="4">Defective PPC lock switch (left)
(Internal defective contact)</td><td colspan="3">1) Turn starting switch OFF.
2) Disconnect connector F5.
3) Connect T-adapter to F5 (male).</td></tr>
<tr><td>F5 (male)</td><td>Lock lever position</td><td>Resistance</td></tr>
<tr><td rowspan="2">Between (1) and (2)</td><td>FREE</td><td>Max. 1 Ω</td></tr>
<tr><td>LOCK</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Defective PPC lock switch (right)
(Internal defective contact)
★ Only canopy specification</td><td colspan="3">1) Turn starting switch OFF.
2) Disconnect connector F14.
3) Connect T-adapter to F14 (male).</td></tr>
<tr><td>F14 (male)</td><td>Lock lever position</td><td>Resistance</td></tr>
<tr><td rowspan="2">Between (1) and (2)</td><td>FREE</td><td>Max. 1 Ω</td></tr>
<tr><td>LOCK</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="8">6</td><td rowspan="8">Defective starting motor relay
(Internal disconnection, defective contact, or fixing)</td><td colspan="3">1) Turn starting switch OFF.
2) Disconnect relay R1.
3) Connect T-adapter to R1 (male).</td></tr>
<tr><td colspan="2">R1 (male)</td><td>Resistance</td></tr>
<tr><td colspan="2">Between (1) and (2)</td><td>86 – 106 Ω</td></tr>
<tr><td colspan="2">Between (3) and (4)</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="2">Between (3) and (5)</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">1) Turn starting switch OFF.
2) Insert T-adapter in relay R1.
3) Turn starting switch ON.</td></tr>
<tr><td colspan="2">R1</td><td>Voltage</td></tr>
<tr><td colspan="2">Between (4) and ground
(Set PPC lock lever in LOCK and starting switch in START)</td><td>10 – 15 V</td></tr>
</table>

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Specification dimension drawing

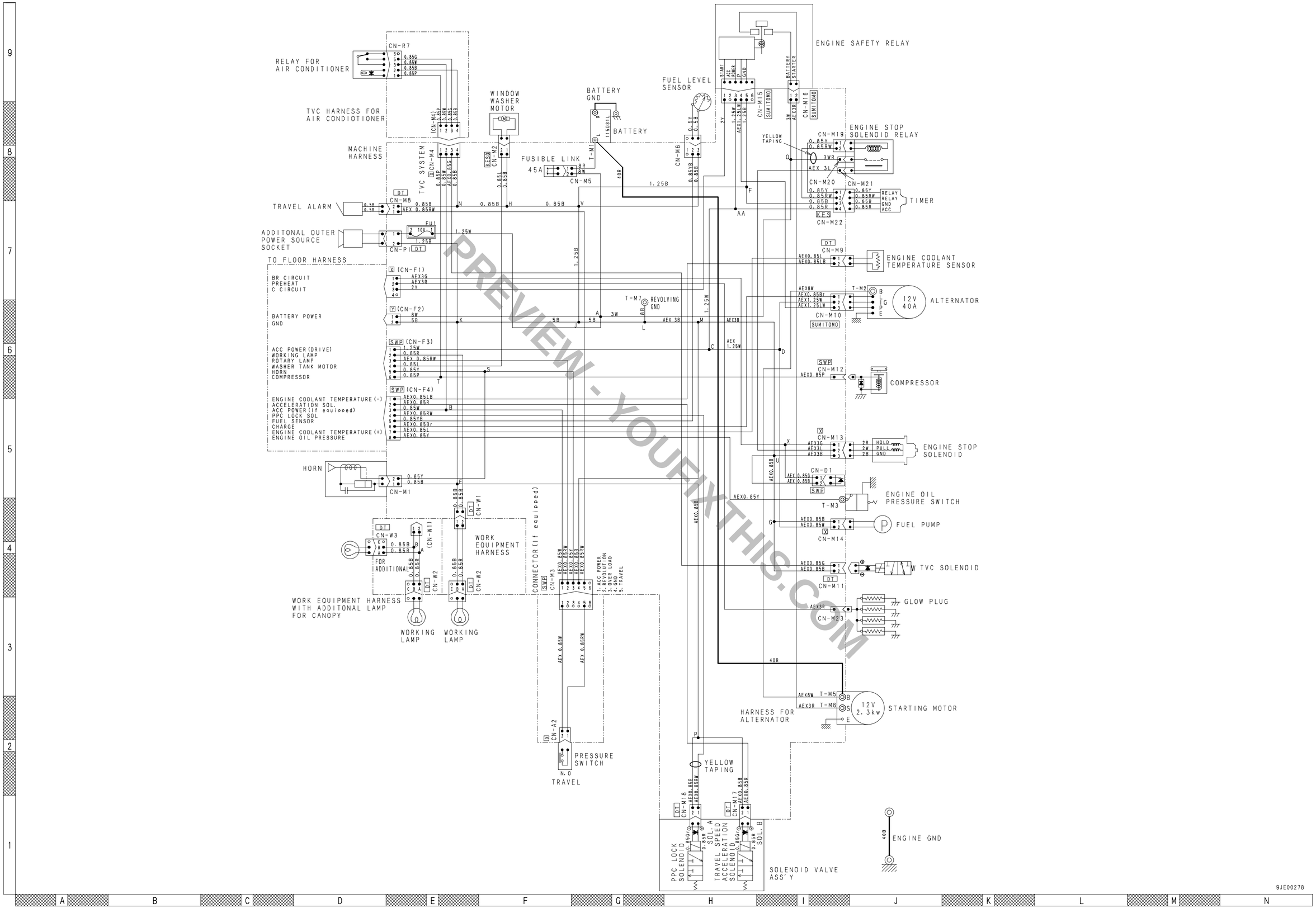


	Item		Unit	PC45MR-3	PC55MR-3
	Operating weight	Canopy specification	kg	4,795	5,160
		Cab specification		4,915	5,280
	Bucket capacity		m^3	0.14	0.16
	Engine model		—	Komatsu 4D88E-6 Diesel engine	Komatsu 4D88E-6 Diesel engine
	Rated engine output		kW{HP}/rpm	28.5 {38.2} / 2,400	28.5 {38.2} / 2,400
A	Overall length		mm	5,330	5,550
B	Overall height		mm	2,550	2,550
C	Overall width		mm	1,960	1,960
D	Shoe width		mm	400	400
E	Tail swing radius	Canopy specification	mm	1,060	1,060
		Cab specification		1,060	1,060
F	Overall length of track		mm	2,520	2,520
G	Distance between tumbler centers		mm	2,000	2,000
	Minimum ground clearance		mm	290	290
	Travel speed (Low / High)		km/h	2.8 / 4.6	2.8 / 4.6
	Continuous swing speed		rpm	9.0	9.0

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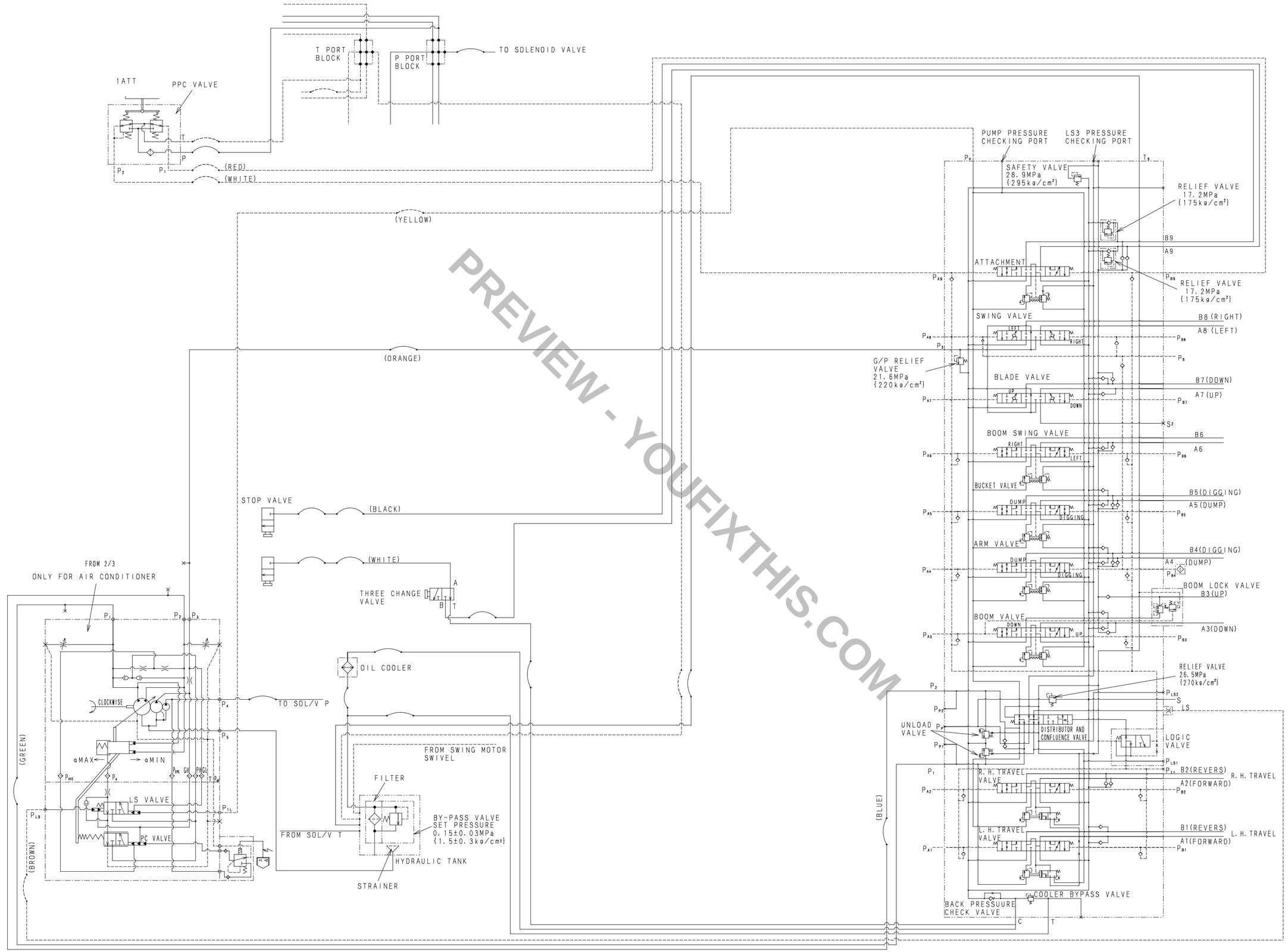
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Electrical circuit diagram (2/2)



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Hydraulic circuit diagram (2/2)



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2. Table of tightening torques for split flange bolts

★ Unless there are special instructions, tighten split flange bolts to the torque below.

Thread diameter of bolt	Width across flats	Tightening torque	
mm	mm	Nm	kgm
10	14	59 – 74	6.0 – 7.5
12	17	98 – 123	10.0 – 12.5
16	22	235 – 285	23.5 – 29.5

3. Table of tightening torques for O-ring boss piping joints

★ Unless there are special instructions, tighten O-ring boss piping joints to the torque below.

Nominal No.	Thread diameter	Width across flats	Tightening torque Nm {kgm}	
	mm	mm	Range	Target
02	14	Varies depending on type of connector.	35 – 63 { 3.5 – 6.5}	44 { 4.5}
03,04	20		84 – 132 { 8.5 – 13.5}	103 {10.5}
05,06	24		128 – 186 {13.0 – 19.0}	157 {16.0}
10,12	33		363 – 480 {37.0 – 49.0}	422 {43.0}
14	42		746 – 1,010 {76.0 – 103}	883 {90.0}

4. Table of tightening torques for O-ring boss plugs

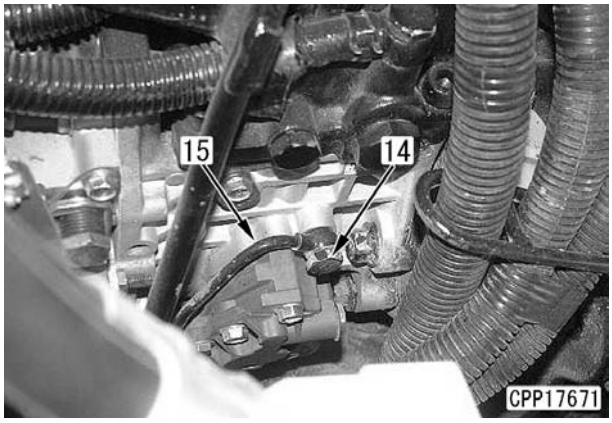
★ Unless there are special instructions, tighten O-ring boss plugs to the torque below.

Nominal No.	Thread diameter	Width across flats	Tightening torque Nm {kgm}	
	mm	mm	Range	Target
08	8	14	5.88 – 8.82 {0.6 – 0.9}	7.35 {0.75}
10	10	17	9.81 – 12.74 {1.0 – 1.3}	11.27 {1.15}
12	12	19	14.7 – 19.6 {1.5 – 2.0}	17.64 {1.8}
14	14	22	19.6 – 24.5 {2.0 – 2.5}	22.54 {2.3}
16	16	24	24.5 – 34.3 {2.5 – 3.5}	29.4 {3.0}
18	18	27	34.3 – 44.1 {3.5 – 4.5}	39.2 {4.0}
20	20	30	44.1 – 53.9 {4.5 – 5.5}	49.0 {5.0}
24	24	32	58.8 – 78.4 {6.0 – 8.0}	68.6 {7.0}
30	30	32	93.1 – 122.5 { 9.5 – 12.5}	107.8 {11.0}
33	33	–	107.8 – 147.0 {11.0 – 15.0}	127.4 {13.0}
36	36	36	127.4 – 176.4 {13.0 – 18.0}	151.9 {15.5}
42	42	–	181.3 – 240.1 {18.5 – 24.5}	210.7 {21.5}
52	52	–	274.4 – 367.5 {28.0 – 37.5}	323.4 {33.0}

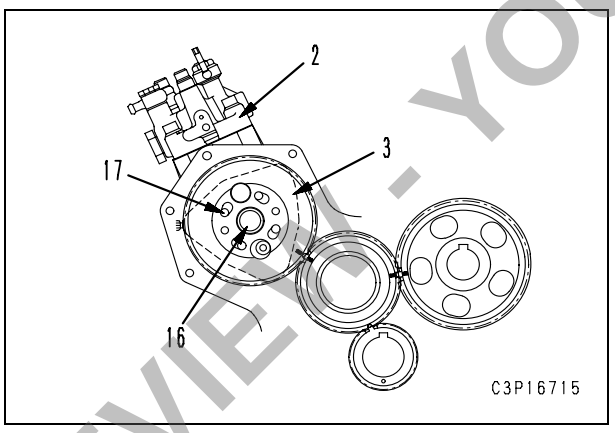
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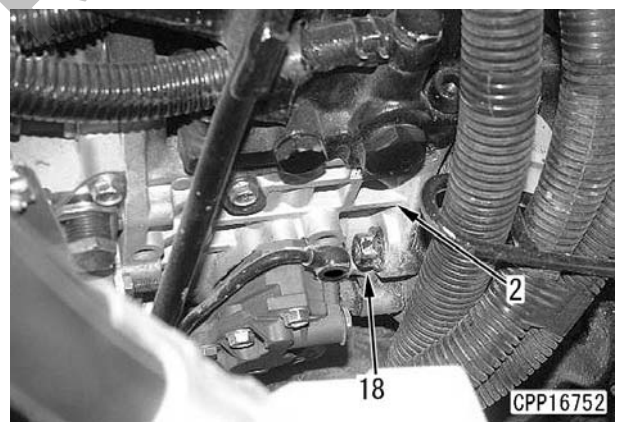
10. Remove mounting bolt (14) and disconnect lubrication tube (15).



11. Remove nut (16) from the end of the fuel injection pump drive shaft.
    - ★ Take care not to drop the nut into the case.
    - ★ Never loosen mounting bolts (17) of pump drive gear (3). (If the flange and pump drive gear move from each other, it becomes very difficult to adjust the injection timing.)
12. Using puller, push out the pump drive shaft from the gear.



13. Remove 3 mounting nuts (18).
14. Remove the injection pump assembly (2).



Installation

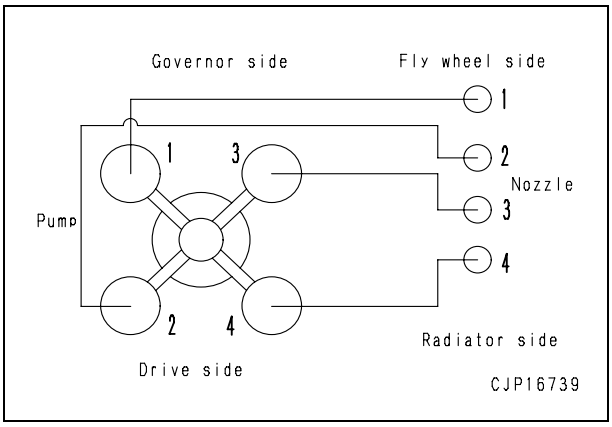
- Carry out installation in the reverse order to removal.

[*1]
- ★ When installing the fan, line up the match marks.
- ★ Check that the identification mark (M) of the fan is on outside.

- Sample of identification mark



[*2]
- ★ Referring to the following figure, install the fuel tube.
- ★ The cylinder of the engine on the flywheel side is the No. 1 cylinder.



[*3]
Nut at shaft end:
113 – 123 Nm {11.5 – 12.5 kgm}

[*4]
- ★ Install the fuel injection pump temporarily, and then tighten the nut at the shaft end first.
- ★ Adjust the injection angle. For details, see Testing and adjusting, “Testing and adjusting fuel injection timing”.

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	Causes		Standard value in normalcy and references for troubleshooting		
Possible causes and standard value in normal state	7	Defective starting motor cutout relay (Internal disconnection, defective contact, or fixing)	1) Turn starting switch OFF. 2) Disconnect relay R6. 3) Connect T-adapter to R6 (male).		
			R6 (male)	Resistance	
			Between (1) and (2)	86 – 106 Ω	
			Between (3) and (4)	Max. 1 Ω	
			Between (3) and (5)	Min. 1 MΩ	
			1) Turn starting switch OFF. 2) Insert T-adapter in relay R1. 3) Turn starting switch ON.		
			R6	Voltage	
			Between (4) and ground (Set PPC lock lever in LOCK and starting switch in START)	10 – 15 V	
	8	Defective starting motor	1) Turn starting switch from OFF to START for troubleshooting. (If power supply and starting input/output are normal and starting motor does not rotate, starting motor is defective.)		
			Starting motor	Starting switch	Voltage
			Power supply: Between terminal B and ground	ON	10 – 15 V
			Starting input: Between terminal S and ground	START	10 – 15 V
	9	Defective safety relay (Internal defective contact or disconnection)	1) Turn starting switch from OFF to START for troubleshooting.		
			M16	Voltage	
			Between (2) and ground	10 – 15 V	
	10	Defective alternator (including regulator) (Internal short circuit)	1) Turn starting switch from OFF to ON or START for troubleshooting.		
			Alternator	Voltage	
			Between terminal P and ground	Max. 1 V	
	11	Disconnection in wiring harness (Disconnection in wiring harness or defective contact in connector)	1) Turn starting switch OFF. 2) Disconnect related connector or terminal. 3) Set PPC lock switch in LOCK.		
			Wiring harness between battery (+) and T-F1 or M16 (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between T-F3 and fuse (2) or between (12) and F3 (1) and M15 (3)	Resistance	Max. 1 Ω
			Wiring harness between fuse (13) and F5 (2) or between (1) and F14 (2) or between (1) and R1 (female) (1) ★ Check F14 for only canopy specification.	Resistance	Max. 1 Ω
			Wiring harness between T-F4 and R6 (female) (3)	Resistance	Max. 1 Ω
			Wiring harness between R1 (female) (3), F1 (3), and M15 (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between M15 (female) (4) and M10 (female) (3)	Resistance	Max. 1 Ω
			Wiring harness between M16 (female) (2) and starting motor terminal S	Resistance	Max. 1 Ω
			Wiring harness between R1 (female) (2), F2 (2), and ground	Resistance	Max. 1 Ω
			Wiring harness between M15 (female) (5) and ground	Resistance	Max. 1 Ω
			Wiring harness between R6 (female) (4) and R1 (female) (4)	Resistance	Max. 1 Ω

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Specifications

Machine model				PC45MR-3	
				Canopy specification	Cab specification
Serial number				5001 and up	
Bucket capacity			m^3	0.14	0.14
Operating weight			kg	4,795 [4,860]	4,915 [4,980]
Performance	Working ranges	Max. digging depth	mm	3,670	3,670
		Max. vertical wall depth	mm	3,060	3,060
		Max. digging reach	mm	6,040	6,040
		Max. reach at ground level	mm	5,885	5,885
		Max. digging height	mm	5,730	5,730
		Max. dumping height	mm	4,060	4,060
		Bucket offset	mm	630 / 880	630 / 880
		Max. blade lifting height	mm	430	430
		Max. blade lowering depth	mm	330	330
	Max. digging force (bucket)		kN {kg}	33.9 {3,460}	33.9 {3,460}
	Continuous swing speed		rpm	9.0	9.0
	Swing max. slope angle		deg.	19.0	19.0
	Travel speed		km/h	2.8 / 4.6	2.8 / 4.6
	Gradeability		deg.	30	30
	Ground pressure		kPa {kg/cm^2}	24.9 {0.25} [25.9 {0.26}]	25.9 {0.26} [26.9 {0.27}]
Dimensions	Overall length (for transport)		mm	5,330	5,330
	Overall width		mm	1,960	1,960
	Overall height (for transport)		mm	2,550	2,550
	Ground clearance of conterweight		mm	608	608
	Min. ground clearance		mm	290	290
	Tail swing radius		mm	1,060	1,060
	Min. swing radius of work equipment (at boom swing)		mm	2,410 (1,830)	2,410 (1,830)
	Height of work equipment at min. swing radius		mm	4,140	4,140
	Overall width of crawler		mm	1,960	1,960
	Overall length of crawler		mm	2,520	2,520
	Distance between tumbler centers		mm	2,000	2,000
	Track gauge		mm	1,560	1,560
	Machine cab height		mm	1,395	1,395
	Blade width x height		mm	1,960 × 355	1,960 × 355

a Values are common to all specifications, unless otherwise specified. (The values of the rubber shoe specification are shown.)
a Values in [ ] are for steel shoe specification.
a Operating weight of machine with full tank of fuel and a 75 kg operator (ISO 6016).

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5. Table of tightening torques for hoses (taper seal type and face seal type)

★ Unless there are special instructions, tighten the hoses (taper seal type and face seal type) to the torque below.

★ Apply the following torque when the threads are coated (wet) with engine oil.

Nominal No. of hose	Width across flats	Tightening torque Nm {kgm}		Taper seal	Face seal	
		Range	Target	Thread size (mm)	Nominal No. – Number of threads, type of thread	Thread diameter (mm) (Reference)
02	19	34 – 54 { 3.5 – 5.5}	44 { 4.5}	–	9/16-18UN	14.3
		34 – 63 { 3.5 – 6.5}		14	–	–
03	22	54 – 93 { 5.5 – 9.5}	74 { 7.5}	–	11/16-16UN	17.5
	24	59 – 98 { 6.0 – 10.0}	78 { 8.0}	18	–	–
04	27	84 – 132 { 8.5 – 13.5}	103 {10.5}	22	13/16-16UN	20.6
05	32	128 – 186 {13.0 – 19.0}	157 {16.0}	24	1-14UNS	25.4
06	36	177 – 245 {18.0 – 25.0}	216 {22.0}	30	1-3/16-12UN	30.2
(10)	41	177 – 245 {18.0 – 25.0}	216 {22.0}	33	–	–
(12)	46	197 – 294 {20.0 – 30.0}	245 {25.0}	36	–	–
(14)	55	246 – 343 {25.0 – 35.0}	294 {30.0}	42	–	–

6. Table of tightening torques for face seal joints

★ Tighten the face seal joints (sleeve nut type) made of plated steel pipes for low pressure service to be used for engines etc. to the torque shown in the following table.

★ Apply the following torque to the face seal joint while their threaded parts are coated with engine oil (wetted).

Outer diameter of pipe (mm)	Width across flats (mm)	Tightening torque Nm {kgm}		Face seal	
		Range	Target	Nominal No. – Number of threads, type of thread	Thread diameter (mm) (Reference)
8	19	14 – 16 {1.4 – 1.6}	15 {1.5}	9/16-18UN	14.3
10	22	24 – 27 {2.4 – 2.7}	25.5 {2.6}	11/16-16UN	17.5
12	24 (27)	43 – 47 {4.4 – 4.8}	45 {4.6}	13/16-16UN	20.6
15 (16)	30 (32)	60 – 68 {6.1 – 6.8}	64 {6.5}	1-14UN	25.4
22 (20)	36	90 – 95 {9.2 – 9.7}	92.5 {9.4}	1-3/16-12UN	30.2

Reference: The face seal joints of the dimensions in ( ) are also used, depending on the specification.

7. Table of tightening torques for 102, 107 and 114 engine series (Bolts and nuts)

★ Unless there are special instructions, tighten the metric bolts and nuts of the 102, 107 and 114 engine series to the torque below.

Thread size	Tightening torque	
	Bolts and nuts	
mm	Nm	kgm
6	10 ± 2	1.02 ± 0.20
8	24 ± 4	2.45 ± 0.41
10	43 ± 6	4.38 ± 0.61
12	77 ± 12	7.85 ± 1.22
14	—	—

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Removal and installation of radiator assembly

Removal

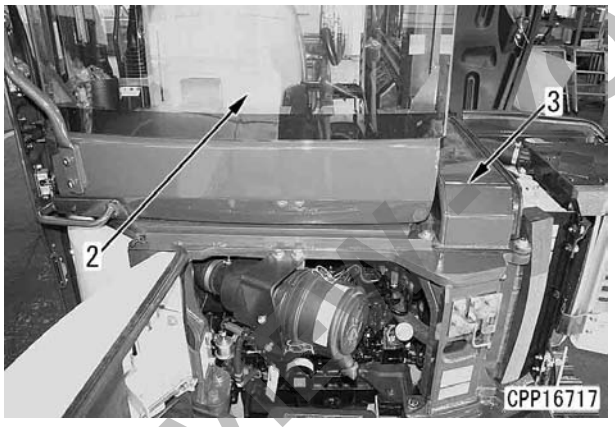
1. Open drain plug (1) to drain the coolant.

   Coolant: **8.5 ℓ**



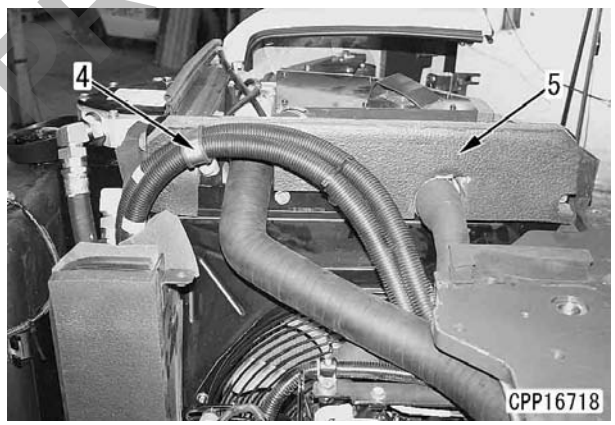
2. Tilt open floor frame (2). For details, see Testing and adjusting, “How to open and close (tilt) floor”.

3. Remove cover (3).



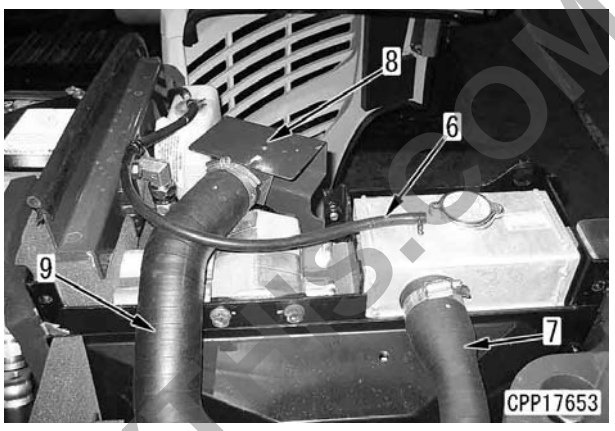
4. Remove heater hose clamp (4).

5. Remove cover board (5).

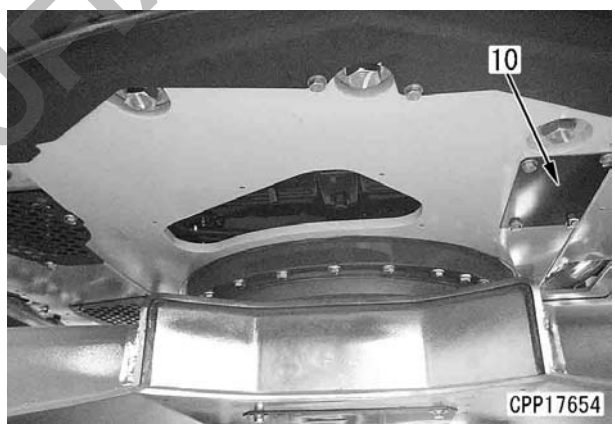


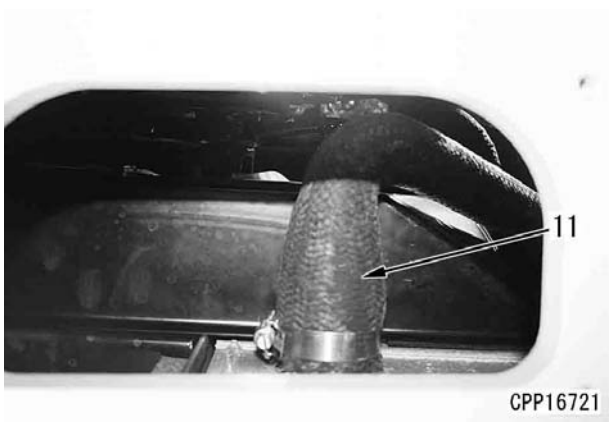
6. Disconnect overflow hose (6) and radiator hose (7). [*1]

7. Disconnect air duct (8).
   ★ Place air duct (8) and air hose (9) as an assembly on a place where they will not be obstacles.



8. Remove undercover (10) and disconnect hose (11). [*2]





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	Causes		Standard value in normalcy and references for troubleshooting		
Possible causes and standard value in normal state	11	Disconnection in wiring harness (Disconnection in wiring harness or defective contact in connector)	Wiring harness between R6 (female) (1) and F32 (female) (3)	Resistance	Max. 1 Ω
			Wiring harness between R6 (female) (2) and F32 (female) (8)	Resistance	Max. 1 Ω
			Wiring harness between T-F4 and F32 (female) (11)	Resistance	Max. 1 Ω
	12	Short circuit with chassis ground in wiring harness (Contact with ground circuit)	1) Turn starting switch OFF. 2) Disconnect related connector or terminal. 3) Set PPC lock switch in LOCK.		
			Between wiring harness between M5 (female) (2), F2 (1), T-F1, or M16 (female) (1) and ground	Resistance	Min. 1 MΩ
			Between wiring harness between fuse (12), F3 (1), M15 (3), or M14 (female) (2) and ground	Resistance	Min. 1 MΩ
			Between wiring harness between fuse (13) and F5 (2) or between (1) and F14 (2) or between (1) and R1 (female) (1) and ground ★ Test F14 for only canopy specification.	Resistance	Min. 1 MΩ
			Between wiring harness between T-F4 and R6 (female) (3) and ground	Resistance	Min. 1 MΩ
			Between wiring harness between R1 (female) (3), F1 (3) and M15 (female) (1) and ground	Resistance	Min. 1 MΩ
			Between wiring harness between M15 (female) (4) and M10 (female) (3) and ground	Resistance	Min. 1 MΩ
			Between wiring harness between M16 (female) (2) and starting motor terminal S and ground	Resistance	Min. 1 MΩ
			Between wiring harness between R6 (female) (4) and R1 (female) (4) and ground	Resistance	Min. 1 MΩ
			Between wiring harness between R6 (female) (1) and F32 (female) (3) and ground	Resistance	Min. 1 MΩ
			Between wiring harness between R6 (female) (2) and F32 (female) (8) and ground	Resistance	Min. 1 MΩ
			Between wiring harness between T-F4 and F32 (female) (11) and ground	Resistance	Min. 1 MΩ

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Machine model				PC45MR-3	
				Canopy specification	Cab specification
Serial number				5001 and up	
Engine	Model			4D88E-6	
	Type			4-cycle, water cooled, in-line direct injection type	
	No. of cylinders – bore x stroke		mm	4 – 88 × 90	
	Piston displacement		l {cc}	2.189 {2,189}	
	Performance	Flywheel horsepower	kW/rpm {HP/rpm}	28.5 / 2,400 {38.2 / 2,400}	
		Maximum torque	Nm/rpm {kgm/rpm}	137 / 1,440 {14.0 / 1,440}	
		High idle speed	rpm	2,550	
		Low idle speed	rpm	1,175	
	Starting motor			12 V, 2.3 kW	
	Alternator			12 V, 40 A	
	Battery (*1)			12 V, 72 Ah × 1 (115D31L)	
	Radiator • Core type			CF68-4	
Undercarriage	Carrier roller			1 on each side	
	Track roller			4 on each side	
	Track shoe (Rubber shoe)			Unit-type rubber crawler	
	Track shoe (Steel shoe)			Assembly-type double grouser: 39 each side	
Hydraulic system	Hydraulic pump	Type x no.		Variable displacement piston type × 1, gear type × 1	
		Theoretical capacity	cm^3/rev	22.3 × 2 + 14.1 + 5.2	
		Set pressure			
		For travel, work equipment	MPa {kg/cm^2}	26.5 {270}	
		For swing	MPa {kg/cm^2}	18.6 {190}	
		For blade	MPa {kg/cm^2}	21.6 {220}	
	Control valve	Type x no.		9-spool type × 1	
		Control method		Hydraulic assist type	
	Hydraulic motor	Travel motor		Variable-displacement piston motor (with counter-balance valve, parking brake) × 2	
		Swing motor		Fixed-displacement piston motor (with brake valve, swing shaft brake) × 1	
	Hydraulic tank			Box-shaped, open type	
	Hydraulic oil filter			Tank return side	
	Hydraulic oil cooler			Air cooled (CF40-1)	

*1: The battery capacity (Ah) is based on 5-hour rate.

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Table of contents

00 Index and foreword
100 Index SEN04599-02
Composition of shop manual ... 2
Table of contents ... 4
200 Foreword and general information SEN04600-00
Safety notice ... 2
How to read the shop manual ... 7
Explanation of terms for maintenance standard ... 9
Handling of electric equipment and hydraulic component ... 11
Handling of connectors newly used for engines ... 20
How to read electric wire code ... 23
Precautions when carrying out operation ... 26
Method of disassembling and connecting push-pull type coupler ... 29
Standard tightening torque table ... 32
Conversion table ... 36

01 Specification
100 Specification and technical data SEN04602-00
Specification dimension drawing ... 2
Working range drawing ... 3
Specifications ... 4
Weight table ... 10
Table of fuel, coolant and lubricants ... 14

10 Structure, function and maintenance standard
100 Engine and cooling system SEN04604-00
PTO ... 2
Cooling system ... 4
200 Power train SEN04605-00
Power train ... 2
Swing circle ... 3
Swing machinery ... 4
300 Undercarriage and frame SEN04606-00
Track frame ... 2
Idler cushion ... 3
Idler ... 4
Track roller ... 6
Carrier roller ... 7
Sprocket ... 8
Track shoe ... 9
410 Hydraulic system, Part 1 SEN04607-00
Hydraulic components layout drawing ... 2
Hydraulic tank, filter ... 3
Center swivel joint ... 5
Travel motor ... 6
Hydraulic cylinder ... 14
Solenoid valve ... 18
Multi-control valve ... 21
420 Hydraulic system, Part 2 SEN04608-00
Hydraulic pump ... 2
Control valve ... 10

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Safety notice

(Rev. 2008/02)

Important safety notice

Proper service and repair are 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.

1. General precautions

⚠ **Mistakes in operation are extremely dangerous. Read the Operation and Maintenance Manual carefully before operating the machine. In addition, read this manual and understand its contents before starting the work.**

1) Before carrying out any greasing or repairs, read all the safety plates stuck to the machine. For the locations of the safety plates and detailed explanation of precautions, see the Operation and Maintenance Manual.
2) 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, water, or oil on the floor. Smoke only in the areas provided for smoking. Never smoke while working.
3) 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.
4) When carrying out any operation with 2 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 warning signs in the operator's compartment.
5) Only qualified workers must carry out work and operation which require license or qualification.
6) Keep all tools in good condition, learn the correct way to use them, and use the proper ones of them. Before starting work, thoroughly check the tools, machine, forklift, service car, etc.
7) If welding repairs are needed, always have a trained and experienced welder carry out the work. When carrying out welding work, always wear welding gloves, apron, shielding goggles, cap and other clothes suited for welding work.
8) Before starting work, warm up your body thoroughly to start work under good condition.
9) Avoid continuing work for long hours and take rests at proper intervals to keep your body in good condition. Take rests in specified safe places.

Safety points

1	Good arrangement
2	Correct work clothes
3	Following work standard
4	Making and checking signs
5	Prohibition of operation and handling by unlicensed workers
6	Safety check before starting work
7	Wearing protective goggles (for cleaning or grinding work)
8	Wearing shielding goggles and protectors (for welding work)
9	Good physical condition and preparation
10	Precautions against work which you are not used to or you are used to too much

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400 Undercarriage and frame ..... SEN04657-00 ○
500 Hydraulic system ..... SEN04658-00 ○
600 Work equipment ..... SEN04659-00 ○
700 Cab and its attachments ..... SEN04660-00 ○
800 Electrical system ..... SEN04661-00 ○

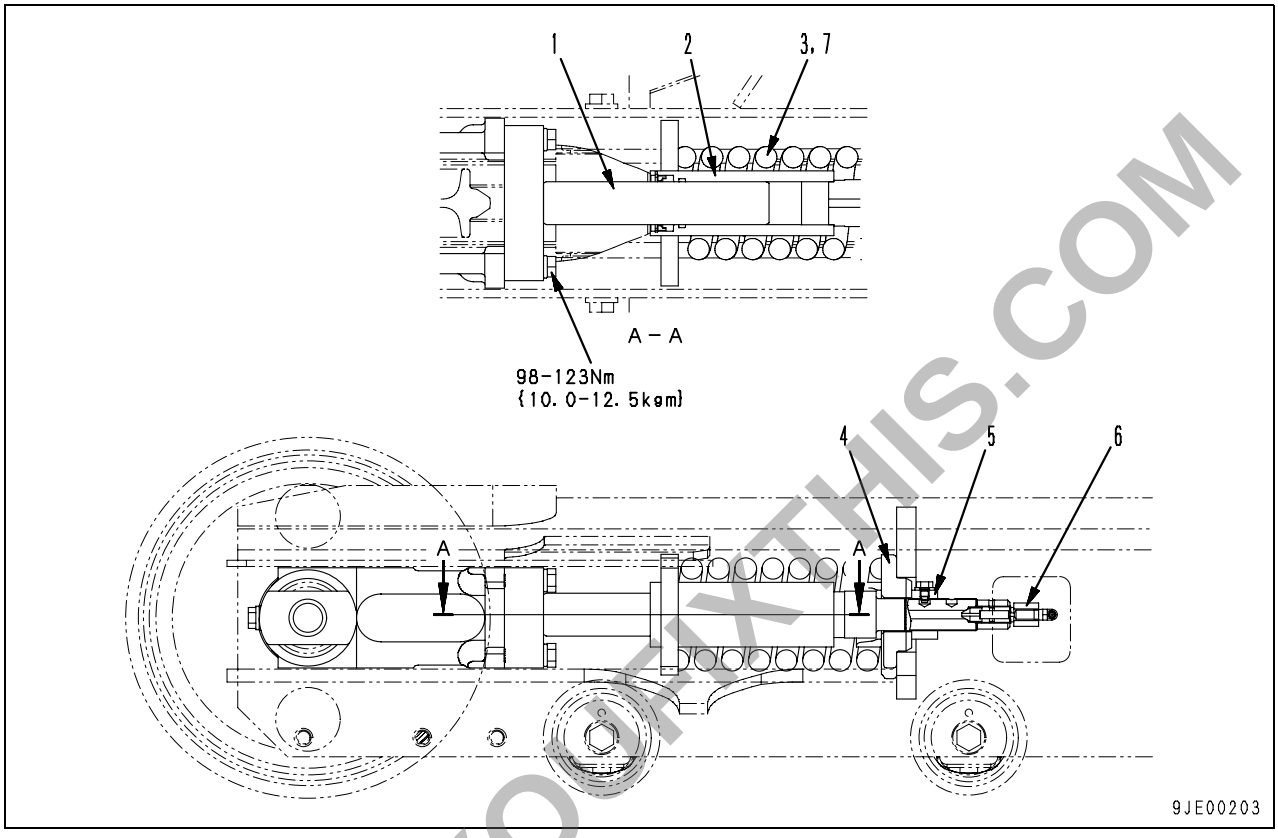
90 Diagrams and drawings SEN04617-01
100 Hydraulic diagrams and drawings SEN04618-00
200 Electrical diagrams and drawings SEN04619-01

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Idler cushion

★ The following figure shows the rubber shoe specification.



1. Rod
2. Cylinder
3. Recoil spring
4. Rear support
5. Nut
6. Lubricator

Specifications

Grease: G2-LI
Amount of grease (mℓ): 120

Unit: mm

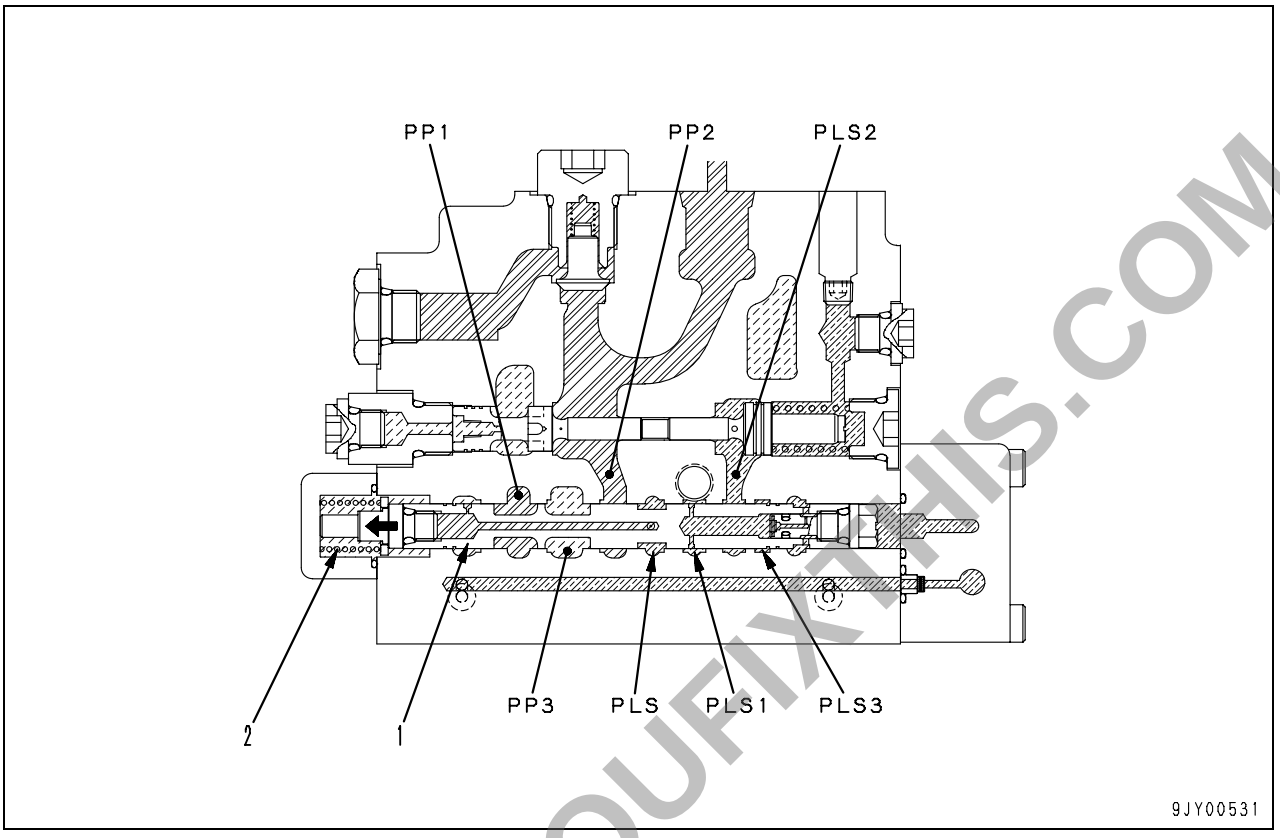
No.	Check item	Criteria					Remedy
		Standard clearance			Repair limit		
		Free length	Installed length	Installed load	Free length	Installed load	
7	Recoil spring (Rubber shoe spec.)	302	202.2	42.4 kN {4,326 kg}	294	39.0 kN {3,980 kg}	Replace
	Recoil spring (Steel shoe spec.)	302	238.2	27.0 kN {2,748 kg}	294	24.0 kN {2,446 kg}	

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Merge-divider valve

When machine travels singly



Function

- When the machine travels singly, the merge-divider valve spool separates pump pressures (PP1) and (PP2).

Operation

- When the machine travels singly, the travel port pressure is applied through the logic valve spool to the right side of merge-divider valve spool (1). If this pressure exceeds the force of spring (2), merge-divider valve spool (1) is pushed to the right and left to separate pump pressures (PP1), (PP2) and (PP3).
- At this time, LS pressures (PLS1), (PLS2) and (PLS3) are also separated from each other. The pump pressure is output to output pressure (PLS) applied to the pump LS valve.

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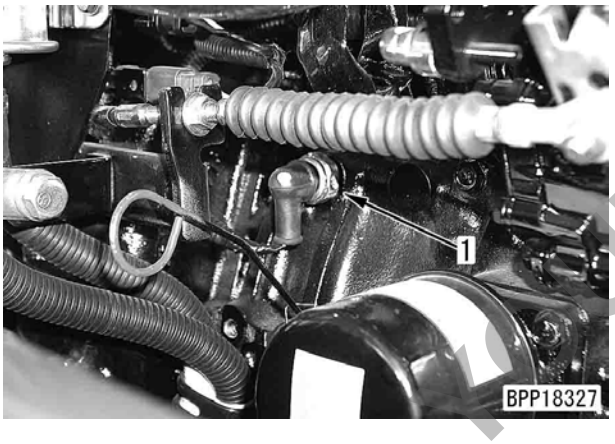
Testing engine oil pressure

★ Measuring instruments for engine oil pressure

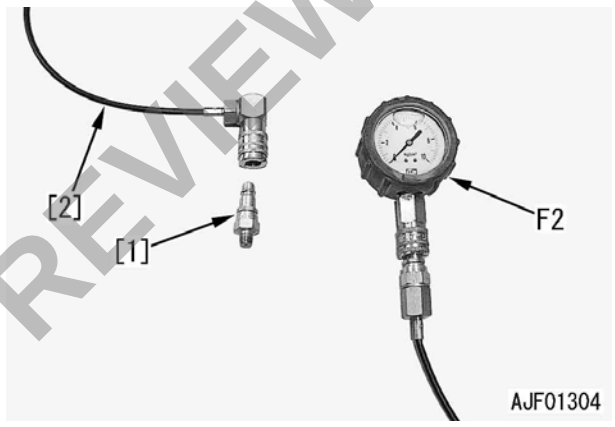
Symbol		Part No.	Part Name
F	1	799-101-5002	Oil pressure gauge kit (Analog)
		790-261-1204	Oil pressure gauge kit (Digital)
	2	799-401-2320	Oil pressure gauge

★ Measure the engine oil pressure under the following condition.
- Coolant temperature: Within operating range

1. Open the engine side cover and remove engine oil pressure switch (1).



2. Install nipple [1] of oil pressure gauge kit **F1** and connect oil pressure gauge **F2** (1 MPa {10 kg/cm²}) by hose [2].

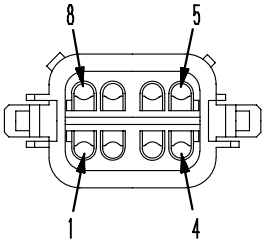
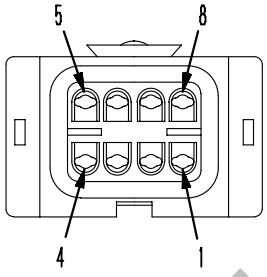
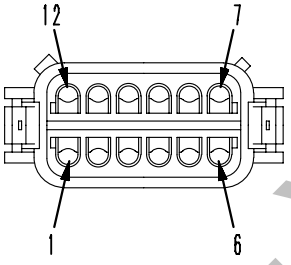
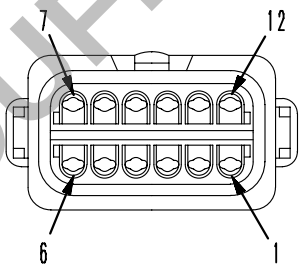


3. Start the engine and measure the oil pressure at low idle and high idle.

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[The pin No. is also marked on the connector (electric wire insertion end)]

No. of pins	DT Series connector		
	Body (plug)	Body (receptacle)	T-adapter Part No.
8	 BWP05045	 BWP05046	8GR:799-601-9060 8B: 799-601-9070 8G: 799-601-9080 8BR:799-601-9090
	Part No. :08192-1820□ (normal type) 08192-2820□ (fine wire type)	Part No. :08192-1810□ (normal type) 08192-2810□ (fine wire type)	
12	 BWP05047	 BWP05048	12GR:799-601-9110 12B: 799-601-9120 12G: 799-601-9130 12BR:799-601-9140
	Part No. :08192-1920□ (normal type) 08192-2920□ (fine wire type)	Part No. :08192-1910□ (normal type) 08192-2910□ (fine wire type)	

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3) Speed or power of swing and blade is low

Failure information	• Speed or power of swing and blade is low.
Relative information	• Before starting troubleshooting, check that the oil level in the hydraulic tank is proper. • When starting troubleshooting, warm up the hydraulic oil to 45 – 55°C. • If a phenomenon disappears as the engine speed is increased, it is not a fault.

	Causes		Standard value in normalcy and references for troubleshooting	
Presumed cause and standard value in normalcy	1	Defective adjustment or malfunction of gear pump relief valve	★ Prepare with engine stopped, then run engine at full throttle and carry out troubleshooting.	
			Control lever	Main relief pressure
			Relieve blade lower circuit	$21.6^{+0.98}_{-0.49}$ MPa {220^{+10}_{-5} kg/cm²}
			If the oil pressure does not become normal after adjustment, the gear pump relief valve may have a malfunction or a defect in it. Check it directly.	
	2	Defective gear pump	If the condition does not become normal after the relief valve is adjusted or replaced, the performance of the gear pump may be lowered.	

4) Speed or power of whole work equipment and blade is low

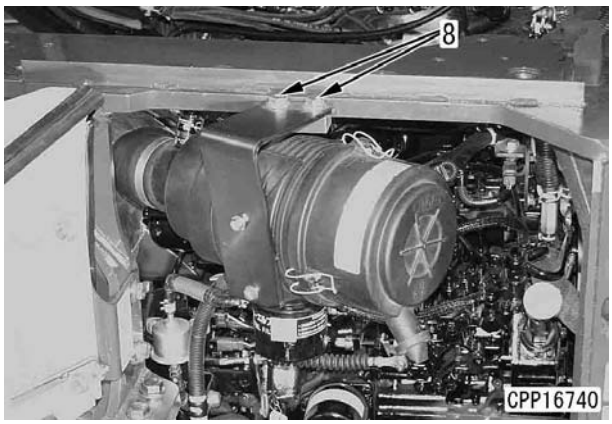
Failure information	• Speed or power of whole work equipment and blade is low.
Relative information	• Before starting troubleshooting, check that the oil level in the hydraulic tank is proper. • When starting troubleshooting, warm up the hydraulic oil to 45 – 55°C. • If a phenomenon disappears as the engine speed is increased, it is not a fault.

	Causes		Standard value in normalcy and references for troubleshooting	
Presumed cause and standard value in normalcy	1	Defective centralized safety valves	★ Prepare with engine stopped, then run engine at full throttle and carry out troubleshooting.	
			Control lever	Main pump pressure and gear pump relief pressure
			• Work equipment control lever (Both directions) • Swing control lever (Right swing)	26.5 ± 0.98 MPa {270 ± 10 kg/cm²}
			• Blade control lever (Lower)	$21.6^{+0.98}_{-0.49}$ MPa {220^{+10}_{-5} kg/cm²}
			If the oil pressure is lower through all of the above measurements, the centralized safety valves may be defective. Check them directly. ★ The centralized safety valves act on both sides of the boom, arm, and bucket, on the head side of the boom swing, and on the bottom side of the blade.	

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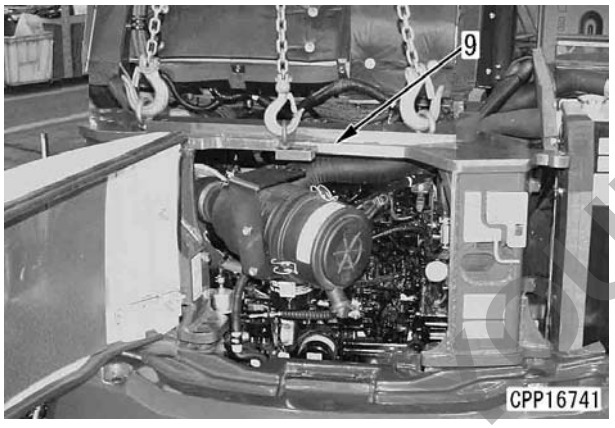
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8. Remove 2 air cleaner mounting bolts (8).

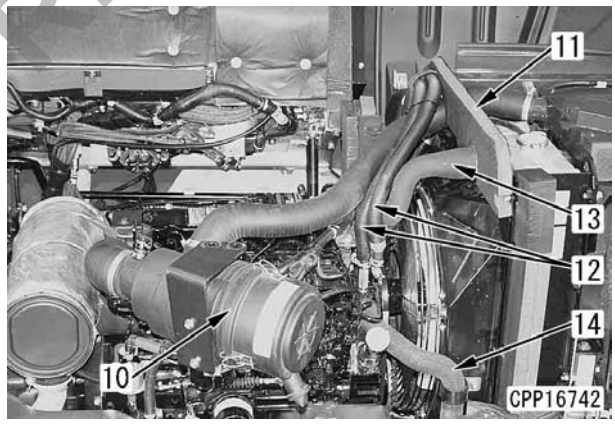


9. Remove guard assembly (9).

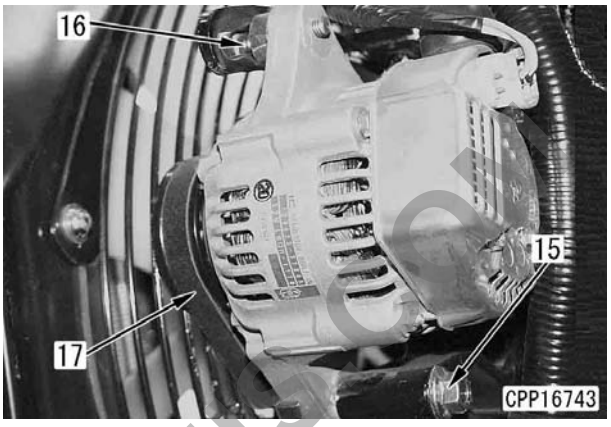
Guard assembly: **45 kg**



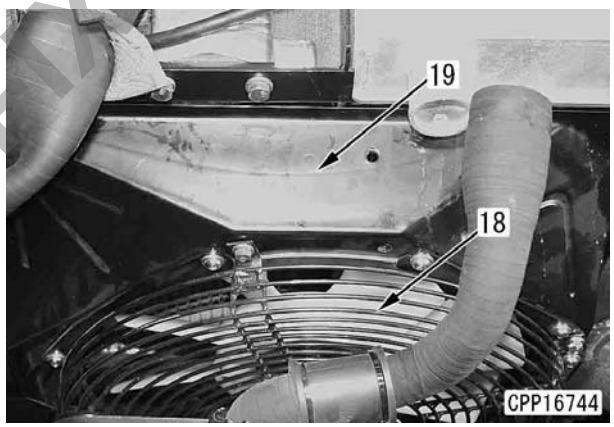
10. Remove air cleaner assembly (10). [*1]
11. Remove cover (11).
12. Disconnect 2 heater hoses (12).
13. Disconnect radiator upper hose (13) from the radiator.
14. Disconnect radiator lower hose (14) from the water pump.



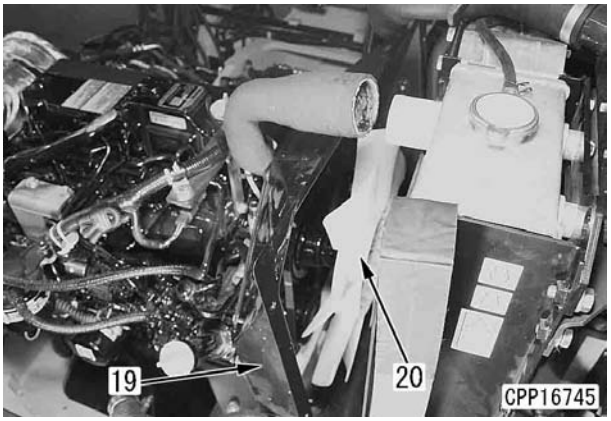
15. Loosen alternator fixing bolt (15) and belt tension adjustment bolt (16) to remove alternator belt (17).



16. Remove fan guard (18).
17. Remove all the mounting bolts of fan shroud (19).



18. Remove fan pulley assembly (20).
19. Remove fan shroud (19).



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