

GROUP 2 TIGHTENING TORQUE

1. MAJOR COMPONENT

No.	Descriptions	Bolt size	Torque		
			kgf · m	lbf · ft	
1	Engine	Engine mounting bolt, nut	M22 × 2.5	76.0±8.5	549.7±61.5
2		Radiator mounting bolt, nut	M12 × 1.75	12.2±1.3	88.2±9.4
3		Coupling mounting socket bolt	M16 × 2.0	22.1±2.4	159.8±17.4
4		Main pump housing mounting bolt	M10 × 1.5	2.8±0.3	20.3±2.2
5	Hydraulic system	Main pump mounting socket bolt	M20 × 2.5	42.0±4.5	303.8±32.5
6		Main control valve mounting bolt	M12 × 1.75	10.2±1.0	73.8±7.2
7		Fuel tank mounting bolt	M20 × 2.5	46.0±5.1	332.7±36.9
8		Hydraulic tank mounting bolt	M20 × 2.5	46.0±5.1	332.7±36.9
9		Turning joint mounting bolt	M12 × 1.75	12.2±1.3	88.2±9.4
10	P/Train system	Swing motor mounting bolt	M16 × 2.0	29.6±3.2	214.1±23.1
11		Swing bearing upper mounting bolt	M18 × 2.5	41.3±4.5	298.7±32.5
12		Swing bearing lower mounting bolt	M16 × 1.5	31.3±3.2	266.4±23.1
13		Travel motor mounting bolt	M16 × 2.0	23.0±2.5	166.4±18.1
14		Sprocket mounting bolt	M16 × 2.0	23.0±2.5	166.4±18.1
15	Under carriage	Upper roller mounting bolt	M16 × 2.0	21.0±2.3	151.9±16.6
16		Lower roller mounting bolt	M16 × 2.0	54.7±6.0	395.6±43.4
17		Track adjuster cylinder bolt	M16 × 2.0	29.6±3.2	214.1±23.1
18		Track chain and shoe mounting bolt, nut	9/16-18UNF	39.0±4.0	282.1±28.9
19		Track guard mounting bolt	M16 × 2.0	24.5±3.0	177.2±21.7
20	Others	Counter weight mounting bolt	M27 × 3.0	140.0±15	1012.6±108.5
21		Cab mounting bolt, nut	M20 × 2.5	57.9±6.4	418.8±46.3

※ For tightening torque of engine and hydraulic components, see each components disassembly and assembly.

2. TORQUE CHART

The torques given are standard figures. Any figures specifically described in this manual has priority.

1) METRIC BOLT-coarse thread

Bolt size	8T		10T	
	kgf · m	lbf · ft	kgf · m	lbf · ft
M 6 × 1.0	0.9 ~ 1.3	6.5 ~ 9.4	1.1 ~ 1.7	8.0 ~ 12.3
M 8 × 1.25	2.0 ~ 3.0	14.5 ~ 21.7	2.7 ~ 4.1	19.5 ~ 29.7
M10 × 1.5	4.0 ~ 6.0	28.9 ~ 43.4	5.5 ~ 8.3	39.8 ~ 60.0
M12 × 1.75	7.4 ~ 11.2	53.5 ~ 81.0	9.8 ~ 15.8	70.9 ~ 114.3
M14 × 2.0	12.2 ~ 16.6	88.2 ~ 120.0	16.7 ~ 22.5	120.8 ~ 162.7
M16 × 2.0	18.6 ~ 25.2	134.5 ~ 182.3	25.2 ~ 34.2	182.3 ~ 247.4
M18 × 2.0	25.8 ~ 35.0	186.6 ~ 253.2	35.1 ~ 47.5	253.9 ~ 343.6
M20 × 2.5	36.2 ~ 49.0	261.8 ~ 354.4	49.2 ~ 66.6	355.9 ~ 481.7
M22 × 2.5	48.3 ~ 63.3	349.4 ~ 457.8	65.8 ~ 98.0	475.9 ~ 708.8
M24 × 3.0	62.5 ~ 84.5	452.1 ~ 611.2	85.0 ~ 115.0	614.8 ~ 831.8
M30 × 3.0	124.1 ~ 167.9	897.6 ~ 1214.4	169.1 ~ 228.9	1223.1 ~ 1655.6
M36 × 4.0	174.3 ~ 235.6	1260.7 ~ 1704.0	250.0 ~ 310.0	1808.3 ~ 2242.2

2) METRIC BOLT-fine thread

Bolt size	8T		10T	
	kgf · m	lbf · ft	kgf · m	lbf · ft
M 8 × 1.0	2.2 ~ 3.4	15.9 ~ 24.6	3.0 ~ 4.4	21.7 ~ 31.8
M10 × 1.2	4.5 ~ 6.7	32.5 ~ 48.5	5.9 ~ 8.9	42.7 ~ 64.4
M12 × 1.25	7.8 ~ 11.6	56.4 ~ 83.9	10.6 ~ 16.0	76.7 ~ 115.7
M14 × 1.5	13.3 ~ 18.1	96.2 ~ 130.9	17.9 ~ 24.1	129.5 ~ 174.3
M16 × 1.5	19.9 ~ 26.9	143.9 ~ 194.6	26.6 ~ 36.0	192.4 ~ 260.4
M18 × 1.5	28.6 ~ 43.6	206.9 ~ 315.4	38.4 ~ 52.0	277.7 ~ 376.1
M20 × 1.5	40.0 ~ 54.0	289.3 ~ 390.6	53.4 ~ 72.2	386.2 ~ 522.2
M22 × 1.5	52.7 ~ 71.3	381.2 ~ 515.7	70.7 ~ 95.7	511.4 ~ 692.2
M24 × 2.0	67.9 ~ 91.9	491.1 ~ 664.7	90.9 ~ 123.1	657.5 ~ 890.4
M30 × 2.0	136.9 ~ 185.1	990.2 ~ 1338.8	181.7 ~ 248.3	1314.2 ~ 1796.0
M36 × 3.0	192.1 ~ 259.9	1389.5 ~ 1879.9	261.8 ~ 354.2	1893.6 ~ 2561.9

3) PIPE & HOSE

Thread size	Width across flat(mm)	kgf · m	lbf · ft
1/4"	19	3	21.7
3/8"	22	4	28.9
1/2"	27	5	36.2
3/4"	36	12	86.8
1"	41	14	101.3

4) FITTING

Thread size	Width across flat(mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	6	43.4
3/4"	36	13	94.0
1"	41	15	108.5