

GROUP 2 TIGHTENING TORQUE

1. MAJOR COMPONENTS

| No. | Descriptions | Bolt size | Torque | | |
|-----|------------------|--|------------|----------|--------------|
| | | | kgf · m | lbf · ft | |
| 1 | Engine | Engine mounting bolt, nut | M16 × 2.0 | 10 | 72.3 |
| 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±17.3 |
| 4 | | Main pump housing mounting bolt | M10 × 1.5 | 4.8±0.3 | 34.7±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 | 12.2±1.3 | 88.2±9.4 |
| 7 | | Fuel tank mounting bolt | M20 × 2.5 | 46.0±5.1 | 332.7±36.9 |
| 8 | | Hydraulic oil tank mounting bolt | M20 × 2.5 | 46.0±5.1 | 332.7±36.9 |
| 9 | | Turning joint mounting bolt, nut | M16 × 2.0 | 29.6±3.2 | 214.1±23.1 |
| 10 | P/Train system | Swing motor mounting bolt | M20 × 2.5 | 57.8±6.4 | 418±46.3 |
| 11 | | Swing bearing upper part mounting bolt | M20 × 2.5 | 57.8±6.4 | 418±46.3 |
| 12 | | Swing bearing lower part mounting bolt | M20 × 2.5 | 57.8±6.4 | 418±46.3 |
| 13 | | Travel motor mounting bolt | M16 × 2.0 | 23±2.5 | 166.4±18.1 |
| 14 | | Sprocket mounting bolt | M16 × 2.0 | 23±2.5 | 166.4±18.1 |
| 15 | Under carriage | Carrier roller mounting bolt | M16 × 2.0 | 29.6±3.2 | 214.1±23.1 |
| 16 | | Track roller mounting bolt | M18 × 2.5 | 41.3±5.0 | 298.7±36.2 |
| 17 | | Track tension cylinder mounting bolt | M16 × 2.0 | 29.6±3.2 | 214.1±23.1 |
| 18 | | Track shoe mounting bolt, nut | M20 × 1.5 | 81±4.0 | 585.9±28.9 |
| 19 | | Track guard mounting bolt | M18 × 2.5 | 41.3±5.0 | 298.7±36.2 |
| 20 | Others | Counter weight mounting bolt | M30 × 3.5 | 199±29 | 1439.4±209.8 |
| 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 | A8.0 ~ 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 × 2.5 | 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 × 3.5 | 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 × 1.25 | 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 ~ 21.1 | 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 |