

## 2. TIGHTENING TORQUE

Use following table for unspecified torque.

### 1) BOLT AND NUT

#### (1) 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  |
| M14 × 2.0  | 12.2 ~ 16.6 | 88.2 ~ 120  | 16.7 ~ 22.5 | 121 ~ 163   |
| M16 × 2.0  | 18.6 ~ 25.2 | 135 ~ 182   | 25.2 ~ 34.2 | 182 ~ 247   |
| M18 × 2.0  | 25.8 ~ 35.0 | 187 ~ 253   | 35.1 ~ 47.5 | 254 ~ 344   |
| M20 × 2.5  | 36.2 ~ 49.0 | 262 ~ 354   | 49.2 ~ 66.6 | 356 ~ 482   |
| M22 × 2.5  | 48.3 ~ 63.3 | 349 ~ 458   | 65.8 ~ 98.0 | 476 ~ 709   |
| M24 × 3.0  | 62.5 ~ 84.5 | 452 ~ 611   | 85.0 ~ 115  | 615 ~ 832   |
| M30 × 3.0  | 124 ~ 168   | 898 ~ 1214  | 169 ~ 229   | 1223 ~ 1656 |
| M36 × 4.0  | 174 ~ 236   | 1261 ~ 1704 | 250 ~ 310   | 1808 ~ 2242 |

#### (2) 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 ~ 116  |
| M14 × 1.5  | 13.3 ~ 18.1 | 96.2 ~ 131  | 17.9 ~ 24.1 | 130 ~ 174   |
| M16 × 1.5  | 19.9 ~ 26.9 | 144 ~ 195   | 26.6 ~ 36.0 | 192 ~ 260   |
| M18 × 1.5  | 28.6 ~ 43.6 | 207 ~ 315   | 38.4 ~ 52.0 | 278 ~ 376   |
| M20 × 1.5  | 40.0 ~ 54.0 | 289 ~ 391   | 53.4 ~ 72.2 | 386 ~ 522   |
| M22 × 1.5  | 52.7 ~ 71.3 | 381 ~ 516   | 70.7 ~ 95.7 | 511 ~ 692   |
| M24 × 2.0  | 67.9 ~ 91.9 | 491 ~ 665   | 90.9 ~ 123  | 658 ~ 890   |
| M30 × 2.0  | 137 ~ 185   | 990 ~ 1339  | 182 ~ 248   | 1314 ~ 1796 |
| M36 × 3.0  | 192 ~ 260   | 1390 ~ 1880 | 262 ~ 354   | 1894 ~ 2562 |

**2) PIPE AND HOSE(FLARE TYPE)**

| Thread size(PF) | Width across flat(mm) | kgf · m | lbf · ft |
|-----------------|-----------------------|---------|----------|
| 1/4"            | 19                    | 4       | 28.9     |
| 3/8"            | 22                    | 5       | 36.2     |
| 1/2"            | 27                    | 9.5     | 68.7     |
| 3/4"            | 36                    | 18      | 130      |
| 1"              | 41                    | 21      | 152      |
| 1-1/4"          | 50                    | 35      | 253      |

**3) PIPE AND HOSE(ORFS TYPE)**

| Thread size(UNF) | Width across flat(mm) | kgf · m | lbf · ft |
|------------------|-----------------------|---------|----------|
| 9/16-18          | 19                    | 4       | 28.9     |
| 11/16-16         | 22                    | 5       | 36.2     |
| 13/16-16         | 27                    | 9.5     | 68.7     |
| 1-3/16-12        | 36                    | 18      | 130      |
| 1-7/16-12        | 41                    | 21      | 152      |
| 1-11/16-12       | 50                    | 35      | 253      |

**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                    | 9.5     | 68.7     |
| 3/4"        | 36                    | 18      | 130      |
| 1"          | 41                    | 21      | 152      |
| 1-1/4"      | 50                    | 35      | 253      |

#### 4) TIGHTENING TORQUE OF MAJOR COMPONENT

| No. | Descriptions       |                                        | Bolt size  | Torque      |              |
|-----|--------------------|----------------------------------------|------------|-------------|--------------|
|     |                    |                                        |            | kgf · m     | lbf · ft     |
| 1   | Engine             | Engine mounting bolt, nut              | M22 × 2.5  | 47.5 ± 2.5  | 344 ± 18.1   |
| 2   |                    | Radiator mounting bolt                 | M12 × 1.75 | 12.2 ± 1.3  | 88.2 ± 9.4   |
| 3   |                    | Coupling mounting socket bolt          | M20 × 2.5  | 42 ± 4.5    | 304 ± 33     |
| 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 ± 4.5    | 304 ± 33     |
| 6   |                    | Main control valve mounting nut        | M12 × 1.75 | 12.2 ± 1.3  | 88.2 ± 9.4   |
| 7   |                    | Fuel tank mounting bolt                | M20 × 2.5  | 46 ± 5.0    | 333 ± 36     |
| 8   |                    | Hydraulic oil tank mounting bolt       | M20 × 2.5  | 46 ± 5.0    | 333 ± 36     |
| 9   |                    | Turning joint mounting bolt, nut       | M12 × 1.75 | 12 ± 1.3    | 86.8 ± 9.4   |
| 10  | Power 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    | 166.3 ± 18.1 |
| 14  |                    | Sprocket mounting bolt                 | M16 × 2.0  | 23 ± 2.5    | 166.3 ± 18.1 |
| 15  | Under carriage     | Carrier roller mounting bolt, nut      | M16 × 2.0  | 29.7 ± 4.4  | 215 ± 31.8   |
| 16  |                    | Track roller mounting bolt             | M20 × 2.5  | 54.7 ± 5.0  | 396 ± 36.2   |
| 17  |                    | Track tension cylinder mounting bolt   | M16 × 2.0  | 29.6 ± 3.2  | 214 ± 23.1   |
| 18  |                    | Track shoe mounting bolt, nut          | M20 × 1.5  | 81 ± 4.0    | 586 ± 28.9   |
| 19  |                    | Track guard mounting bolt              | M24 × 3.0  | 94.5 ± 10.5 | 684 ± 76     |
| 20  | Others             | Counter weight mounting bolt           | M36 × 3.0  | 308 ± 46    | 2228 ± 333   |
| 21  |                    | Cab mounting bolt                      | M12 × 1.75 | 12.2 ± 1.3  | 88.2 ± 9.4   |
| 22  |                    | Operator's seat mounting bolt          | M 8 × 1.25 | 1.17 ± 0.1  | 8.5 ± 0.7    |

※ For tightening torque of engine and hydraulic components, see engine maintenance guide and service manual.