

## 2. TIGHTENING TORQUE

Use following table for unspecified torque.

### 1) BOLT AND NUT

#### (1) Coarse thread

| Bolt size  | 8T          |             | 10T         |             |
|------------|-------------|-------------|-------------|-------------|
|            | kg · m      | lb · ft     | kg · m      | lb · ft     |
| M 6 × 1.0  | 0.85 ~ 1.25 | 6.15 ~ 9.04 | 1.14 ~ 1.74 | 8.2 ~ 12.6  |
| M 8 × 1.25 | 2.0 ~ 3.0   | 14.5 ~ 21.7 | 2.73 ~ 4.12 | 19.5 ~ 29.8 |
| M10 × 1.5  | 4.0 ~ 6.0   | 28.9 ~ 43.4 | 5.5 ~ 8.3   | 39.8 ~ 60   |
| M12 × 1.75 | 7.4 ~ 11.2  | 53.5 ~ 79.5 | 9.8 ~ 15.8  | 71 ~ 114    |
| M14 × 2.0  | 12.2 ~ 16.6 | 88.2 ~ 120  | 16.7 ~ 22.5 | 121 ~ 167   |
| M16 × 2.0  | 18.6 ~ 25.2 | 135 ~ 182   | 25.2 ~ 34.2 | 182 ~ 247   |
| M18 × 2.5  | 25.8 ~ 35.0 | 187 ~ 253   | 35.1 ~ 47.5 | 254 ~ 343   |
| M20 × 2.5  | 36.2 ~ 49.0 | 262 ~ 354   | 49.2 ~ 66.6 | 356 ~ 482   |
| M22 × 2.5  | 48.3 ~ 63.3 | 350 ~ 457   | 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 ~ 1655 |
| M36 × 4.0  | 174 ~ 236   | 1261 ~ 1703 | 250 ~ 310   | 1808 ~ 2242 |

#### (2) Fine thread

| Bolt size  | 8T           |             | 10T         |             |
|------------|--------------|-------------|-------------|-------------|
|            | kg · m       | lb · ft     | kg · m      | lb · ft     |
| M 8 × 1.0  | 2.17 ~ 3.37  | 15.7 ~ 24.3 | 3.04 ~ 4.44 | 22.0 ~ 32.0 |
| M10 × 1.25 | 4.46 ~ 6.66  | 32.3 ~ 48.2 | 5.93 ~ 8.93 | 42.9 ~ 64.6 |
| M12 × 1.25 | 7.78 ~ 11.58 | 76.3 ~ 83.7 | 10.6 ~ 16.0 | 76.6 ~ 115  |
| M14 × 1.5  | 13.3 ~ 18.1  | 96.2 ~ 130  | 17.9 ~ 24.1 | 130 ~ 174   |
| M16 × 1.5  | 19.9 ~ 26.9  | 144 ~ 194   | 26.6 ~ 36.0 | 193 ~ 260   |
| M18 × 1.5  | 28.6 ~ 43.6  | 207 ~ 315   | 38.4 ~ 52.0 | 278 ~ 376   |
| M20 × 1.5  | 40.0 ~ 54.0  | 289 ~ 390   | 53.4 ~ 72.2 | 386 ~ 522   |
| M22 × 1.5  | 52.7 ~ 71.3  | 381 ~ 515   | 70.7 ~ 95.7 | 512 ~ 692   |
| M24 × 2.0  | 67.9 ~ 91.9  | 491 ~ 664   | 90.9 ~ 123  | 658 ~ 890   |
| M30 × 2.0  | 137 ~ 185    | 990 ~ 1338  | 182 ~ 248   | 1314 ~ 1795 |
| M36 × 3.0  | 192 ~ 260    | 1389 ~ 1879 | 262 ~ 354   | 1893 ~ 2561 |

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

| 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      |

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

| Thread size | 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      |

### 5) TIGHTENING TORQUE OF MAJOR COMPONENT

| No. | Descriptions       | Bolt size                                      | Torque    |            |             |
|-----|--------------------|--|-----------|------------|-------------|
|     |                    |  | kgf · m   | lbf · ft   |             |
| 1   | Engine             | Engine mounting bolt, nut (rubber, 4EA)        | M16×2.0   | 29.7 ± 4.5 | 215 ± 32.5  |
| 2   |                    | Engine mounting bolt (bracket)                 | M12×1.75  | 10.7 ± 1.6 | 77.4 ± 11.6 |
| 3   |                    | Radiator mounting bolt                         | M16×2.0   | 29.7 ± 4.5 | 215 ± 32.5  |
| 4   |                    | Fuel tank mounting bolt, nut                   | M16×2.0   | 29.7 ± 4.5 | 215 ± 32.5  |
| 5   |                    | Air cleaner mounting bolt                      | M 8×1.5   | 2.5 ± 0.5  | 18.1 ± 3.6  |
| 6   |                    | Muffler mounting nut                           | M12×1.75  | 10.7 ± 1.6 | 77.4 ± 11.6 |
| 7   | Hydraulic system   | Main pump housing mounting bolt                | M12×1.75  | 12.8 ± 3.0 | 92.6 ± 21.7 |
| 8   |                    | Fan & brake pump housing mounting bolt         | M10×1.5   | 6.9 ± 1.4  | 50 ± 10.1   |
| 9   |                    | Main control valve mounting bolt               | M10×1.5   | 6.9 ± 1.4  | 50 ± 10.1   |
| 10  |                    | Steering unit mounting bolt                    | M10×1.5   | 6.9 ± 1.4  | 50 ± 10.1   |
| 11  |                    | Stop valve mounting bolt                       | M10×1.5   | 6.9 ± 1.4  | 50 ± 10.1   |
| 12  |                    | Cushion valve mounting bolt                    | M8×1.25   | 2.5 ± 0.5  | 18.1 ± 3.6  |
| 13  |                    | Brake valve mounting bolt                      | M10×1.25  | 6.9 ± 1.4  | 50 ± 10.1   |
| 14  |                    | Cut-off valve mounting bolt                    | M12×1.75  | 12.8 ± 3.0 | 92.6 ± 21.7 |
| 15  |                    | Remote control lever mounting bolt             | M6×1.0    | 1.1 ± 0.2  | 8.0 ± 1.4   |
| 16  |                    | Safety valve mounting bolt                     | M10×1.5   | 6.9 ± 1.4  | 50 ± 10.1   |
| 17  |                    | Hydraulic oil tank mounting bolt               | M16×2.0   | 29.7 ± 4.5 | 215 ± 32.5  |
| 18  | Power train system | Transmission mounting bolt, nut (rubber, 4EA)  | M20×2.5   | 57.9 ± 8.7 | 419 ± 63    |
| 19  |                    | Transmission mounting bolt (bracket, T/C side) | M16×2.0   | 18.4 ± 2.0 | 133 ± 14.5  |
| 20  |                    | Front axle mounting bolt, nut                  | M24×2.0   | 100 ± 15   | 723 ± 108   |
| 21  |                    | Rear axle support mounting bolt, nut           | M24×2.0   | 100 ± 15   | 723 ± 108   |
| 22  |                    | Tire mounting nut                              | M22×1.5   | 79 ± 2.5   | 571 ± 18.1  |
| 23  |                    | Drive shaft joint mounting bolt, nut           | 3/8-24UNF | 2.8 ± 0.4  | 20.3 ± 2.9  |
| 24  | Others             | Counterweight mounting bolt                    | M30×3.5   | 199 ± 30   | 1439 ± 216  |
| 25  |                    | Operator's seat mounting bolt                  | M8×1.25   | 3.4 ± 0.8  | 24.6 ± 5    |
| 26  |                    | ROPS Cab mounting bolt (4EA)                   | M20×2.5   | 58 ± 8.7   | 419 ± 63    |