

# 9010 Excavator Service Manual

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# Section

# 1001

## STANDARD TORQUE SPECIFICATIONS FOR 9000 SERIES EXCAVATORS



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### TORQUE SPECIFICATIONS - DECIMAL HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers, dry, or when lubricated with engine oil. Not applicable if special graphites, molydisulfide greases, or other extreme pressure lubricants are used.

| Grade 5 Bolts, Nuts, and Studs                                                                                                                                                                                                                        |            |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
|    |            |               |
| Size                                                                                                                                                                                                                                                  | Pound-Feet | Newton metres |
| 1/4 in                                                                                                                                                                                                                                                | 9-11       | 12-15         |
| 5/16 in                                                                                                                                                                                                                                               | 17-21      | 23-28         |
| 3/8 in                                                                                                                                                                                                                                                | 35-42      | 48-57         |
| 7/16 in                                                                                                                                                                                                                                               | 54-64      | 73-87         |
| 1/2 in                                                                                                                                                                                                                                                | 80-96      | 109-130       |
| 9/16 in                                                                                                                                                                                                                                               | 110-132    | 149-179       |
| 5/8 in                                                                                                                                                                                                                                                | 150-180    | 203-244       |
| 3/4 in                                                                                                                                                                                                                                                | 270-324    | 366-439       |
| 7/8 in                                                                                                                                                                                                                                                | 400-480    | 542-651       |
| 1.0 in                                                                                                                                                                                                                                                | 580-696    | 787-944       |
| 1-1/8 in                                                                                                                                                                                                                                              | 800-880    | 1085-1193     |
| 1-1/4 in                                                                                                                                                                                                                                              | 1120-1240  | 1519-1681     |
| 1-3/8 in                                                                                                                                                                                                                                              | 1460-1680  | 1980-2278     |
| 1-1/2 in                                                                                                                                                                                                                                              | 1940-2200  | 2631-2983     |

| Grade 8 Bolts, Nuts, and Studs                                                                                                                                                                                                                             |            |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
|    |            |               |
| Size                                                                                                                                                                                                                                                       | Pound-Feet | Newton metres |
| 1/4 in                                                                                                                                                                                                                                                     | 12-15      | 16-20         |
| 5/16 in                                                                                                                                                                                                                                                    | 24-29      | 33-39         |
| 3/8 in                                                                                                                                                                                                                                                     | 45-54      | 61-73         |
| 7/16 in                                                                                                                                                                                                                                                    | 70-84      | 95-114        |
| 1/2 in                                                                                                                                                                                                                                                     | 110-132    | 149-179       |
| 9/16 in                                                                                                                                                                                                                                                    | 160-192    | 217-260       |
| 5/8 in                                                                                                                                                                                                                                                     | 220-264    | 298-358       |
| 3/4 in                                                                                                                                                                                                                                                     | 380-456    | 515-618       |
| 7/8 in                                                                                                                                                                                                                                                     | 600-720    | 814-976       |
| 1.0 in                                                                                                                                                                                                                                                     | 900-1080   | 1220-1465     |
| 1-1/8 in                                                                                                                                                                                                                                                   | 1280-1440  | 1736-1953     |
| 1-1/4 in                                                                                                                                                                                                                                                   | 1820-2000  | 2468-2712     |
| 1-3/8 in                                                                                                                                                                                                                                                   | 2380-2720  | 3227-3688     |
| 1-1/2 in                                                                                                                                                                                                                                                   | 3160-3560  | 4285-4827     |
| NOTE: Use thick nuts with Grade 8 bolts.                                                                                                                                                                                                                   |            |               |

## TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following torques when specifications are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or molydisulfide grease or oil is used.

| Grade 8.8 Bolts, Nuts, and Studs                                                  |            |               |
|-----------------------------------------------------------------------------------|------------|---------------|
|  |            |               |
| Size                                                                              | Pound-Feet | Newton metres |
| M6                                                                                | 6-7        | 8-9           |
| M8                                                                                | 14-17      | 20-23         |
| M10                                                                               | 29-34      | 39-46         |
| M12                                                                               | 50-59      | 68-80         |
| M16                                                                               | 128-149    | 173-202       |
| M20                                                                               | 249-291    | 337-393       |
| M22                                                                               | 342-399    | 464-541       |
| M24                                                                               | 431-503    | 584-681       |
| M27                                                                               | 637-743    | 864-1008      |
| M30                                                                               | 863-1007   | 1170-1365     |
| M33                                                                               | 1180-1377  | 1600-1867     |
| M36                                                                               | 1977-2307  | 2680-3127     |
| M42                                                                               | 2434-2840  | 3300-3850     |
| M45                                                                               | 3054-3563  | 4140-4830     |
| M48                                                                               | 3658-4268  | 4960-5787     |
| M52                                                                               | 4757-5549  | 6450-7525     |
| M56                                                                               | 5908-6893  | 8010-9345     |
| M64                                                                               | 8925-10413 | 12100-14117   |

| Grade 10.9 Bolts, Nuts, and Studs                                                   |             |               |
|-------------------------------------------------------------------------------------|-------------|---------------|
|  |             |               |
| Size                                                                                | Pound-Feet  | Newton metres |
| M6                                                                                  | 8-10        | 11-13         |
| M8                                                                                  | 20-24       | 28-32         |
| M10                                                                                 | 41-47       | 55-64         |
| M12                                                                                 | 71-83       | 96-112        |
| M16                                                                                 | 178-208     | 242-282       |
| M20                                                                                 | 350-408     | 475-554       |
| M22                                                                                 | 481-561     | 652-761       |
| M24                                                                                 | 606-707     | 821-958       |
| M27                                                                                 | 900-1050    | 1220-1423     |
| M30                                                                                 | 1217-1420   | 1650-1925     |
| M33                                                                                 | 1667-1945   | 2260-2637     |
| M36                                                                                 | 2124-2478   | 2880-3360     |
| M39                                                                                 | 2773-3235   | 3760-4387     |
| M42                                                                                 | 3422-3992   | 4640-5413     |
| M45                                                                                 | 4293-5009   | 5820-6790     |
| M48                                                                                 | 5141-5998   | 6970-8132     |
| M52                                                                                 | 6690-7805   | 9070-10582    |
| M56                                                                                 | 8334-9723   | 11300-13183   |
| M64                                                                                 | 12612-14714 | 17100-19950   |

### Grade 12.9 Bolts, Nuts, and Studs



Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

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