

Reusing screws and bolts is a safety risk and decreases fan reliability



Howden recommends never to reuse bolts and screws on rotating parts as this will increase the risk of equipment failure.

Reusing old bolts and screws may appear to be the easy and cheap solution. However, it is very important always to use new screws and bolts on rotating parts that have been exposed to dynamic forces. Once they have been under such exposure the fatigue lifetime is reduced.

If screws and bolts are reused it may result in equipment failure. Depending on where the bolt or screw is located, the failure may be more or less severe. The reasons for using new bolts and screws are obvious: it will add to the safety of the equipment and keep your staff safe.

A used bolt or screw may seem to be in perfect condition. Nevertheless, metal fatigue does not necessarily show and it may be tempting to reuse them if there is an urgent need for the fan to go back in operation, e.g after a fan outage.

You may also find a loose bolt which appears suitable for reuse while checking the torque during outage. However, reusing it may lead to fatigue failure, and broken bolts can cause fan vibration alarms and could eventually trip the fan.

Bolts and screws that have been exposed to dynamic forces will have a reduced lifetime which is why it is vital for the fan reliability and safety that all bolts and screws are replaced with new ones.

Bolts on static parts can normally be reused if there are no obvious defects.

How to assemble bolts and screws correctly

- Ensure metallic contact as this will avoid bolt fatigue and loose bolts.
- Use the specified lubricants or it will not be possible to obtain the required bolt pre-load.
- Torque screws and bolts according to manual.

Maintenance

We recommend that bolts are checked for torque and defects during inspection.

Replacing a bolt or screw that has a defect or that is not tightened correctly can save you time and costs. Also, the expenses for new screws and bolts are quite small compared to the potential consequences.

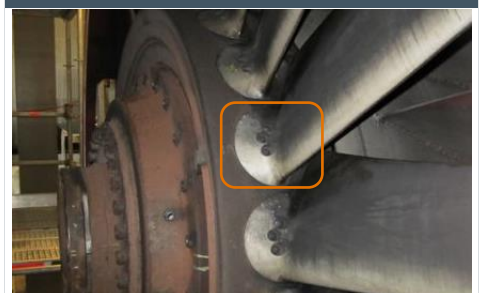
Legacy fans

The implications if you reuse blade bolts on legacy fans, e.g. N hubs, can be severe fan damage.

Due to the way the blades are mounted on legacy fans, there is a possibility that the blades may break off and damage the fan.

As the failure on legacy fans can be more critical in case of screw or bolt failure, it is of utmost importance always to use new screws and bolts on these fan types to keep people and equipment safe.

N hub fixed with blade screws



Tightening torques for screws and bolts in VARIAX® fans

| Torques in Nm/lbft for non-lubricated screws and bolts Lubricant: No lubricant or oil | | | | |
|--|-------------|-------------|-------------|-------------|
| Screw quality | 4,6 | 8,8 | 12,9 | 12,9 |
| Metric nut quality | 4 | 4 | 4 | 8 |
| <i>Numbers are shown as metric units / imperial units</i> | | | | |
| M6 | 5,9 / 4,3 | 8,8 / 6,4 | 11,5 / 8,4 | 14,5 / 10,6 |
| M8 | 14,5 / 10,6 | 21,5 / 15,8 | 28,5 / 21 | 37,5 / 27,6 |
| M10 | 27,5 / 20,2 | 43 / 31,7 | 53 / 39 | 72,5 / 53,4 |
| M12 | 49 / 36,1 | 73,5 / 54,2 | 93 / 68,5 | 123 / 90,7 |
| M16 | 118 / 87 | 181 / 133 | 231 / 170 | 304 / 224 |
| M20 | 235 / 173 | 353 / 260 | 441 / 325 | 589 / 434 |
| M24 | 392 / 289 | 589 / 434 | 736 / 542 | 981 / 723 |
| M27 | 540 / 398 | 850 / 626 | 1040 / 767 | 1390 / 1025 |
| M30 | 760 / 560 | 1170 / 862 | 1500 / 1106 | 1930 / 1423 |
| M36 | 1310 / 966 | 2020 / 1489 | 2530 / 1866 | 3330 / 2456 |
| M42 | 2060 / 1519 | 3180 / 2345 | 4000 / 2950 | 5300 / 3909 |

| Torques in Nm/lbft for lubricated screws and bolts Lubricant: Never Seez or molybdenum disulphide | | | | |
|--|-------------|-------------|-------------|-------------|
| Screw quality | 4,6 | 8,8 | 12,9 | 12,9 |
| Metric nut quality | 4 | 4 | 4 | 8 |
| <i>Numbers are shown as metric units / imperial units</i> | | | | |
| M6 | 3,9 / 2,8 | 6,9 / 5 | 8,8 / 6,4 | 11,5 / 8,4 |
| M8 | 8,8 / 6,4 | 17,5 / 12,9 | 21,5 / 15,8 | 29,5 / 21,7 |
| M10 | 16,5 / 12,1 | 34,5 / 25,4 | 43 / 31,7 | 59 / 43,5 |
| M12 | 29 / 21,3 | 59 / 43,5 | 73,5 / 54,2 | 98 / 72,2 |
| M16 | 70,5 / 51,9 | 147 / 108 | 181 / 133 | 245 / 180 |
| M20 | 141 / 103 | 284 / 209 | 353 / 260 | 491 / 362 |
| M24 | 235 / 173 | 491 / 362 | 589 / 434 | 834 / 615 |
| M27 | 325 / 239 | 685 / 505 | 860 / 634 | 1150 / 848 |
| M30 | 450 / 331 | 1017 / 750 | 1150 / 848 | 1600 / 1180 |
| M36 | 775 / 571 | 1778 / 1311 | 2020 / 1489 | 2680 / 1976 |
| M42 | 1220 / 899 | 2662 / 1963 | 3250 / 2397 | 4260 / 3142 |

| Compressive forces in kN/1000*lbft corresponding to the torques listed | | | | |
|--|-------------|-------------|-------------|------------|
| Screw quality | 4,6 | 8,8 | 12,9 | 12,9 |
| Metric nut quality | 4 | 4 | 4 | 8 |
| <i>Numbers are shown as metric units / imperial units</i> | | | | |
| M6 | 4,4 / 0,9 | 7,4 / 1,6 | 10,3 / 2,3 | 12,7 / 2,8 |
| M8 | 8,3 / 1,8 | 14,2 / 3,1 | 18 / 4 | 23,5 / 5,2 |
| M10 | 13,2 / 2,9 | 22 / 4,9 | 28 / 6,2 | 38 / 8,5 |
| M12 | 19,5 / 4,3 | 33 / 7,4 | 41,5 / 9,3 | 55 / 12,3 |
| M16 | 36,5 / 8,2 | 62 / 13,9 | 78,5 / 17,6 | 104 / 23,3 |
| M20 | 57 / 12,8 | 96,5 / 21,6 | 121 / 27,2 | 163 / 36,6 |
| M24 | 82,5 / 18,5 | 140 / 31,4 | 176 / 39,5 | 236 / 53 |
| M27 | 104 / 23,3 | 175 / 39,3 | 223 / 50,1 | 298 / 66,9 |
| M30 | 128 / 28,7 | 215 / 48,3 | 275 / 61,8 | 370 / 83,1 |
| M36 | 185 / 41,5 | 310 / 69,6 | 390 / 87,6 | 520 / 116 |
| M42 | 250 / 56,2 | 420 / 94,4 | 530 / 119 | 710 / 159 |

For more information please **contact your local Howden office or Howden Sales representative:**

Howden North America Inc.

For fan sales and parts
Tel: 1-800-327-8885

Email: hnasales@howden.com
Web: www.howden.com

Revolving Around You™