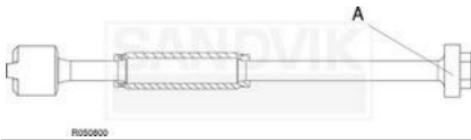


## Tie rods

### Torques, adjustments and lubricants

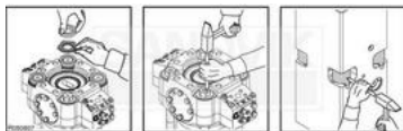


| Item                                      | Tightening torque                                                        |
|-------------------------------------------|--------------------------------------------------------------------------|
| Tie rod (A) pre-tightening torque steps   | 1) 100 Nm 2) 300 Nm 3) 700 Nm (1) 74 lbf ft 2) 221 lbf ft 3) 516 lbf ft) |
| Additional tightening angle after heating | 330°                                                                     |

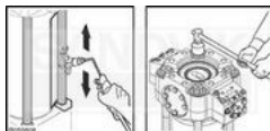
| Item                                                                | Lubricant or locking fluid |
|---------------------------------------------------------------------|----------------------------|
| Tie rod threads and bearing surfaces, tie rod nuts                  | Thread grease              |
| Part of tie rod inside front head                                   | Heat resistant paint       |
| Outer and inner surface of the tie rod vibration dampening elements | Silicone grease            |
| Grooves between front head and the tie rods                         | Silicone sealant           |

### Loosening tie rods

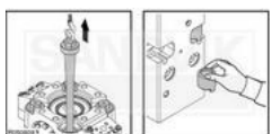
1. Remove rubber rings and lock plates.
2. Check and if necessary copy tie rod location number from hammer front head to each tie rod.. Mark each tie rod and its nut as pairs.



3. Place shield plate between cylinder and tie rods and flame-proof fabric or plate over vibration dampening elements. Preheat every tie rods with propane flame 200 °C. Ensure flame heats only tie rods, not tie rod vibration dampening elements or hammer body. Avoid heating one spot only. Do not exceed 350 °C. There has to be at least 100 mm distance between vibration dampening element and heating flame. Heat one tie rod until it can be loosened using a wrench. Then heat one tie rod on the opposite side of the hammer until it can be opened. Repeat prosedure with the remaining two tie rods.



4. Lift tie rods out with lifting device. Be careful with hot parts.
5. Remove nuts.



6. Cut cable ties and remove tie rod vibration dampening elements if necessary.



### Tightening tie rods

1. Clean all parts thoroughly.
2. Use crack detecting equipment to check if there are cracks in rod threads or under head. If cracks are detected, change tie rod and its nut. Also change diagonal tie rod and nut.
3. If tie rod have been in use, apply heat resistant paint to part of tie rods located inside front head. Thorough corrosion protection is required in order to avoid corrosion cracking of tie rod.
4. Apply silicone grease on outer and inner surfaces of the tie rod vibration dampening elements. Install vibration dampening elements on the tie rods and insert cable ties. Tighten cable ties properly.
5. Apply silicone grease to the tie rod bores of the front head.



6. Grease threads and bearing surfaces of tie rods, valve body and tie rod nuts.

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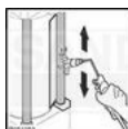
7. Install tie rod nuts and tie rods. Check each tie rod has correct nut as it's pair. Also check location of each tie rod in hammer is same as before disassembly.



8. Use torque wrench to tighten tie rods in small steps crosswise to pretightening torque.
9. Mark additional tightening angle to valve body and tie rods.

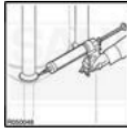


10. Place shield plate between cylinder and tie rods and flame-proof fabric or plate over vibration dampening elements. Heat tie rod with propane flame so it can be tightened to required tightening angle with a socket and handle. The maximum allowed torque is 1200 Nm (885 lbf ft). If the tie rods won't turn to the specified setting, apply more heat, but do not exceed 350 °C temperature. Ensure flame heats only tie rods, not tie rod vibration dampening elements or hammer body. There has to be at least 100 mm distance between vibration dampening element and heating flame. Then heat one tie rod on opposite side of the hammer and tighten it. Repete prosedure with the remaining two tie rods.



11. Install lock plates.
12. Install rubber rings.

13. Fill grooves between tie rods and front head with silicone sealant, when sufficiently cool.



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