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Technical Instruction



Torque wrench



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1 Adjusting the torque wrench

- 1.1 Set the prescribed tightening torque in accordance with the manufacturer's instructions.

2 Assembly instructions

- 2.1 Clean the threads of screw and nuts as well as contact surfaces. Do not re-use reduced-shank bolts (torque-to-yield bolts) damaged by corrosion, notching etc. In case of piston seizing or bearing troubles, new reduced-shaft bolts must be used unless the perfect condition of the bolts is confirmed using existing testing facilities.
- 2.2 Oil the threads and contact surfaces lightly with fresh engine oil.
- 2.3 Always pull smoothly and evenly on the torque wrench. Always pull smoothly and evenly (no jerks), keeping the direction of pull at right angles to the wrench. Stop tightening immediately when the wrench releases.
- 2.4 Do not turn bolts on parts sitting on seals or gaskets through more than 60° to 90° in one turn, and then turn the next bolt through the same angle. After turning and tightening each bolt through the same angle, repeat this procedure until the wrench releases. If tightening is carried out correctly, the each opposite bolt or screw should make the torque wrench release at the same angle when tightened.
- If a greater angle should be found necessary on the second bolt, this shows that tightening has not been carried out symmetrically. In that case, slacken the first bolt until the releasing clicks of the torque wrench can all be heard for all screws at the same angle.
- Always tighten crosswise, changing frequently from one bolt to another.
- 2.5 When tightening parts without seals or gaskets, moving from one bolt to another before reaching the tightening torque is advisable, as is crosswise tightening. After tightening the bolts, apply short hard blows to the bolt head or work piece (with a light alloy or plastic mallet). Then retighten. If retightening is possible, the procedure must be repeated.

- 2.6 Note that it is still possible to continue tightening after the torque wrench has released. You must therefore stop tightening immediately when the torque wrench releases.
- 2.7 Caution! Components connected by a locking element (cannular spring-locking elements) must not be treated as described in Section 2.5 after being tightened using a torque wrench. If a blow with a mallet is applied to the thrust piece which transmits the preloading of the bolts to the locking rings, the friction of the element will be overcome and the component will be displaced. Such a stroke would put an additional load onto the component for which it is not designed and which is therefore not permissible. The procedure mentioned in section 2.5 (i.e. repeated retightening) could lead to a so-called "cold welding" of parts and components, as a result of which it may be impossible to loosen them again.

3 Loosening of reduced-shaft bolts (torque-to-yield bolts)

Bolts positioned opposite to each other must be loosened alternatively in several sequences. Never loosen one bolt fully before loosening the other. If more bolts are involved (along a circumference), these must be loosened in a crosswise pattern in several sequences (bolt by bolt).

This loosening procedure will prevent screw seizing.

First loosen the bolts 1/4 turn only until the tightening torque is eliminated and the screws, bolts or nuts may be easily removed.

3.1 Important:

Never loosen reduced-shaft bolts if these have operating temperature:

If disassembly becomes necessary immediately after engine shutdown, immediately open all crankcase covers to ensure a quicker engine cool-down. The reduced-shaft bolts to be loosened - in particular the cylinder head bolts - may not be loosened until they have cooled down so far that they can be touched continuously (below 40 °C to 45 °C).

4 Calibrating torque wrenches

The torque wrench must be calibrated annually. It must also be calibrated whenever it is subjected to an overload or if incorrectly handled, which can affect its measuring uncertainty.

5 Revision code

Revision history

Index	Date	Description / Revision summary	Expert Auditor
4	10.04.2019	GE durch INNIO ersetzt / GE replaced by INNIO	Stojiljkovic T. Pichler R.
3	01.12.2011	Layoutanpassung / Layout Adjustment	Bilek Bilek
2	09.08.2011	Änderung zu universellen Drehmomentschlüssel / Change to universal torque wrench	Kramartschik Winterle
1	26.05.2010	Umstellung auf CMS / Change to Content Management System ersetzt / replaced Index: g	Schartner Giese