

CLAIMS

1. A tool for evaluating the connection condition of a mechanical fitting comprising:
(i) a first component shaped to facilitate its engagement with a fitting to be
5 evaluated; and
(ii) a second component connected to, and moveable relative to, the first
component;
wherein a relative movement between the first and second components establishes a
measurement between two surfaces of a fitting to be evaluated, said measurement being
10 directly or indirectly indicative of one or more predetermined connection conditions.
2. A tool according to claim 1, wherein the first component comprises a recess for
facilitating its engagement at least partially around a fitting to be evaluated.
- 15 3. A tool according to claim 2, wherein the recess progressively widens towards its
opening; and/or is provided with chamfered edges.
4. A tool according to claim 2 or 3, wherein the first component has a maximum length
along a longitudinal axis which is longer than its maximum width along a width-wise axis;
20 and wherein said recess extends generally width-wise proximate one end of the first
component.
5. A tool according to claim 4, wherein a central axis of the recess extends away from
the first component at an angle of greater than 0 degrees in a clockwise direction relative
25 to said width-wise axis of the first component.
6. A tool according to any preceding claim, wherein the second component is
rotatably connected to the first component about a rotation axis.
- 30 7. A tool according to claim 6, wherein the rotation axis is positioned substantially
centrally on the first component.
8. A tool according to any preceding claim, wherein the second component is, at least
in part, in the form of a disc.

9. A tool according to any preceding claim, wherein at least part of a peripheral edge portion of the second component coincides with at least part of a peripheral edge of the first component.
- 5 10. A tool according to any preceding claim, wherein at least part of a peripheral edge portion of the first component defines a protective lip for the second component by extending beyond a peripheral edge portion of the second component.
11. A tool according to claim 10, wherein said protective lip is absent at one or more
10 circumferential portions around the first component to facilitate manual movement of the second component relative to the first component.
12. A tool according to any preceding claim, wherein at least part of a peripheral edge portion of the second component has a thickness in the axial direction which varies
15 progressively around its circumference.
13. A tool according to claim 12, wherein a reference surface is defined on the second component at the circumferential meeting point between the minimum and maximum thicknesses of its peripheral edge portion.
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14. A tool according to any preceding claim, wherein the thickness of the first component distal to its shaped portion is relatively greater than the thickness of other parts of the first component.
- 25 15. A tool according to any preceding claim, wherein visually perceptible indicia are provided on the second component for alignment with a reference feature of the first component so as to indicate said connection conditions.
16. A tool according to claim 15, wherein said reference feature is located on the first
30 component at a position remote from its point of engagement with a fitting to be evaluated.
17. A tool according to any of claims 1 to 14 paired to a remote electronic device and wherein said measurement and/or associated predetermined connection conditions of a fitting is readable on said remote electronic device.

18. A tool according to claim 17, wherein a plurality of contactless communication targets is connected to, and movable with, the second component; said targets being individually readable via the remote electronic device.

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19. A tool according to claim 18, wherein the second component is in the form of a rotatable disc and the targets are arranged circumferentially thereon/therein at positions which correlate with differing predetermined connection conditions of a fitting as the disc is rotated relative to the first component.

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20. A tool according to claim 19, wherein a physical or virtual aperture is provided in the first component such that, when a near-field communication (NFC) or radio-frequency identification (RFID) target is aligned therewith a radio frequency (RF) or magnetic field can be established between it and a remote radio-frequency (RF) or magnetic field initiator.

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21. A tool according to claim 20, the aperture is defined by an RF or magnetic field blocking material provided on and/or in the first component.

20 22. A tool according to any of claims 19 to 21, wherein the first component is formed from front and rear sub-components, and wherein the rotatable disc and its associated targets are sandwiched between the two.

23. A tool according to claim 22, wherein the front and rear sub-components are each provided with said physical or virtual apertures and an RF or magnetic field blocking material.

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24. A method of evaluating the connection condition of a fitting comprising:
(i) providing a tool in accordance with any of claims 1 to 16; or any of claims 17 to

30 23;

(ii) engaging the first component with the fitting to be evaluated proximate fixed and adjustable fitting parts thereof;

(iii) effecting relative movement between the first and second components until respective surfaces thereof each contact surfaces of said fixed and adjustable fitting parts;

and

(iv) establishing a measurement between said surfaces of said fixed and adjustable fitting parts;

wherein said measurement is directly or indirectly indicative of one or more
5 predetermined connection conditions.

25. A method according to claim 24, wherein said measurement may be indicative of one or more predetermined connection conditions selected from the list comprising:

- (i) over-tightened fastener;
- 10 (ii) under-tightened fastener;
- (iii) incorrect fastener type;
- (iv) incorrect fastener shape;
- (v) incorrect fastener size;
- (vi) incorrect internal or external components;
- 15 (vii) mixed fastener components from differing manufacturers;
- (viii) more or less fastener components than the optimum number;
- (ix) incorrect positioning of internal or external fastener components;
- (x) presence of mixed imperial and metric fasteners;
- (xi) fastener movement over time; and
- 20 (vii) incorrect fastener angle.

26. A method according to claim 24 or 25, wherein said second component is provided with visually perceptible indicia and said measurement and/or associated predetermined connection conditions of a fitting is discernible by virtue of the alignment of said indicia
25 with a reference feature on the first component.

27. A method according to claim 24 or 25, wherein said tool is paired to a remote electronic device and said measurement and/or associated predetermined connection conditions of a fitting is readable on said remote electronic device.

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28. A method according to claim 27, wherein said measurement and/or associated predetermined connection conditions is/are stored on said remote electronic device and/or uploaded to a database for processing and/or comparison against acceptable tolerance values.

29. A method according to any of claims 24 to 26, wherein said indication of one or more predetermined connection conditions is not displayed on the tool.

5 30. A method according to claim 27 or 28, wherein said indication of one or more predetermined connection conditions is not displayed on the remote device.

31. A method according to claim 29 or 30, wherein said measurement is provided as an input to a database to subsequently provide a predetermined connection conditions as an
10 output.