
Overview

This standard identifies the competences you need to check mechanical components for serviceability during overhaul activities, in accordance with approved procedures. You will be required to obtain all relevant and current documentation, and to obtain the appropriate tools and equipment to carry out the required checks. You will select the appropriate inspection equipment, based on the features to be checked and the accuracy to be measured. This will involve checking that the appropriate equipment is within current test dates and, where necessary, setting up and calibrating the equipment ready for the inspection operations to be performed. In carrying out the inspection activities, you will be expected to check the components for obvious wear defects, damage, dimensional and geometrical accuracy.

Your responsibilities will require you to comply with organisational policy and procedures for checking the mechanical components, and to report any problems with the activities that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You will be expected to ensure that all tools and equipment used to inspect the components are correctly accounted for on completion of the activities and returned to the correct location. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying appropriate checking techniques and procedures to dismantled components from mechanical equipment. You will understand how to use the tools and equipment used to check the mechanical components, in adequate depth to provide a sound basis for carrying out the checking activities and identifying where components do not meet the required specification tolerances or serviceability requirements.

You will understand the safety precautions required when carrying out the checking activities. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

Performance criteria

You must be able to:

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1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow the correct specification for the product or equipment being inspected
3. use the correct equipment to carry out the inspection
4. identify and confirm the inspection checks to be made and acceptance criteria to be used
5. carry out all required inspections as specified
6. identify any defects or variations from the specification
7. record the results of the inspection in the appropriate format
8. deal promptly and effectively with problems within your control and report those that cannot be solved

Knowledge and understanding

You need to know and understand:

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1. how to work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. regulations with regard to the substances used in the inspection process
3. the hazards associated with carrying out inspection activities on components removed for overhaul activities, and how to minimise them and reduce any risks
4. the appropriate personal protective equipment (PPE) and clothing to be worn during the inspection activities
5. how and where to obtain the required drawings and related specifications, and how to check that they are current and complete
6. how to extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate standards) in relation to work undertaken
7. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
8. the use of relevant standards in determining if components and products are fit for purpose
9. preparations to be undertaken before the components are inspected
10. the effects that the environment may have on the measurements taken (in particular, where precision measurements are concerned)
11. the need to select and use set datum faces, and the effects of taking readings from different datums
12. the application and uses of the tools and equipment used to inspect mechanical products
13. how to determine the correct equipment for the feature to be inspected, taking into account the tolerances to be achieved
14. the importance of ensuring that tools and equipment are set up correctly and are in a safe and useable condition
15. the procedure and methods used to check that tools and equipment are within calibration date

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16. the typical defects and variations that can be found on components removed for overhaul activities, and how to identify them
 17. the need to carry out the checks, and to record the results in the appropriate documentation
 18. the procedure to be followed when the inspected components have defects or are out of specification
 19. the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve

Scope/range related to performance criteria

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1. Carry out all of the following during the checking activities:
 - 1.1 obtain and use the correct overhaul documentation
 - 1.2 obtain and check the condition and calibration dates of tools, measuring instruments and equipment to be used
 - 1.3 adhere to procedures or systems in place for risk assessment, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
 - 1.4 provide and maintain safe access and working arrangements for the work area
 - 1.5 follow specified or appropriate checking procedures
 - 1.6 use the correct and appropriate tools and equipment at all times
 - 1.7 identify and record, in the appropriate format, any out-of-specification features
 - 1.8 leave the work area and tools in a safe and appropriate condition on completion of the activities
2. Check dismantled mechanical components for eight of the following:
 - 2.1 visual signs of damage (such as wear, breaks, impact marks, cracks)
 - 2.2 concentricity
 - 2.3 eccentricity
 - 2.4 wear/out-of-tolerance dimensions
 - 2.5 parallelism
 - 2.6 fit/working clearance
 - 2.7 straightness
 - 2.8 deterioration of surface finish
 - 2.9 flatness
 - 2.10 squareness
 - 2.11 alignment
 - 2.12 ovality/lobing
 - 2.13 distortion
3. Check/inspect mechanical components using six of the following:
 - 3.1 external micrometer
 - 3.2 engineers' square
 - 3.3 vernier protractors
 - 3.4 internal micrometer
 - 3.5 feeler gauge
 - 3.6 surface texture comparison plates

- 3.7 depth micrometer
- 3.8 hole gauge
- 3.9 surface texture measuring machines
- 3.10 specialist micrometers
- 3.11 thread gauge
- 3.12 optical equipment (such as shadowgraphs, microscopes)
- 3.13 length vernier
- 3.14 slip gauge
- 3.15 depth vernier
- 3.16 dial test indicator
- 3.17 height vernier
- 3.18 radius/profile gauges
- 3.19 straight edge
- 3.20 company-specific equipment

4. Use the relevant equipment to measure and check eight of the following features:

- 4.1 external diameters
- 4.2 external tapers
- 4.3 fit/working clearance
- 4.4 internal diameters
- 4.5 thread fit
- 4.6 external profiles/forms
- 4.7 length/linear dimensions
- 4.8 thread form/profile
- 4.9 angles
- 4.10 depth
- 4.11 internal profiles/forms
- 4.12 chamfers and radii
- 4.13 internal tapers

SEMMME3102

Checking mechanical components for serviceability during overhauling activities



Developed by	Enginuity
Version Number	3
Date Approved	30 Mar 2023
Indicative Review Date	31 Mar 2028
Validity	Current
Status	Original
Originating Organisation	Enginuity
Original URN	SEMMME3102
Relevant Occupations	Engineering, Engineering and Manufacturing Technologies, Engineering Technicians
Suite	Mechanical Manufacturing Engineering Suite 3
Keywords	Mechanical engineering; overhaul; checking; mechanical equipment; mechanical components; serviceability; visual signs; damage; wear; cracks; breaks; impact marks; out of tolerance; fit; working clearance; deterioration; surface finish; alignment; distorti
