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**Remanufacturing - Technological specifications for assembly
of mechanical products**

再制造 机械产品装配技术规范

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Table of Contents

Foreword.....	3
1 Scope	4
2 Normative references.....	4
3 Terms and definitions.....	4
4 General requirements.....	4
5 Assembly process	5
6 Main assembly modes.....	6
7 Assembly quality inspection of remanufactured products	7
8 Labeling and information management.....	7
9 Safety and environmental protection	8
Appendix A (Informative) General flow chart of assembly of remanufactured mechanical products	9
Appendix B (Informative) Selection of different assembly methods.....	10
Appendix C (Informative) Selection of different assembly processes	11
Appendix D (Informative) Assembly modes of different production scales of remanufactured mechanical products	14
References.....	15

Remanufacturing - Technological specifications for assembly of mechanical products

1 Scope

This document specifies the general requirements for assembly of remanufactured mechanical products, the assembly process, the main assembly modes, as well as the assembly quality inspection of remanufactured products, the identification and information management, and the safety and environmental protection requirements.

This document applies to the assembly process of remanufactured mechanical products; it also applies as a reference to the assembly of other remanufactured products.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 27611, General requirements and labeling for recycled and remanufactured products

GB/T 28619, Remanufacturing - Terminology

3 Terms and definitions

Terms and definitions determined by GB/T 28619 are applicable to this document.

4 General requirements

4.1 Factors such as the material, function, size, batch quantity, assembly accuracy requirements, and relevant technical document requirements of the enterprise shall be comprehensively considered to select the appropriate assembly process, specification, mode and method.

4.2 Assembly and inspection shall be carried out according to the quality requirements of assembled products and the technical documents of assembly. The technical documents shall include remanufacturing parts information, assembly process

documents, assembling work instructions, confirmation records of key assembly procedures and assembly quality inspection specifications or operating instructions, etc.

4.3 The parts and components shall be tested for quality before assembly; the surface quality, dimensional accuracy and surface cleanliness shall meet the assembly requirements. Unless there are special requirements, the sharp corners and sharp edges of the parts and components shall be blunt before assembly.

4.4 For parts and components with dynamic balance requirements, weight sorting and balance testing shall be carried out before assembly.

4.5 During the assembly process, damage, which will affect product quality, shall be avoided between parts and components.

4.6 The assembly environment (such as temperature, humidity, dust falls, lighting, shock resistance, space) shall comply with the provisions of the product assembly technical documents.

4.7 Necessary measuring tools, inspection tools and other testing tools and equipment shall be provided.

5 Assembly process

5.1 The assembly process shall be carried out in accordance with the assembly process to ensure product assembly accuracy and assembly quality. Refer to Appendix A for the general process of assembly of remanufactured mechanical products.

5.2 Factors such as assembly accuracy and material of parts and components shall be comprehensively considered, and the applicable assembly methods such as exchange method, matching method, repair method and adjustment method shall be selected with reference to Appendix B.

Note: In order to ensure the assembly efficiency, the selection of the repair method and the adjustment method should be reduced.

5.3 The appropriate assembly process shall be selected by comprehensively considering factors such as the material, size and coordination requirements of the parts. For the selection of different assembly processes, refer to Appendix C.

5.4 Select the corresponding assembly mode according to the number of assembled products, preferably using methods such as mechanization and automation; refer to Appendix D for the assembly modes of different production scales of remanufactured mechanical products.

5.5 For parts and components using the dimensional repair method, the geometric parameter testing requirements shall be specified in the technical documents to ensure the matching accuracy.

5.6 The friction pieces with relative motion shall be lubricated as necessary; for example, an appropriate amount of lubricating oil or grease shall be injected at the lubricating point.

5.7 The lighting method or ventilation method should be used for checking whether the holes for conveying the medium are blocked or not.

5.8 Standard protective measures shall be taken to avoid contamination, corrosion and deformation on the surface of parts and components during assembly.

6 Main assembly modes

6.1 Press fitting

6.1.1 Except for special requirements, the surface of press-fitted parts shall be coated with clean lubricant during press-fitting. When pressing, the center line of the force shall be coaxial with the center line of the containing part and the contained part.

6.1.2 When adopting impact for press-fitting, soft metal or hard non-metallic material shall be used as protective liner, to keep the surface of parts away from smash marks. The pressure change shall be stable during the press-fitting process.

6.2 Hot assembly

6.2.1 The heating temperature of the hot-assembled parts shall be determined according to the material of the parts, the diameter of the joint, the magnitude of interference and the minimum clearance of the hot-assembled parts.

6.2.2 The action shall be quick during hot assembly, and it shall be assembled in place at one time. If an abnormality occurs, it shall be hot-assembled after troubleshooting and then reheated.

6.2.3 The hot-assembled parts shall be cooled naturally. If necessary, auxiliary cooling can be used. It is necessary to comply with the corresponding material specifications and pay attention to the maximum allowable cooling temperature.

6.3 Cold assembly

6.3.1 Factors such as the cooling method, cooling temperature and cooling time of the parts and components shall be considered during cold assembly. For the selection of the specific assembly mode, refer to Appendix C.

6.3.2 The parts shall be assembled immediately after cooling, to avoid affecting the assembly quality due to surface frosting or condensation of water droplets.

6.4 Assembly of hydraulic cylinders, air cylinders and seals

6.4.1 Before assembly, check and remove the sharp corners, burrs and foreign objects left in the processing of the parts to ensure that the seals are not scratched when they are assembled.

6.4.2 When assembling, pay attention to the working direction of the seal to avoid oil leakage and air leakage due to assembly errors.

6.4.3 When the piston with two-way sealing ring is assembled into the blind hole oil cylinder, directivity tooling shall be used. The seals shall not be beaten or assembled forcibly to avoid damage to the sealing performance.

6.4.4 The hydraulic cylinder and air cylinder, after assembly, shall be tested for sealing and idling.

7 Assembly quality inspection of remanufactured products

7.1 The remanufactured and assembled products shall be tested for some performance parameters or comprehensive quality according to the performance requirements of the remanufactured products.

7.2 The remanufactured products, assemblies or components – which are subject to medium pressure and required for sealing – shall be tested for the sealing performance, to ensure that the corresponding quality requirements are met.

7.3 The parts and components – which are required for equilibrant moment – shall be tested for static balance or dynamic balance as required during assembly. The main methods include the following two:

- a) When calibrating by the method of adding mass, it shall be fixed and reliable to avoid loosening or flying out during the working process.
- b) When correcting by the method of removing mass, the stiffness, strength and appearance of the parts shall not be affected.

7.4 The combined rotating body, after general equilibrium, is not allowed to move or exchanged for parts.

7.5 The inspection process and results shall be recorded.

8 Labeling and information management

8.1 Remanufactured products shall be labeled according to the requirements of GB/T 27611.

8.2 A remanufactured products assembly file shall be established, for the information traceability of the parts and components used for assembly.

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