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## CNC hydraulic punching and drilling composite machines

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# Table of Contents

Foreword .....	III
Introduction .....	IV
1 Scope .....	1
2 Normative References .....	1
3 Terms and Definitions .....	1
4 Technical Requirements .....	1
4.1 General Requirements .....	1
4.2 Appearance .....	2
4.3 Castings, Forgings and Weldments .....	2
4.4 Part Machining .....	2
4.5 Electrical System .....	2
4.6 Numerical Control (NC) System .....	2
4.7 Hydraulic, Pneumatic, Cooling and Lubrication Systems .....	2
4.8 Assembly .....	3
4.9 Noise .....	3
4.10 Safety Protection .....	3
4.11 No-Load and Load Operation Requirements .....	4
5 Accuracy .....	4
5.1 General Requirements .....	4
5.2 Geometric Accuracy Inspection .....	5
5.3 Positioning Accuracy and Repeatability Inspection of NC Axes .....	9
5.4 Working Accuracy Inspection .....	10
6 Test Methods .....	10
6.1 General Requirements .....	10
6.2 Appearance Inspection .....	10
6.3 Inspection of Castings, Forgings and Weldments .....	10
6.4 Part Machining Inspection .....	10
6.5 Electrical System Inspection .....	10
6.6 NC System Inspection .....	11
6.7 Hydraulic System Inspection .....	11

6.8 Pneumatic System Inspection .....	11
6.9 Lubrication System Inspection .....	11
6.10 Cleanliness Inspection .....	11
6.11 Assembly Inspection .....	11
6.12 Noise Inspection .....	11
6.13 Safety and Protection Inspection .....	11
6.14 Accuracy Inspection .....	11
6.15 No-Load Operation Test .....	11
6.16 Load Operation Test .....	11
7 Inspection Rules .....	12
7.1 Inspection Classification .....	12
7.2 Factory Inspection .....	12
7.3 Type Inspection .....	12
8 Marking, Packaging, Storage and Transportation .....	12
Figure 1 Axes and Movement Directions of the Combined Machine .....	5
Table 1 Geometric Accuracy Inspection .....	6
Table 2 Positioning Accuracy and Repeatability Inspection of NC Axes .....	9
Table 3 Working Accuracy Inspection .....	10

# Foreword

This document is drafted in accordance with the provisions of GB/T 1.1-2020 Directives for Standardization - Part 1: Rules for the Structure and Drafting of Standardization Documents.

This document replaces GB/T 33639-2017 CNC Hydraulic Punching and Drilling Combined Machine. Compared with GB/T 33639-2017, in addition to structural adjustments and editorial revisions, the main technical changes are as follows:

- Revised the general requirements for the combined machine, and incorporated the relevant requirements for accompanying technical documents and accessories into the general requirements (see 4.1, 3.1 and 3.11 of the 2017 edition);
- Revised the requirements for castings, forgings and weldments (see 4.3, 3.3 of the 2017 edition);
- Revised the assembly requirements (see 4.8, 3.8 of the 2017 edition);
- Revised the noise limit requirements (see 4.9, 3.9 of the 2017 edition);
- Revised the safety protection requirements (see 4.10, 3.2 of the 2017 edition);
- Revised the geometric accuracy inspection requirements (see 5.2, 5.3 of the 2017 edition);
- Revised the working accuracy inspection requirements (see 5.4, 5.5 of the 2017 edition);
- Revised the inspection rules (see Chapter 7, Chapter 6 of the 2017 edition).

Attention is drawn to the possibility that some elements of this document may be subject to patent rights. The issuing body of this document shall not be responsible for identifying any such patent rights.

This document was proposed by the China Machinery Industry Federation.

This document is administered by the National Technical Committee 220 on Forging and Stamping Machinery of Standardization Administration of China (SAC/TC 220).

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The history of issuance of this document and the document it replaces is as follows:

- First issued as GB/T 33639-2017 in 2017;
- This is the first revision.

# Introduction

With the continuous growth in the demands of modern manufacturing industry for production efficiency, machining accuracy and product diversification, traditional single-function machine tools can hardly meet the requirements of machining complex parts. Against this backdrop, the CNC Hydraulic Punching and Drilling Combined Machine has come into being. It combines the advantages of both punching and drilling processes, and realizes a high-precision and high-efficiency automated machining process through numerical control (NC) technology.

The revision of this document is intended to standardize the requirements for the design, manufacture, inspection and use of CNC hydraulic punching and drilling combined machines, so as to promote the technological progress and quality improvement of such equipment, protect the legitimate rights and interests of users, and provide a unified standard for exchanges and technical cooperation among relevant enterprises.

# CNC Hydraulic Punching And Drilling Composite Machines

## 1 Scope

This document prescribes the technical requirements for CNC hydraulic punching and drilling combined machines, describes the corresponding test methods, and specifies the inspection rules, marking, packaging, storage and transportation requirements.

This document is applicable to the manufacture of CNC hydraulic punching and drilling combined machines that perform punching, drilling and marking operations on various flat plate workpieces, and is also applicable to the manufacture of CNC hydraulic punching machines that perform only punching and marking operations.

## 2 Normative References

The contents of the following documents are incorporated as indispensable provisions of this document through normative reference in the text. For dated reference documents, only the edition corresponding to the specified date applies to this document; for undated reference documents, the latest edition (including all amendments) applies to this document.

GB/T 191 Packaging and Storage Pictorial Markings

GB/T 3766 Hydraulic Fluid Power—General Rules and Safety Requirements for Systems and Their Components

GB/T 5226.1 Electrical Safety of Machinery—Electrical Equipment of Machines—Part 1: General Requirements

GB/T 6576 Machine Tool Lubrication Systems

GB/T 7932 Pneumatic Fluid Power—General Rules and Safety Requirements for Systems and Their Components

GB/T 9969 General Rules for Instruction Manuals of Industrial Products

GB/T 13306 Nameplates

GB 17120 Safety Technical Requirements for Forging and Stamping Machinery

GB/T 17421.1-2023 General Principles for Machine Tool Testing—Part 1: Geometric Accuracy of Machines Under No-Load or Quasi-Static Conditions

GB/T 17421.2 General Principles for Machine Tool Testing—Part 2: Determination of Positioning Accuracy and Repeatability of Numerical Control Axes

GB/T 19660 Industrial Automation Systems and Integration—Numerical Control of Machines—Coordinate Systems and Motion Nomenclature

GB/T 23281 Method for Measuring Noise Sound Pressure Level of Forging and Stamping Machinery

GB/T 23571 Metal Cutting Machine Tools—Compilation of Accompanying Technical Documents

GB/T 26220 Industrial Automation Systems and Integration—Numerical Control of Machines—General Technical

Requirements for Numerical Control Systems

GB/T 36484 Terminology for Forging and Stamping Machinery

JB/T 1829 General Technical Requirements for Forging and Stamping Machinery

JB/T 8356 Technical Requirements for Machine Tool Packaging

JB/T 8609 Technical Requirements for Weldments of Forging and Stamping Machinery

JB/T 9954 Cleanliness of Hydraulic Systems for Forging and Stamping Machinery

## 3 Terms and Definitions

The terms and definitions specified in GB/T 36484 shall apply to this document.

## 4 Technical Requirements

### 4.1 General Requirements

**4.1.1** The CNC hydraulic punching and drilling combined machine (hereinafter referred to as the combined machine) shall comply with the provisions of JB/T 1829 and this document, and shall be manufactured in accordance with the drawings and technical documents approved through the prescribed procedures.

**4.1.2** The combined machine shall be equipped with nameplates or marks indicating lubrication, operation and safety information.

**4.1.3** The nameplates of the combined machine shall conform to the requirements of GB/T 13306.

**4.1.4** The accompanying accessories, tools and spare parts shall be complete. The wear parts of the combined machine shall be easy to replace.

**4.1.5** The accompanying technical documents of the combined machine shall include the product instruction manual, product qualification certificate and packing list. The compilation of accompanying technical documents shall comply with the relevant provisions of GB/T 23571. The instruction manual shall conform to the requirements of GB/T 9969.

### 4.2 Appearance

**4.2.1** The external surfaces of the combined machine shall be free from unprescribed protrusions, depressions, roughness and other damages. Exposed machined surfaces shall be free from collision damage, scratches and corrosion.

**4.2.2** Sputter on the surface of exposed welds shall be cleaned thoroughly and ground smooth.

**4.2.3** Non-machined surfaces shall be puttied and polished. The paint film shall have uniform color, and shall be free from peeling, blistering, missing spraying and other defects. The boundary lines between paint films of different colors shall be distinct.

**4.2.4** Bolts, nuts, oil cups, non-metallic pipelines and other surfaces that do not require painting shall be free from paint residue.

4.2.5 The exposed parts of various pipelines and circuits shall be arranged compactly, neatly and fastened securely.

4.2.6 The movement indication directions of various nameplates on the combined machine shall be correct; the text descriptions shall be clear and easy to understand; the installation positions shall be conspicuous and appropriate; and the fixing shall be correct, flat and firm.

4.2.7 The protective layers of electroplated, blued and blackened parts on the combined machine shall be intact, and shall be free from fading, cracking, peeling and corrosion. The surface of the protective cover of the combined machine shall be flat, and shall be free from warping or depression.

### 4.3 Castings, Forgings and Weldments

4.3.1 The weldments of the combined machine shall comply with the provisions of JB/T 8609.

4.3.2 Forgings shall be free from laminations, folds, cracks, forging defects, scars, slag inclusions and other flaws.

4.3.3 Castings shall be free from sand holes, air holes, porosity, cold shuts, slag inclusions, cracks and other casting defects that affect the working performance and appearance.

4.3.4 Important welded metal components, castings and forgings—such as the machine frame, worktable, base, oil cylinder block and drilling power head housing—shall undergo stress relief treatment.

### 4.4 Part Machining

4.4.1 Machined surfaces of parts shall be free from burrs and defects that impair the service quality and appearance of the combined machine, such as collision damage, scratches and corrosion.

4.4.2 Sharp edges and corners on machined parts shall be blunted, unless otherwise specified in the drawings.

4.4.3 Scraped surfaces of parts shall be free from prior machining marks, and the scraping spots shall be evenly distributed across the entire scraped surface.

### 4.5 Electrical System

The electrical system of the combined machine shall comply with the provisions of GB/T 5226.1.

### 4.6 Numerical Control (NC) System

4.6.1 The environmental adaptability, safety, power supply adaptability, electromagnetic compatibility and manufacturing quality of the NC system of the combined machine shall comply with the provisions of GB/T 26220.

4.6.2 The NC system shall meet the operational requirements of the combined machine, and shall be equipped with automatic and manual operation functions, program editing function, self-diagnosis function and alarm display function.

4.6.3 The determination of positioning accuracy and repeatability of NC axes shall comply with the provisions of GB/T 17421.2.

### 4.7 Hydraulic, Pneumatic, Cooling and Lubrication Systems

**4.7.1** The hydraulic system of the combined machine shall comply with the provisions of GB/T 3766.