ICS 01.110
CCS J 01

# DB 46

Hainan Provincial Standard

DB46/T 621-2024

# General technical requirements for maintenance and remanufacturing of used equipment for export construction machinery

# 工程机械出口二手机维修及再制造通用技术要求

*(English Translation)*

Issue date: 2024-03-26 Implementation date: 2024-05-26

Issued by Administration for Market Regulation of Hainan Province

# Contents

# Foreword

Industry and Information Technology Department of Hainan Province is in charge of this English translation. In case of any doubt the contents of English translation, the Chinese original shall be considered authoritative.

This document is drafted in accordance with the rules given in the GB/T 1.1-2020 *Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents.*

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

This document was proposed and prepared by Department of Commerce of Hunan Province and Department of Industry and Information Technology of Hainan Province.

# General technical requirements for maintenance and remanufacturing of used equipment for export construction machinery

## 1 Scope

This document specifies the requirements and inspection of used engineering machinery equipment for export.

This document is applicable to used engineering machinery equipment that is intended for export after repair or remanufacturing.

## 2 Normative references

The following documents contain provisions which, through normative reference in this text, constitute indispensable provisions of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 28619, *Remanufacturing-Terminology*

GB/T 41495, *Specification for truck-mounted concrete pump maintenance, repair and scrap*

JB/T 14204-2021, *Earth-moving machinery - remanufactured crawler hydraulic excavators*

## 3 Terms and definitions

For the purpose of this document, the terms and definitions given in GB/T 28619 and GB/T 41495 as well as the following apply.

3.1
**used engineering machinery equipment**
engineering machinery equipment that has been used and is now back on the market

3.2
**repair**
a series of work to restore equipment functions by repairing or replacing the damaged components, in response to damage and malfunctions that affect the normal operation of equipment due to daily use or abnormal reasons
[SOURCE: GB/T 41495-2022, 3.4, modified]

3.3
**remanufacturing**
for the purpose of recycling of waste/old engineering machinery resources, a series of

technical measures or engineering activities by using remanufacturing technology to repair and transform waste/old engineering machinery products or components to ensure their functions, performance, and environmental, economic and safety characteristics at least as good as those of the original new equipment or components.
[SOURCE: JB/T 14204-2021, 3.2, modified]

3.4
**used equipment**
used engineering machinery equipment that is intended for export after repairing or remanufacturing

3.5
**original equipment**
brand-new engineering machinery equipment produced by the original manufacturer

## 4. Requirements

### 4.1 Basic requirements

4.1.1 The operating conditions such as ambient temperature, altitude for used equipment, shall comply with corresponding product standards or the requirements of export destinations.

4.1.2 The used equipment shall be able to start normally, those with driving functions shall be able to drive normally, and all working devices shall comply with the basic usage requirements.

4.1.3 The used equipment shall have basically intact appearance, and shall have no signs of serious deformation, impact, overturning, water immersion, fire burning, etc.

4.1.4 The main structural parts for load bearing shall have no obvious damage, deformation, cracking, etc.; important welds shall have no visible cracks; and bolts and pin shafts shall have no obvious deformation and severe wear.

4.1.5 The working devices and accessory devices shall be intact, and their functions shall comply with the provisions of the factory documents for original equipment.

4.1.6 All pipelines and cables shall be arranged neatly and fixed properly if necessary, and shall have no signs of wear or interference.

4.1.7 The components and wearing parts replaced on the used equipment shall not affect its normal operation, and shall comply with the relevant requirements of the original equipment.

4.1.8 The labels and signs on the used equipment shall be legible and consistent with the documents of the original equipment.

4.1.9 The used engineering machinery equipment which has been repaired shall retain the original equipment label containing the equipment identification number (PIN/VIN) or serial number; the used engineering machinery equipment which has been remanufactured shall have a label containing the equipment identification number (PIN/VIN) or serial number, and it may also include information such as the designation and address of the remanufacturer,

machine model, production date. The information on the above labels shall be clear and uneasily to remove throughout the life cycle of the equipment. The documents enclosed with the used equipment shall include:

a) instruction manual or operation and maintenance manual;

b) components manual;

c) legal transaction vouchers or statement;

d) major accident statement (major accidents include rollover, fire, water immersion, serious damage caused by falling objects, and assembly replacement caused by serious traffic accidents);

e) documents such as the original equipment ' s factory certificate;

f) list of replaced components and wearing parts (the information of the list includes but not limited to the manufacturer designation, specifications and models of the components and wearing parts);

g) details of remanufactured components (applicable only to remanufactured used equipment ).

4.1.10 The used equipment shall comply with the following safety requirements:

a) The safety signs and hazard pictograms shall be complete, clear and firmly posted;

b) The alarm functions shall be normal, the lighting and signal devices shall be complete and effective, and shall comply with the requirements of the corresponding product standards;

c) The safety devices shall be complete, and shall operate properly;

d) The balancing valves and the hydraulic locks shall function normally, and the interlocking devices shall be safe and reliable;

e) The accesses, steps, ladders, etc. shall maintain their original structures, and shall be safe and reliable;

f) In case that the falling-object protective structures, roll-over protective structures and tip-over protective structures are provided, they shall maintain their original structures, and shall be safe and reliable;

g) There shall be no risk of crushing, shearing, entanglement, or being caught between fixed parts and moving parts as well as in related areas;

h) Protective devices shall be provided around the easily accessible operating and moving parts as well as high-temperature parts;

i) There shall be no obvious deformation for the lateral and rear underrun protection;

j) Stability of the machinery shall comply with the requirements of the corresponding product standards;

k) The emergency stop switch shall operate effectively and reliably.

4.1.11 The used equipment shall comply with the following environmental requirements:

a) The limits of parotic noise for the driver, the external radiated noise, and the external noise during acceleration shall comply with the relevant requirements of the export destinations;

b) The exhaust emissions of the engine shall comply with the relevant requirements of the export destinations.

### 4.2 General requirements for systems

#### 4.2.1 Control system

4.2.1.1 The functions of the control devices shall comply with the control information specified in the documents of the original equipment.

4.2.1.2 The operations of the control handle, control pedal or buttons shall be flexible and free from interference. When the control handle and the control pedal are in the neutral position, they shall not be out of position due to vibration.

#### 4.2.2 Power system

4.2.2.1 The power system shall run smoothly without obvious abnormal noise.

4.2.2.2 The oil pressure shall be normal, and there shall be no abnormal smoke color; the engine cooling, intake and exhaust and fuel systems shall have no obvious oil leakage, water leakage and air leakage.

#### 4.2.3 Hydraulic system

4.2.3.1 The hydraulic system shall operate and reverse smoothly.

4.2.3.2 There shall be no obvious abnormal noise, oil leakage and creeping during the operation of hydraulic components such as hydraulic pumps, motors, reducers, control valve banks.

4.2.3.3 There shall be no obvious leakage or damage in the hydraulic pipelines, and there shall be no obvious leakage, damage or bending in the oil cylinder.

4.2.3.4 The maximum temperature of hydraulic oil shall not exceed 80℃ during operation.

#### 4.2.4 Electrical system

4.2.4.1 The electrical system components such as instruments, meters, and lighting equipment shall function normally and comply with the requirements of the corresponding product standards.

4.2.4.2 There shall be no exposed wires or loose connectors.

4.2.4.3 The grounding resistance and the insulation resistance shall comply with the requirements of corresponding product standards.

#### 4.2.5 Transmission system

4.2.5.1 The transmission system shall have no abnormal noise, obvious damage or deformation.

4.2.5.2 When components such as torque converter, main clutch, transfer case, coupling, gearbox, central transmission, final drive are in operation, the power transmission, the gear changes and the power take-off device switching shall operate without seizure.

#### 4.2.6 Steering system

The steering system shall have the capability of automatically return to the center position and maintain straight-line driving, and there shall be no obvious seizure or oil leakage. The fit clearance of the steering knuckle arm, the steering rod and the ball joint shall be normal, and there shall be no interference during steering.

#### 4.2.7 Braking system

4.2.7.1 The braking system shall operate normally, and it shall be safe and reliable.

4.2.7.2 Service brakes, parking brakes, slewing brakes, etc. shall comply with the requirements of relevant product standards.

### 4.3 Specific technical requirements for common used equipment

#### 4.3.1 Concrete machinery

4.3.1.1 The outriggers of the concrete pump shall be stable and easy for fixation.

4.3.1.2 The concrete pump shall have the function of cleaning the concrete delivery pipeline or shall be equipped with cleaning devices and accessories.

4.3.1.3 The front and rear axles, frame and suspension of the concrete truck mixer chassis shall be intact, and the basic usage functions shall be equipped.

4.3.1.4 The specific operating devices of the concrete truck mixer shall comply with the following requirements:

a) The mixing drum and the roller track shall operate normally;

b) The supporting roller shall rotate normally without serious wear and deformation;

c) The water supply system shall function normally with respect to pressure maintaining, and there shall be no air leakage.

4.3.1.5 The frame, sub-frame, and front and rear axles of the truck-mounted concrete pump chassis shall have no obvious deformation or cracks.

4.3.1.6 The maximum support force marking on the outriggers of the truck-mounted concrete pump shall be visible, and it shall be consistent with the requirements of the instruction manual.

4.3.1.7 The specific operating devices of the truck-mounted concrete pump shall comply with the following requirements:

a) The placing boom, turntable, chassis and outriggers shall have no obvious deformation or crackage;

b) The concrete delivery pipe shall have no damage and cracks;

c) The stirring device shall operate normally, and there shall be no serious material

accumulation or obvious grout leakage in the hopper;

d) The concrete cylinder shall have no obvious grout leakage, and the piston rod and the cylinder barrel shall have no obvious bending;

e) The measures taken by the placing boom to prevent the front hose of the delivery pipe from sudden falls shall be reliable and effective, and no other delivery pipes shall be connected to the rear hose of the placing boom.

### 4.3.2 Mobile crane

4.3.2.1 The superstructure and chassis of the mobile crane shall be intact, and the boom, slewing table, frame and outriggers shall have no obvious damage.

4.3.2.2 The tensioning degree for the crawler track of the crawler crane shall be adjustable. For the crawler frame with telescopic and translational functions, the telescopic movement shall be stable.

4.3.2.3 The front and rear axles of the tyre crane shall have no obvious deformation and cracks, and the frame shall have no plastic deformation, rust and cracks.

4.3.2.4 The specific operating devices shall comply with the following requirements:

a) The hook shall be intact, and it shall have no cracks, patch welding and obvious deformation. The mousing-hook device shall be effective;

b) The model, diameter and minimum breaking force of the wire rope shall comply with the documents of the original equipment, and the rope end shall be firmly fixed;

c) The counterweight shall have no defects or damage, and its quantity and quality shall conform to the instruction manual;

d) The devices on the drum and the pulley to prevent the rope from detaching or jumping out of the groove shall be reliable and effective;

e) When the load is suspended and lifted again, the load shall have no obvious reverse movement under any conditions;

f) The luffing mechanism shall stop the boom stably in any position under the control of the operator, and it shall maintain the boom and the rated load when the operator does not perform any operation;

g) The telescopic mechanism shall reliably support each extended boom section, extend and retract the boom to the predetermined length under the control of the operator, and effectively control the rated load.

### 4.3.3 Earth-moving machinery

4.3.3.1 The lower frame shall be intact, and the driving wheel, the guide wheel, the support wheel, the riding wheel and the crawler track shall have basic usage functions.

4.3.3.2 The structural parts such as the push rod, bulldozer blade, ridger of the bulldozer shall not have obvious cracks, and they shall also have no wear and deformation that affect the functions.

4.3.3.3 The boom, dipper handle and bucket of the excavator shall be free of weld cracking, base material cracks and deformation that affects the function; and the pins and bushings shall fit well.

4.3.3.4 The components such as the boom, swing arm, tie rod of the loader shall have no deformation that affects the function; the pins and bushings shall fit well; and the bucket wear shall not affect the bucket strength and the original bucket capacity requirements.

### 4.3.4 Pile driving machinery

4.3.4.1 The rotary drilling rig shall comply with the following requirements:

a) The main winch shall enable the drill pipe and the power head to move synchronously and normally;

b) The braking system of the winch shall operate normally. When the operating device of the winch does not operate or the power is interrupted, the braking system shall be able to automatically operate and prevent the load from falling back accidentally.

4.3.4.2 The vibratory pile hammer shall comply with the following requirements:

a) The vibrating eccentric block of the vibrator shall be installed securely, there shall be no abnormal noise in the vibrating case, and the bearing shall not be overheated when the eccentric shaft runs at a high speed;

b) The belt pulley shall have no cracks, defects or damage;

c) The transmission V-belt shall have a moderate tightness without slip, and its wear shall not exceed the requirements in the instruction manual; and the protective cover shall have no deformation or damage;

d) The springs and shaft pins of the vibration isolators shall be complete and free of plastic deformation and cracks; and the guide rollers shall be tightly installed, and they shall rotate flexibly without any defects or damage;

e) The guide rollers shall be tightly installed, and they shall rotate flexibly without any defects or damage;

f) The lifting pulley block shall have a neat appearance, the pulley shall rotate flexibly and easily, and there shall be no cracks, defects or other damage;

g) There shall be no lateral vibration.

4.3.4.3 The auger driller shall comply with the following requirements:

a) The drill pipe shall not be bent;

b) The center of the power box drill pipe, the intermediate stabilizer and the lower guide ring shall be on the same axis;

c) The motor configured in the power box shall run smoothly without abnormal noise or overheating;

d) The V-belt that transmits power to the power box shall have a moderate tightness, and it shall not have slip, damage or aging.

4.3.4.4 The clamping mechanism of the static pile driver shall operate flexibly, and the clamping plate shall have no deformation and cracks.

4.3.4.5 The tubular diesel pile hammer shall comply with the following requirements:

a) The accessories shall be complete. The upper and lower cylinder bodies shall not have cracks or severe rust;

b) The accessories such as the fuel pump, the oil pump shall be firmly connected;

c) The radiating fins for the lower cylinder of the air-cooled diesel pile hammer shall be kept clean without oil stains.

### 4.4 Specific requirements for remanufactured used engineering machinery equipment

In addition to the requirements in 4.1 to 4.3 of this document, the functions, performance, and environmental and safety characteristics of remanufactured used engineering machinery equipment shall comply with the relevant product standards or the requirements specified by the export destinations.

## 5 Test

### 5.1 General test items and methods

#### 5.1.1 Functions of machinery

The used equipment shall operate in no-load test conditions specified in the relevant product standards. This is to check whether each operating device complies with the requirements of 4.1.2 and whether the machinery with the driving function can drive normally.

#### 5.1.2 Appearance inspection

Check whether the appearance of the machinery complies with the requirements of 4.1.3.

#### 5.1.3 Main structural parts for bearing load, important welds, bolts and pin shafts

Check whether the main structural parts for bearing load, important welds, bolts and pin shafts comply with the requirements of 4.1.4.

#### 5.1.4 Operating equipment and accessories

Check whether the operating equipment and accessories comply with the requirements of 4.1.5.

#### 5.1.5 Pipelines and cables

Check whether all the pipelines and cables comply with the requirements of 4.1.6.

#### 5.1.6 Replaced parts and wearing parts

Check whether the replaced parts and wearing parts comply with the requirements of 4.1.7.

#### 5.1.7 Labels and signs

Check whether labels and signs comply with the requirements of 4.1.8.

#### 5.1.8 Labels and enclosed documents

Check whether the label of the original equipment or the label and the enclosed documents for remanufactured used engineering machinery equipment comply with the requirements of 4.1.9.

#### 5.1.9 Safety requirements

5.1.9.1 Check whether the safety signs and hazard pictograms are complete, clear and firmly posted.

5.1.9.2 Check whether the alarm functions operate normally, whether the lighting and signal devices are complete and effective, and whether all of them comply with the requirements of the corresponding product standards.

5.1.9.3 Check whether the safety devices are complete, and whether they operate properly.

5.1.9.4 Check whether the balancing valves and the hydraulic locks function normally, and whether the interlocking devices are safe and reliable.

5.1.9.5 Check whether the accesses, steps, ladders, etc. maintain their original structures, and whether they are safe and reliable.

5.1.9.6 In case that the falling-object protective structures, roll-over protective structures and tip-over protective structures are provided, check whether they maintain their original structures, and whether they are safe and reliable.

5.1.9.7 Check whether there is any risk of crushing, shearing, entanglement, or being caught between fixed parts and moving parts as well as in related areas.

5.1.9.8 Check whether protective devices are provided around the easily accessible operating and moving parts as well as high-temperature parts.

5.1.9.9 Check whether there is obvious deformation for the lateral and rear underrun protection.

5.1.9.10 Test whether the stability of the machinery complies with the requirements of the corresponding product standards.

5.1.9.11 Test whether the emergency stop switch operates effectively and reliably.

#### 5.1.10 Environmental requirements

5.1.10.1 Test the parotic noise for the driver, the external radiated noise, and the external noise during acceleration in accordance with the relevant requirements of the export destinations.

5.1.10.2 Review the relevant certification documents on exhaust emissions of the engine.

#### 5.1.11 Control system

Check whether the control system complies with the requirements of 4.2.1.

#### 5.1.12 Power system

Check whether the power system complies with the requirements of 4.2.2.

#### 5.1.13 Hydraulic system

Check whether the hydraulic system complies with the requirements of 4.2.3.

#### 5.1.14 Electrical system

5.1.14.1 Check whether the electrical system components such as instruments, meters, lighting equipment, the wires and the connectors comply with the requirements of 4.2.4.1 and 4.2.4.2.

5.1.14.2 Test the grounding resistance and the insulation resistance in accordance with the relevant product standards.

#### 5.1.15 Transmission system

Check whether the transmission system complies with the requirements of 4.2.5.

#### 5.1.16 Steering system

Check whether the steering system complies with the requirements of 4.2.6.

#### 5.1.17 Braking system

Test service brakes, parking brakes, slewing brakes, etc. in accordance with the requirements of corresponding product standards.

### 5.2 Specific test items and methods for common used equipment

#### 5.2.1 Concrete machinery

5.2.1.1 Check whether the outriggers of the concrete pump are stable and easy for fixation.

5.2.1.2 Check whether the concrete pump has the function of cleaning the concrete delivery pipeline or whether it is provided with cleaning devices and accessories.

5.2.1.3 Check whether the front and rear axles, frame and suspension of the concrete truck mixer chassis are intact, and whether the basic usage functions are equipped.

5.2.1.4 Check whether the specific operating devices of the concrete truck mixer comply with the requirements of 4.3.1.4.

5.2.1.5 Check whether the frame, sub-frame, and front and rear axles of the truck-mounted concrete pump chassis have obvious deformation or cracks.

5.2.1.6 Check whether the maximum support force marking on the outriggers of the truck-mounted concrete pump is visible, and whether it is consistent with the requirements of the instruction manual.

5.2.1.7 Check whether the specific operating devices of the truck-mounted concrete pump comply with the requirements of 4.3.1.7.

#### 5.2.2 Mobile crane

5.2.2.1 Check the superstructure and chassis of the mobile crane are intact, and whether the boom, slewing table, frame and outriggers have obvious damage.

5.2.2.2 Check whether the tensioning degree for the crawler track of the crawler crane is

adjustable. For the crawler frame with telescopic and translational functions, check whether the telescopic movement is stable.

5.2.2.3 Check whether the front and rear axles of the tyre crane have obvious deformation and cracks, and whether the frame has plastic deformation, rust and cracks.

5.2.2.4 Check whether the specific operating devices comply with the requirements of 4.3.2.4.

### 5.2.3 Earth-moving machinery

5.2.3.1 Check whether the lower frame is intact, and whether the driving wheel, the guide wheel, the support wheel, the riding wheel and the crawler track has basic functions.

5.2.3.2 Check whether the structural parts such as the push rod, bulldozer blade, ridger of the bulldozer have obvious cracks, and whether they have wear and deformation that affect the functions.

5.2.3.3 Check whether the boom, dipper handle and bucket of the excavator are free of weld cracking, base material cracks and deformation that affects the function; and the pins and bushings shall fit well.

5.2.3.4 Check whether the components such as the boom, swing arm, tie rod of the loader have deformation that affects the function; whether the pins and bushings fit well; and whether the bucket wear affects the bucket strength and the original bucket capacity requirements.

### 5.2.4 Pile driving machinery

5.2.4.1 Check whether the rotary drilling rig complies with the requirements of 4.3.4.1.

5.2.4.2 Check whether the vibratory pile hammer complies with the requirements of 4.3.4.2.

5.2.4.3 Check whether the auger driller complies with the requirements of 4.3.4.3.

5.2.4.4 Check whether the clamping mechanism of the static pile driver operates flexibly, and whether the clamping plate has deformation and cracks.

5.2.4.5 Check whether the tubular diesel pile hammer complies with the requirements of 4.3.4.5.

## 5.3 Specific test items and methods for remanufactured used engineering machinery equipment

In addition to the test items in 5.1 to 5.2 of this document, the items such as the functions, performance, and environmental and safety characteristics of remanufactured used engineering machinery equipment shall be tested in accordance with the relevant product standards or the requirements specified by the export destinations.

**Bibliography**

[1]GB/T 14560-2022, *Crawler cranes*

[2]GB/T 21682-2019, *Rotary drilling rig*

[3]GB/T 26408-2020, *Concrete truck mixer*

[4]GB/T 41101.3-2021, *Earth-moving machinery-Sustainability-Part 3: Used machines*

*[5]JB/T 12576-2015, Tyre cranes*

[6]JB/T 14203-2021, *Earth-moving machinery--Remanufactured vibratory roller*

[7]JGJ 160-2016, *Technical code for inspection of machinery and equipment on construction site*

[8]QC/T 718-2013, *Truck mounted concrete pump*

[9]SB/T 10674-2012, *Technical specification for circulation of used loader*

[10]SB/T 10675-2012, *Technical specification for circulation of used excavator*

[11]SB/T 10676-2012, *Technical specification for circulation of used truck-mounted concrete pump*

[12]SB/T 10677-2012, *Technical specification for circulation of used mobile crane*

[13]SB/T 11056-2013, *Technical specification for circulation of used dozer*

[14]SB/T 11057-2013, *Technical specifications for circulation of second-hand concrete truck mixer*