



Instruction manuals

XCT45 U Truck-Mounted Crane Rated Lifting Load Manual



List of Manuals

1. XCT45_U Truck-Mounted Crane Operation and Maintenance Manual
2. **XCT45_U Truck-Mounted Crane Rated Lifting Load Manual**
3. XCT45_U Truck-Mounted Crane Parts Catalogue

XCT45_U Truck-Mounted Crane Rated Lifting Load Manual

Version: 20251230

XCT45_U Truck-Mounted Crane Rated Lifting Load Manual

VIN	
Engine number	
Delivery date	Year Month

Instruction manuals are part of the crane and must be kept with the crane and accessible by the operator.

Please read and understand this manual before operating the crane.

This crane is designed and manufactured in accordance with:

ASME B30.5-2021 Mobile and Locomotive Cranes

Fire extinguisher and first aid kit which meet the local requirements must be added to the crane before putting it to work.

WARNING

California Proposition 65

This product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Batteries, battery posts, terminals, and related accessories can expose you to chemicals, including lead and lead compounds, which are known to the State of California to cause cancer and birth defects or other reproductive harm.

Avoid direct contact with the chemical substances. Use appropriate protective equipment; wear protective gloves at all times during handling. Wash hands thoroughly after use. Dispose of waste chemicals in accordance with local environmental regulations and legal requirements.

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Note

Use genuine parts only. If non-genuine parts are used, XCMG will not be responsible for any damage to the machine or lost operation time.

Preface

Sincerely thank you for trusting and using this XCMG branded boom truck made by Xuzhou Heavy Machinery Co., Ltd.

This manual covers all the configurations of the product and is for reference only. Please refer to the configuration of the model purchased.

This manual includes the specifications, technical parameters and rated load charts of the crane. Any lifting work involves risks. In order to minimize the risk of accident and still fully utilize the crane, please pay special attention to the contents of “Danger”, “Warning” and “Caution” in this manual.

The manual along with other supplied technical documents are part of the crane. Please keep them carefully in the service life with the crane. Due to product improvements or modifications, there may be differences between this manual and the crane. XCMG reserves the right to modify the manual or the crane without notice of improvement. The illustrations used in this manual are intended as representative reference views only. Thus, information, illustrations and/or specifications to explain and/or exemplify a product, service or maintenance improvement may be changed at any time without notice.

Manufacturer information

XCMG

Add: No. 68 Gaoxin Road, Economic and Technological Development Zone, Xuzhou, Jiangsu, P. R. China

Tel: +86-516-83462242

Quality Inquiry Tel: +86-516-87888268



Spare Parts Tel: +86-516-83461542

Post Code: 221004

Website: <http://www.xcmg.com>

Safety symbols and their meanings

Layout of warning notice:

 Signal words	= Safety alert symbol  + Safety words: Safety words: Danger-Warning-Caution-Notice
Harm severity	General design of safety instructions Severity of danger (Signal words: Danger-Warning-Caution-Notice) Aspects and sources of danger (such as: Duration, probability of danger) Consequences of ignoring dangers Measures to avoid or prevent the occurrence of dangers
Description:	1. Type of hazard explained 2. Risk of ignoring warnings 3. Measures/precautions to be taken to avoid or prevent hazards


Example:



1. Definition and description of risks or hazards
2. Explain the consequences of ignoring warnings
3. Provide solutions to avoid/prevent dangers!

Graduation of the warning notices

Warning notices addressed to hazards affecting human physical injuries vary with decreasing hazard gravity as follows:

 — This safety warning symbol means ATTENTION! It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



“Danger” identifies an imminent danger, which, if not avoided, will result in death or serious irreversible injury.



“Warning” identifies a potential danger, which, if not avoided, can result in death or serious irreversible injury.

⚠ CAUTION

“Caution” identifies a potential danger, which, if not avoided, can result in minor or moderate injury.

NOTICE

Indicates a situation that can cause damage to the equipment, personal property and/or the environment, or cause the equipment to operate improperly. Damage to personal property and the parts of the crane and decrease in crane performance could be caused if the message is not followed strictly.



——It is used to supply indications or additional explanations for individual items.

Data recording device

This crane is equipped with a data recording device.

Among others, the following data is recorded:

- Date and time.
- Entered configuration of the crane.
- Actual load.
- Percentage of utilization of the crane.
- Working radius.
- Boom angle, luffing jib angle.
- Total telescopic boom length, length of each telescopic section.
- Every actuation of bypass devices.

The recorded data can be read with a corresponding software.

Intended use of the crane

Intended use as defined in this section is a basic requirement for any safe operation!

Intended use of the crane is mainly used for lifting operation and installation projects. It is widely used for lifting operations and installation projects in various road conditions in cities, rural areas and off-road environment. It is suitable for large-scale projects and complex working environments such as ports, docks and bridges.

Utilization is limited only to the work areas and conditions of use listed and described in this instruction for use.

Use and park the machine only over surfaces capable of supporting it.

Protect the working areas of use (i.e. by fences) to prevent the access of an unauthorized and uninstructed persons (i.e. children).

Non-observation of the intended use of crane may result in the following consequences:

- Life-threatening or fatal injuries.
- Severe damage to the machine, the assets or environmental contamination for which the owner/operator may be held liable.
- Loss of warranty and guarantee claims.
- The crane may only be operated in enabled setup condition and modes as provided in the manuals.
- Any application, not described in the operating and maintenance instruction for use must be authorized in writing by the manufacturer beforehand.
- Any divergent use without the manufacturer's written consent is considered as "non-intended use".

Intended use requires the following:

- Install all safety devices properly and ensure their correct function.
- Provide and perform all maintenance and repair work as stated in this instruction handbook and according to the given specifications.
- Involve only qualified maintenance personnel or authorized personnel.
- Follow the safety instructions in the manuals when operating.
- Apply all valid local, national and international safety regulations
- Use only the operating materials as listed in this instruction handbook (oil, grease, etc.)
- All persons involved in the machine's operation must follow the safety instructions in the manuals.
- All personnel involved in the machine's operation must perform their duties.
- Regard and respect the technical information values and their limits.
- Follow and respect the operating capacities as listed in the instruction manuals.
- Take into account the corresponding crane model and maximum loads.

Unintended use of the crane

The machine is not intended to be used:

- as transport vehicle (i.e. for materials and people),
- neither for applications not related to lifting operations.
- on sites with potentially explosive environment and on sites with insufficient ventilation (i.e. within closed spaces) is prohibited.
- Use other that described here as intended is not authorized by the manufacturer and is outside legal limits of manufacturers' liability.

Residual risks

XCMG evaluated and designed the machine having safety as main task. Although it is impossible to foresee all events that may occur, existing residual risks have been mentioned in this manual as many as possible at the time this manual has been edited.

Follow safety instructions provided in this manual, and with the warning signs on the machine, most risks could be avoided and safe operation of the machine could be available.

Residual risks may occur in following situations:

- Risks of injury and even death by:
 - Failure to comply with local occupational health and safety guidelines, requirements, and instructions.
 - Ignorance, misuse or incorrect operation of this manual.
 - Improper machine transportation, e.g. transporting the machine on unsuitable vehicles or lack in securing measures;
 - Delayed repair or replacement of defective parts.
 - Operate the machine under the influence of drugs, alcohol, or any other substance;
 - Personnel working on the machine are not qualified, e.g. too young, inexperienced, untrained or uninstructed.
 - The machine is not cleaned, the safety access system (steps, handrails, etc.) is slippery, the safety warning signs are poorly readable, and the operating elements are damaged.
 - The machine is not properly secured when it is parked, maintained, serviced or repaired.
 - There are insufficient safety precautions at the job-site.
 - There is insufficient required personal protective equipment.
 - Smoking or open fire when dealing with flammable substances (e.g. when refueling).
 - Refueling while engine is running or spilling fuel over surfaces high temperature parts.
- Risks of damaging the machine and property by:
 - Ignorance, misuse or incorrect operation of this manual.
 - Operating the machine in an inappropriate environment (e.g. insufficient ground support).
 - Use of unsuitable consumables and spare parts.

- Inadequate or improper maintenance.
- Environmental risks:
 - Ignorance, misuse or incorrect operation of this manual.
 - Exhaust gas and noise pollution caused by idle running of engine.
 - Use of unsuitable consumables and spare parts.
 - Inadequate or improper maintenance.
 - Clean the crane with improper cleaning agent and in improper environment.
- The performance and service life of the machine may be reduced due to:
 - Ignorance, misuse or incorrect operation of this manual.
 - Use of unsuitable consumables and spare parts.
 - Inadequate or improper maintenance.
 - Unnecessary idle running of engine

Prohibited operations

The crane is designed and manufactured in compliance with relevant laws and regulations. Man-made damage from the operator or the third party may cause abnormality of crane during operation.

Inspect the machine's safety devices before operating the machine. Do not operate the machine if a safety device is damaged or not operating properly. Any trouble that may impair the usual operation of crane should be removed in time.

XCMG is not responsible for the damage caused by mis-operation and misuse. Any related risk will be borne by crane owner, operator and user.

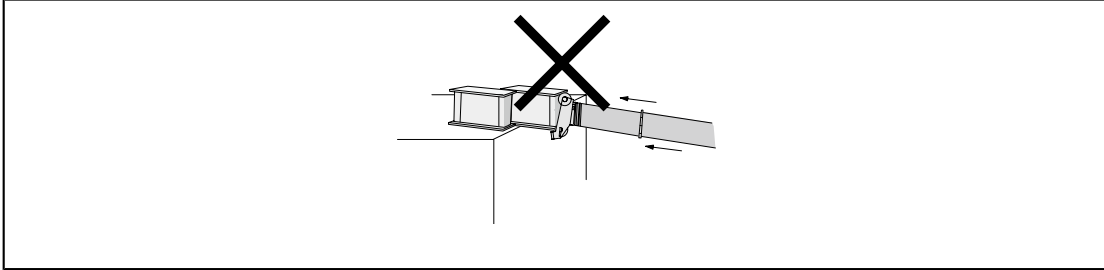
⚠ WARNING

Danger of fatal injury and danger of crane damage:

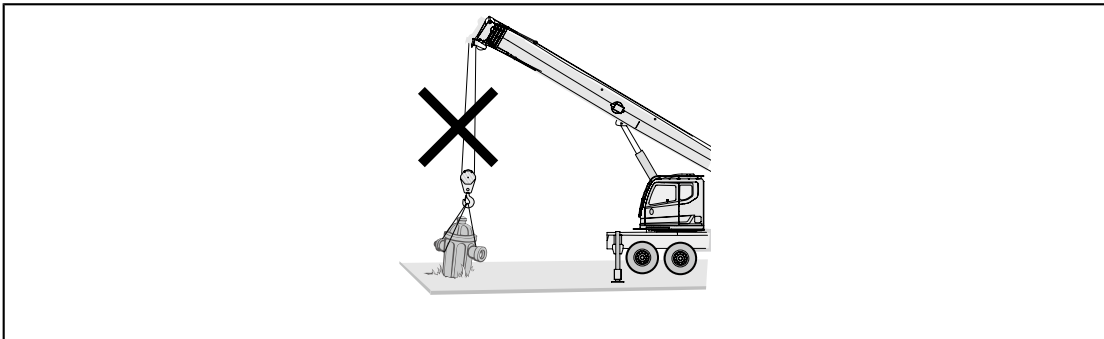
- **Do not modify the crane without the manufacturer's permission.**
- **All consequences caused by unauthorized modifications rest with the user.**

In order to minimize the risk of accident and still fully utilize the crane, never attempt any of the following:

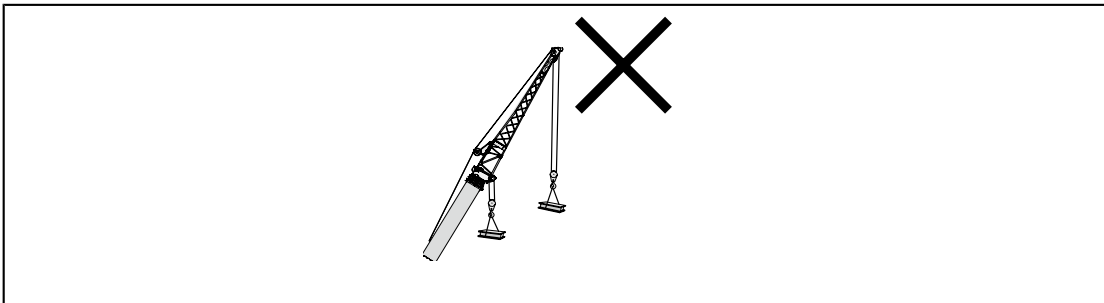
1. Transporting loads on the chassis;
2. Pushing, pulling or hoisting the load by adjusting the telescopic boom or the outrigger cylinder;



3. Lifting a load by slewing or luffing the boom;
4. Separating the connected objects with the crane;

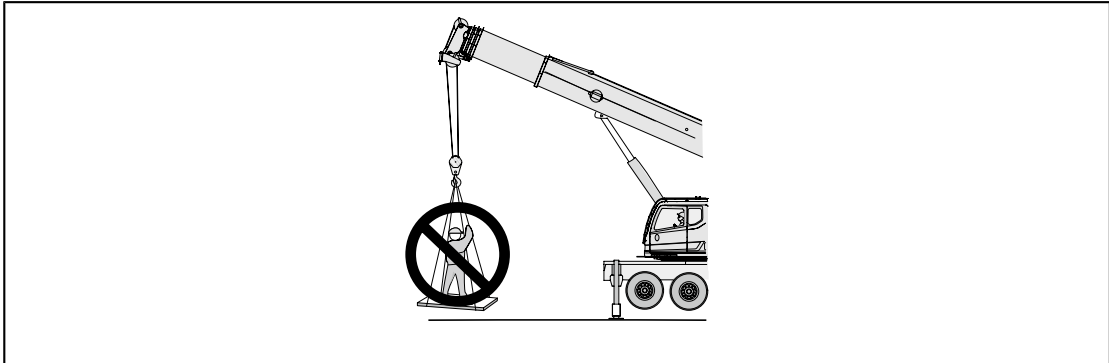


5. Lifting two independent loads by dual-hook.



6. Operating the crane when outriggers are not extended (wheels are not off the ground);
7. Overload;
8. Driving on public roads while exceeding maximum or permitted axle loads, machine width, length or height, etc.;

9. Traveling with a load suspended;
10. Using spare parts or attachments which are not approved by the crane manufacturer.
11. During travel, allowing person to stay on the lifting device, load or in the operator's cab;
12. Operating the crane while a person is standing under a suspended load or carrying a load over people;
13. Transferring personnel with the lifting equipment or on the load;



14. Handling loads that are beyond the values specified in the load charts;
15. Operating the crane beyond the specified working radius and areas;
16. Setting the LMI to a configuration that does not match the physical configuration of the crane;
17. Adding ballast or additional load to an already suspended load;
18. Using the crane for sports or recreational events, such as bungee jumping.

Reasonably foreseeable misuse

"Reasonably foreseeable misuse" means also the use of machinery in a way not prescribed in the instruction handbook, but which may result from readily predictable human behavior. This includes any undeclared application or type of misuse listed.

State of art technologies control a number of such "foreseeable misuses" but not all misuse cases can be managed by technical and technological means.

Misuse or improper use of the machine may lead to severe injuries or death and consequently to expiration of the warranty!

- The machine operator and /or owner will be fully responsible for all damages done due to machine "unintended use" .
- Any use that is not described in this instruction handbook is considered as "unintended use" .

Reasonably foreseeable misuse is considered -but not limited to:

- Fail to read and observe the Safety Manual and Operation Manual.
- Operate the machine while the instruction manuals are missing, incomplete or not available in the contractually agreed language at the machine.
- The crane is operated by uninstructed or unqualified personnel.
- Operate the crane when ignoring safety requirement applicable at your site.
- Expose the machine to physical quantities that exceed the limits prescribed by the manufacturer. (e.g. ambient temperature, altitude, carried load, operating restrictions for soil with slope inclination etc.)
- Operator's habitual behaviors.
- Transport of materials or passengers.
- Dragging loads.
- Operate the crane while not on driver's seat.
- Operate the crane without correctly fastening the seat belt.
- Remove of bypass protective equipment (i.e. seat belt, etc.).
- Perform maintenance/repair tasks with engine running or machine not secured.
- Operate the machine knowing that the machine is not in a proper technical condition.
- Use or park the machine in areas exceeding environmental limits specified for this crane including (but not limited on):
 - Temperature.
 - Lateral and transversal surface gradient.
 - Surface load-bearing ability.
- Moving the machine without adequate vision, or without a supervising coworker.
- Without the manufacturer's written approval, carry out any modification on the machine or interchangeable equipment that may affect the operation safety.

- Fail to follow the maintenance instructions and intervals.
- Skip or delay repairs and activities meant to prevent or to detect damage.
- Improper maintenance and repair work.
- Not use of approved spare parts.
- Unauthorized modifications of the machine.
- Inappropriate use of high-pressure cleaners or use inappropriate cleaning agents and other devices.
- Transport the machine without appropriate lashing on the transport vehicle.
- Unsafe parking, storage or use of the machine by unauthorized personnel (i.e. in inclined areas, open areas, with ignition key left at the machine, etc.).
- Open fire or smoke while handling inflammable materials (e.g. during refueling).

Scope of usage limitations

The manual clearly defines the machine's operational limitations and scope of use.

- All phases in the machine's entire life cycle (transport, assembly and installation, commissioning/delivery, use, disassembly, decommissioning and scrapping).
- The intended use of the machine, please see 1.5 “Intended Use of the Machine” .
- Reasonably Foreseeable misuse, please see 1.9 “Foreseeable misuse” .
- Basic requirements (such as the operator’ s age, eyesight or hearing) for safe operation of the machine (such as industrial, non-industrial and household machines). See the relevant section in 3.6 “General staff requirements” in the Operation and Maintenance Manual for details.
- Training level, experience or competence of the operators, maintenance personnel, interns and the general public.
- Inexperienced/more vulnerable persons, including:
 1. Vulnerable groups (e.g. interns, pregnant women).
 2. Other personnel (such as management personnel in construction sites, operators of adjacent machinery, employees from other jobsites, visitors, etc.).

Space Limitations

- The movement range of the machine, such as the jobsite and the working radius of the machine. Refer to 3.4 working areas in the Rated Lifting Load Manual for specific parameters.
- Space requirements for man-machine interaction during operation and maintenance.
- Human-machine interaction mode, such as "human-machine" screen.
- “Machine - power source” port.

Time Limitations

- Limitation on the service life of the complete machine or specific components (such as wear parts, critical safety parts, etc.).
- For the maintenance cycle of the crane, please refer to 11.9 “Regular Maintenance and Inspection” in the Operation and Maintenance Manual.

Other Limitations

- Limitations due to environmental factors: e.g., limitations due to specific environmental conditions (temperature, altitude, gradient, etc.). Refer to 5.4 operating conditions in the Operation and Maintenance Manual for specific parameters.
- Maintenance that meets the requirements of the cleanliness level.
- Energy supply limitations:
 - Types of energy.
 - Energy supply modes.
- Material-related limitations:

- Properly handle waste, see 11.7 Safety Disposal Recommendations in the Operation and Maintenance Manual.
- Materials used by the machine, such as raw materials and auxiliary materials, shall not be harmful to the safety and health of personnel.
- Machine operation information:
 - Use specialized hardware and software.
 - Process different information inputs (deliver information through sensors or other types of software).
 - Controller and integrated circuit.

Permissible environmental conditions

Environmental conditions should be taken into consideration when using the machine to ensure its safe operation, improve reliability, and extend its service life. Such as:

- Check or adjust the oil (fuel, engine oil, hydraulic oil, etc.) according to the environmental conditions.
- In cold weather, if the battery electrolyte is frozen, do not start the machine or charge the battery.
- The ambient temperature will affect the machine operation, especially acceleration, deceleration and stop.
- Always operate or park the machine on a ground that is stable enough to withstand the maximum possible load (including dynamic vibration load) applied by the machine.
- Follow safety warnings.

Operational aids

Operational aids are accessories that provide information to facilitate crane operation, or accessories that can control specific functions without the need for operator operation when limiting conditions are detected.

Operational aids include but are not limited to the following:

- LMI
- Anti-two block
- Lowering limiter
- Boom length/radius/angle sensor
- Crane levelness indicator
- Anemometer

Check the chapter of 9.2 Safety Devices in the Operation and Maintenance Manual for the details of above devices.

If the operational aids cannot work properly, the crane user or owner must ensure that the repair or recalibration is completed as soon as reasonably possible.

NOTICE

Test daily to ensure normal operation. Do not interfere with the normal operation of auxiliary device or warning device.

DANGER

Tipping hazard!

To avoid death or injury, do not exceed the rated capacity shown on the load table.

Check the load chart frequently to ensure that the load lifted within the required radius is within the rated performance range of the crane.

DANGER

Tipping hazard!

In order to avoid death or physical injury, ensure that the load and crane configuration are within the capacity range stated in the crane performance table and its notes.

The crane shall be equipped with a load moment limiter (LMI).

Carry out daily inspection to ensure the normal operation of the LMI.

⚠ DANGER

Danger of height beyond range!

In order to avoid death or serious physical injury, keep the rigging away from the top of the boom/jib during boom luffing, telescoping and lifting.

The crane shall be equipped with an anti-two block and the LMI.

Carry out daily inspection to ensure the normal operation of the LMI.



The electronic aids on a crane are designed to enhance the safety of operators.

- **When the electronic aids are functioning properly, operators must still comply with the safety operation requirements specified in the crane's load chart and instruction manual. Non-compliant operations can lead to safety accidents.**
- **It is prohibited to deactivate the electronic aids or conduct operations with excessive loads in violation of regulations.**
- **Do not tear off the labels or plates on the crane body, or remove the load chart or operation and maintenance manual from the operator's cab.**

Unit conversion table

No.	Initial unit	Coefficient	Target unit
Length	mm	0.03937	in
	in	25.4000	mm
	mm	0.00328	ft
	ft	304.8	mm
	cm	0.39370	in
	in	2.5400	cm
	cm	0.0328	ft
	ft	30.48	cm
	m	39.37	in
	in	0.0254	m
	m	3.281	ft
	ft	0.3048	m
	km	0.62137	mile
	mile	1.6093	km
Area	cm ²	0.155	in ²
	in ²	6.4516	cm ²
	m ²	10.764	ft ²
	ft ²	0.0929	m ²
Volume	cm ³	0.06102	in ³
	in ³	16.387	cm ³
	m ³	35.3147	ft ³
	ft ³	0.0283	m ³
	l	0.001	m ³
	m ³	1000	l
	l	61.024	in ³
	in ³	0.016387	l
	l	0.0353	ft ³
	ft ³	28.32	l
	l	0.264178	US.liq.gal
	US.liq.gal	3.7853265	l
Mass (weight)	kg	2.20462	lb
	lb	0.45359	kg
	t	2204.62	lb
	lb	0.0004536	t

No.	Initial unit	Coefficient	Target unit
	t	1.1023	short ton US(tn.sh.)
	short ton US(tn.sh.)	0.90718	t
	t	2.20462	kip
	kip	0.45359	t
Mass/length	kg/m	0.055998	lb/in
	lb/in	17.857781	kg/m
	kg/m	0.67197	lb/ft
	lb/ft	1.48816	kg/m
Force	N	0.2248	lbf
	lbf	4.4483986	N
	kN	224.809	lbf
	lbf	0.0044483986	kN
Torque	N·m	8.85075	lbf·in
	lbf·in	0.112984	N·m
	N·m	0.73756	lbf·ft
	lbf·ft	1.3559	Nm
Power	PS	0.7355	kW
	kW	1.3596	PS
	HP	0.7457	kW
	kW	1.3410	HP
Speed	m/s	39.37	in/s
	in/s	0.0254	m/s
	m/s	3.28084	ft/s
	ft/s	0.3048	m/s
	km/h	0.62137	mph(mi/h)
	mph(mi/h)	1.60935	km/h
	m/s	2.2369	mph(mi/h)
	mph(mi/h)	0.44704	m/s
Pressure	kPa(kN/m ²)	0.01	bar
	bar	100	kPa(kN/m ²)
	bar	14.5038	psi
	psi	0.06895	bar
	kPa(kN/m ²)	0.145038	psi
	psi	6.894759	kPa(kN/m ²)

No.	Initial unit	Coefficient	Target unit
	N/cm ²	1.450377	psi
	psi	0.6894759	N/cm ²
	N/m ²	0.000145038	psi
	psi	6894.759	N/m ²
	t/m ²	204.81	lbs/ft ²
	lbs/ft ²	0.0048828	t/m ²
Load-related area	m ² /t	0.004882	ft ² /lbs
	ft ² /lb	204.81	m ² /t
Temperature	°C	([°C]·1.8)+32	°F
	°F	([°F]-32)/1.8	°C

Table of contents

Preface	III
Manufacturer information	V
Safety symbols and their meanings	VII
Data recording device	IX
Intended use of the crane	XI
Unintended use of the crane	XIII
Residual risks	XV
Prohibited operations	XVII
Reasonably foreseeable misuse	XXI
Scope of usage limitations	XXIII
Operational aids	XXV
Unit conversion table	XXVII
1 Manual description	1-1
1.1 About the manual.....	1-2
1.2 Text structure and symbols of the manual	1-3
1.3 Other text types.....	1-3
1.4 Supplementary information	1-4
2 Cautions	2-1
2.1 Setting up the crane	2-2
2.2 Dangerous operations	2-2
2.3 Telescopic boom	2-2
2.4 Winch.....	2-2
2.5 Wire rope	2-3
2.6 Hook block	2-4
2.7 Overload safety device and limit switch.....	2-5
2.8 Norms for using the override function	2-6
3 Rated load charts	3-1
3.1 Description.....	3-2
3.2 Explanation of symbols	3-3
3.3 Notes on the load charts.....	3-7



3.4 Working areas	3-9
3.5 Working range diagram for boom.....	3-10
3.6 Working range diagram for jib	3-11
3.7 Load charts for boom.....	3-12
3.8 Load charts for jib.....	3-26

Chapter 1 Manual description

1 Manual description.....	1-1
1.1 About the manual	1-2
1.2 Text structure and symbols of the manual.....	1-3
1.3 Other text types	1-3
1.4 Supplementary information.....	1-4

1.1 About the manual

1. The manual is an integral part of the crane. Keep it properly during the service life of the crane. You may keep it in the operator's cab for convenient reading and operation.
2. To prevent machine damage and personal injury or death, fully understand and master all information in the manual and strictly comply with all safety precautions.



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NOTICE

- **Read the operation instructions before operation. Improper operation will result in damage to the machine.**
- **If any action that is not recommended or allowed in the manual is to be taken, the operator should carry out risk assessment and take necessary measures to ensure safety. The operator should take full responsibility for all consequences.**

NOTICE

Always comply with all the precautions measures specified in the manuals to prevent accidents during operation or maintenance.

3. The safety information in the manual cannot cover all potential risks under all OMs, so the operator, slinger and supervisor must take other potential safety hazards into consideration.
4. If a guideline in the manual differs from a guideline issued by local government or authorities, follow the stricter guideline.
5. Correctly understanding and mastering what is described in the manual will help you:
 - 1) Know the structure and performance of the machine;
 - 2) Minimize misoperation and reduce danger;
 - 3) Improve working efficiency of the machine;
 - 4) Prolong the service life of the machine;
 - 5) Reduce maintenance costs.
6. If you have questions about anything in the manual, contact your dealer or XCMG's service department.

7. If the manual is lost or damaged, contact XCMG customer service center for a copy of the same edition.
8. Keep this manual with the crane and ensure that it is included with the crane if it is sold.

1.2 Text structure and symbols of the manual

Page number description: The page numbers of this manual are relative. Example: 3-21: Represents Chapter 3, Page 21, and the corresponding chapter name will be displayed in the footer of the manual.



——It is used to supply indications or additional explanations for individual items.

* —— It indicates optional, which is not a part of the standard configuration

1) , 2) , 3) , ——It indicates notes, which is used for explanations in the manual.

1.3 Other text types

1. Operation instructions

Operation instructions are demanding you to undertake an activity or to perform a work step. Always carry out handling instructions stepwise and in pre-defined sequence. The structure of operation instructions are as follows:

Step 1: Safety warning messages

Step 2: Operation steps (pictures & text)+function realization, machine feedback

Step 3: Cancel the recovery step

2. List

The structure of operation instructions are as follows:

The structure of the list without a number is as below:

- List - Level 1
 - List - Level 2
 - ◆ List - Level 3

The structure of the list with a number is as below:

1. List Level 1
 2. List Level 2
 - 2.1 List Level 2
 - 2.1.1 List Level 3
 - 2.1.2 List Level 3
 - 2.1.3 ...
 - 2.2 List Level 2
 - 2.3 ...
 3. List Level 1

1.4 Supplementary information

1. Figures

The figures are provided for additional or more detailed information and may differ from the actual product. Figures and corresponding serial numbers are shown in bold in the notes. Guide lines and numbers in the figure:

- Guide line: Generally, it is a straight line or arrow, indicating the relevant position and structure.
- Number: Generally, it is expressed by Arabic or Latin numerals, and the number meanings are explained in the table or text, and correspond to the numbers described in the text.
 - Arabic numerals refer to physical components;
 - Latin numerals refer to additional notes.

2. Dimensions

Dimensions are given in ISO unit (in imperial units for regional markets such as North America). For details on the conversion between metric and imperial units, see 1.12 Unit Conversion Table.

3. Applicable documents

Pay attention to supplementary documents, such as maintenance documents for applicable devices (like engines or other installed equipment), relevant standards, and legislative documents.

4. Availability

Ensure that this manual (including applicable documents) is available to all personnel working on the machine.

Chapter 2 Cautions

2 Cautions.....	2-1
2.1 Setting up the crane.....	2-2
2.2 Dangerous operations.....	2-2
2.3 Telescopic boom.....	2-2
2.4 Winch.....	2-2
2.5 Wire rope.....	2-3
2.6 Hook block.....	2-4
2.7 Overload safety device and limit switch.....	2-5
2.8 Norms for using the override function.....	2-6

2.1 Setting up the crane

- Before the crane is raised on the outriggers, the axles must be lowered and locked. (Available for all terrain cranes)
- The outrigger beams must be extended (to a uniform length on both sides) to the extent stated in the applied load capacity table.
- The outrigger beams must be locked in place with the pins.
- It may be necessary to place suitable outrigger pads or cribbing under the outrigger floats according to the ground conditions.
- All wheels must be raised clear off the ground.
- Use the outrigger control unit to level the crane. Horizontal positioning of the crane must also be checked from time to time and adjusted as necessary.

2.2 Dangerous operations

- Before the turntable perform slewing operation, the crane is not supported on outriggers.
- The four hydraulic jacks of the crane are not properly supported or in vertical position.
- Cranes are operated on surfaces that can't support the load. Examples include but are not limited to landfills, basements and slopes.
- The loads and /or the working radius in the load capacity charts corresponding to the boom length are exceeded.
- Use a counterweight combination or outrigger configuration that is not stated in the load charts.
- The outrigger beams are not extended out to the exact measurement specified in the load charts (on both sides).
- The outrigger beams are not secured with pins.
- The hook block and load begin swinging due to improper handling.

2.3 Telescopic boom

- The lifting capacity of the telescopic boom with its extendable telescopic sections is limited. The loads stated in the load capacity tables must not be exceeded.
- The specifications for the telescopic sections to be extended according to load and required boom length must be observed under all circumstances.
- Generally the boom should first be extended to the required length, and then loaded.
- Even without a load, the telescopic boom may only be moved within the working radius ranges for which values are listed in the load capacity charts.

2.4 Winch

- Main winch:

Main winch is designed for a maximum rope tension of 5000 kg (11023 lb). This rope tension must not be exceeded under any circumstances. Accordingly, the minimum number of hoisting rope lines (rope reeving) should be selected according to the weight of the load to be lifted.

- **Auxiliary winch**

Auxiliary winch is designed for a maximum rope tension of 5000 kg (11023 lb). This rope tension must not be exceeded under any circumstances. Accordingly, the minimum number of hoisting rope lines (rope reeving) should be selected according to the weight of the load to be lifted.

- **Prevention of disordered wire rope**

When boom is being retracted, the winch must be in a raising state at the same time, so as to prevent disordered wire rope due to contact to earth of hook block. The moving speed of wire rope should match boom retracting speed. During assembling the additional equipment, the rope guide and rope guard on the winches must be monitored by a worker.

- **The main / auxiliary winch is equipped with a normally closed brake, which can control the loads automatically to avoid free-fall when the lever returns to neutral.**

Table 2-1 Main winch specifications

Name	Parameters (main winch)	Parameters (auxiliary winch)
Drum specification	Φ14.96×23.43×0.66 (in)	Φ14.96×23.43×0.66 (in)
Drum rope groove type	Lebus-type grooving	Lebus-type grooving
Turning direction of drum rope groove	Right-handed	Right-handed
Drum capacity	410 ft	423 ft
Drum material	QT500-7	QT500-7
Wire rope diameter	0.63in	0.63in
The maximum layer around drum	3	4

2.5 Wire rope

1. The wire rope must be installed between boom head and hook block, and properly selected according to maximum tensile force that winch can bear and weight of lifted load; If the number of parts of line is too small, overload on single line will occur; if the number of parts of line is too large, the hook block could not reach the ground, and only low hoist speed is gained. The wire rope may be disordered if it is less loaded during the hook lowering.
2. If several wire rope lines are reeved in, the efficiency of the hook block is reduced due to sheave friction and rope flexure. For example: tensile force of wire rope is 23589 lb, 10-strand rope (235890 lb) can only lift 218698.6 lb.
3. The number of hoisting rope lines reeved must be set on the control and display unit of the overload safety device according to the current hoisting rope reeving total.

4. If the hook block is operated with more parts of line than necessary for the respective boom length loads, then the hook block weight will not be sufficient to keep the needed tension on the rope when lowering, which can lead to damage to the rope.

Table 2-2 Main specifications for the wire rope

Name	Parameters (main winch wire rope)	Parameters (auxiliary winch wire rope)
Type of rope	Compacted strand wire rope	Compacted strand wire rope
Nominal rope diameter	0.63in	0.63in
Wire rope length	Main winch 410ft	Auxiliary winch 423 ft
Construction of the rope	35W×K7	35W×K7
Construction of termination	Pouch socket	Pouch socket
Kind of lay	Turn leftwards	Turn leftwards
Mass (weight) per unit length	0.894lb/ft	0.894lb/ft
Tensile strength of the wire rope	313.3psi	313.3psi
Calculated aggregate breaking load	61,182lbf	61,182lbf
Minimum breaking load of rope	61,183lbf	61,183lbf
Minimum breaking load of rope end termination	61,184lbf	61,184lbf

Table 2-3 Relationship between parts of line and lifting weight

Parts of line	Lifting load/klb
1	11.02
2	22.05
3	33.07
4	44.09
5	55.12
6	66.14
7	77.16
8	88.18

2.6 Hook block

The relationship between the hook block and parts of line is shown in the following table, max. parts of line n is corresponding to the max. lifting load of current boom length. The relationship between the number of reevings n and max. lifting load is shown in the figure below:

No.	Type of hook block	Dead weight of hook block (lb)	Max. parts of line n	Notes
1	40 USt hook block*	794	8	Single hook
2	27.5 USt hook block*	440	6	Single hook
3	15 USt hook block*	400	3	Single hook
4	5.5 USt	220	1	Single hook

⚠ WARNING

Risk of serious injury or death to personnel!
If the hook block weight is insufficient, the wire rope will suddenly pull the hook block of the boom head upwards from a certain lifting height, which may cause damage to the boom head and hook block. Damaged parts and the wire rope between boom head and the winch have the risk of falling down.
When releasing the rope, if the wire rope between the winch and boom head is loose, there is a risk of the hook block suddenly falling down.

⚠ CAUTION

- **Note that insufficient hook weight could cause damage to the wire rope.**
- **If the hook cannot deliver the sufficient tension to the wire rope, the wire rope may be disarranged during the hook lifting and lowering, damaging to the wire rope.**

2.7 Overload safety device and limit switch

- If the permissible load moment is exceeded, the load moment indicator (LMI) shuts down the hoisting and boom lowering, and telescoping movements. It is possible to decrease the load moment with movements in the opposite direction. Check each operation mode of overload protective device before crane operation.
- Overload protective device must be consistent with actual condition of equipment. The state of overload protective device can be set by inputting 5 digit control code from function key.
- The LMI is a safety device and must not be used as a shutdown device for operating purposes. Before lifting operation, crane operator must make sure the weight of the load to be lifted. The fact that the crane is equipped with the overload protective device does not free the operator from responsibility with regard to operating safety.
- The overload protective device demonstrates and controls the working radius, boom length, sheave height, load and percent of the maximum capacity.

- The hoisting limit or ATB (anti-two block) switch fastened to the boom head or jib head should prevent the hook block from running into the boom or jib head. Check each operation mode of anti-two block before crane operation.
- Counter on the rope winch ensure that at least 3 wraps of rope remain on the rope drum. When there is only the final rope layer left, visually check the winch to ensure that the lowering limiter is working normally. If the winch system overwinds in the lifting direction, or if the wire rope is replaced, the counter must be reset before continuing work.
- The slewing locking device must be locked in travel configuration (excluding the use of the Dolly), and must be released before slewing.
- The LMI must be checked for correct operation on each occasion before operating the crane. The crane manufacturer will accept no liability for damage to the crane and consequential damage resulting from non-function or dis-activation of the overload protective device.

⚠ WARNING**Danger of fatal injury and danger of crane damage:**

- **Unauthorized installation of equipment or modifications of hydraulic and electrical lines will lead to serious accidents such as boom breaking and crane tipping.**
- **XCMG is not responsible for any damage caused by user's unauthorized modifications.**

2.8 Norms for using the override function

- a. The override function is mainly used for the service and maintenance of vehicle in emergency. It is not allowed to be used for normal lifting operations or overloaded operations. The override switch is located near the electric control cabinet on the right of the superstructure;
- b. The override function is not provided upon the delivery (sales) of this product. If this function is required, the user shall sign a detailed function demand agreement with the Customer Service Department of XCMG. Upon the signing of the agreement, the Customer Service Department will notify the relevant departments to activate the override function for the user;
- c. There is a major danger of tipping and damage while using the override function for hoisting operation or overloaded operation. The onboard computer system will record the operation data. All vehicle damages arising from the rule-breaking operations will be solely borne by the user.

⚠ WARNING

- **Select proper outrigger span according to the rated load charts. Secure the outriggers with pins. Ensure all wheels are off the ground, otherwise, tipping of the crane may be caused.**
- **Select proper counterweight combination according to the rated load charts. Otherwise, tipping of the crane may be caused.**
- **Select proper boom length and telescoping combination according to the rated load charts. Otherwise, tipping of the crane may be caused.**
- **Boom pins must be well secured before lifting operation. During lifting operation, the suspension system must be locked, and it is not allowed to touch any buttons for adjusting suspensions. (Applicable to all terrain cranes)**
- **It is prohibited to overload. Otherwise, broken boom and tipping of the crane may be caused.**

Chapter 3 Rated load charts

3 Rated load charts	3-1
3.1 Description	3-2
3.2 Explanation of symbols	3-3
3.3 Notes on the load charts	3-7
3.4 Working areas	3-9
3.5 Working range diagram for boom	3-10
3.6 Working range diagram for jib	3-11
3.7 Load charts for boom	3-12
20.3ft×23.6ft_5952lb_with the 5th jack 360°	3-12
20.3ft×23.6ft_4409lb_with the 5th jack 360°	3-16
20.3ft×16.1ft_5952lb_with the 5th jack 360°	3-18
20.3ft×16.1ft_4409lb_with the 5th jack 360°	3-20
20.3ft×7.4ft_5952lb_with the 5th jack 360°	3-22
20.3ft×7.4ft_4409lb_with the 5th jack 360°	3-24
3.8 Load charts for jib	3-26
F30.5ft_20.3ft×23.6ft_5952lb_with the 5th jack 360°	3-26
F53.5ft_20.3ft×23.6ft_5952lb_with the 5th jack 360°	3-28
F30.5ft_20.3ft×23.6ft_4409lb_with the 5th jack 360°	3-30
F53.5ft_20.3ft×23.6ft_4409lb_with the 5th jack 360°	3-32
F30.5ft_20.3ft×16.1ft_5952lb_with the 5th jack 360°	3-34
F53.5ft_20.3ft×16.1ft_5952lb_with the 5th jack 360°	3-36
F30.5ft_20.3ft×16.1ft_4409lb_with the 5th jack 360°	3-38
F53.5ft_20.3ft×16.1ft_4409lb_with the 5th jack 360°	3-40
F30.5ft_20.3ft×7.4ft_5952lb_with the 5th jack 360°	3-42
F53.5ft_20.3ft×7.4ft_5952lb_with the 5th jack 360°	3-44
F30.5ft_20.3ft×7.4ft_4409lb_with the 5th jack 360°	3-46
F53.5ft_20.3ft×7.4ft_4409lb_with the 5th jack 360°	3-48













3.1 Description

- The load capacity values in the tables are stated in lb.
- The working radius is the horizontal distance between the gravity center of load and the rotational axis of the crane superstructure measured on the ground. The radius stated is valid under load conditions, i.e. including boom flexure.
- Boom positions differing from those given in the load capacity tables are not permissible.
- The boom may only be maneuvered into those areas specified in the load chart, even if no load is suspended, otherwise there is a risk of the crane tipping over.
- The total rated load given in the rated load charts is the maximum lifting capacity when the crane is set up on firm and level ground. The total rated load includes the weight of the hook blocks and rigging. The rated lifting load=the total weight of the load + hook block + wire rope + slings.
Note: The weight of the wire rope=the number of parts of line ×lifting height×wire rope weight/ft (for the crane, the weight of the wire rope per foot is 0.86 lb)
- Lifting performance of the auxiliary sheave remains the same as that of the boom; its maximum lifting capacity cannot exceed 11023 lb, with one part of line and the hook block of 5.5 USt.
- Max. outrigger reaction force: 62986 lb (diameter of the outrigger float: 15.7 in).
- A lifting operation is permissible only when the wind force is below grade 5 (instantaneous wind speed of 46 ft/s, wind pressure of 0.018 psi).
- The working wind force should be below grade 5 (46.3 ft/s).
Boom or auxiliary sheave OM:
 - When $L \leq 65.6\text{ft}$, $v \leq 46.3\text{ft/s}$;
 - When $L \leq 98.4\text{ft}$, $v \leq 42.0\text{ft/s}$;
 - When $L \leq 196.9\text{ft}$, $v \leq 36.4\text{ft/s}$;
 - When $L > 196.9\text{ft}$, $v \leq 29.5\text{ft/s}$.
 - When wind speed $V \leq 29.5\text{ft/s}$, all operation modes are permissible.
- The blank area in this table are the area which could not be loaded.
- It is not allowed to extend or retract the boom with a load attached.
- Never operate beyond the rated loads, working radius or working areas specified in rated load chart.
- The rated lifting capacity of the crane is calculated on the condition that the load is freely suspended and the crane is leveled and placed on a solid ground. It is forbidden to move the load horizontally from any direction on the ground.
- The actual allowable lifting capacity depends on the support surface, wind speed, and other factors that affect stability, such as hazardous environments, personal experience, and correct handling, as well as all factors that must be considered by the operator.




- The forward and backward tilt stability has been considered in all operating modes in the rated load chart.

3.2 Explanation of symbols

1. Symbol explanation

No.	Symbol	Description	Notes
1		Boom	
2		Extension	
3		Fixed jib	
4		Jib offset angle	
5		Luffing jib	
6		Independent jib head	
7		Super lift	
8		Wind power jib	
9		Outrigger span	
10		360° slewing	
11		360° slewing with the 5th jack down	
12		Side and rear working areas	

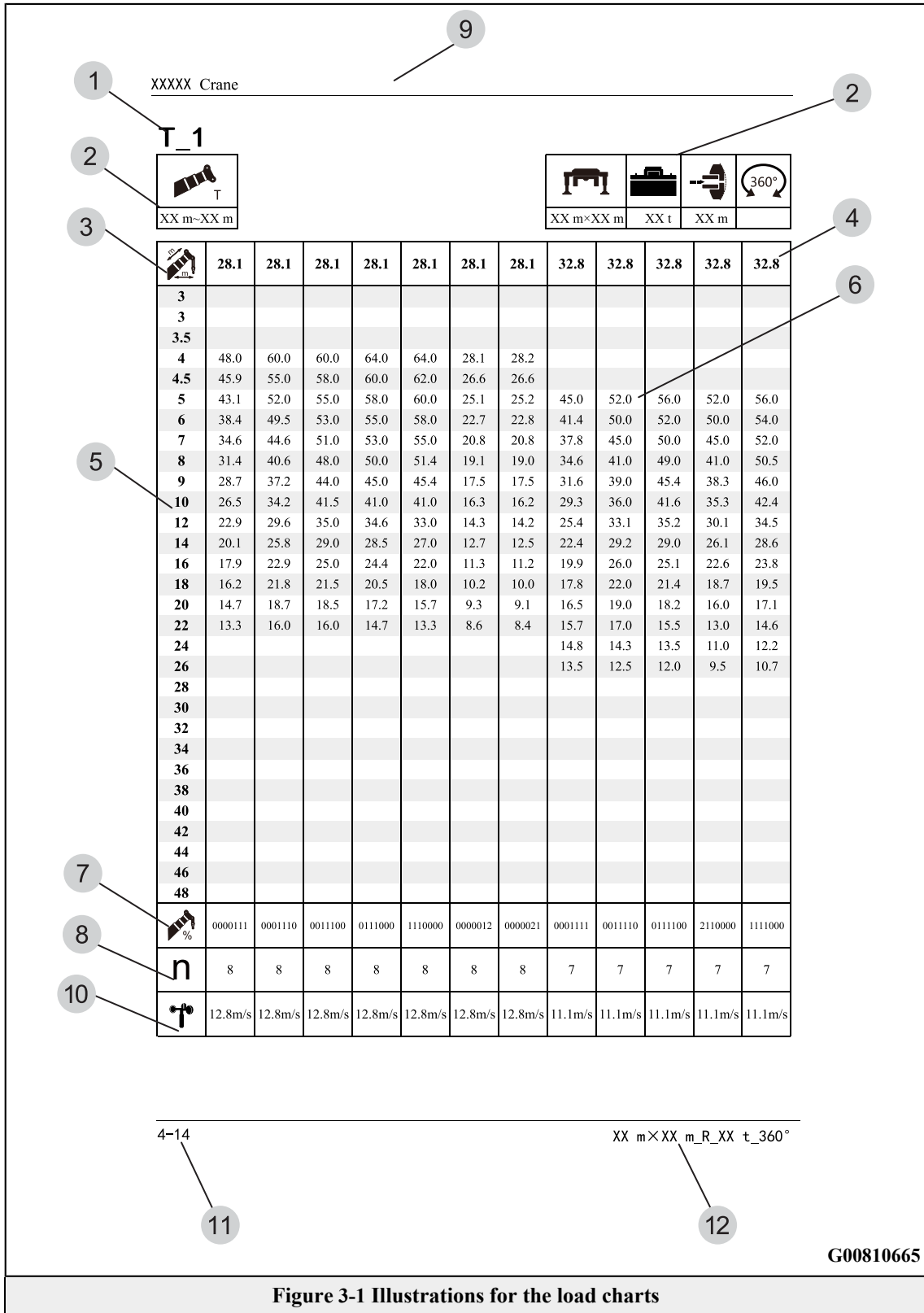
No.	Symbol	Description	Notes
13		Boom over rear	
14		Operation over front	
15		Counterweight	
16		Variable-position counterweight	The figures represent the slewing radius of counterweight
17		Support on tires	Suitable for rough terrain cranes
18		Traveling with a load suspended, keep the travel speed at no more than 1.2mi/h.	Suitable for Rough Terrain Cranes
19		OM code	
20	EN	EN 13000 standard	
	EN13000		
21	ASME	ASME B30.5 standard	
22	ISO	ISO standard	
23		Boom length and working radius	
24		Working radius	
25		Boom angle	
26		Hook block	

No.	Symbol	Description	Notes
27		Boom length combination	<p>1. In percentage form: 0% stands for the boom section is fully retracted, and 100% stands for the boom section is fully extended;</p> <p>2. In digit combination form: “0” means that 0% of boom section is extended; “1” indicates 46% extended, “2” indicates 92% extended, and “3” indicates 100% extended. The digits from left to right respectively are the codes of the 2nd, 3rd, 4th, 5th and 6th boom sections extended.</p> <p>3. The “-” added to the extension quantity means that telescoping is available when the boom pin of this boom section is pulled out. For example: “46 - ” means telescoping is available at the 46% boom position when the boom pin is pulled out (related lifting capacities are stated in the load charts for telescoping with load).</p>
28		Wind speed	The maximum allowable wind speed for lifting operations under specific boom length.
29		Parts of line	Parts of line used to achieve a specific rated lifting capacity.

2. OM description

No.	Operation mode code	Description	Notes
1	T	Boom OM	T: 360° operation; T_1: 360° slewing with the 5th jack down; T_2: side and rear operation; T_3: telescoping with load; T_4: traveling with load; T_5: crane on tires; T_6: operation over front; T_7: 360° slewing under auxiliary sheave OM; T_8: 360° slewing with the 5th jack down under auxiliary sheave OM; T_8: side and rear operation under auxiliary sheave OM; T_9: operation over front under auxiliary sheave OM
2	TF	Boom+jib	TF: 360° operation; TF_1: 360° slewing with the 5th jack down; TF_2: side and rear operation; TF_3: operation over front; TF_4: 360° operation (wire-rope-type); TF_5: 360° operation (luffing with load)
3	TFV	Boom+extension+jib OM	TFV: 360° operation; TFV_1: 360° slewing with the 5th jack down; TFV_2: side and rear operation; TFV_3: operation over front; TFV_4: luffing with load
4	TI	Boom+independent jib head OM	
5	TV	Rated load charts for extension	
6	TY	Boom + super lift	
7	TYF	Boom+super lift+jib	
8	TYFV	Boom+extension+super lift+jib	
9	TYN	Boom+super lift+luffing jib	
10	TYW	Boom + super lift + wind power jib	TYW_1: wind power jib (heavy-duty)

3.3 Notes on the load charts



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Figure 3-1 Illustrations for the load charts

No.	Description
1	OM code: for example, T stands for boom OM; TF stands for boom + jib OM.
2	The icon for OM conditions and their values: boom length, lattice jib length and angle, super lift (angle), outriggers span, counterweight weight and slewing radius, working area, OM code, standard, and so on.
3	Boom length and working radius, in m or ft.
4	Boom length, in m or ft.
5	Working radius, in m or ft.
6	Lifting capacity, in kg/t or lb/klb.
7	Icon for boom length combination.
8	Icon for parts of line.
9	Page header.
10	Icon for wind speed, in m/s or ft/s.
11	Pages: chapter number - current page number.
12	OM name ¹⁾ : it consists of the operating conditions contained in the OM code load charts. As shown in the contents. For example: V8m_F17.5m_F30°_7.5m×8.1m_F_38t_360°

OM name¹⁾ : V8m_F17.5m_F30°_7.5m×8.1m_F_38t_360°

- V8m: extension length: 8m;
- F17.5m: jib length: 17.5m;
- F30°: jib offset angle: 30°;
- 7.5m×8.1m: outrigger span: 7.5m×8.1m;
- F: variable-position counterweight in front position F: Front position; M: middle position; R: rear position. No such items for fixed counterweight.
- 38t: counterweight weight is 38 t;
- 360°: 360° working area.

3.4 Working areas

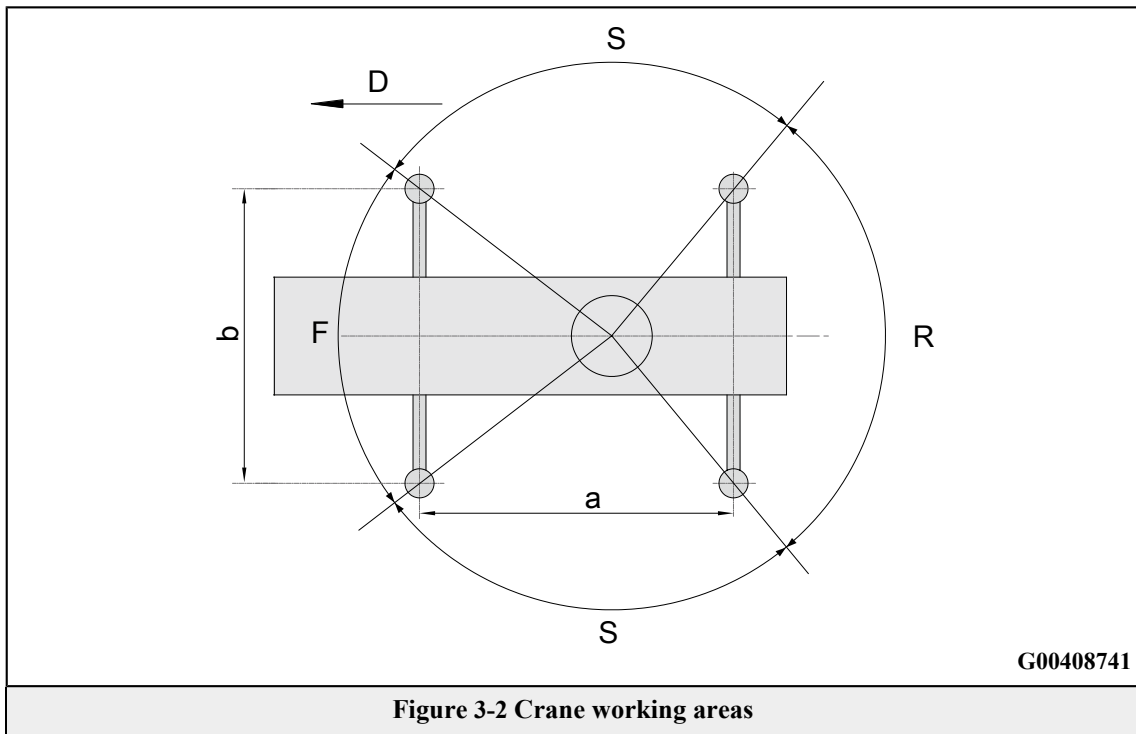


Figure 3-2 Crane working areas

Explanation:

Name	Meaning	Parameters
a	Longitudinal outrigger span	20.3ft
b	Lateral outrigger span	Fully extended: 23.6ft Half extended: 16.1ft Fully retracted: 7.4ft
F	Front working area	Fully extended: 85° Half-extended: 65° Fully retracted: 32°
R	Rear working area	Fully extended: 113° Half-extended: 92° Fully retracted: 53°
S	Side working area	Fully-extended: 81° Half-extended: 101.5° Fully retracted: 138°
D	Forward direction	—

3.5 Working range diagram for boom

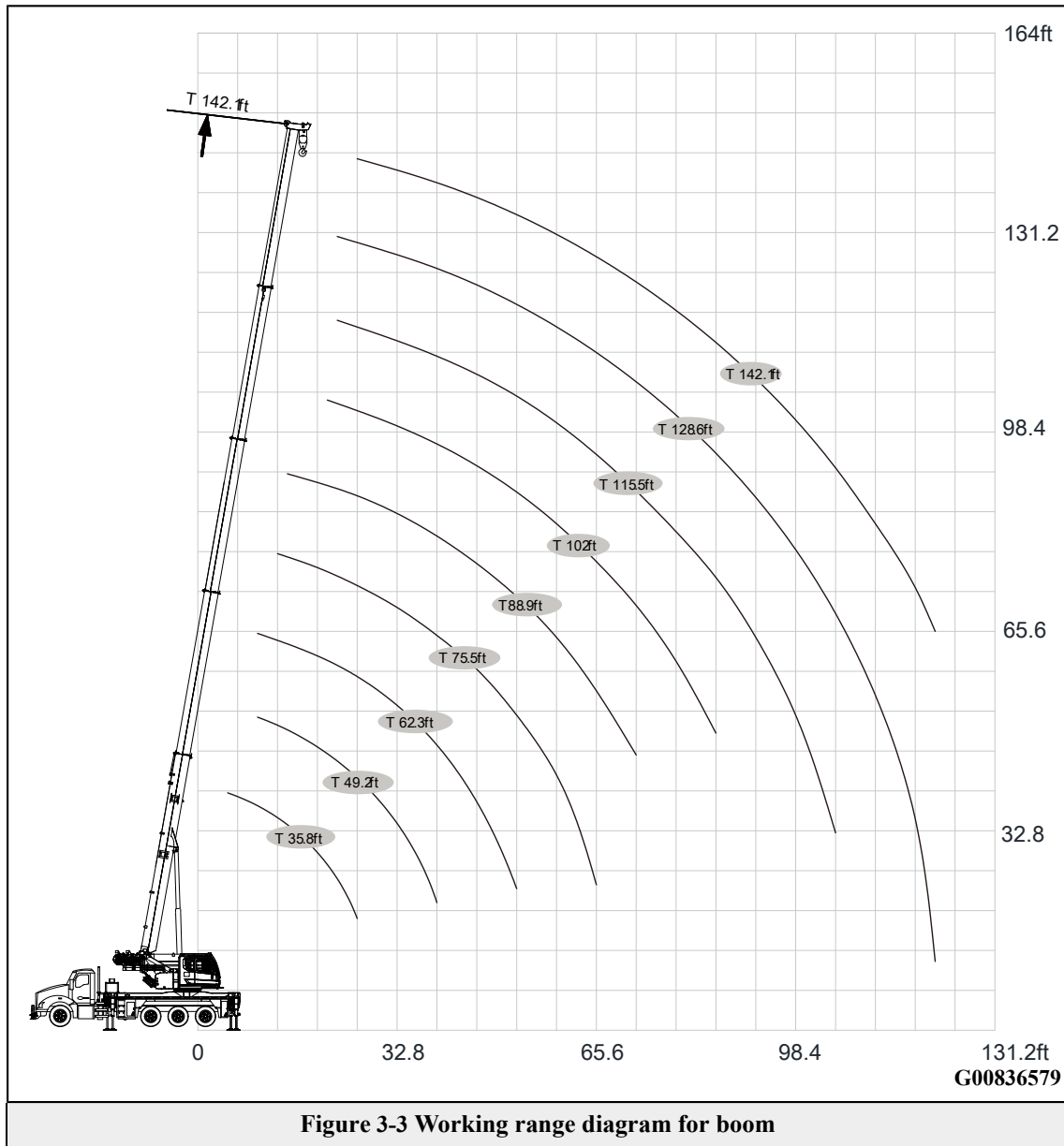


Figure 3-3 Working range diagram for boom

3.6 Working range diagram for jib

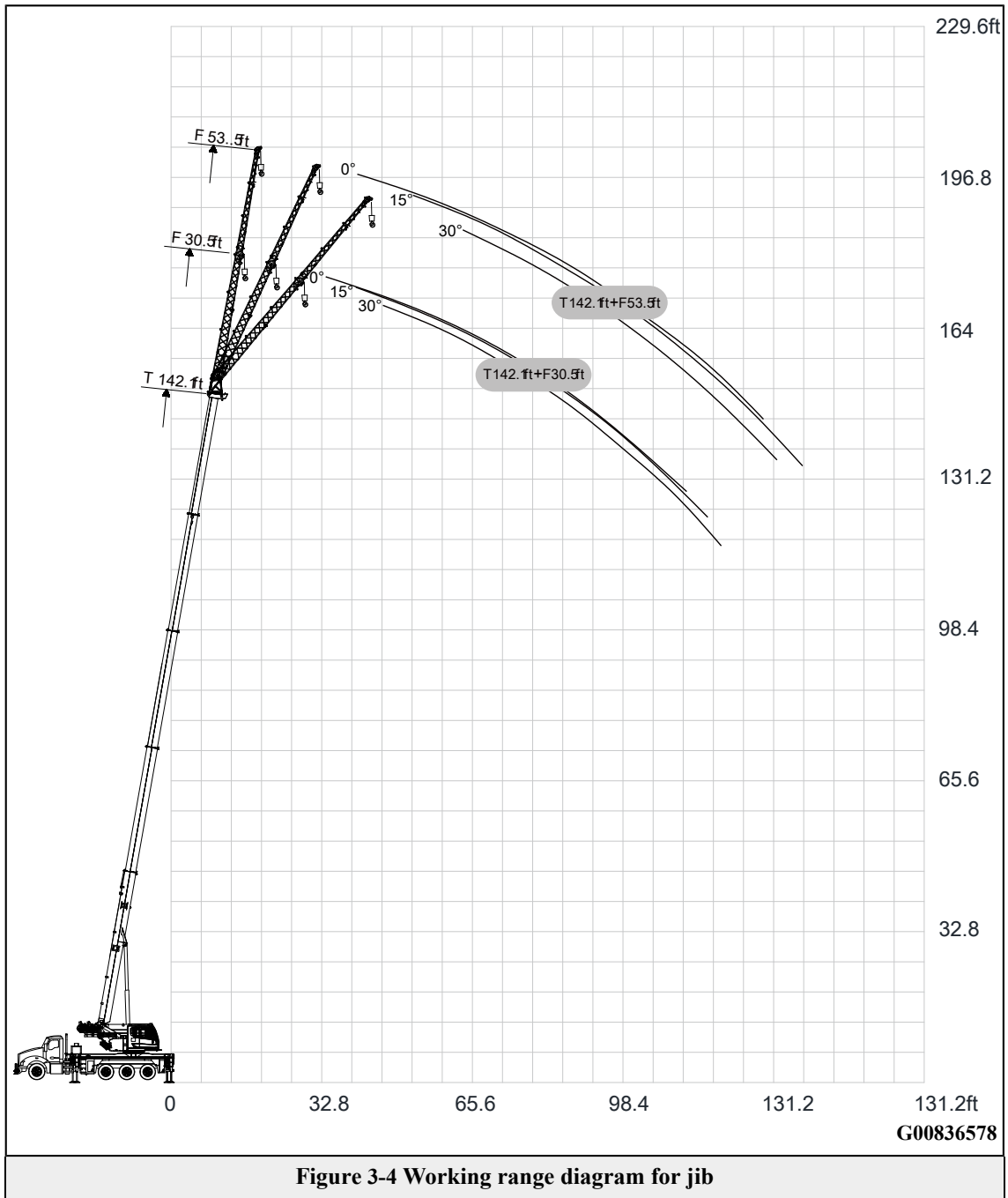
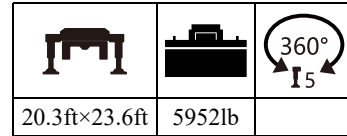
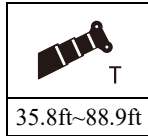


Figure 3-4 Working range diagram for jib

T_1

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	35.8	49.2	49.2	62.3	62.3	62.3	75.5	75.5	75.5	88.9	88.9	88.9
4.9	89948 ¹⁾											
6.6	70547											
8.2	61729											
9.8	55115	31746	46297	30864	29100	41667						
11.5	54013	31746	46297	30864	29100	41667						
13.1	49603	31746	46076	30864	29100	41667	28219	19841	30864			
14.8	46297	31746	44092	30864	29100	41667	28219	19841	30864	19841	14550	28660
16.4	43210	31746	40565	30864	29100	38580	28219	19841	30864	19841	14550	27557
18	39021	31746	37919	30864	29100	35714	28219	19841	30864	19841	14550	26896
19.7	34832	31746	35053	30864	29100	33510	28219	19841	30864	19841	14550	25353
21.3	31746	29762	30864	30864	29100	30864	28219	19841	30423	19841	14550	24250
23	29321	29541	28660	29982	29100	27337	28219	19841	28880	19841	14550	23368
26.2	24471	26896	24691	25794	26675	23368	26014	19841	24912	19841	14550	21825
27.9	21825	24912	22928	24250	24912	21825	24250	19621	22707	19841	14550	21384
28.2	21164	24471	22487	23809	24471	21384	23809	19621	22046	19841	14550	21164
28.5	20723	24030	22046	23589	24250	21164	23368	19621	21605	19841	14550	21164
29.5		22707	20943	22487	23148	20062	22266	19400	20282	19841	14550	20723
32.8		20723	18298	19621	20502	17857	20502	19180	18959	19841	14109	18518
36.1		17857	15432	16755	17636	14550	17196	18739	15652	17857	13889	16534
39.4		15211	13007	14330	15211	12345	14991	16314	13448	15432	13889	14550
41.3		14109	11904	13227	13889	11243	13889	15211	12345	14330	13889	13007
41.7		13889	11684	13007	13668	11023	13668	14991	12125	14109	13889	12786
42		13668	11464	12786	13448	11023	13448	14770	11904	13889	13889	12566
42.7				12345	13007	10582	13007	14330	11464	13448	13889	12125
45.9				10582	11684	8818	11464	12786	9920	11904	12786	10802
49.2				9259	10141	7495	9920	11243	8598	10582	11464	9479
52.5				8157	9038	6393	9038	10361	7495	9259	10141	8377
54.5				7275	8377	5732	8377	9700	7054	8818	9700	7716
54.8				7275	8377	5732	8377	9700	6834	8598	9479	7716
55.1				7054	8157	5511	8157	9479	6834	8598	9479	7495
Cyd I	0%	0%	50%	50%	0%	100%	50%	0%	100%	50%	0%	100%
Cyd II	0%	17%	0%	17%	33%	0%	33%	50%	17%	50%	67%	33%
n	8	3	5	3	3	4	3	2	3	2	2	3
	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s




¹⁾Capacity class.

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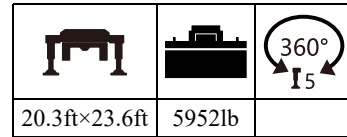
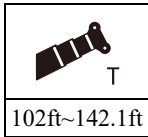
 T
35.8ft~88.9ft

		
20.3ft×23.6ft	5952lb	

	35.8	49.2	49.2	62.3	62.3	62.3	75.5	75.5	75.5	88.9	88.9	88.9
59.1							7054	8377	5732	7495	8377	6172
65.6							5511	6834	4188	6172	7054	4850
67.6							5070	6172	3747	5732	6834	4409
67.9							4850	6172	3527	5732	6613	4409
68.2							4850	5952	3527	5732	6613	4409
72.2										4850	5952	3527
78.7										3968	4850	2866
81										3527	4409	2425
81.4										3306	4188	2204
81.7										3306	4188	2204
												
Cyd I	0%	0%	50%	50%	0%	100%	50%	0%	100%	50%	0%	100%
Cyd II	0%	17%	0%	17%	33%	0%	33%	50%	17%	50%	67%	33%
n	8	3	5	3	3	4	3	2	3	2	2	3
	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s

T_1

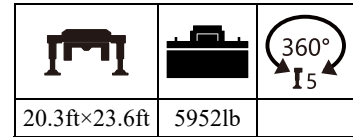
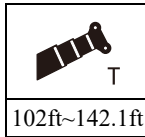
ASME



	102	102	102	115.5	115.5	115.5	128.6	128.6	142			
21.3	14550	10802	18959									
23	14550	10802	18959	10802	8818	14550	8818	10802				
26.2	14550	10802	16755	10802	8818	14550	8818	10802	8818			
27.9	14550	10802	16314	10802	8818	13889	8818	10802	8818			
28.2	14550	10802	16093	10802	8818	13668	8818	10802	8818			
28.5	14550	10802	16093	10802	8818	13668	8818	10802	8818			
29.5	14550	10802	15652	10802	8818	13227	8818	10802	8818			
32.8	14550	10802	14991	10802	8818	13007	8818	10802	8818			
36.1	14550	10802	14109	10802	8818	12786	8818	10582	8818			
39.4	13889	10802	13668	10802	8818	12566	8818	10582	8818			
41.3	13448	10582	13007	10802	8598	12125	8818	10361	8818			
41.7	13448	10582	13007	10802	8598	11904	8818	10361	8818			
42	13448	10361	12786	10802	8377	11904	8818	10361	8818			
42.7	13227	10361	12566	10802	8377	11684	8818	10361	8818			
45.9	12125	10361	11243	10361	8377	10802	8818	10141	8157			
49.2	10802	10361	9920	10361	8377	9700	8377	9259	7936			
52.5	9700	10141	8598	9700	8377	9038	7936	8598	7495			
54.5	9038	9700	8157	9259	8157	8377	7936	8157	7275			
54.8	9038	9479	7936	9038	8157	8377	7936	8157	7054			
55.1	8818	9479	7936	9038	8157	8157	7936	8157	7054			
59.1	7716	8377	6834	7936	7716	7054	7716	7275	6393			
65.6	6172	7054	5291	6393	7054	5732	6613	5952	5952			
67.6	5952	6834	5070	6172	6834	5291	6172	5511	5732			
67.9	5732	6613	4850	5952	6613	5291	6172	5511	5511			
68.2	5732	6613	4850	5952	6613	5291	6172	5511	5511			
72.2	5070	5952	4188	5291	5952	4409	5291	4629	4850			
78.7	4188	5070	3086	4409	5070	3527	4629	3747	3747			
81	3968	4850	2866	4188	4850	3306	4409	3527	3527			
81.4	3747	4629	2866	3968	4629	3086	4188	3306	3527			
81.7	3747	4629	2866	3968	4629	3086	4188	3306	3527			
Cyd I	50%	0%	100%	50%	0%	100%	50%	100%	100%			
Cyd II	67%	83%	50%	83%	100%	67%	100%	83%	100%			
n	2	1	2	1	1	2	1	1	1			
	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s			

T_1


ASME









	102	102	102	115.5	115.5	115.5	128.6	128.6	142			
85.3	3306	4188	2425	3527	4188	2645	3747	2866	3086			
91.9	2645	3527	1763	2866	3527	1984	3086	2204	2425			
94.2	2204	3086	1322	2645	3306	1763	2866	1984	2204			
94.5	2204	3086	1322	2645	3306	1763	2866	1984	2204			
94.8	2204	3086	1322	2645	3306	1763	2866	1984	2204			
98.4				2204	3086	1322	2425	1763	1984			
105				1763	2645	1102	1984	1102	1322			
107.3				1322	2204	661	1763	881	1102			
107.6				1322	2204	661	1763	881	1102			
107.9				1322	2204	661	1763	881	1102			
111.5							1543	661	881			
118.1							1102	440	661			
121.4							881		440			
Cyd I	50%	0%	100%	50%	0%	100%	50%	100%	100%			
Cyd II	67%	83%	50%	83%	100%	67%	100%	83%	100%			
n	2	1	2	1	1	2	1	1	1			
	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s			

T_1

ASME


35.8ft~88.9ft

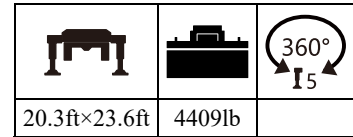
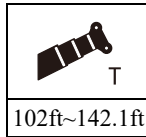
		
20.3ft×23.6ft	4409lb	

	35.8	49.2	49.2	62.3	62.3	62.3	75.5	75.5	75.5	88.9	88.9	88.9
4.9	89948 ¹⁾											
6.6	70547											
8.2	61729											
9.8	55115	31746	46297	30864	29101	41667						
11.5	54013	31746	46297	30864	29101	41667						
13.1	49604	31746	46076	30864	29101	41667	28219	19841	30864			
14.8	46297	31746	44092	30864	29101	41667	28219	19841	30864	19841	14550	28660
16.4	43210	31746	40565	30864	29101	38581	28219	19841	30864	19841	14550	27558
18	39021	31746	37919	30864	29101	35715	28219	19841	30864	19841	14550	26896
19.7	34833	31746	35053	30864	29101	33510	28219	19841	30864	19841	14550	25353
21.3	31746	29762	30864	30864	29101	30864	28219	19841	30423	19841	14550	24251
23	29101	29101	28660	29983	29101	27337	28219	19841	28880	19841	14550	23369
26.2	24251	26455	24251	25794	26676	23369	26014	19841	24912	19841	14550	21826
29.5		22487	20503	22046	22707	19841	22046	19400	20282	19841	14550	20723
32.8		20503	18078	19400	20503	17416	20282	19180	18960	18960	14109	18519
36.1		17637	15212	16535	17416	14330	16975	18519	15432	17857	13889	16535
39.4		14991	12787	13889	14991	12125	14771	16094	13228	15432	13889	14330
42.7				12125	12787	10362	12787	14109	11243	13228	13889	12125
45.9				10362	11243	8598	11243	12346	9700	11684	12787	10582
49.2				9039	9921	7275	9700	11023	8377	10362	11464	9259
52.5				7937	8818	6173	8598	9921	7055	9039	10141	8157
59.1							6614	7937	5291	7055	8157	5952
65.6										5732	6834	4630
72.2										4630	5512	3307
												
Cyd I	0%	0%	50%	50%	0%	100%	50%	0%	100%	50%	0%	100%
Cyd II	0%	17%	0%	17%	33%	0%	33%	50%	17%	50%	67%	33%
n	8	3	5	3	3	4	3	2	3	2	2	3
	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s

¹⁾Capacity class.

T_1


ASME









	102	102	102	115.5	115.5	115.5	128.6	128.6	142			
21.3	14550	10803	18960									
23	14550	10803	18960	10803	8818	14550	8818	10803				
26.2	14550	10803	16755	10803	8818	14550	8818	10803	8818			
29.5	14550	10803	15653	10803	8818	13228	8818	10803	8818			
32.8	14550	10803	14991	10803	8818	13007	8818	10803	8818			
36.1	14550	10803	14109	10803	8818	12787	8818	10582	8818			
39.4	13889	10803	13669	10803	8818	12566	8818	10582	8818			
42.7	13228	10362	12566	10803	8377	11684	8818	10362	8818			
45.9	12125	10362	11023	10362	8377	10803	8818	10141	8157			
49.2	10803	10362	9700	10362	8377	9700	8377	9259	7937			
52.5	9480	10141	8377	9700	8377	8818	7937	8598	7496			
59.1	7496	8377	6614	7716	7716	6834	7716	7275	6393			
65.6	5952	7055	5071	6393	7055	5512	6614	5952	5952			
72.2	4850	5512	3968	5071	5952	4189	5291	4630	4630			
78.7	3968	4850	2866	4189	5071	3307	4409	3748	3748			
85.3	3086	3748	1984	3307	4189	2425	3527	2866	2866			
91.9				2646	3527	1543	2866	2205	2205			
98.4				1984	2646	1102	1984	1764	1543			
105							1543	1102	1102			
111.5							1102		661			
Cyd I	50%	0%	100%	50%	0%	100%	50%	100%	100%			
Cyd II	67%	83%	50%	83%	100%	67%	100%	83%	100%			
n	2	1	2	1	1	2	1	1	1			
	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s			

T_1

ASME

 T
35.8ft~88.9ft

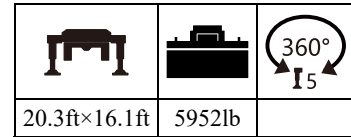
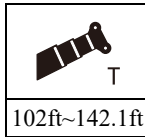
		
20.3ft×16.1ft	5952lb	

	35.8	49.2	49.2	62.3	62.3	62.3	75.5	75.5	75.5	88.9	88.9	88.9
4.9	89948 ¹⁾											
6.6	70547											
8.2	61729											
9.8	55115	31746	46297	30864	29101	41667						
11.5	54013	31746	46297	30864	29101	41667						
13.1	49604	31746	46076	30864	29101	41667	28219	19841	30864			
14.8	46297	31746	44092	30864	29101	41667	28219	19841	30864	19841	14550	28660
16.4	43210	31746	40565	30864	29101	38581	28219	19841	30864	19841	14550	27558
18	39021	31746	37919	30864	29101	35715	28219	19841	30864	19841	14550	26896
19.7	33510	31746	32628	30864	29101	32187	28219	19841	30864	19841	14550	25353
21.3	28439	29762	27778	29542	29101	27117	28219	19841	28880	19841	14550	24251
23	24471	26455	23810	25573	27778	23369	26676	19841	24912	19841	14550	23369
26.2	18739	20723	18078	19621	21605	17637	20723	19841	18960	19841	14550	20062
29.5		16535	14109	15653	17416	13669	16535	18078	14991	17196	14550	15873
32.8		13448	11023	12566	14330	10803	13448	14991	11905	14109	14109	12787
36.1		11023	8818	10362	12125	8598	11243	12566	9700	11905	13007	10582
39.4		9259	7055	8377	10141	6834	9259	10803	7937	9921	11243	8818
42.7				7055	8598	5291	7937	9259	6393	8377	9700	7275
45.9				5732	7496	4189	6614	7937	5291	7275	8377	5952
49.2				4850	6393	3086	5512	6834	4189	6173	7275	5071
52.5				3968	5512	2205	4630	5952	3307	5291	6393	4189
59.1							3307	4630	1984	3748	4850	2646
65.6										2646	3748	1543
72.2										1764	2866	661
												
Cyd I	0%	0%	50%	50%	0%	100%	50%	0%	100%	50%	0%	100%
Cyd II	0%	17%	0%	17%	33%	0%	33%	50%	17%	50%	67%	33%
n	8	3	5	3	3	4	3	2	3	2	2	3
	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s

¹⁾Capacity class.

T_1

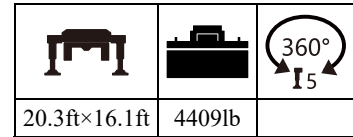
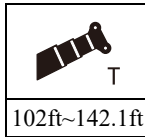
ASME



	102	102	102	115.5	115.5	115.5	128.6	128.6	142			
21.3	14550	10803	18960									
23	14550	10803	18960	10803	8818	14550	8818	10803				
26.2	14550	10803	16755	10803	8818	14550	8818	10803	8818			
29.5	14550	10803	15653	10803	8818	13228	8818	10803	8818			
32.8	14550	10803	13448	10803	8818	13007	8818	10803	8818			
36.1	12346	10803	11243	10803	8818	11684	8818	10582	8818			
39.4	10362	10803	9259	10803	8818	9921	8818	10141	8818			
42.7	8818	9921	7937	9259	8377	8377	8818	8598	8818			
45.9	7716	8598	6614	7937	8377	7055	8157	7496	7716			
49.2	6614	7496	5512	6834	7716	5952	7055	6393	6614			
52.5	5732	6614	4630	5952	6834	5071	6173	5512	5732			
59.1	4189	5071	3307	4409	5291	3748	4850	3968	4189			
65.6	3086	3968	2205	3307	4189	2646	3527	2866	3086			
72.2	2205	3086	1323	2425	3307	1543	2646	1984	2205			
78.7	1543	2425	441	1764	2646	882	1984	1323	1543			
85.3	882	1764		1102	1984		1323	661	882			
91.9				661	1323		882		441			
98.4					882		441					
105					661							
Cyd I	50%	0%	100%	50%	0%	100%	50%	100%	100%			
Cyd II	67%	83%	50%	83%	100%	67%	100%	83%	100%			
n	2	1	2	1	1	2	1	1	1			
	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s			

T_1

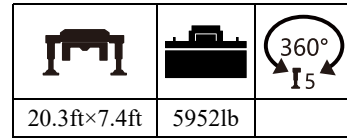
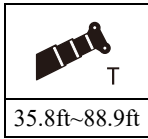
ASME



	102	102	102	115.5	115.5	115.5	128.6	128.6	142			
21.3	14550	10803	18960									
23	14550	10803	18960	10803	8818	14550	8818	10803				
26.2	14550	10803	16755	10803	8818	14550	8818	10803	8818			
29.5	14550	10803	15653	10803	8818	13228	8818	10803	8818			
32.8	13889	10803	12787	10803	8818	13007	8818	10803	8818			
36.1	11464	10803	10582	10803	8818	11023	8818	10582	8818			
39.4	9700	10803	8598	10141	8818	9259	8818	9480	8818			
42.7	8377	9259	7275	8598	8377	7716	8818	8157	8377			
45.9	7055	8157	6173	7496	8377	6614	7716	6834	7055			
49.2	6173	7055	5071	6393	7275	5512	6614	5952	6173			
52.5	5291	6173	4189	5512	6393	4630	5732	5071	5291			
59.1	3748	4850	2866	4189	4850	3307	4409	3527	3748			
65.6	2646	3748	1764	3086	3748	2205	3307	2425	2866			
72.2	1764	2866	882	2205	2866	1323	2425	1543	1984			
78.7	1102	1984		1543	2205	661	1764	882	1102			
85.3	661	1543		882	1764		1102	441	661			
91.9				441	1102		661					
98.4					661							
105					441							
Cyd I	50%	0%	100%	50%	0%	100%	50%	100%	100%			
Cyd II	67%	83%	50%	83%	100%	67%	100%	83%	100%			
n	2	1	2	1	1	2	1	1	1			
	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s			

T_1

ASME

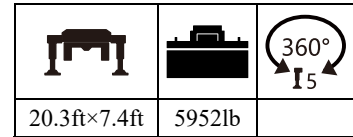
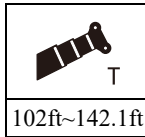


	35.8	49.2	49.2	62.3	62.3	62.3	75.5	75.5	75.5	88.9	88.9	88.9
4.9	89948 ¹⁾											
6.6	70547											
8.2	55335											
9.8	38581	31746	37699	30864	29101	37258						
11.5	28880	31085	27998	29983	29101	27558						
13.1	22487	24692	21826	23589	25794	21385	24692	19841	22928			
14.8	18078	20062	17416	18960	21164	16975	20062	19841	18298	19841	14550	19400
16.4	14771	16535	14109	15653	17637	13669	16755	18298	14991	17416	14550	16094
18	12125	13889	11464	13007	14991	11243	14109	15653	12566	14771	14550	13448
19.7	10141	11905	9480	11023	12787	9259	11905	13448	10362	12566	13889	11243
21.3	8598	10141	7937	9259	11023	7496	10141	11684	8818	10803	12125	9700
23	7055	8818	6614	7937	9700	6173	8818	10141	7275	9480	10582	8157
26.2	5071	6614	4409	5732	7496	3968	6614	7937	5291	7275	8377	5952
29.5		4850	2866	4189	5732	2425	4850	6173	3527	5512	6614	4409
32.8		3748	1543	2866	4409	1323	3748	5071	2425	4189	5291	3086
36.1		2646	661	1764	3307		2646	3968	1323	3086	4189	1984
39.4		1764		1102	2646		1764	3086	441	2425	3307	1323
42.7				441	1764		1102	2425		1543	2646	661
45.9					1323		441	1764		1102	2205	
49.2					661			1323		441	1543	
52.5								882			1102	
59.1											441	
Cyd I	0%	0%	50%	50%	0%	100%	50%	0%	100%	50%	0%	100%
Cyd II	0%	17%	0%	17%	33%	0%	33%	50%	17%	50%	67%	33%
n	8	3	5	3	3	4	3	2	3	2	2	3
	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s

¹⁾Capacity class.

T_1

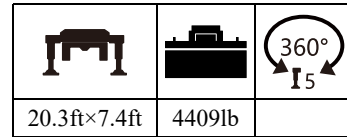
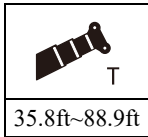
ASME



	102	102	102	115.5	115.5	115.5	128.6	128.6	142			
21.3	11243	10803	10141									
23	9921	10803	8818	10141	8818	9259	8818	9700				
26.2	7716	8598	6614	7937	8818	7055	8157	7496	7716			
29.5	5952	6834	4850	6173	7055	5291	6614	5732	5952			
32.8	4630	5512	3748	4850	5732	4189	5291	4409	4630			
36.1	3527	4630	2646	3968	4630	3086	4189	3307	3748			
39.4	2646	3748	1764	3086	3968	2205	3307	2425	2866			
42.7	1984	2866	1102	2425	3086	1543	2646	1764	1984			
45.9	1323	2425	441	1764	2425	882	1984	1323	1543			
49.2	882	1764		1102	1984	441	1543	661	882			
52.5	441	1323		661	1543		882		441			
59.1		661			882							
Cyd I	50%	0%	100%	50%	0%	100%	50%	100%	100%			
Cyd II	67%	83%	50%	83%	100%	67%	100%	83%	100%			
n	2	1	2	1	1	2	1	1	1			
	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s			

T_1

ASME

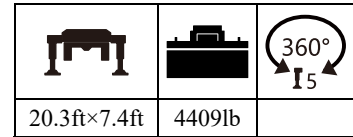
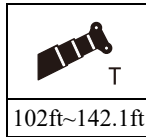


	35.8	49.2	49.2	62.3	62.3	62.3	75.5	75.5	75.5	88.9	88.9	88.9
4.9	89948 ¹⁾											
6.6	70547											
8.2	52029											
9.8	36155	31746	35274	30864	29101	34833						
11.5	26896	29321	26235	28219	29101	25573						
13.1	20944	23148	20282	22046	24251	19841	23148	19841	21385			
14.8	16755	18739	16094	17637	19841	15653	18739	19841	16975	19621	14550	18078
16.4	13669	15432	13007	14550	16535	12566	15432	17196	13889	16314	14550	14771
18	11243	13007	10582	12125	13889	10141	13007	14550	11464	13669	14550	12346
19.7	9259	11023	8598	10141	11905	8157	11023	12566	9480	11684	13007	10362
21.3	7716	9259	7055	8598	10362	6614	9480	10803	7937	10141	11243	8818
23	6393	7937	5732	7275	8818	5512	8157	9480	6614	8598	9921	7496
26.2	4409	5952	3748	5071	6834	3307	5952	7275	4630	6614	7716	5291
29.5		4409	2205	3527	5071	1984	4409	5732	3086	4850	6173	3748
32.8		3086	1102	2425	3968	661	3086	4409	1764	3748	4850	2646
36.1		2205	15432	1323	2866		2205	3527	882	2646	3748	1543
39.4		1323		661	2205		1323	2646		1984	3086	882
42.7					1543		661	1984		1323	2425	
45.9					882			1323		661	1764	
49.2					441			882			1323	
52.5								441			882	
Cyd I	0%	0%	50%	50%	0%	100%	50%	0%	100%	50%	0%	100%
Cyd II	0%	17%	0%	17%	33%	0%	33%	50%	17%	50%	67%	33%
n	8	3	5	3	3	4	3	2	3	2	2	3
	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	46.3ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s	42ft/s

¹⁾Capacity class.



T_1




ASME







	102	102	102	115.5	115.5	115.5	128.6	128.6	142			
21.3	10582	10803	9480									
23	9039	10141	8157	9480	8818	8598	8818	8818				
26.2	7055	7937	5952	7275	8157	6393	7496	6834	7055			
29.5	5291	6393	4409	5732	6614	4850	5952	5071	5512			
32.8	4189	5071	3086	4409	5291	3527	4630	3968	4189			
36.1	3086	4189	2205	3527	4189	2646	3748	2866	3086			
39.4	2425	3307	1323	2646	3527	1764	2866	2205	2425			
42.7	1543	2646	661	1984	2866	1102	2205	1543	1764			
45.9	1102	1984		1323	2205	661	1543	882	1102			
49.2	661	1543		882	1764		1102	441	661			
52.5		1102		441	1323		661					
59.1		441			441							
Cyd I	50%	0%	100%	50%	0%	100%	50%	100%	100%			
Cyd II	67%	83%	50%	83%	100%	67%	100%	83%	100%			
n	2	1	2	1	1	2	1	1	1			
	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s	36.4ft/s			



TF_4




 T	 F
102ft~115.5ft	30.5ft





		
20.3ft×23.6ft	5952lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		11023	6834	3307	9259	6393	3086
78		10803	6393	3086	9259	5952	3086
75		9700	5732	2866	9039	5512	2866
72		9039	5291	2866	8157	5071	2646
70		8598	4850	2646	7496	4850	2646
65		6614	4409	2646	5512	4189	2425
60		4850	3968	2425	3968	3527	2425
55		3527	3307	2205	2866	2646	2205
50		2646	2425	2205	1984	1984	1764
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
128.6ft~142ft	30.5ft





		
20.3ft×23.6ft	5952lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		6834	5952	3307	3747	3306	2645
78		6614	5732	3086	3527	3306	2645
75		6393	5291	2866	3306	3306	2645
72		6173	4850	2646	3086	3086	2425
70		5732	4409	2646	2866	2866	2425
65		4189	3527	2425	2866	2645	2425
60		3086	2646	2205	2645	2425	2204
55		2205	1984	1764	1984	1763	1543
50		1323	1323	1323	1322	1102	1102
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
102ft~115.5ft	53.5ft





		
20.3ft×23.6ft	5952lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		6614	2866	1543	5512	2866	1543
78		5952	2866	1543	5071	2866	1323
75		5291	2646	1323	4630	2425	1102
72		4630	2425	1102	4409	2425	1102
70		4409	2205	1102	4189	2205	1102
65		3748	1984	1102	3527	1984	1102
60		3307	1764	1102	3086	1543	882
55		2646	1323	882	2205	1323	882
50		1984	1102	882	1323	882	661
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
128.6ft~142ft	53.5ft





		
20.3ft×23.6ft	5952lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		4630	2866	1323	2204	1102	661
78		4409	2646	1102	1984	1102	661
75		4189	2425	882	1984	1102	440
72		3968	2205	882	1763	881	440
70		3748	1984	882	1543	881	440
65		3086	1543	661	1322	881	440
60		2205	1323	661	1102	661	440
55		1543	882	441	881	440	
50		1102	661		661		
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
102ft~115.5ft	30.5ft





		
20.3ft×23.6ft	4409lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		11023	6834	3307	9259	6393	3086
78		10803	6393	3086	9259	5952	3086
75		9700	5732	2866	9039	5512	2866
72		9039	5291	2866	8157	5071	2646
70		8598	4850	2646	7496	4850	2646
65		6393	4409	2646	5071	4189	2425
60		4630	3968	2425	3748	3307	2425
55		3307	3086	2205	2646	2425	2205
50		2425	2205	2205	1764	1764	1543
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
128.6ft~142ft	30.5ft





		
20.3ft×23.6ft	4409lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		6834	5952	3307	3748	3307	2646
78		6614	5732	3086	3527	3307	2646
75		6393	5291	2866	3086	3086	2646
72		6173	4850	2646	3086	3086	2425
70		5732	4409	2646	2866	2866	2425
65		4189	3527	2425	2866	2646	2425
60		2866	2646	2205	2646	2425	2205
55		1984	1764	1764	1764	1543	1543
50		1323	1323	1102	882	661	661
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
102ft~115.5ft	53.5ft





		
20.3ft×23.6ft	4409lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		6614	2866	1543	5512	2866	1543
78		5952	2866	1543	5071	2866	1323
75		5291	2646	1323	4630	2425	1102
72		4630	2425	1102	4409	2425	1102
70		4409	2205	1102	4189	2205	1102
65		3748	1984	1102	3527	1984	1102
60		3307	1764	1102	2866	1543	882
55		2425	1323	882	1984	1323	882
50		1764	1102	882	1323	882	661
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
128.6ft~142ft	53.5ft





		
20.3ft×23.6ft	4409lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		4630	2866	1323	2205	1102	661
78		4409	2646	1102	1984	1102	661
75		4189	2425	882	1984	1102	441
72		3968	2205	882	1764	882	441
70		3748	1984	882	1543	882	441
65		3086	1543	661	1323	882	441
60		2205	1323	661	1102	661	441
55		1323	882	441	882		
50		882	661				
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
102ft~115.5ft	30.5ft





		
20.3ft×16.1ft	5952lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		11023	6834	3307	9259	6393	3086
78		10803	6393	3086	9259	5952	3086
75		9700	5732	2866	7937	5512	2866
72		7055	5291	2866	5732	4850	2646
70		5732	4850	2646	4630	3968	2646
65		3527	3086	2646	2646	2425	2205
60		2205	1984	1984	1543	1323	1323
55		1323	1323	1102	882	661	661
50		661	661	441			
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
128.6ft~142ft	30.5ft





		
20.3ft×16.1ft	5952lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		6834	5952	3307	3748	3307	2646
78		6614	5732	3086	3527	3307	2646
75		6393	5291	2866	3307	3307	2646
72		4630	3968	2646	3086	3086	2425
70		3748	3086	2646	2866	2866	2425
65		2205	1764	1764	1984	1764	1543
60		1102	882	882	882	661	661
55		441	441	441			
50							
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s

TF_4

 T	 F
102ft~115.5ft	53.5ft

		
20.3ft×16.1ft	5952lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		6614	2866	1543	5512	2866	1543
78		5952	2866	1543	5071	2866	1323
75		5291	2646	1323	4630	2425	1102
72		4630	2425	1102	4189	2425	1102
70		4189	2205	1102	3527	2205	1102
65		2646	1984	1102	1984	1543	1102
60		1543	1323	1102	1102	882	661
55		882	661	661	441	441	441
50		441					
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




128.6ft~142ft	53.5ft





20.3ft×16.1ft	5952lb	I5

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		4630	2866	1323	2205	1102	661
78		4409	2646	1102	1984	1102	661
75		4189	2425	882	1984	1102	441
72		3527	2205	882	1764	882	441
70		2866	1984	882	1543	882	441
65		1323	1323	661	1323	882	
60		661	441	441	441		
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
102ft~115.5ft	30.5ft





		
20.3ft×16.1ft	4409lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		11023	6834	3307	9259	6393	3086
78		10803	6393	3086	9259	5952	3086
75		9039	5732	2866	7275	5512	2866
72		6614	5291	2866	5071	4409	2646
70		5291	4409	2646	3968	3527	2646
65		3086	2866	2425	2205	2205	1984
60		1984	1764	1543	1323	1323	1102
55		1102	882	882	441	441	441
50		441	441	441			
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
128.6ft~142ft	30.5ft





		
20.3ft×16.1ft	4409lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		6834	5952	3307	3748	3307	2646
78		6614	5732	3086	3527	3307	2646
75		5732	4850	2866	3086	3086	2646
72		3968	3527	2646	3086	3086	2425
70		3086	2866	2425	2866	2646	2425
65		1764	1543	1323	1543	1323	1323
60		661	661	661			
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
102ft~115.5ft	53.5ft





		
20.3ft×16.1ft	4409lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		6614	2866	1543	5512	2866	1543
78		5952	2866	1543	5071	2866	1323
75		5291	2646	1323	4630	2425	1102
72		4630	2425	1102	3968	2425	1102
70		3968	2205	1102	3086	2205	1102
65		2205	1984	1102	1764	1323	1102
60		1323	1102	882	882	661	441
55		441	441	441			
50							
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
128.6ft~142ft	53.5ft





		
20.3ft×16.1ft	4409lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		4630	2866	1323	2205	1102	661
78		4409	2646	1102	1984	1102	661
75		4189	2425	882	1984	882	441
72		3086	2205	882	1543	882	441
70		2425	1984	882	1543	882	
65		1323	1102	661	661		
60		441	441	441			
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
102ft~115.5ft	30.5ft





		
20.3ft×7.4ft	5952lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		7055	5071	3307	5732	4189	3086
78		5071	3968	3086	3968	3086	2646
75		3086	2425	2205	2205	1764	1543
72		1764	1323	1323	1323	882	882
70		1323	882	882	661	441	441
65							
60							
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
128.6ft~142ft	30.5ft





		
20.3ft×7.4ft	5952lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		4409	3307	2866	3748	3307	2646
78		3086	2425	2205	2866	2205	1984
75		1543	1323	1102	1323	1102	882
72		661	441	441			
70							
65							
60							
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
102ft~115.5ft	53.5ft





		
20.3ft×7.4ft	5952lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		5291	2866	1543	4189	2866	1543
78		3748	2425	1543	2866	1984	1323
75		2205	1543	1323	1543	1102	882
72		1323	882	661	661	441	441
70		661	441	441	441		
65							
60							
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s

TF_4

 T	 F
128.6ft~142ft	53.5ft

		
20.3ft×7.4ft	5952lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		3307	2205	1323	2205	1102	661
78		2205	1543	1102	1984	1102	661
75		1102	661	441	882	661	441
72		441					
70							
65							
60							
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




102ft~115.5ft	30.5ft





20.3ft×7.4ft	4409lb	I5

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		6393	4630	3307	4850	3748	3086
78		4409	3307	2866	3307	2646	2205
75		2425	1984	1764	1764	1323	1323
72		1323	1102	882	661	441	441
70		661	661	441	441		
65							
60							
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
128.6ft~142ft	30.5ft





		
20.3ft×7.4ft	4409lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		3968	3086	2425	3748	2866	2425
78		2425	1984	1543	2205	1764	1543
75		1323	882	882	882	661	661
72		441					
70							
65							
60							
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s



TF_4




 T	 F
102ft~115.5ft	53.5ft





		
20.3ft×7.4ft	4409lb	

		102			115.5		
		0°	15°	30°	0°	15°	30°
79		4630	2866	1543	3748	2425	1543
78		3086	2205	1543	2425	1764	1323
75		1764	1323	882	1323	882	661
72		882	441	441	441		
70		441					
65							
60							
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	4	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
	5	50.0%	50.0%	50.0%	66.7%	66.7%	66.7%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s

TF_4

 T	 F
128.6ft~142ft	53.5ft

		
20.3ft×7.4ft	4409lb	

		128.6			142		
		0°	15°	30°	0°	15°	30°
79		2866	1984	1323	2205	1102	661
78		1764	1323	1102	1543	1102	661
75		661	441	441	441		
72							
70							
65							
60							
55							
50							
	2	100%	100%	100%	100%	100%	100%
	3	83.3%	83.3%	83.3%	100%	100%	100%
	4	83.3%	83.3%	83.3%	100%	100%	100%
	5	83.3%	83.3%	83.3%	100%	100%	100%
n		1	1	1	1	1	1
		29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s	29.5ft/s

Index

C

Crane working areas 3-9

E

Explanation of symbols 3-3

H

Hook block 2-4

I

Intended use of the crane XI

N

Note 3-2

Notes on the load charts 3-7

O

Overload safety device and limit switch 2-5

R

Reasonably foreseeable misuse XXI

Residual risks XV



Add: No. 68, Gaoxin Road, Economic and Technological
Development Zone, Xuzhou, Jiangsu, P. R. China
Post Code: 221004
Tel: +86-516-83462242
Quality Inquiry Tel: +86-516-87886268
Spare Parts Tel: +86-516-83461542
Website: <http://www.xcmg.com>

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