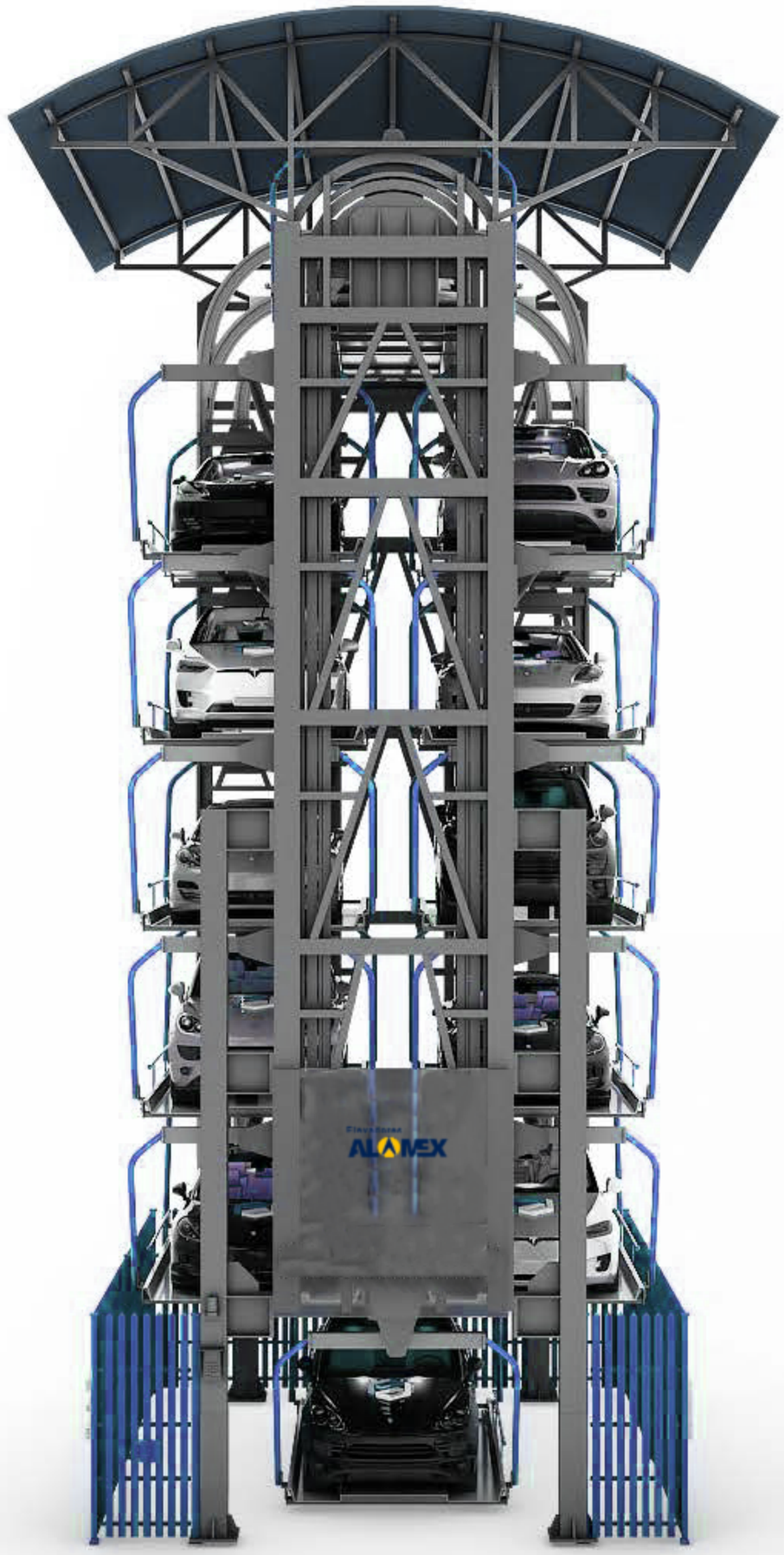
Elevadores ALAMEX

Automatic Rotary Parking System

Installation Manual



www.alam.mx

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1. General Information

1.1 Foreword

This installation manual is intended to familiarize with installation work of Vertical Rotary Parking system. It contains important information on installation safely, correctly and economically. The installation manual must be read, understood and used by every person who is entrusted with installation and commissioning of Vertical Rotary Parking system.

1.2 Information about Company

- Company name: Alamex
- Web: www.alam.mx
- Email: info@alam.mx

1.3 Copyrights

The copyright of this Installation manual remains with Company.

Without issuer's written permission, It is not allowed to copy or distribute any content by any photocopying, mechanical mean ,electronic way or other information storage etc.

Warnings and promises

This Installation manual is only intended for installation and technical specifications of the Series Vertical Rotary Parking System. Although we have spared no effort to make this manual as complete and accurate as possible, but the omissions and defects are unavoidable.

This manual is made based on long-term production and experience of installation and maintenance, not a standard or specification. Any loss or damage caused by improper operation, Alamex does not assume any liability or obligation.

2. Safety Instructions

The following basic principle shall be applied to the process of installation.

Safety First

Do not start installation before you read this Installation Manual!

WARNING



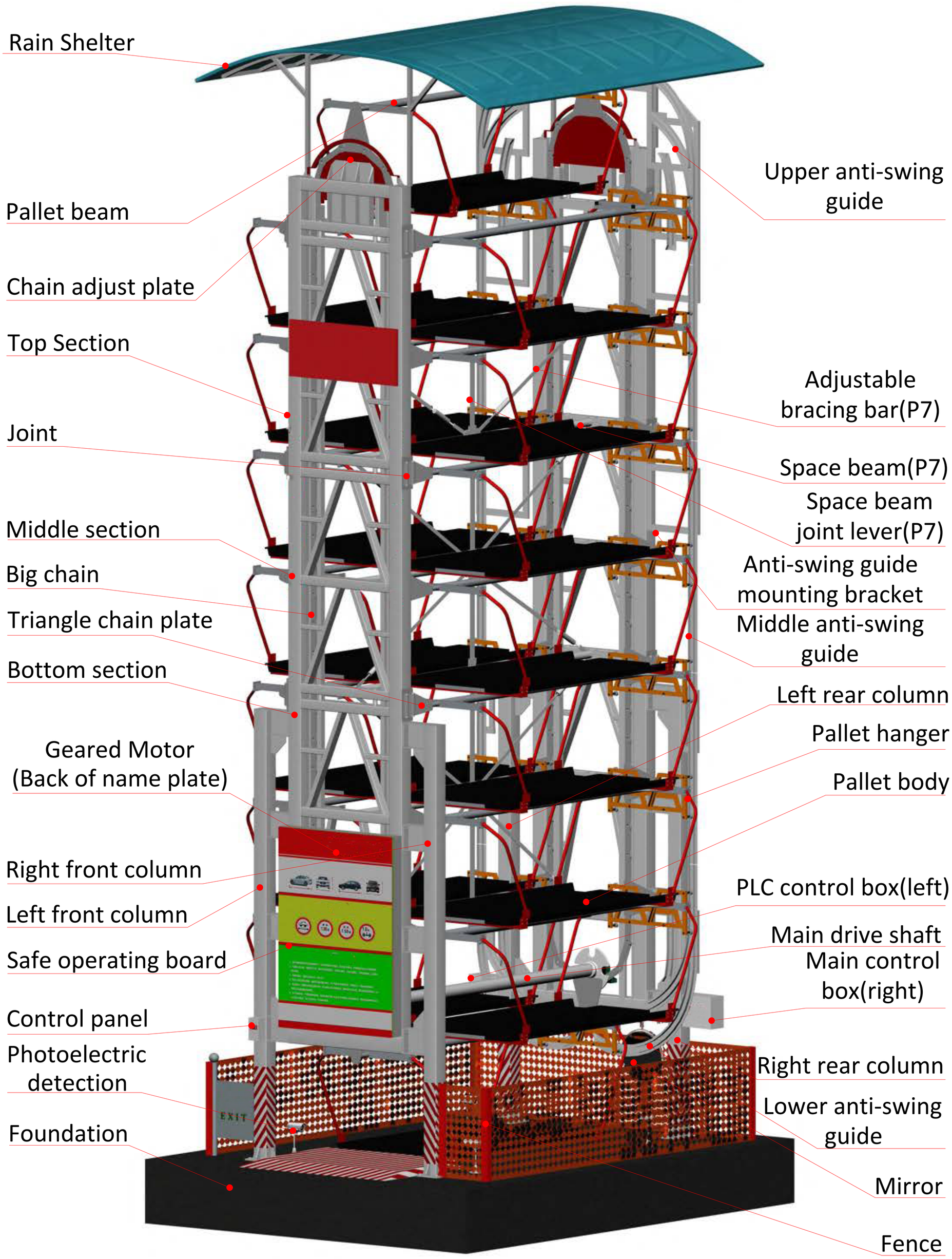
- Read and understood exactly this manual before start installation of Vertical Rotary Parking System .
- In your own interests, please ensure that you understand all safety instructions and observe them when install parking equipment.
- In addition to this manual, observe the generally valid legal and other binding regulations concerning accident prevention and environmental protection.
- In addition to the binding regulations valid in the country of use and at the place of installation, the recognized technical rules for safe, professional work are to be observed.
- The installation workers must wear a safety helmet and a safety shoes, and must fasten a safety belt properly when doing any of installation works.
- The installation workers always have to watch steps when they work at high place not to be a fall down by losing one's footing, and fasten your safety belt.
- Observe operation procedures on electricity safety , relevant operators should hold qualification certificate.

3.Specification

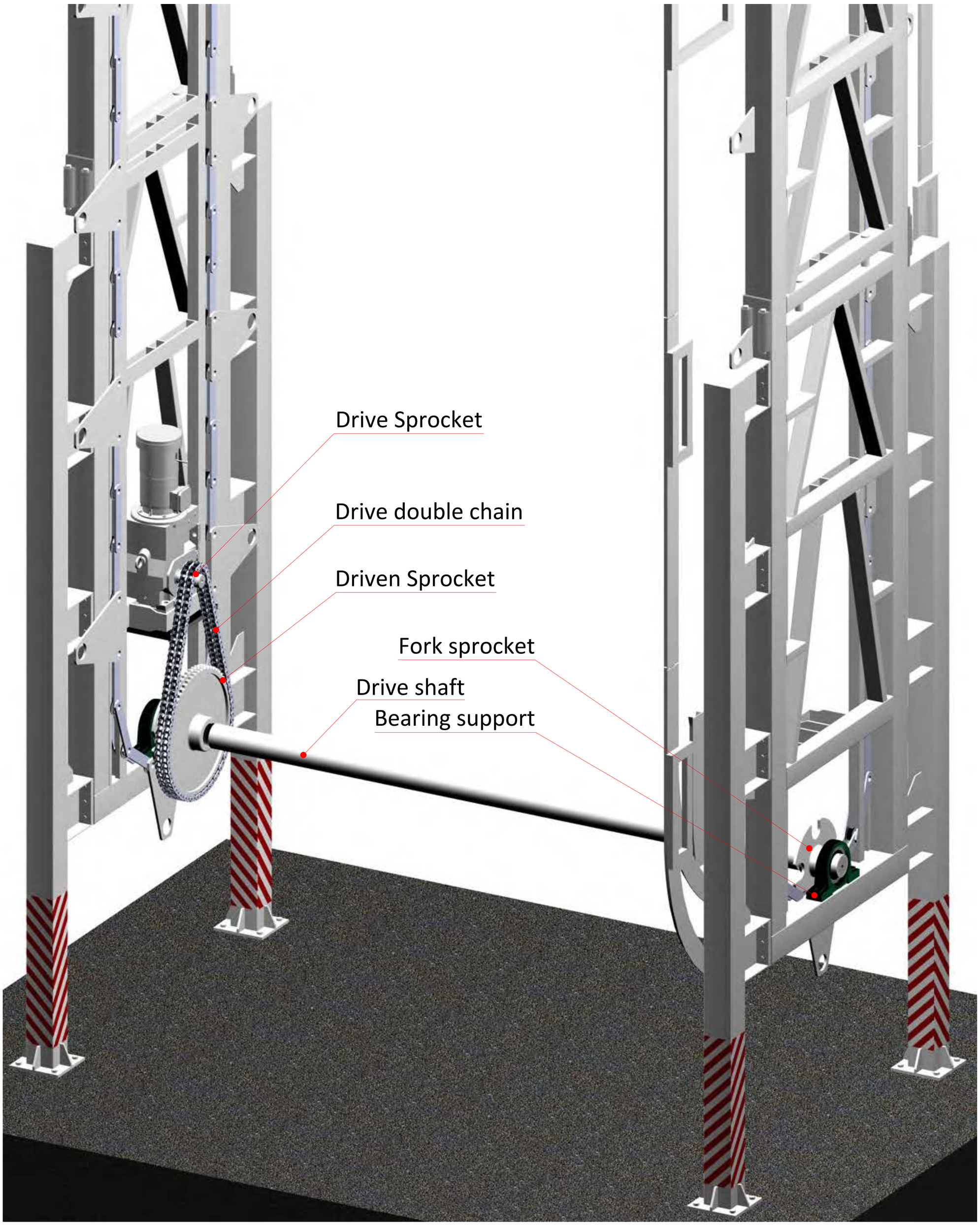
Products Name		Vertical Rotary Parking System								
Model No.		alam-8	alam-10	alam-12	alam-14	alam-16	alam-8S	alam-10S	alam-12S	alam-14S
Type of mechanical parking		Vertical Rotary								
Dimension(mm)	Length(mm)	6500	6500	6500	6500	6500	6500	6500	6500	6500
	Width(mm)	5200	5200	5200	5200	5200	5400	5400	5400	5400
	Height(mm)	9920	11760	13600	15440	17280	12100	14400	16700	19000
Parking Capacity (cars)		8	10	12	14	16	8	10	12	14
Available car	Length(mm)	5300	5300	5300	5300	5300	5300	5300	5300	5300
	Width(mm)	1850	1850	1850	1850	1850	1950	1950	1950	1950
	Height(mm)	1550	1550	1550	1550	1550	2000	2000	2000	2000
	Weight(kgf)	1800	1800	1800	1800	1800	2500	2500	2500	2500
Motor(kw)		7.5	7.5	9.2	11	15	7.5	9.2	15	18
Operation type		Button+ Card								
Noise level		≤50bd								
Available temperature		-40℃-+40℃								
Relative humidity		70% (No obvious water droplets)								
Protection		IP55								
Power		Three-phase five wire 380V 50HZ								
Parking manner		Forward parking & Reverse retrieving								
Safety factor	lifting system	≥7								
	steel structure	≥3								
Control mode		PLC control								
Running Control mode		Double system Power frequency and frequency conversion								
Drive mode		Motor + reducer + chain								
CE certificate		Certificate number : M.2016.201.Y1710								

4.Main structure instruction

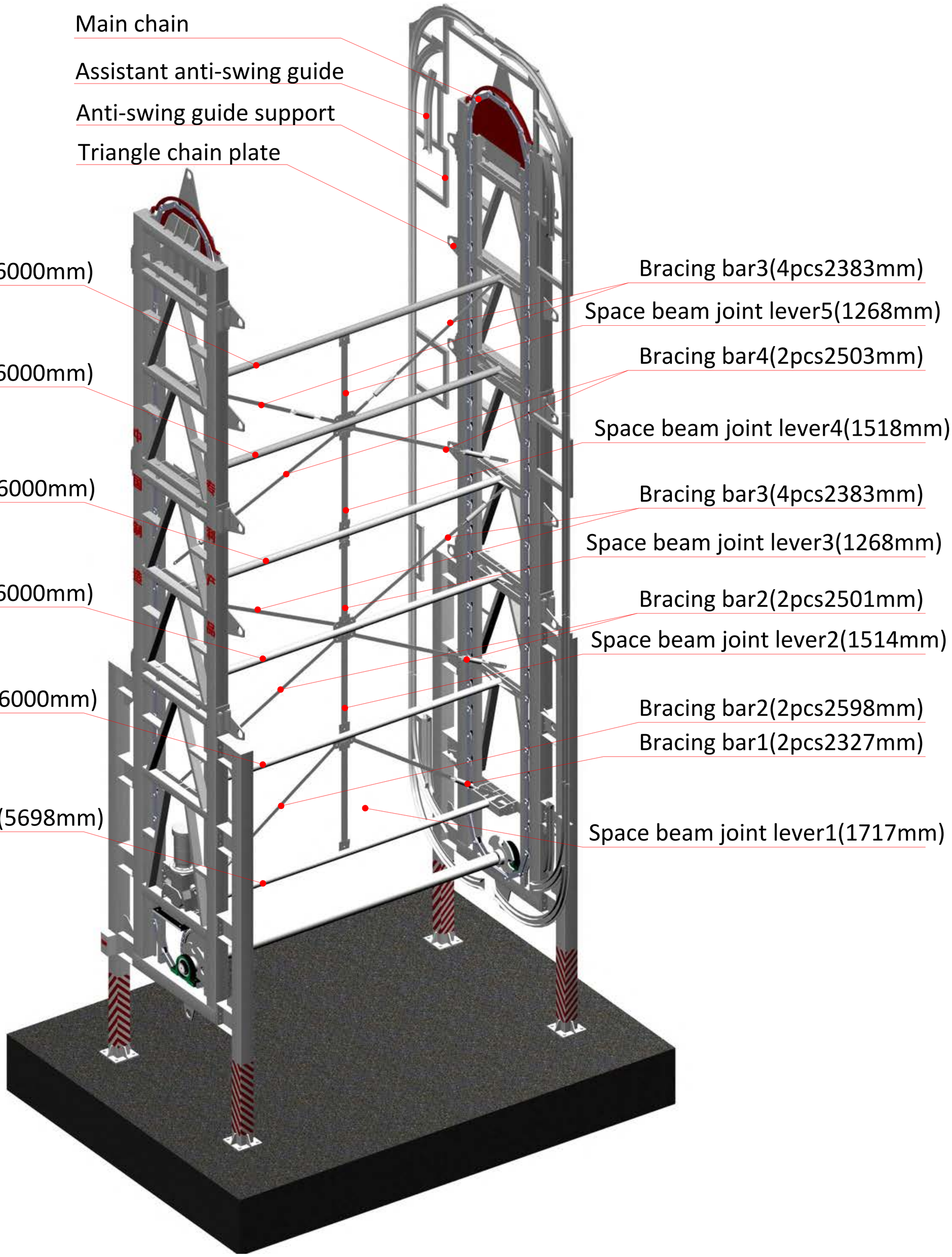
4.1 Overall



4.2 Driving part



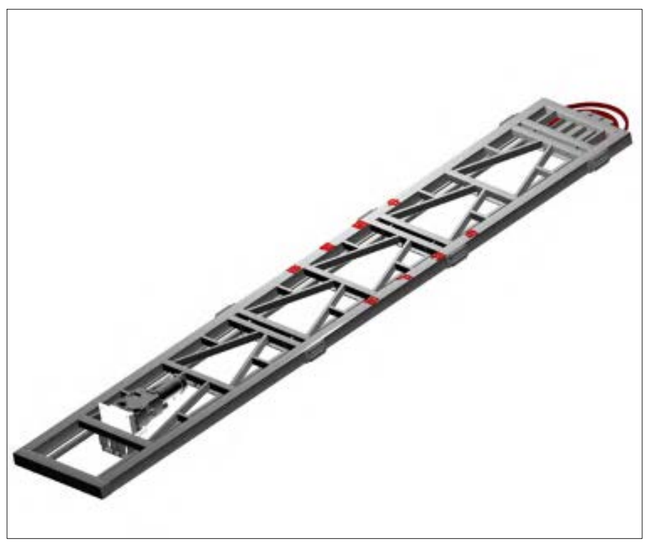
4.2 and rear frame assembly and installation



The drawing is configuration for ALAM-16 as reference,others refer to P34-35

4.2 Sub parts detail

Main frame



Drive assembly



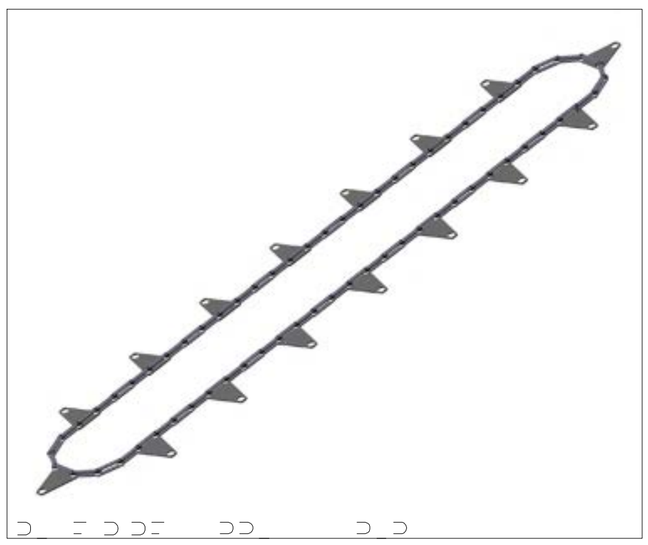
Column



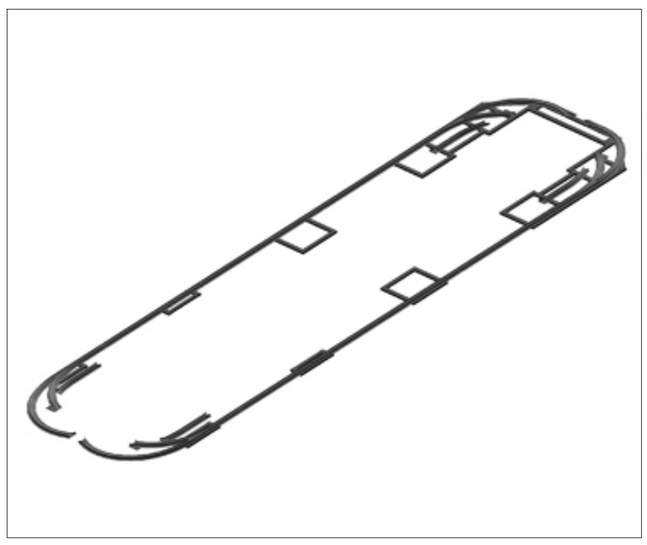
Pallet assembly



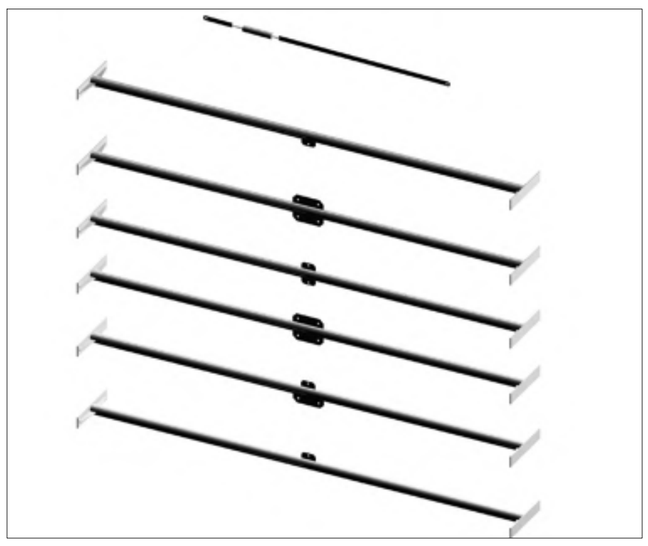
Main Chain



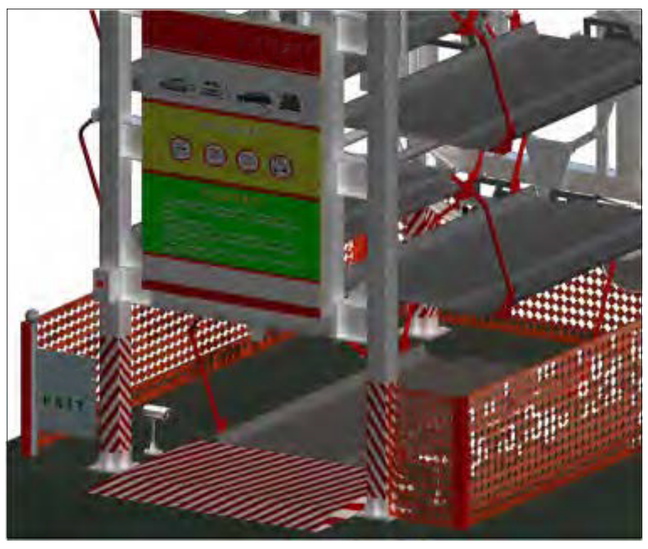
Anti-swing guide assembly



Space beam&bracing bar



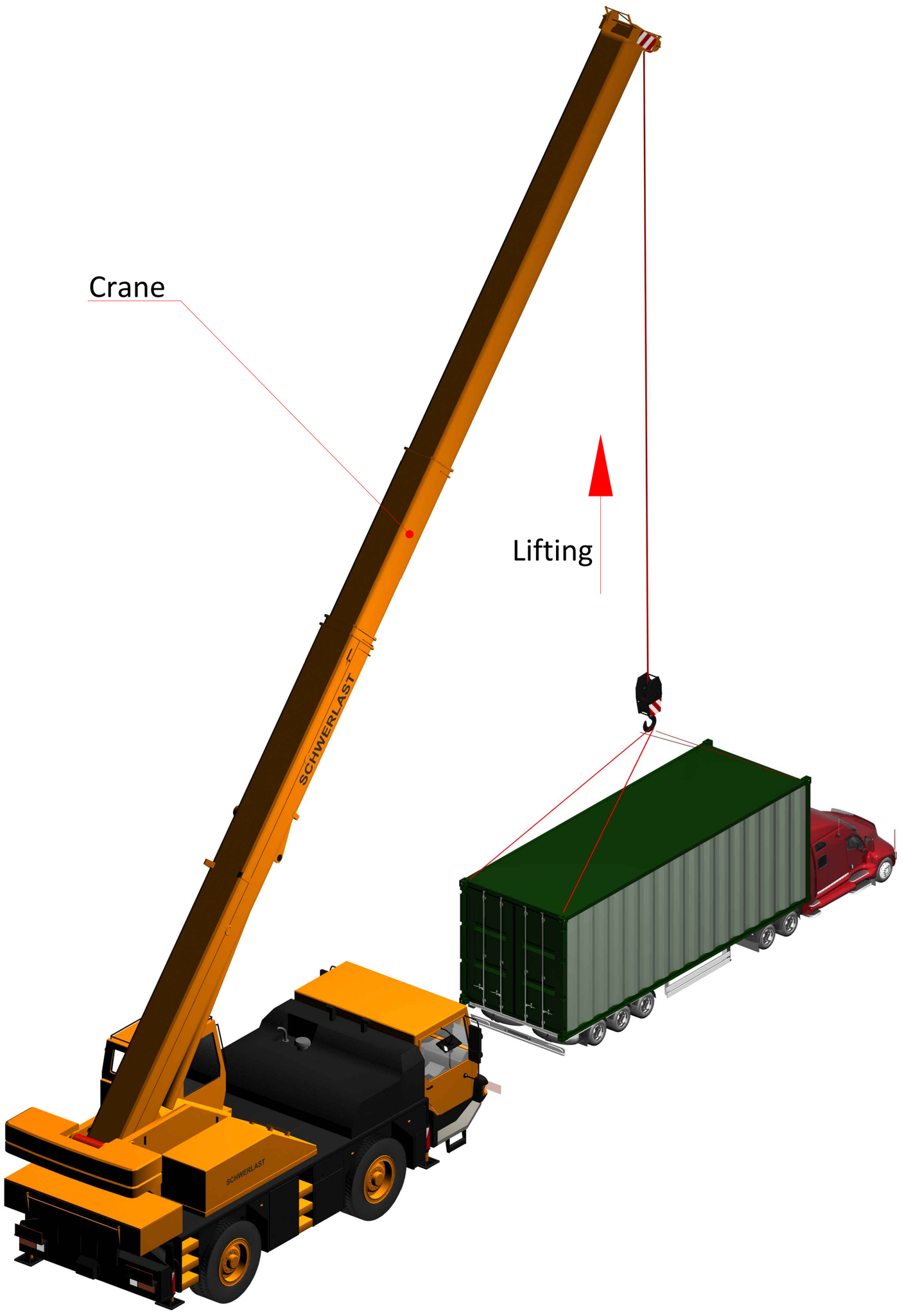
Entrance



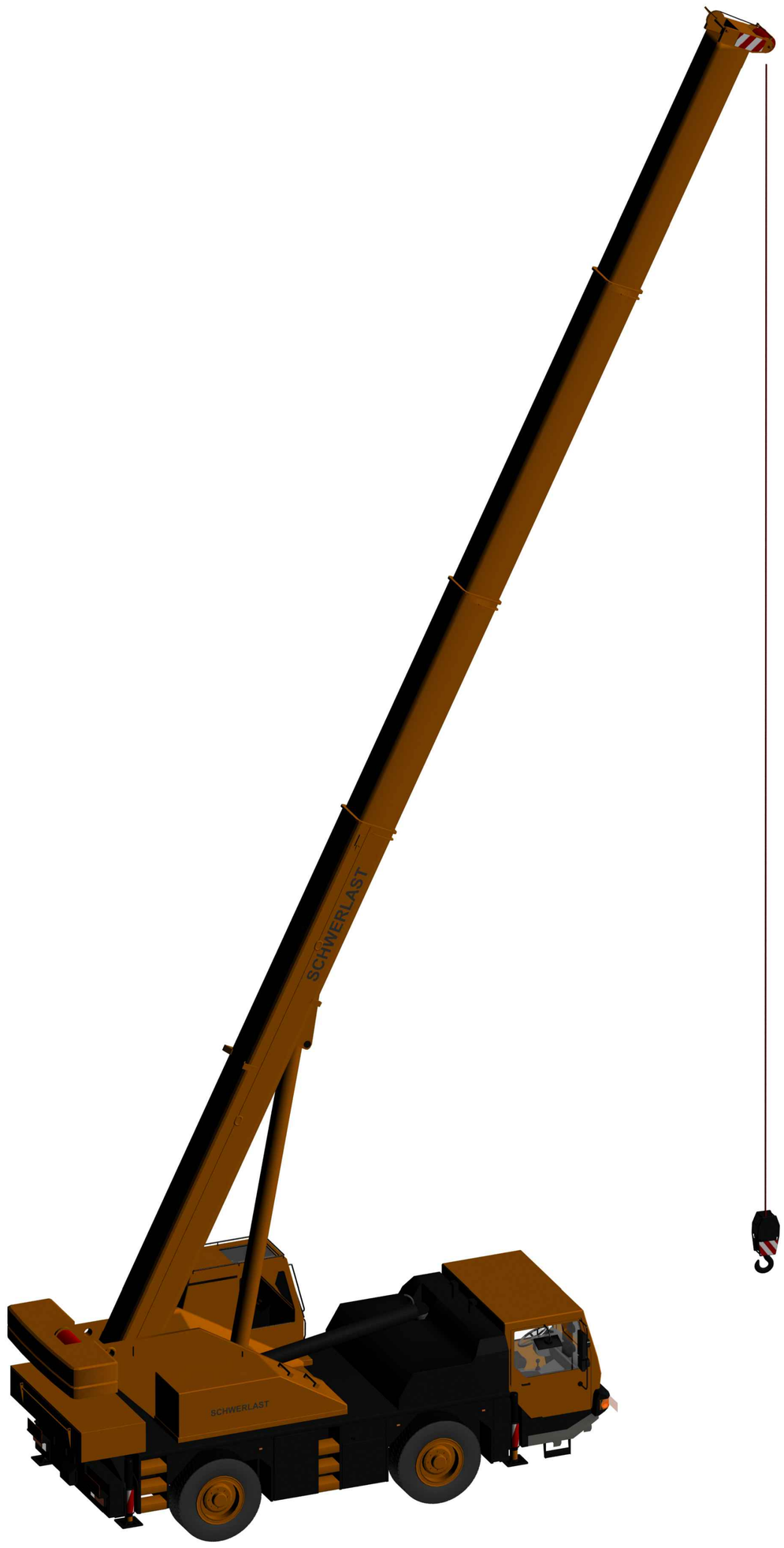
This drawing is configuration for ALAM-16

5.Installation Process

Step 1: Lift container by crane



Step 2: At the construction site,different crane be used for different parking system.



ALAM-8,ALAM-10: **≥16T Crane**

ALAM-12, ALAM-8S, ALAM-10S: **≥20T Crane**

ALAM-14, ALAM-16, ALAM-12S, ALAM-14S: **≥25T Crane**

Step 3: Crane unloads the container:

1.Crane lift container.

2.The truck moves away from the container.

3.Crane load down the container to the forklift position.

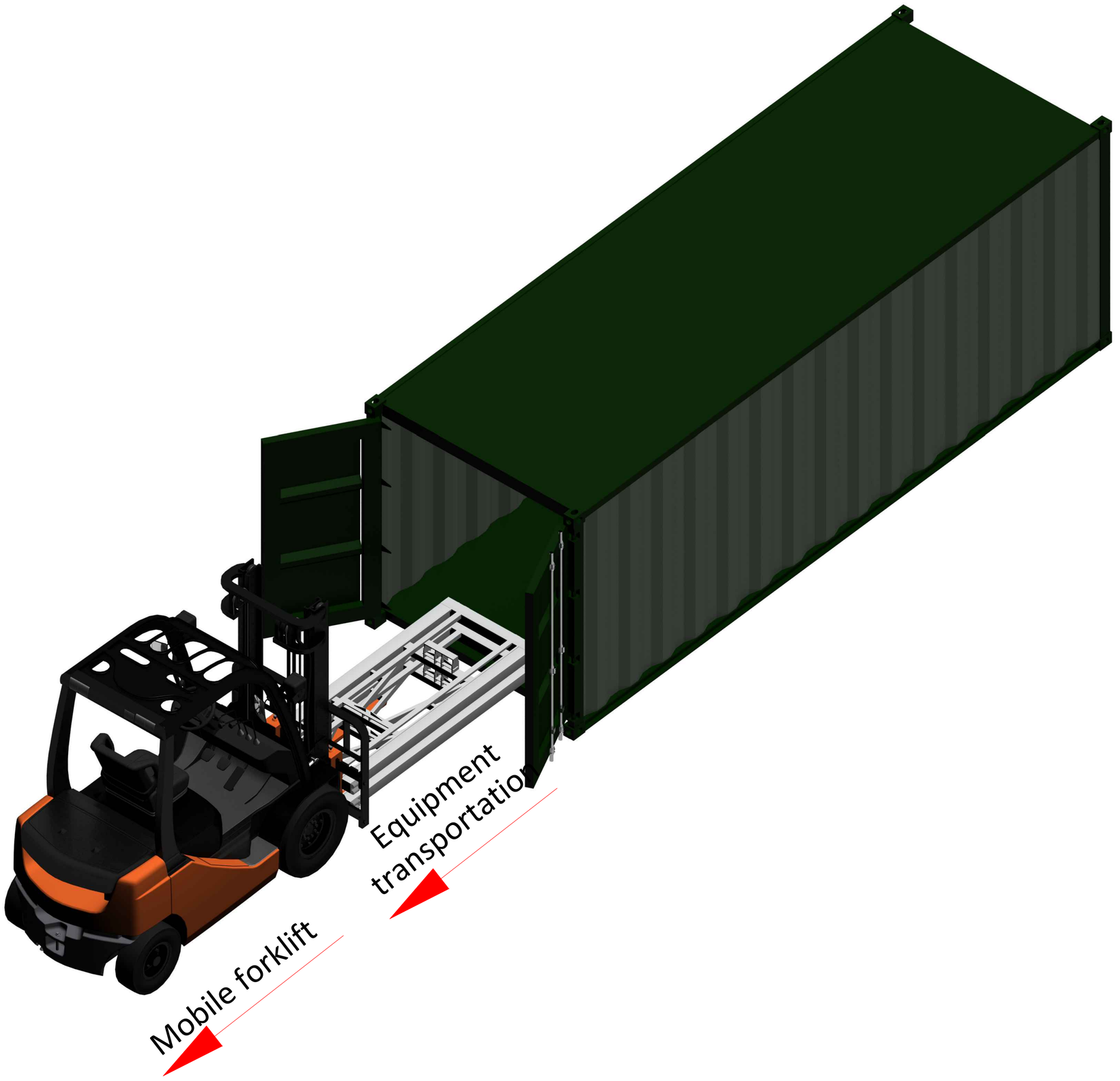


Step 4: The container is placed on a operable platform for forklift or crane

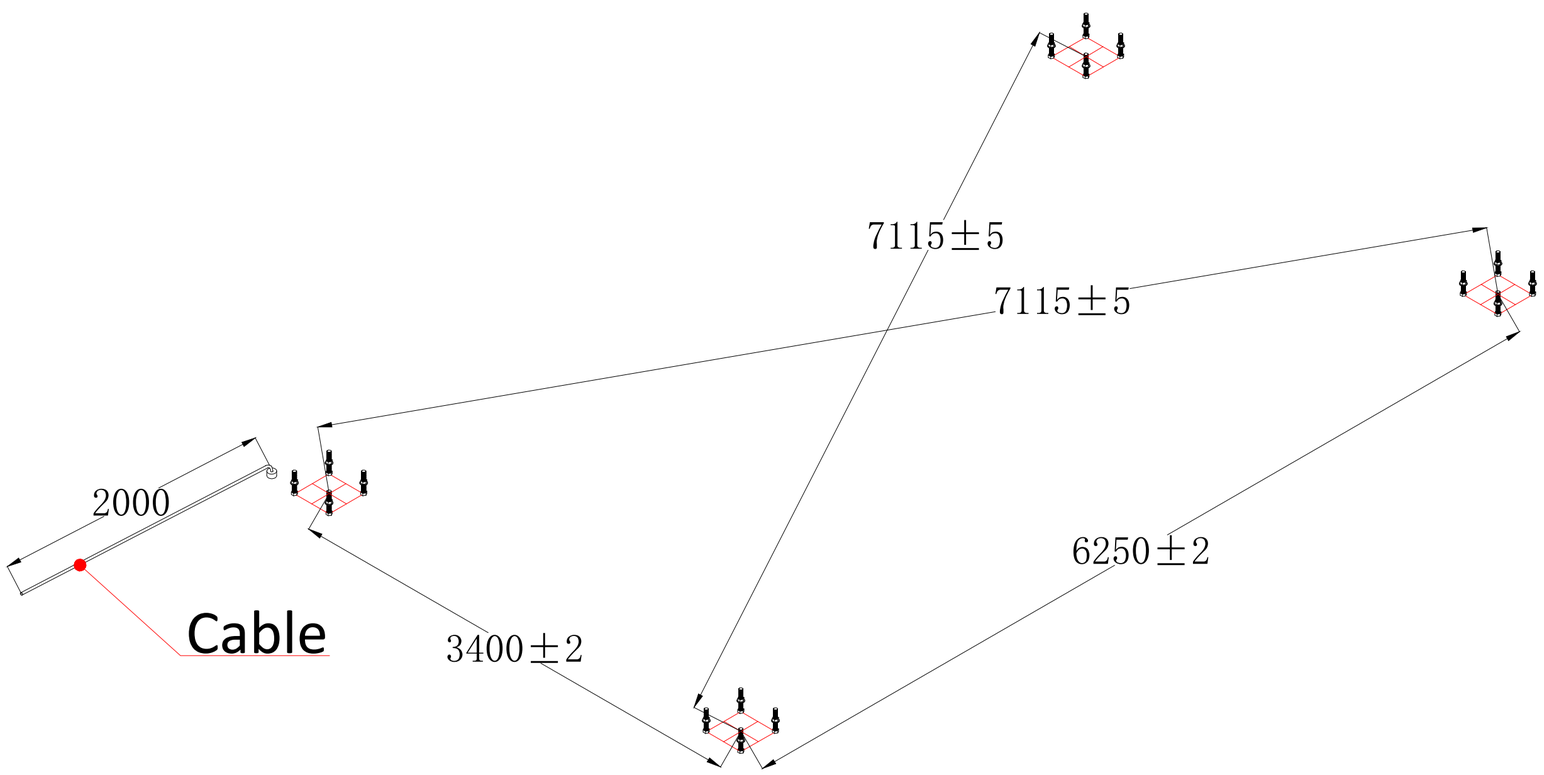
1. Open the container and check the parts according to the packing list.
2. Forklift or other transport equipment get ready for unloading.

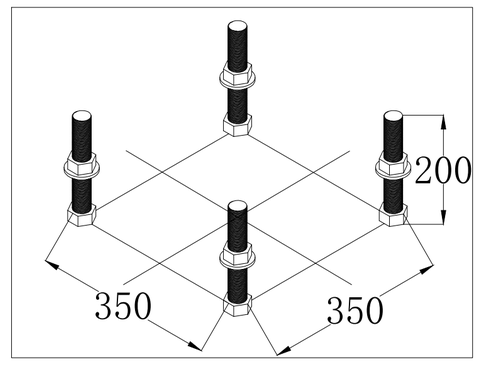


Step 5: Use the forklift or crane to transport the equipment



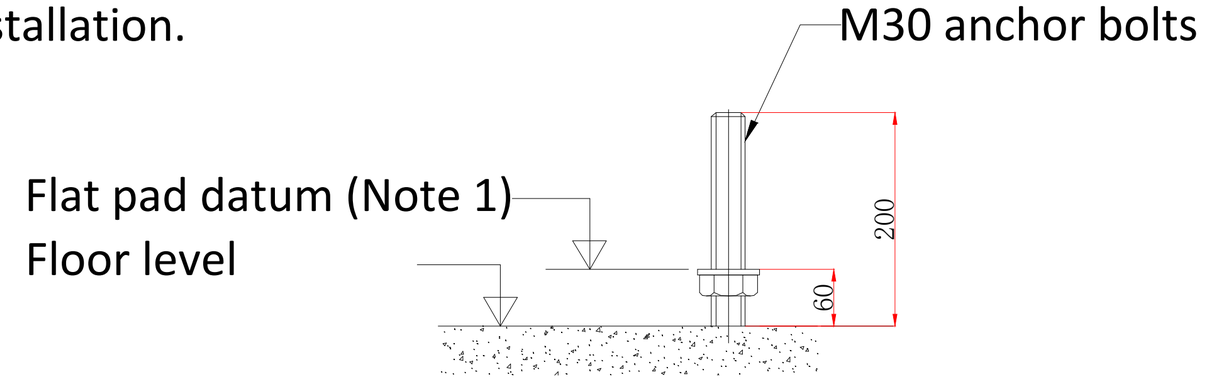
Step 6: Check the foundation dimensions, fix bolts





Note: The above drawing applies to 16 car parking equipment.The other types installation is subject to the accompanied drawing with the equipment.

Note: Adjust the base level o f anchor nut before installation.



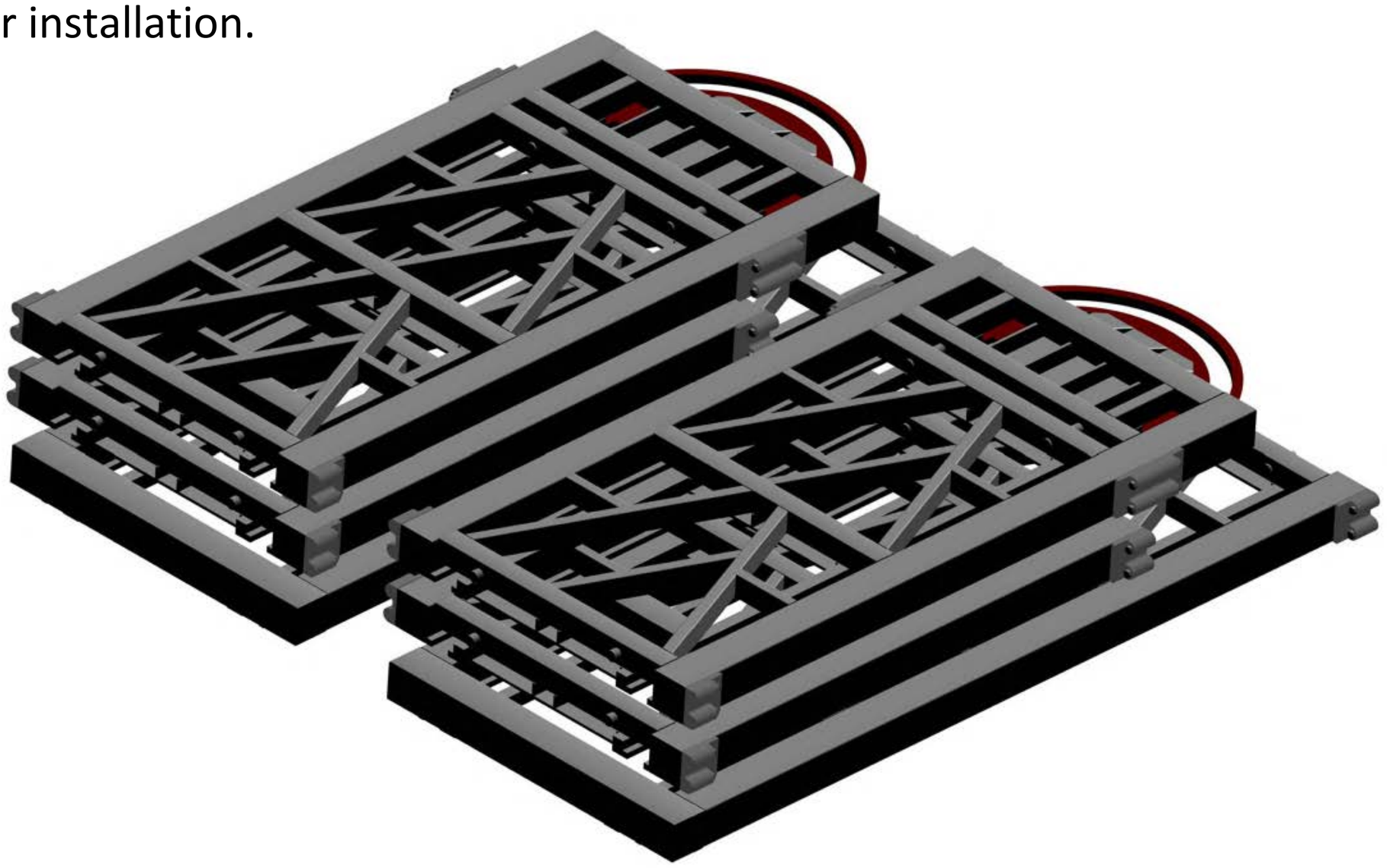
Note 1: The surface of the flad pad of 16 bolts are kept at the same leve(the error±1mm)

Note 2: Check the accompanied drawing with the equipment according to the actual requirements

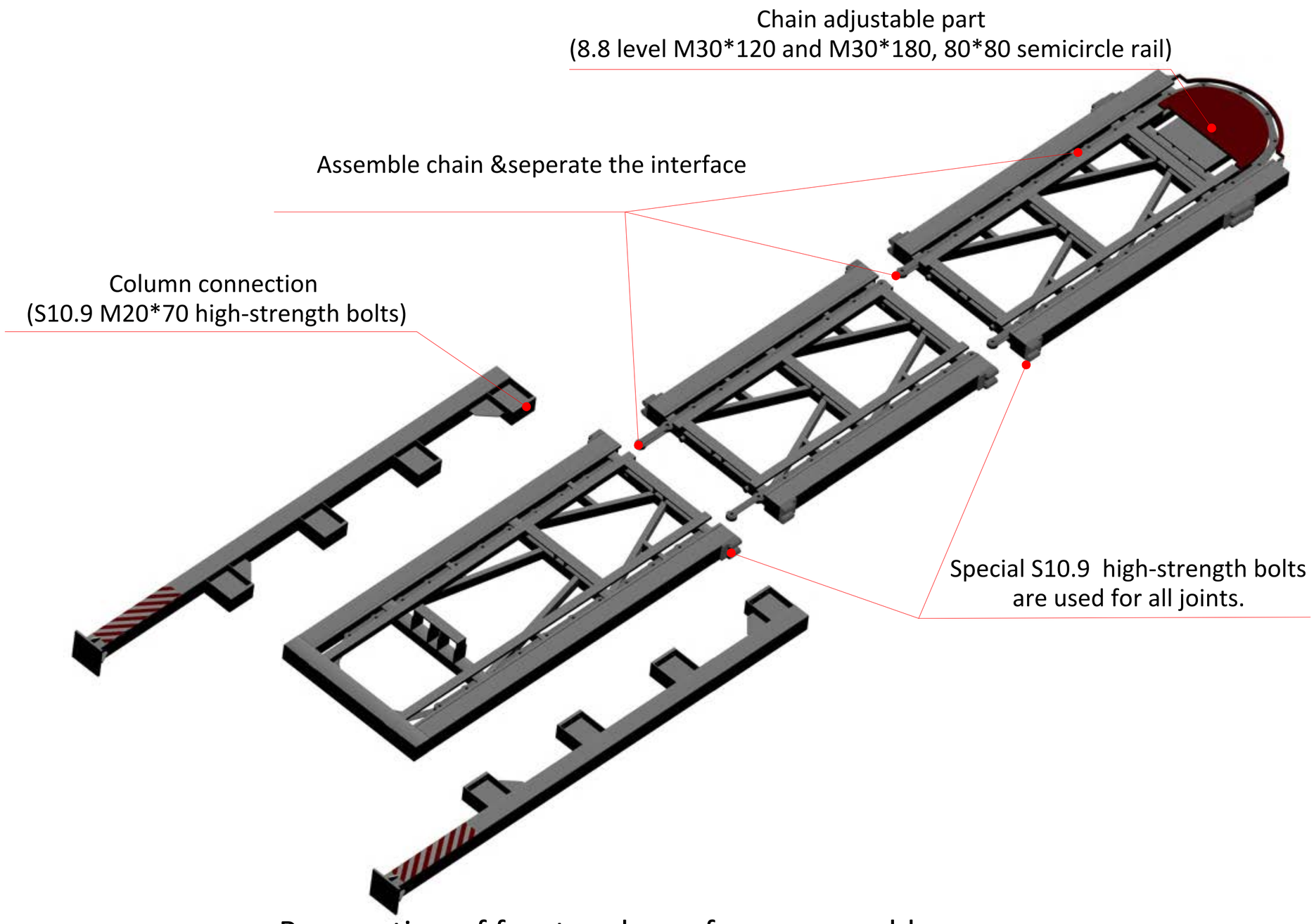
Tool set

M30 nut----------46wrench

Step 7：Unload front frame & rear frame and locate in convenient place for installation.



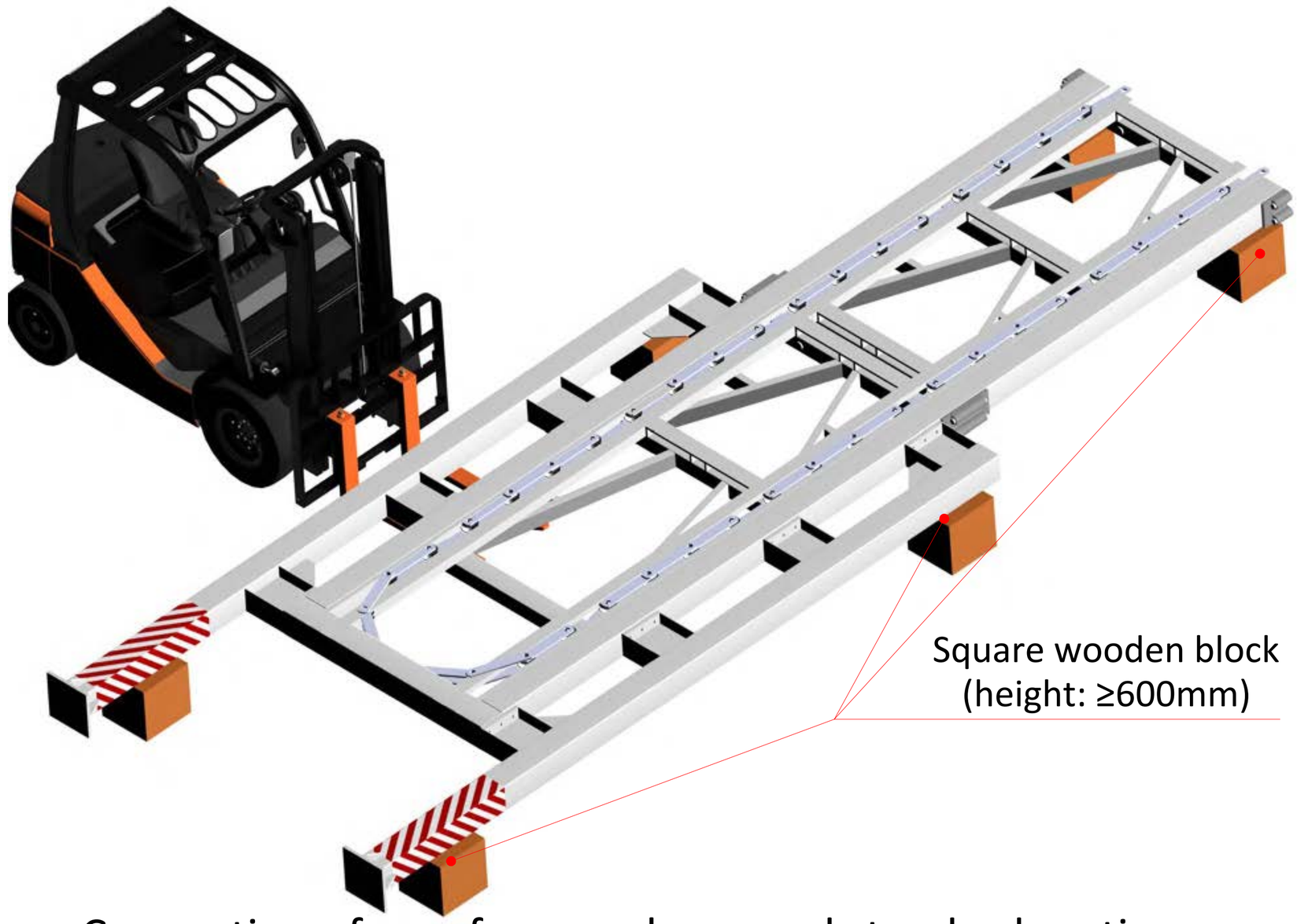
Unload bottom section, middle section and top section.



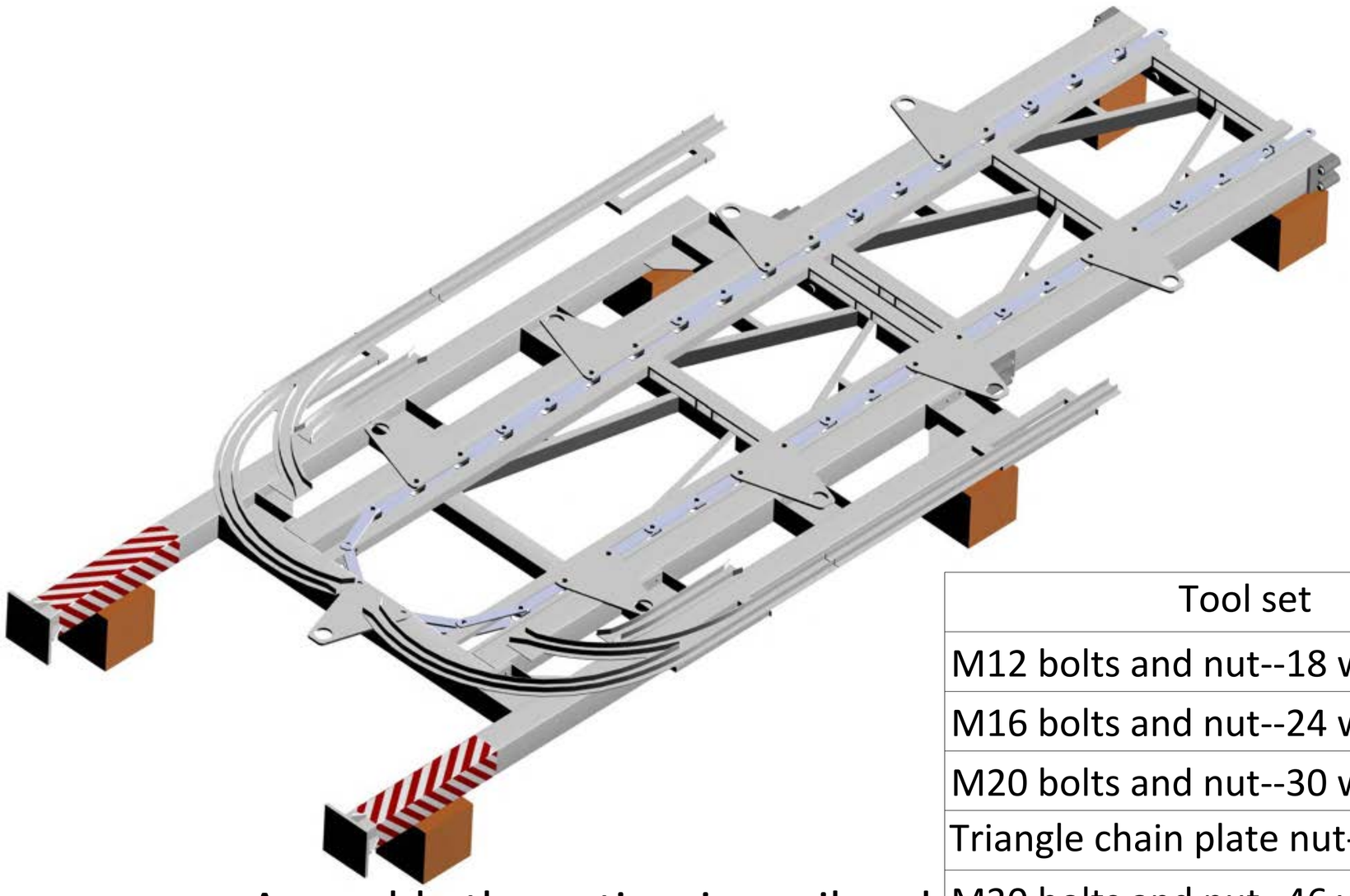
Preparation of front and rear frame assembly

Step 8: Column of rear frame and standard section assembly.

1. Support the bottom section with square wooden block and assemble the columns .
2. Connect the middle section with the bottom section.
3. Assemble flat chain.
4. Assemble the triangle chain plate, fasten bolts and band split pin.



Connection of rear frame column and standard section.



Assemble the anti-swing rail and chain rail of bottom section

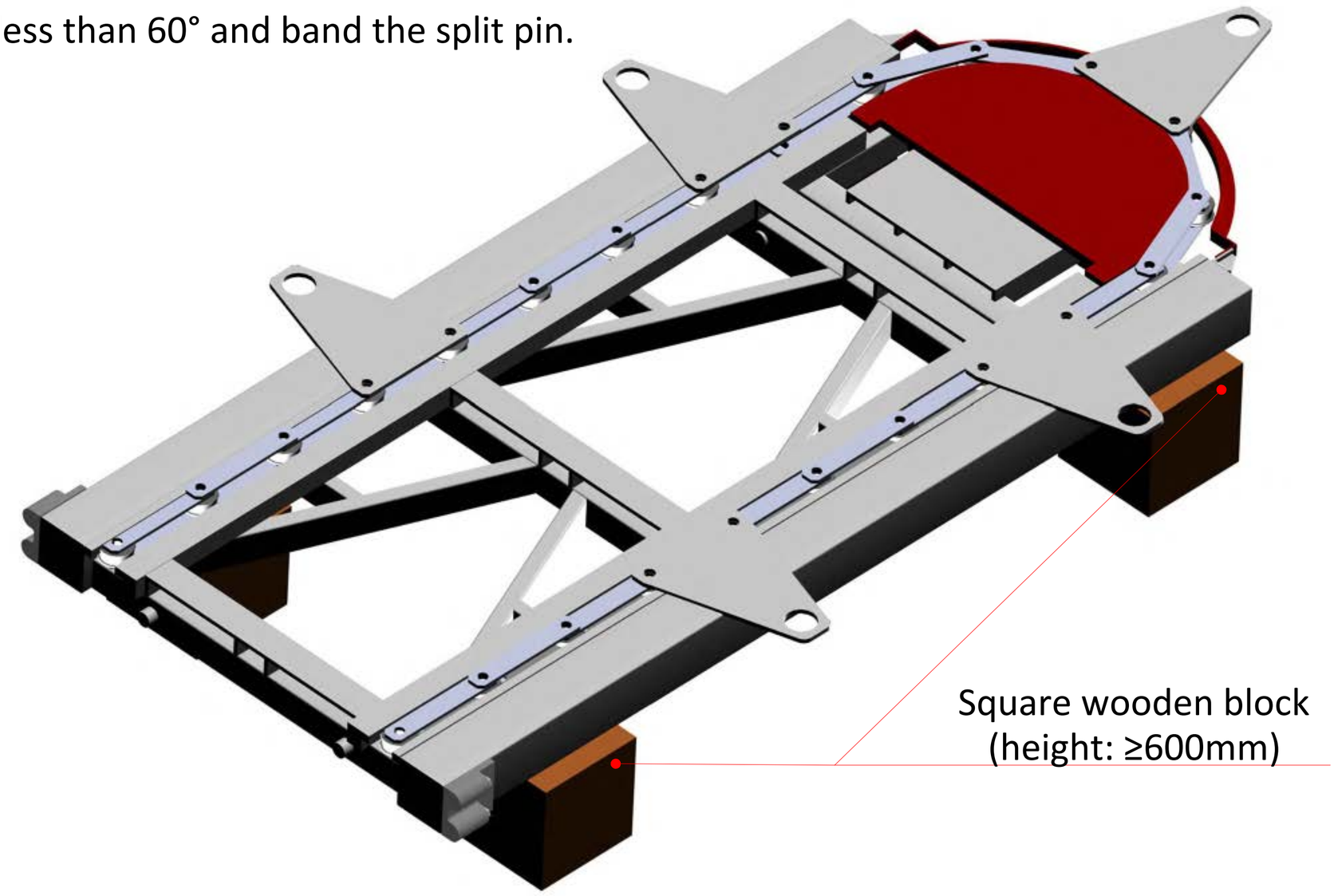
Tool set
M12 bolts and nut--18 wrench
M16 bolts and nut--24 wrench
M20 bolts and nut--30 wrench
Triangle chain plate nut--36 wrench
M30 bolts and nut--46 wrench

Step 9: Triangle chain plate of top section and rail assembly(rear frame).

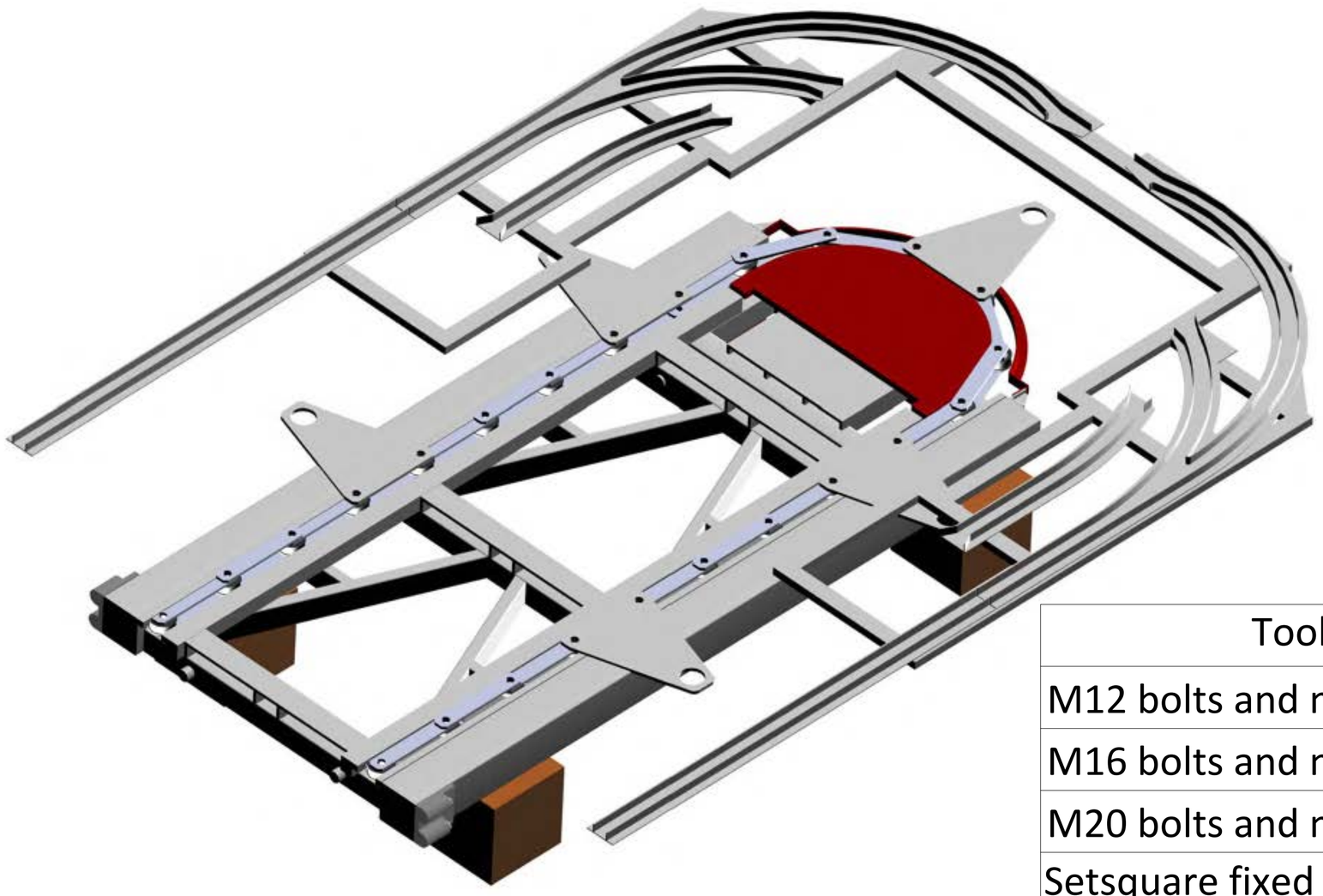
1.Assemble triangle chain plate supported with square wooden block

2.Assemble flat chain

3.Assemble triangle chain plate and fasten bolt.Pretighting force is around 140KN with reversal angle less than 60° and band the split pin.



Assemble the top section triangle chain plate of rear frame.

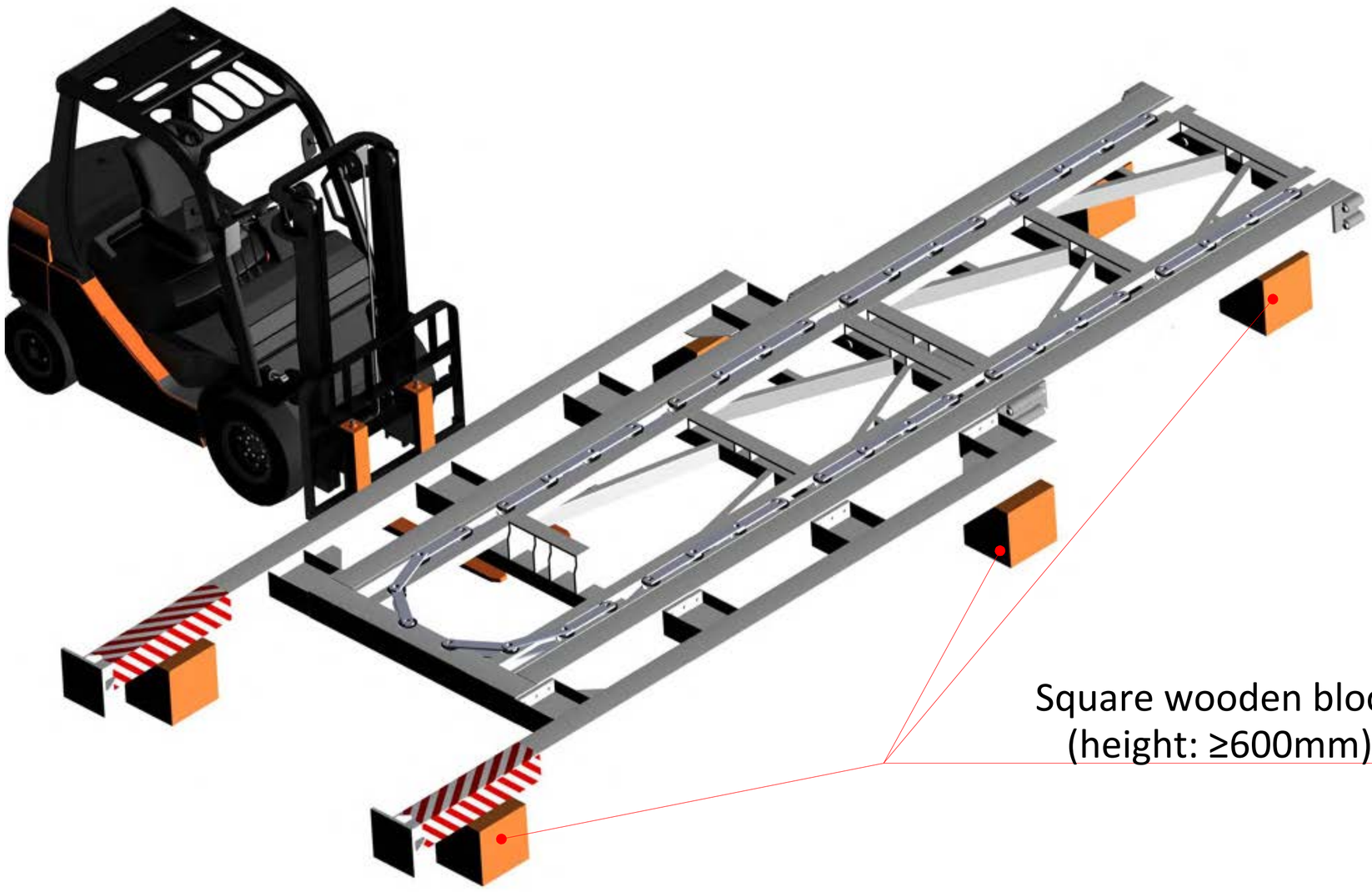


Assemble the top section anti-swing rail of rear frame

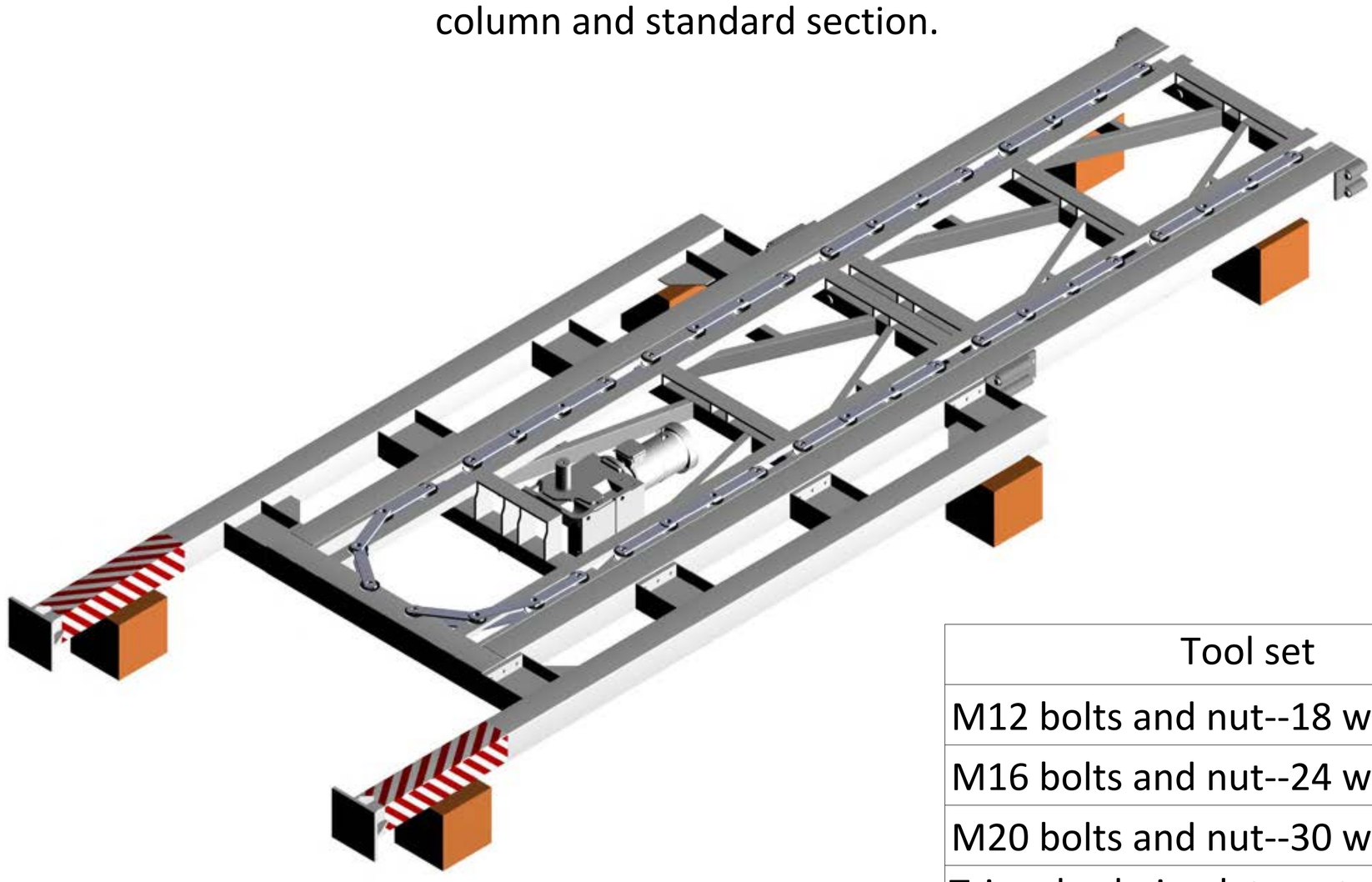
Tool set
M12 bolts and nut--18 wrench
M16 bolts and nut--24 wrench
M20 bolts and nut--30 wrench
Setsquare fixed nut--36 wrench
M30 bolts and nut--46 wrench

Step 10: Column of front frame and standard section assembly

1. Support the bottom section with square wooden block and assemble the columns .
2. Connect the middle section with the bottom section.
3. Assemble flat chain.
4. Assemble the triangle chain plate, fasten bolts and band split pin.



Connection of front frame
column and standard section.

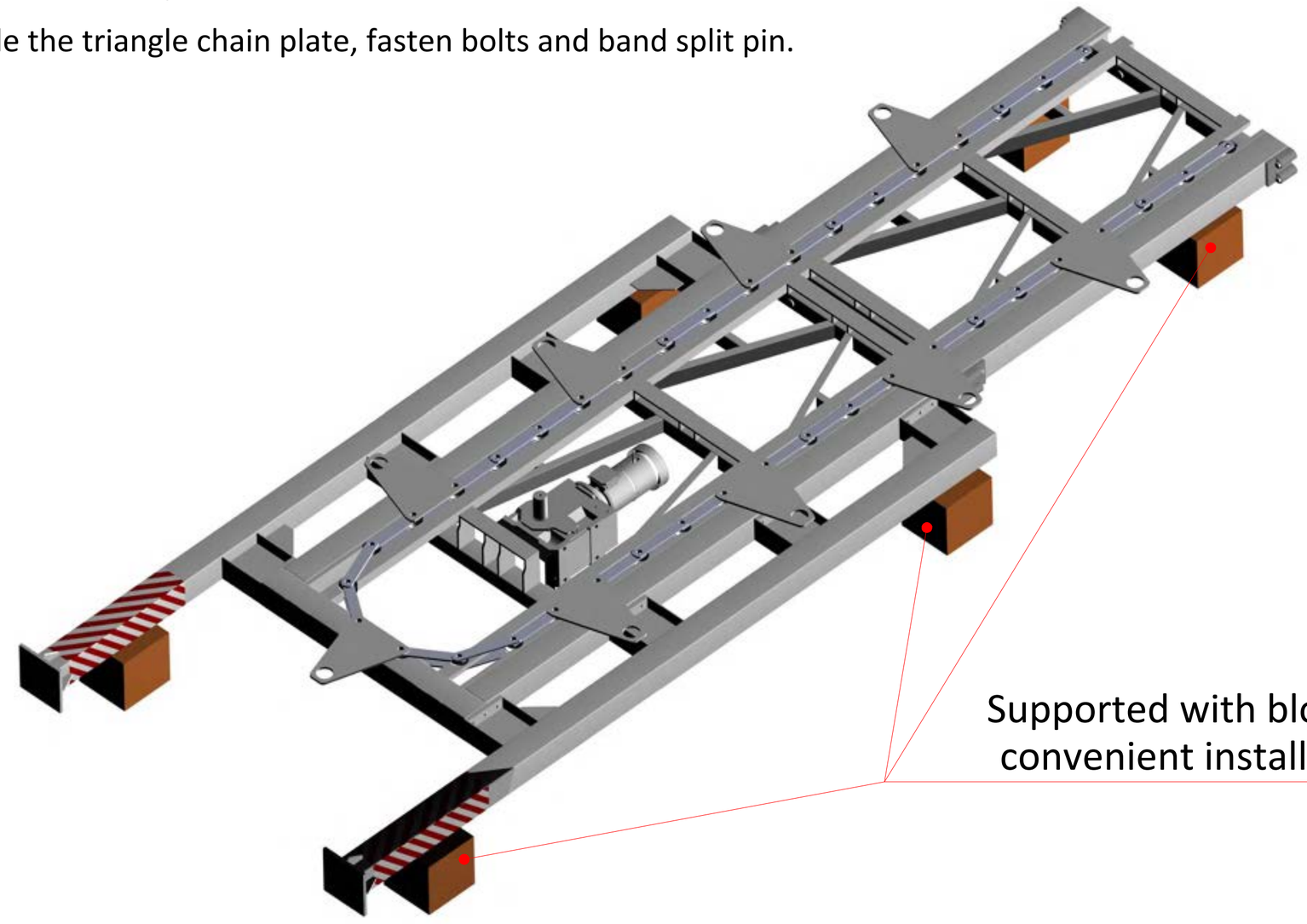


Install the motor on front frame.

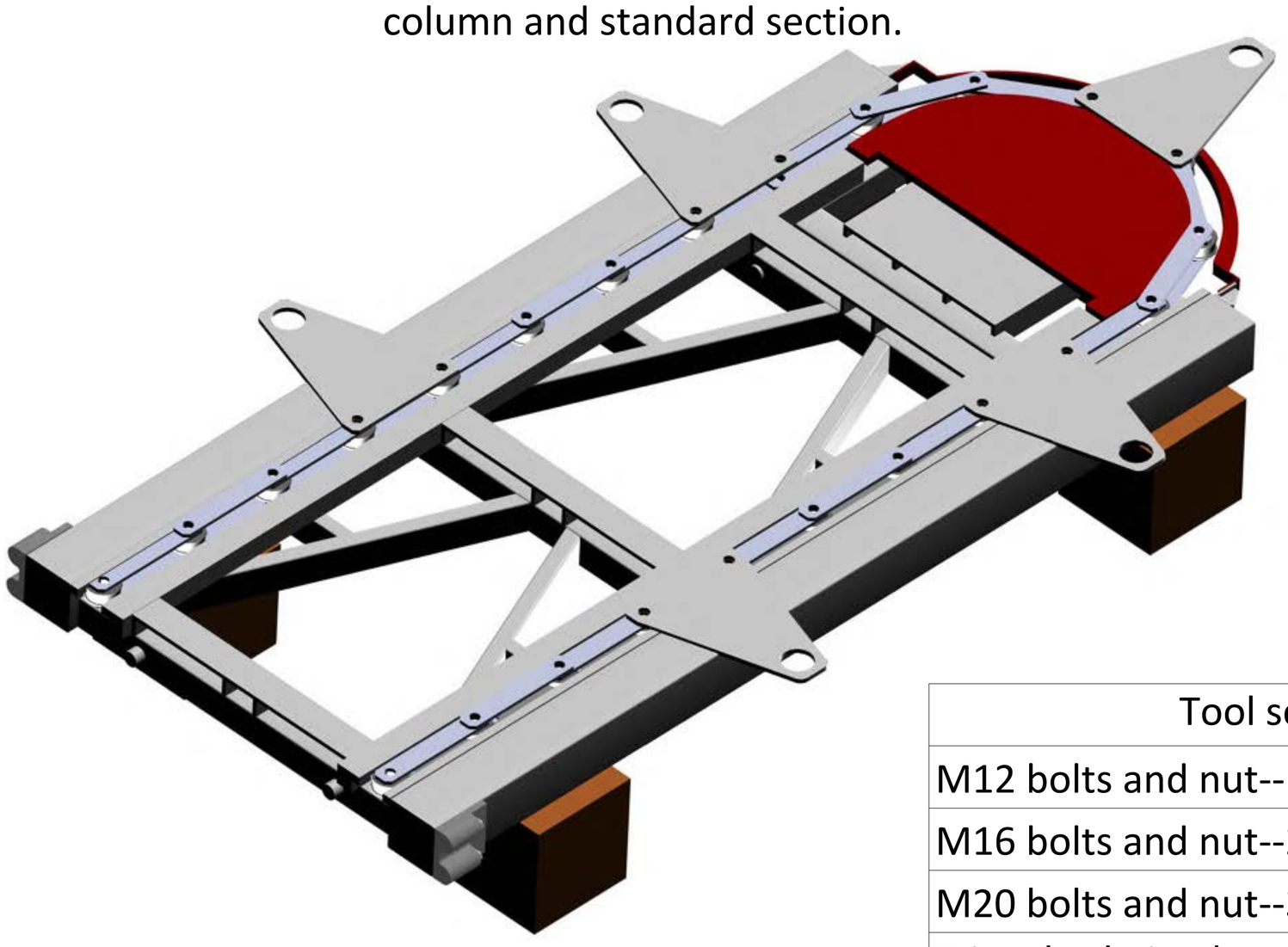
Tool set
M12 bolts and nut--18 wrench
M16 bolts and nut--24 wrench
M20 bolts and nut--30 wrench
Triangle chain plate nut--36 wrench
M30 bolts and nut--46 wrench

Step 11: Triangle chain plate of top section and bottom section assembly (front frame)

1. Support the bottom section with square wooden block and assemble the columns .
2. Connect the middle section with the bottom section.
3. Assemble the chain plate.
4. Assemble the triangle chain plate, fasten bolts and band split pin.



Connection of front frame column and standard section.



Assemble the triangle chain plate of top section of front frame.

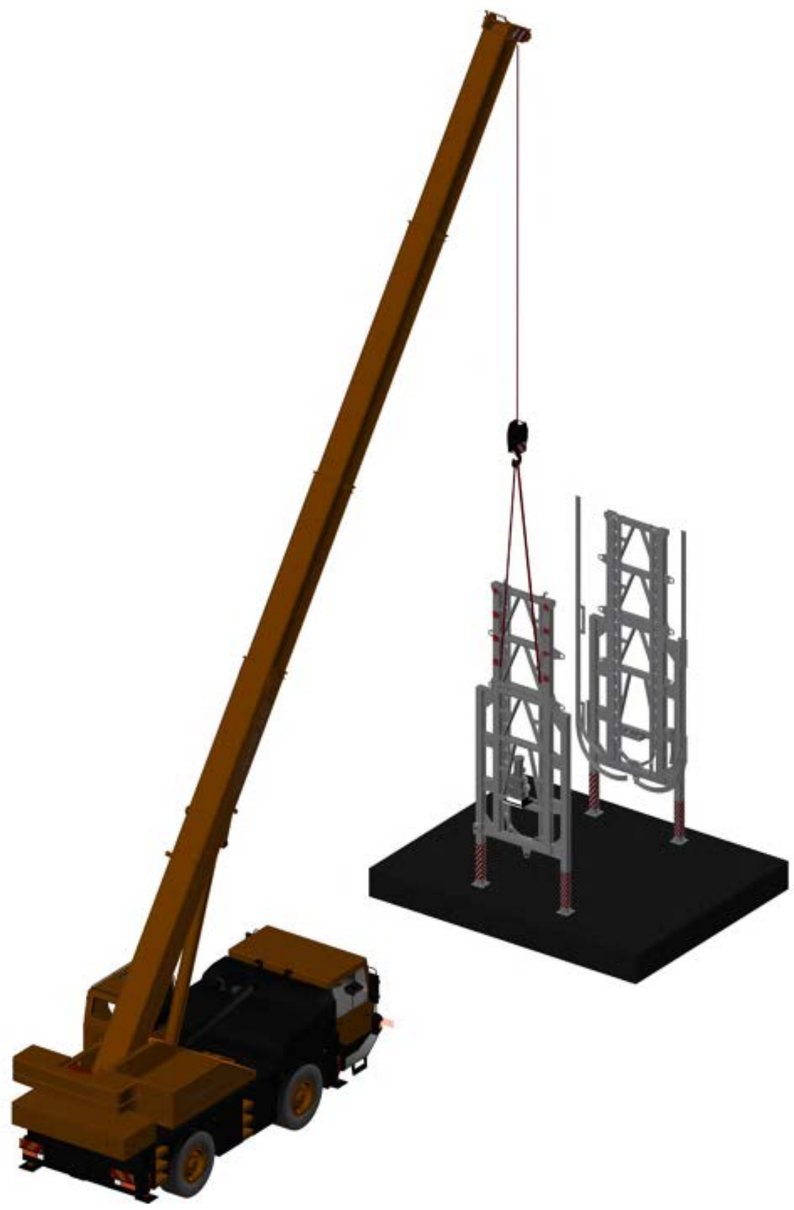
Tool set
M12 bolts and nut--18 wrench
M16 bolts and nut--24 wrench
M20 bolts and nut--30 wrench
Triangle chain plate nut--36 wrench
M30 bolts and nut--46 wrench

No.12 Erect assembly frame

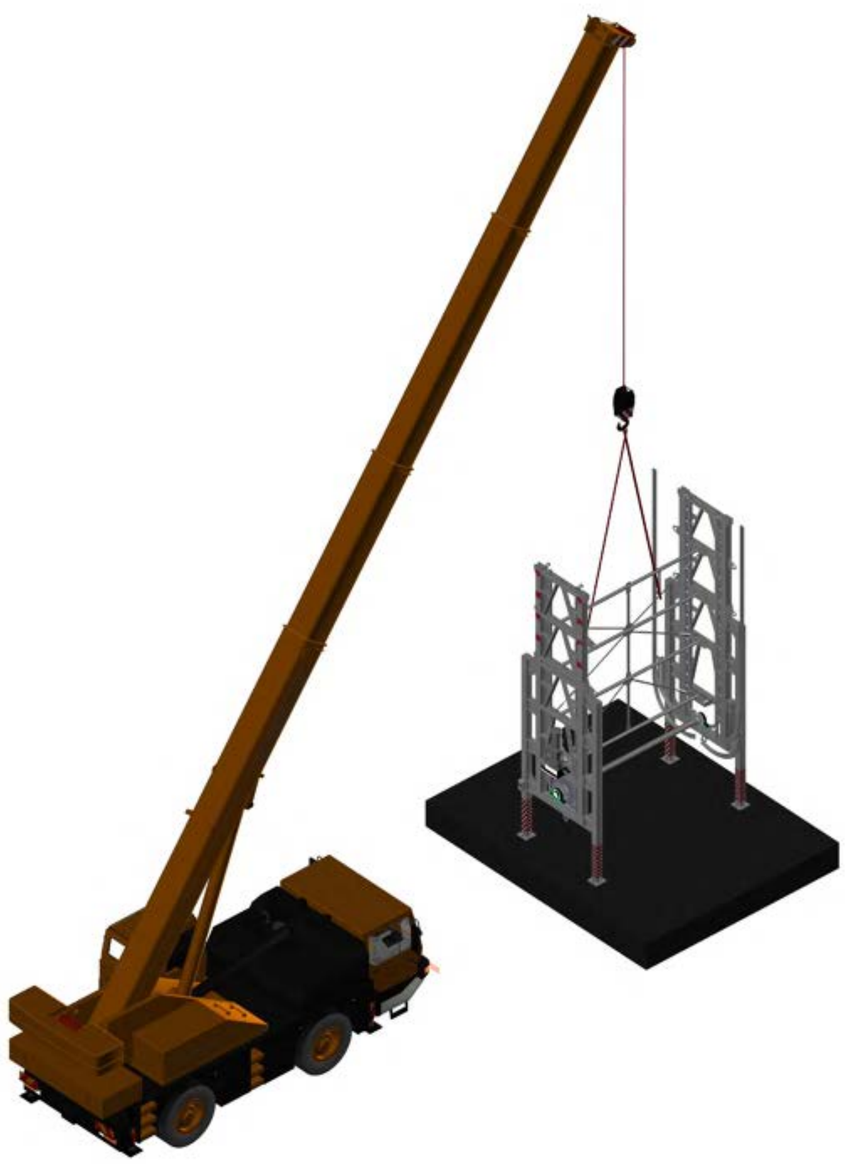
Note: Lift the front and rear section to match with the anchor bolts and pretight the anchor bolts.



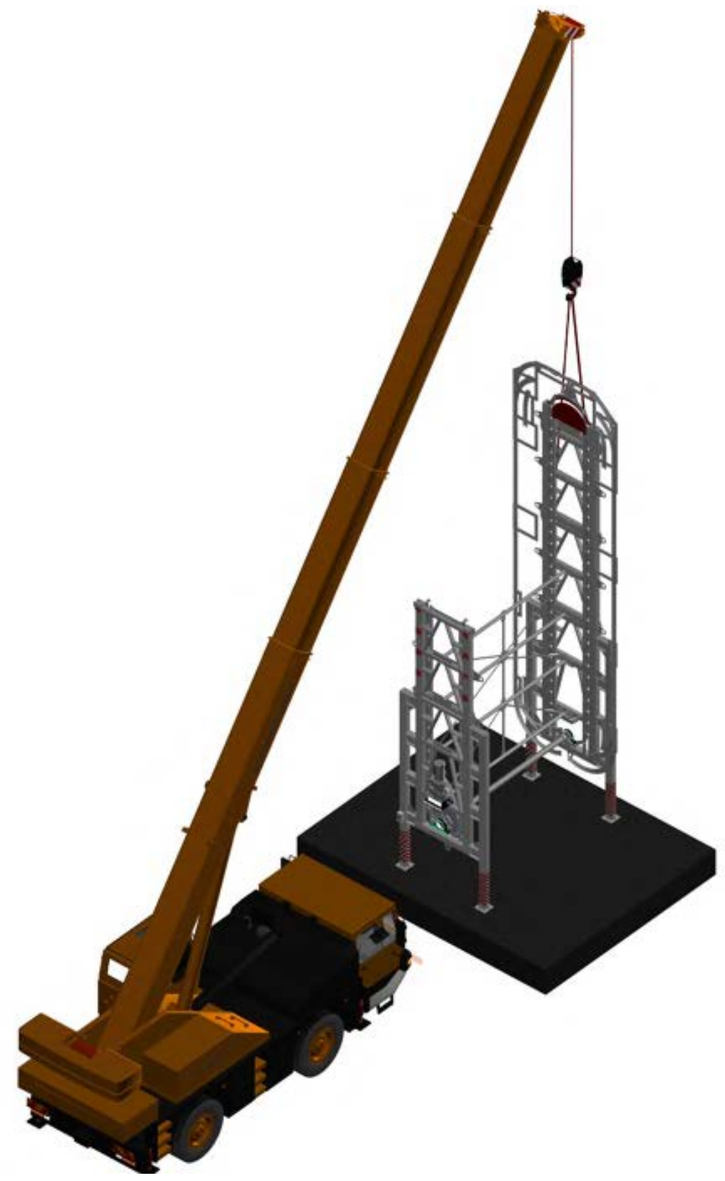
1. Erect the bottom section of rear frame



2. Erect the bottom section of front frame



3.Assemble the main drive Shaft &Spacer Beam 01



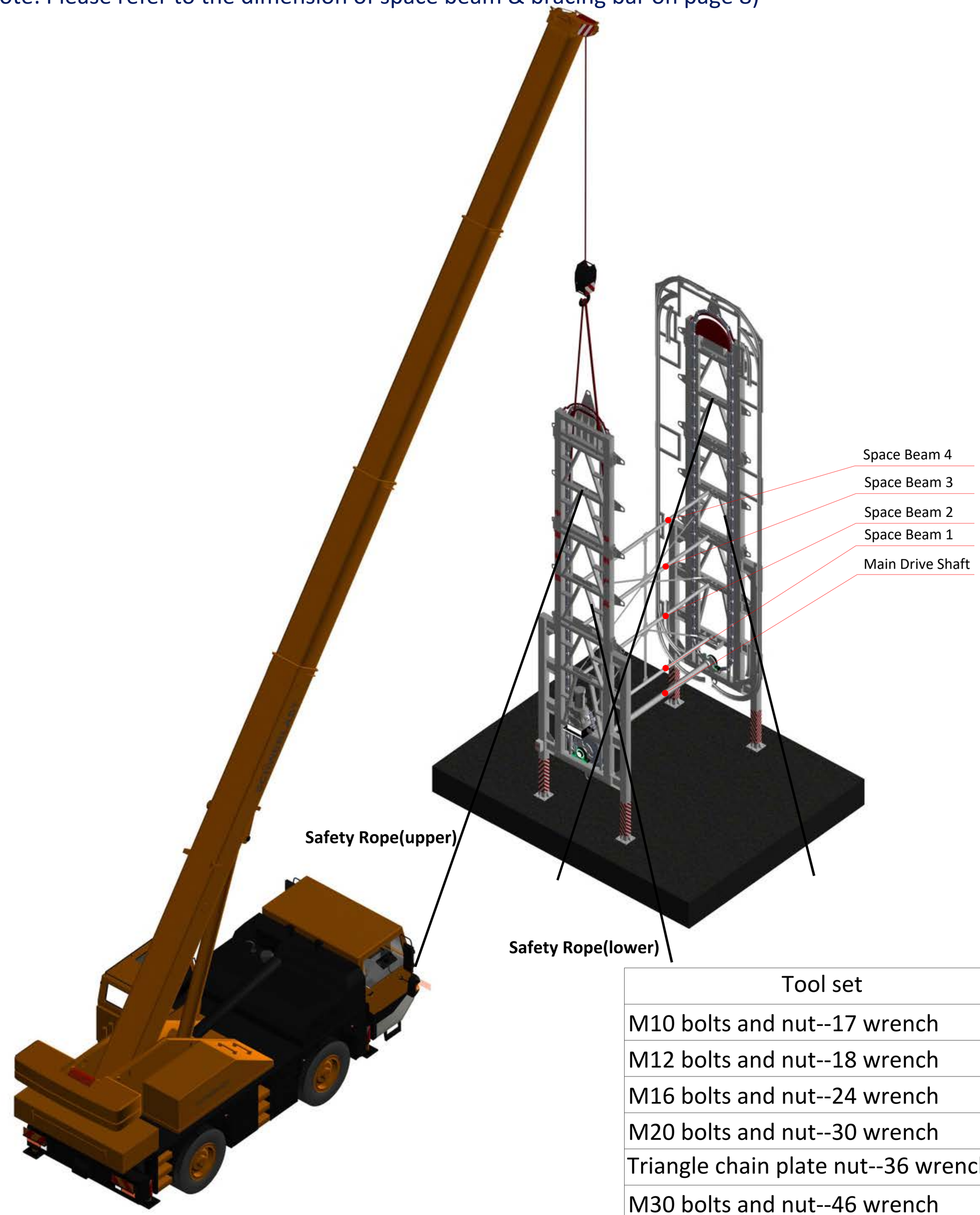
4. Erect the top section of rear frame

Step13:Assemble the left space beam and bracing bar

1. Assemble the space beam from bottom to top

2. Adjust the bracing bar

(Note: Please refer to the dimension of space beam & bracing bar on page 8)

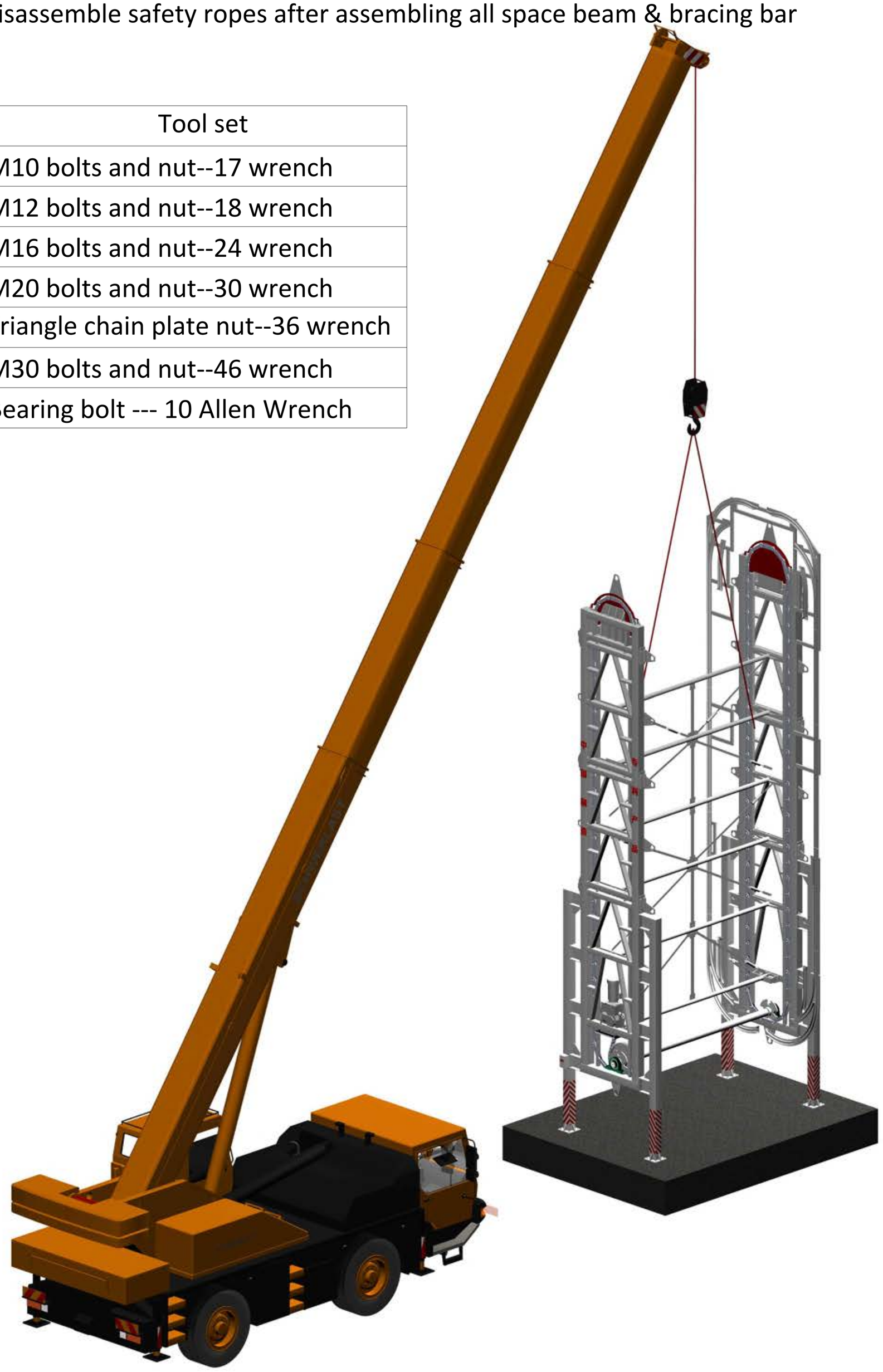


Tool set
M10 bolts and nut--17 wrench
M12 bolts and nut--18 wrench
M16 bolts and nut--24 wrench
M20 bolts and nut--30 wrench
Triangle chain plate nut--36 wrench
M30 bolts and nut--46 wrench
Bearing bolt --- 10 Allen Wrench

The drawing is configuration for ALAM-16

1. Assemble the Space Beam from bottom to top
2. Pay attention to the size of different bracing bar in the process of assembly
3. Adjust bracing bar to keep the vertical degree of Front & Rear Frames within ±2mm
4. Disassemble safety ropes after assembling all space beam & bracing bar

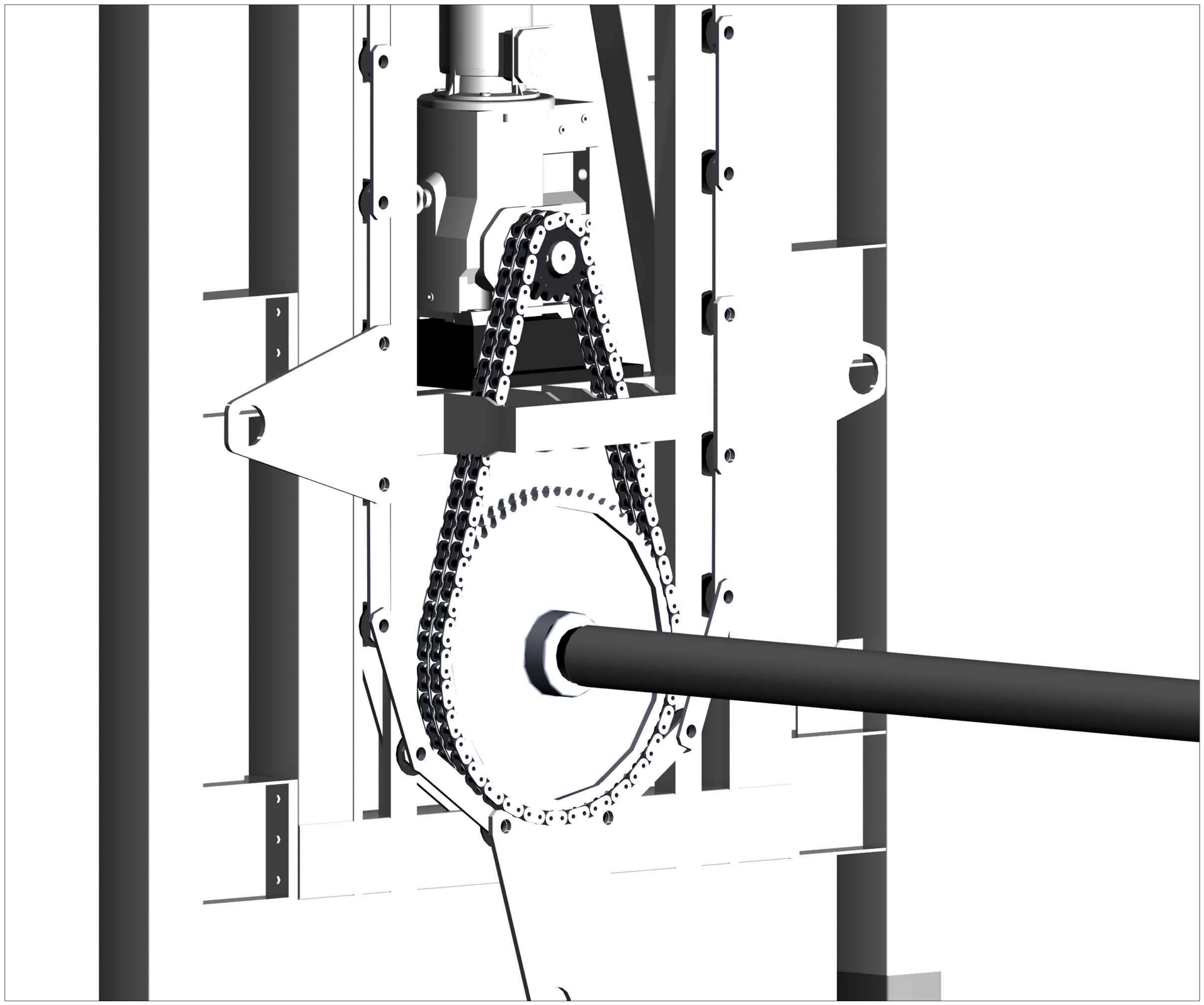
Tool set
M10 bolts and nut--17 wrench
M12 bolts and nut--18 wrench
M16 bolts and nut--24 wrench
M20 bolts and nut--30 wrench
Triangle chain plate nut--36 wrench
M30 bolts and nut--46 wrench
Bearing bolt --- 10 Allen Wrench



The drawing is configuration for ALAM-16 as reference

Step14:Assemble Drive Parts

1. Assemble Drive Double Chains.
2. Adjust the tension of Chain; adjust the height of the motor base according to the chain condition, prevent the chain from being too loose or too tight.
3. Turn on the power of motor, get ready for assembling car pallets.

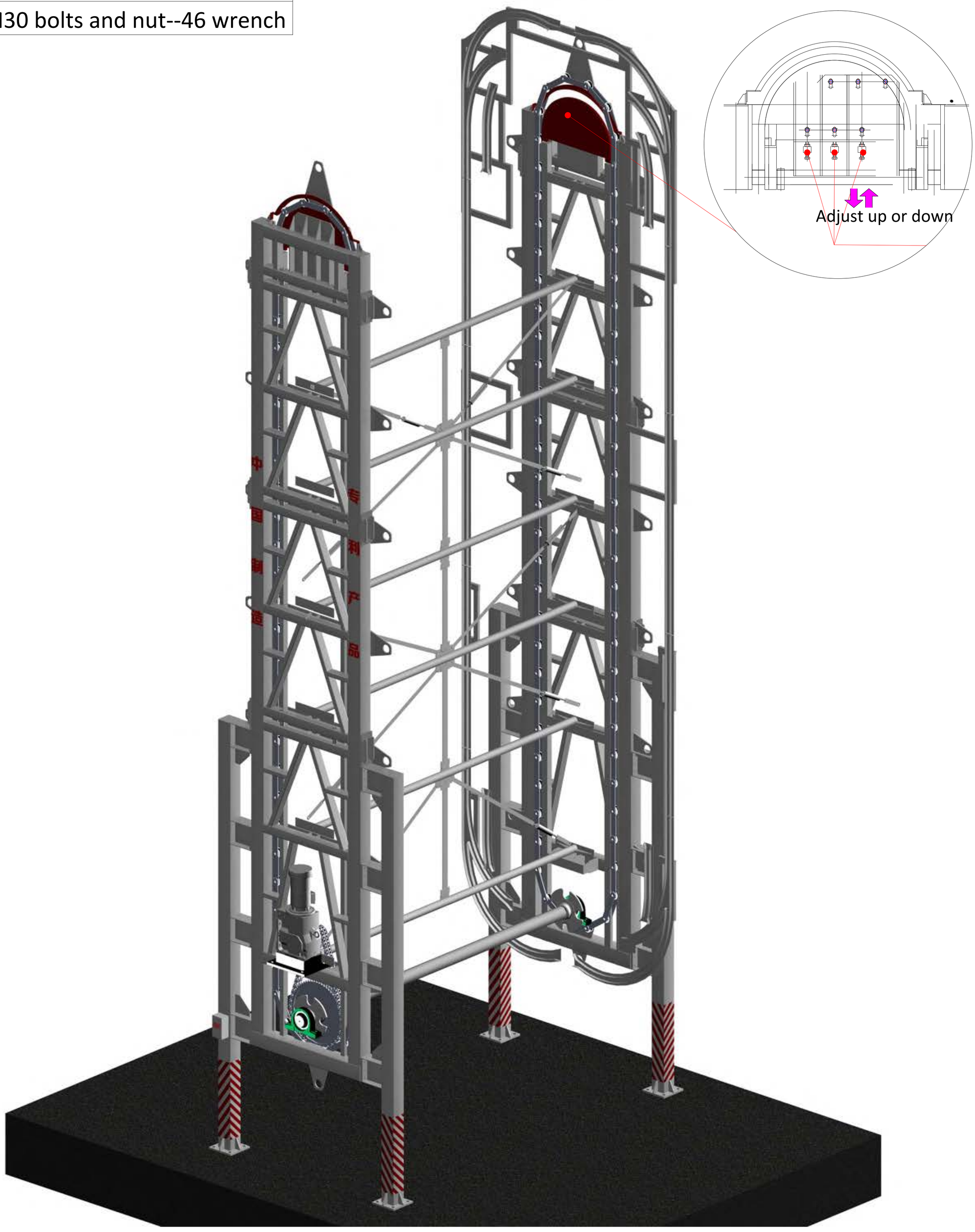


Tool set
Terminal Blocks --------- 10Wrench
M30 bolts and nut------ 46Wrench
Screwdriver: Flat--Blade & Phillips
Pliers, Wire Strippers and Terminal Crimping Pliers

The drawing is configuration for ALAM-16 as reference

Step15:Adjust the tension of big chain to mesh with fork sprocket

Tool set
M30 bolts and nut--46 wrench



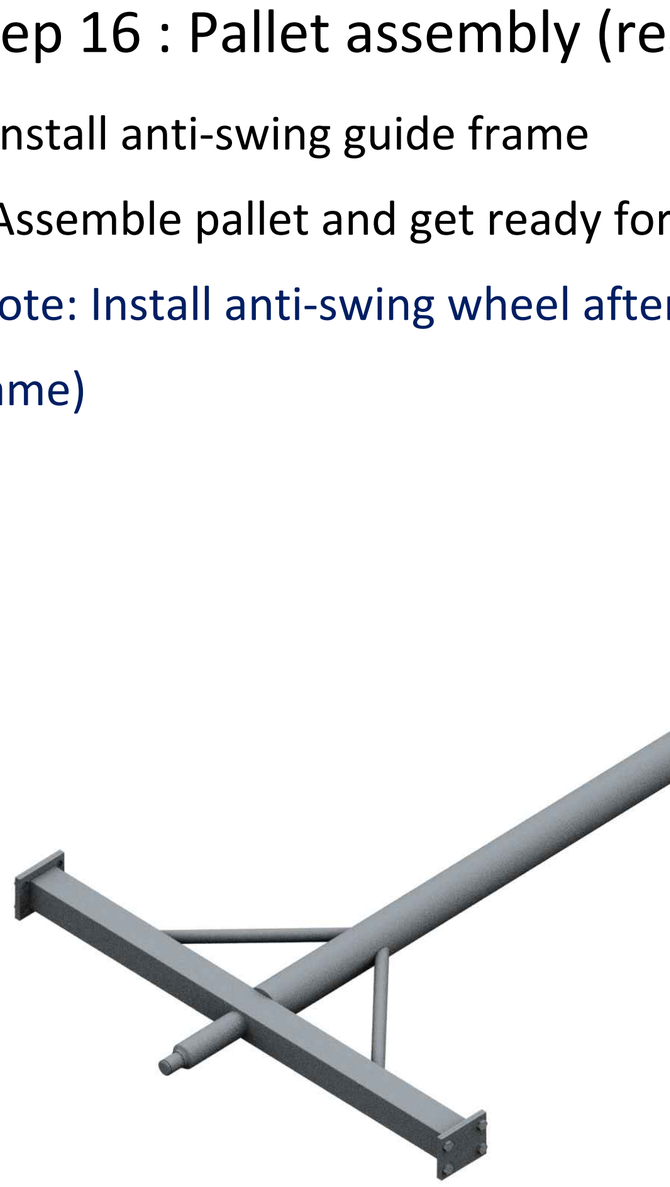
The drawing is configuration for ALAM-16 as reference

Step 16 : Pallet assembly (reserve)

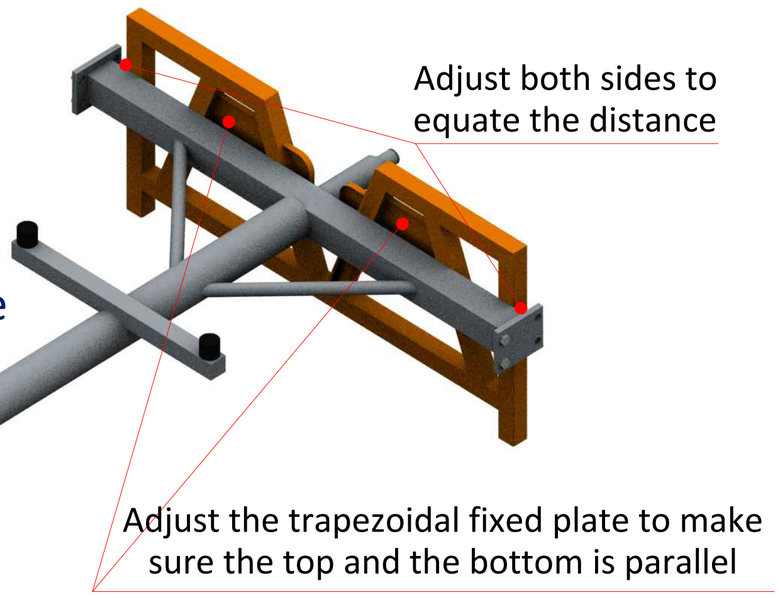
1.Install anti-swing guide frame

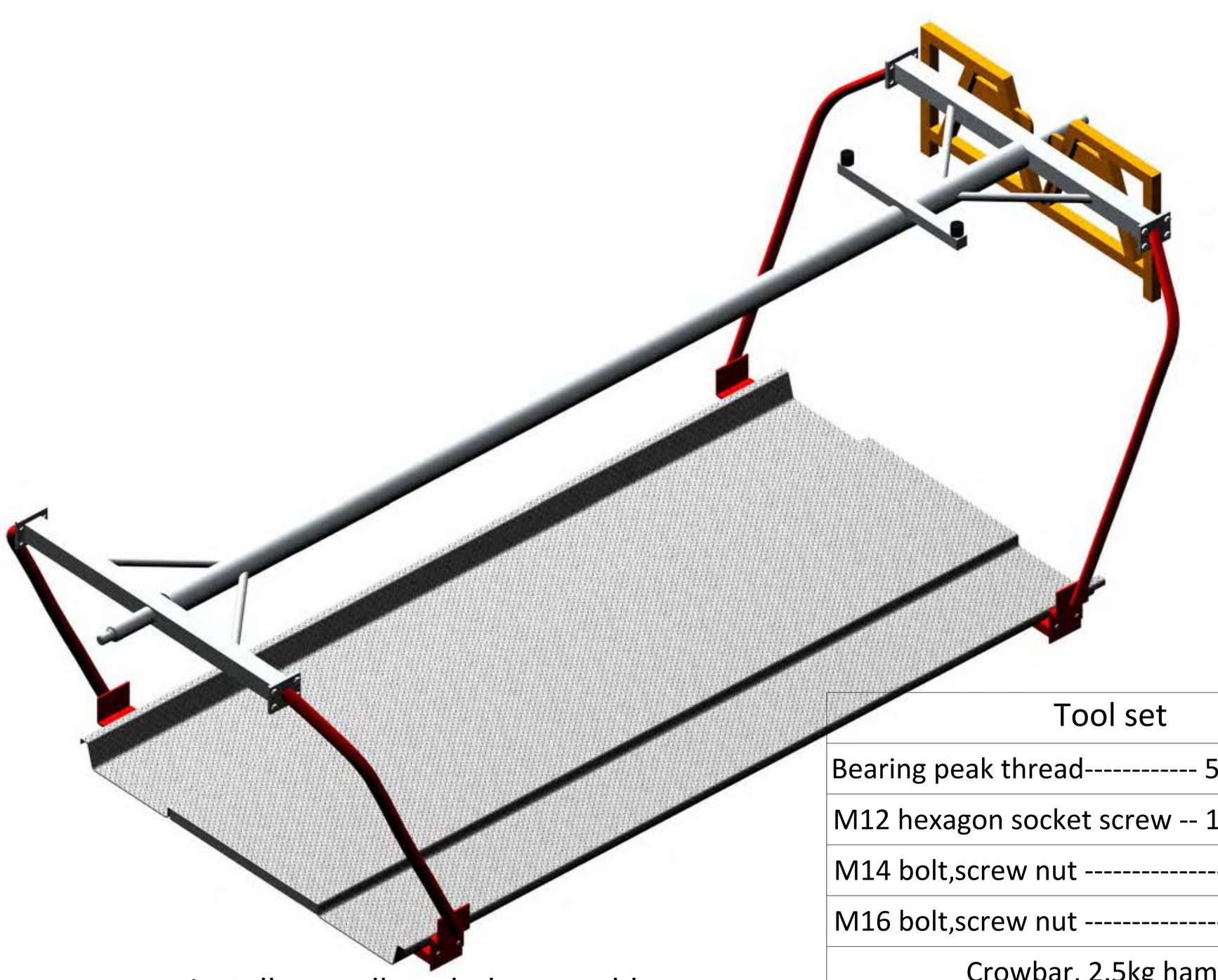
2.Assemble pallet and get ready for the next step

(Note: Install anti-swing wheel after pallet installed on assemble frame)



Anti-swing guide frame assembly





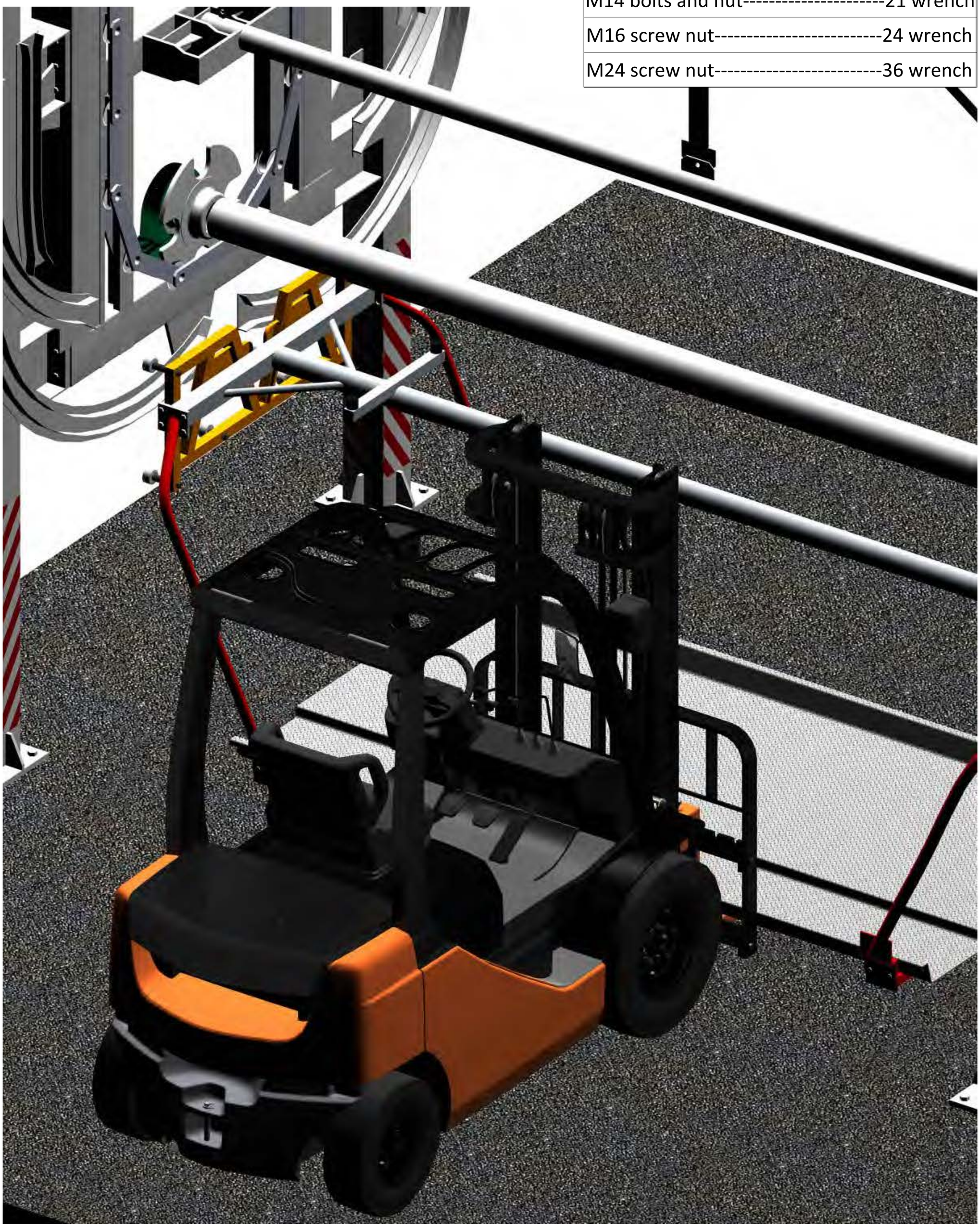
Install car pallet whole assembly

Tool set
Bearing peak thread---------- 5 allen wrench
M12 hexagon socket screw -- 10 allen wrench
M14 bolt,screw nut ----------21 wrench
M16 bolt,screw nut ----------24 wrench
Crowbar, 2.5kg hammer
external pliers

Step 17 Use forklift or crane to install car pallet

1.Hang the first car pallet beam

Tool set
M16 hexagon socket screw -- 12 Allen wrench
M14 bolts and nut----------21 wrench
M16 screw nut----------24 wrench
M24 screw nut----------36 wrench

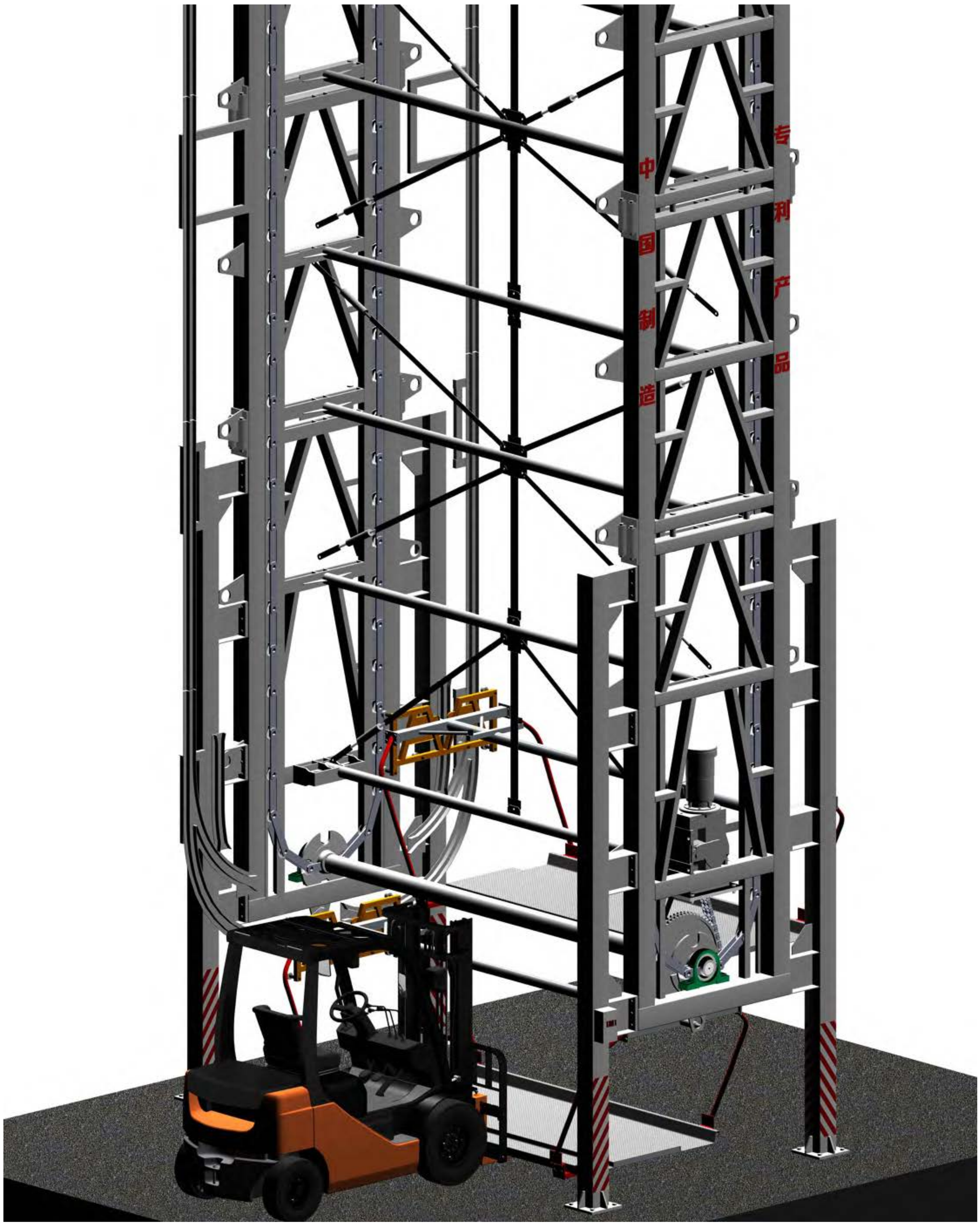


Step 18: Car pallet assembly

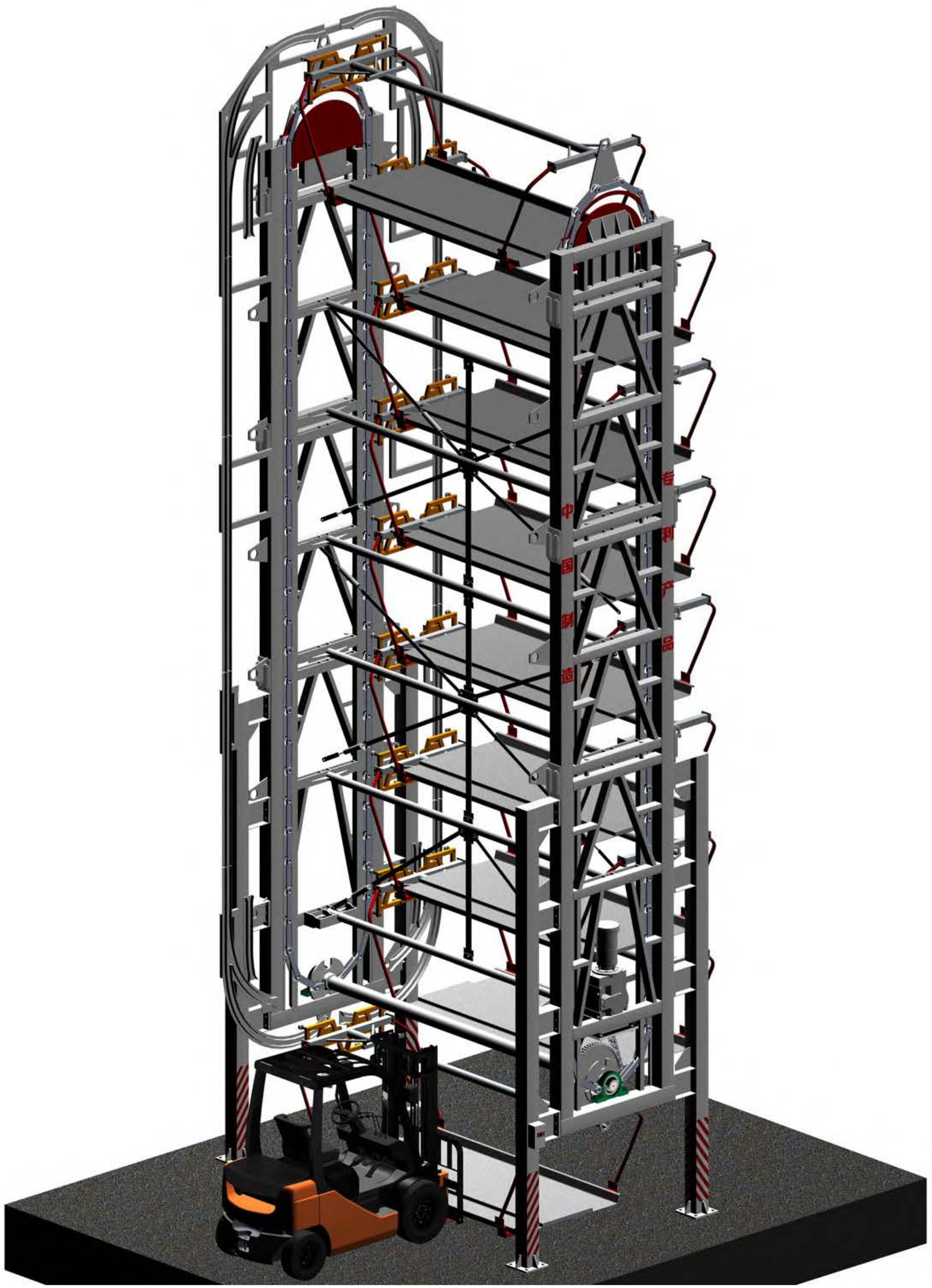
1.Use motor to rotate fork sprocket

2.Counterclockwise rotate and stop until the next triangle chain plate in center position.

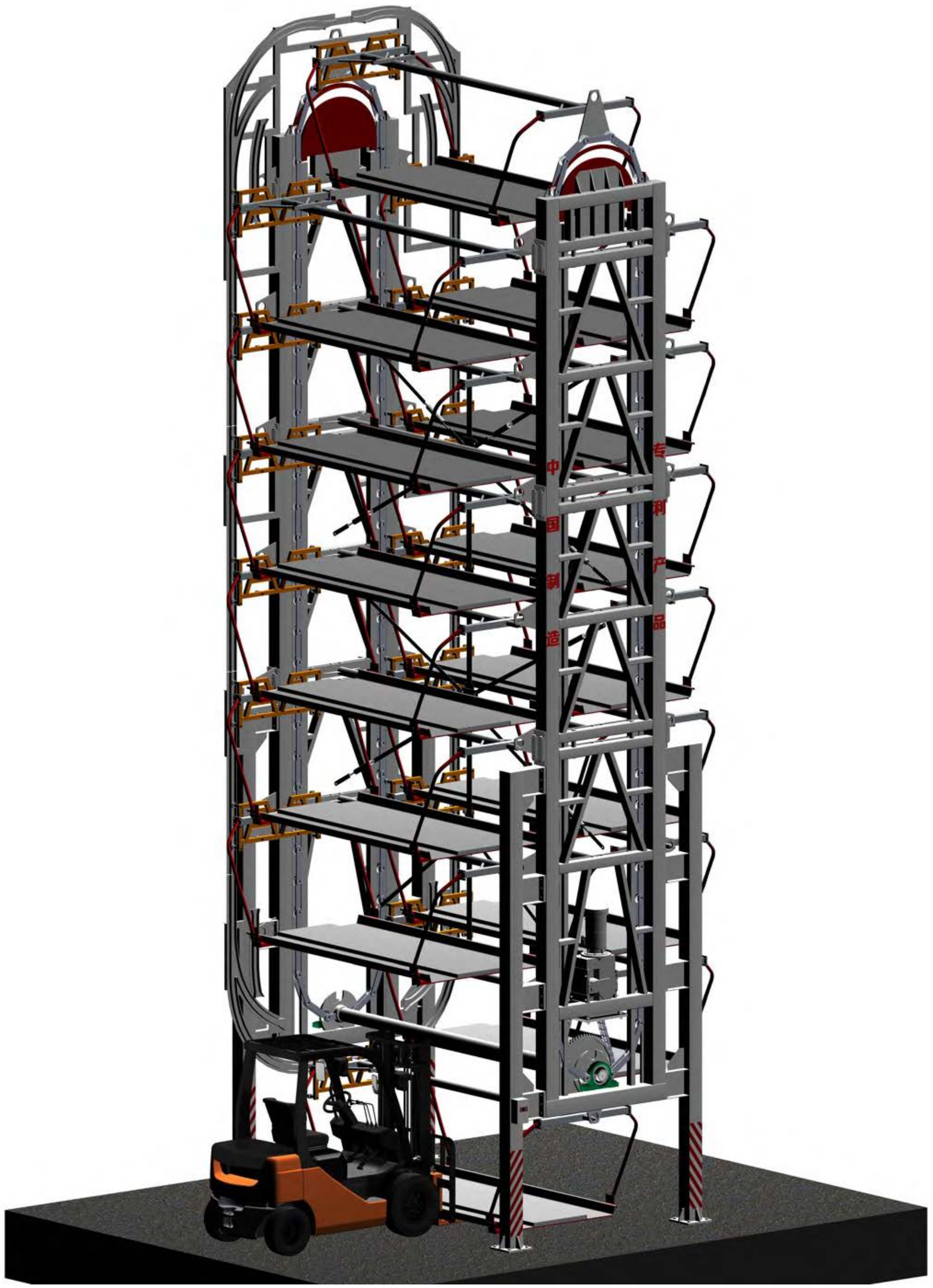
3.Install all car pallets in turn.



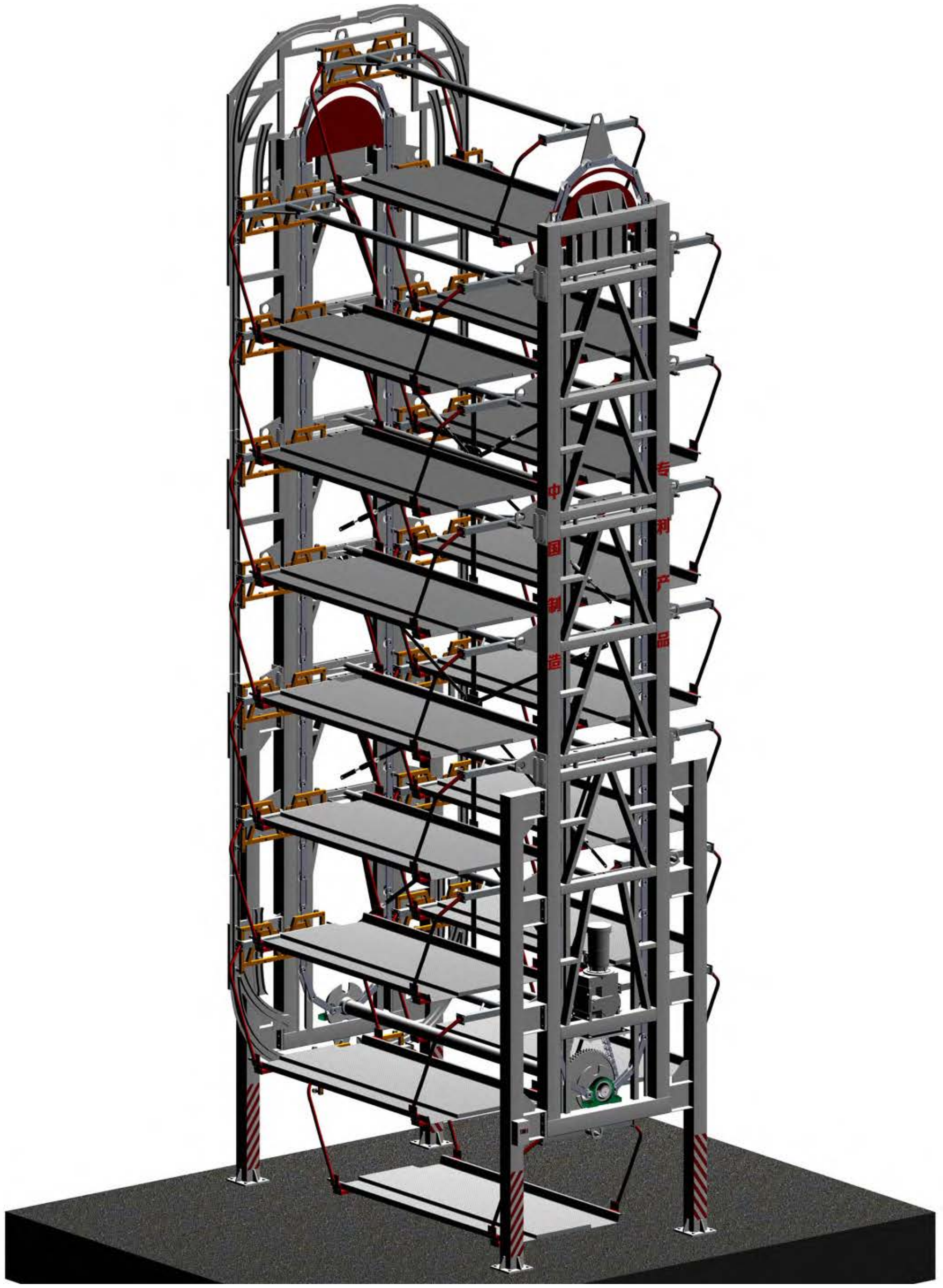
The drawing is configuration for ALAM-16 as reference



The drawing is configuration for ALAM-16 as reference



The drawing is configuration for ALAM-16 as reference



The drawing is configuration for ALAM-16 as reference

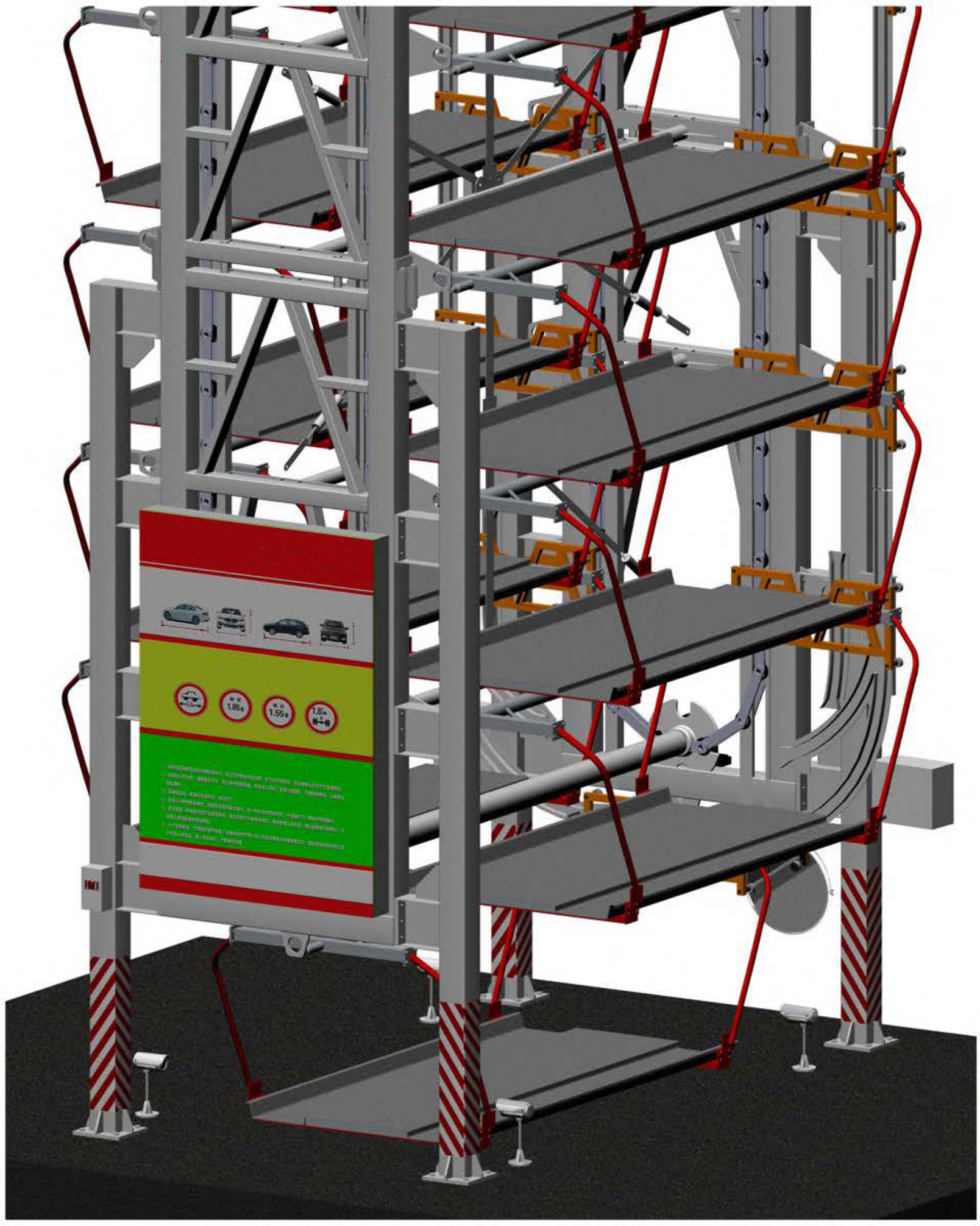
Step19: Equipment Inspection and observation mirror installation

1.Install and debug photoelectric detector ,Install main control box and PLC control box.

2.Adjust the position and angel of the observation mirror for clear traffic condition when retrieve car.

(Notice:The electronics layout and wiring diagram can be found on auxiliary documents.)

Tool set
slotted,phillips screwdriver,insulating rubber tape
Cutter stripper,electric drill,drilling screws
M10 bolts and nut----------16 wrench
M16 nut----------24 wrench



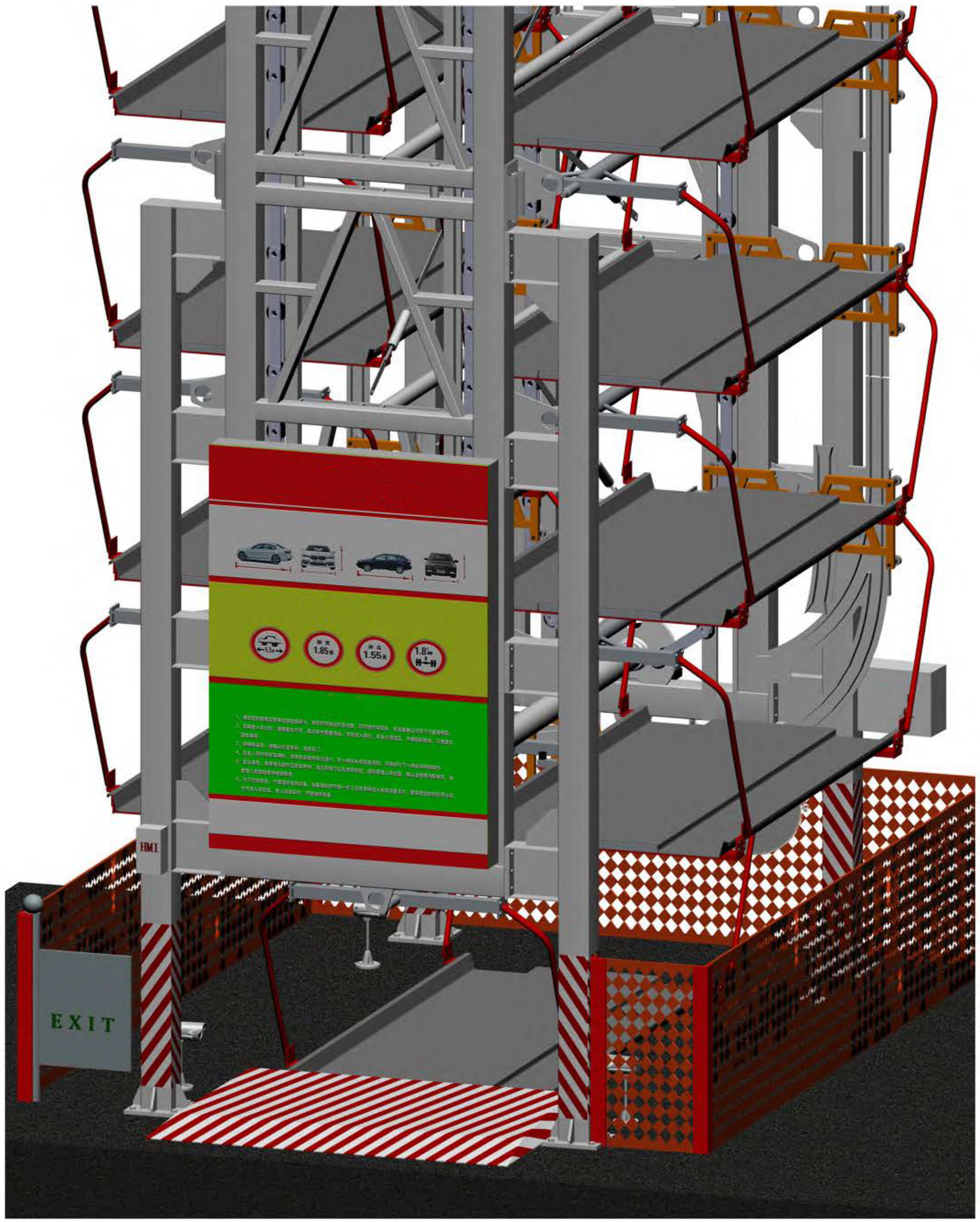
The drawing is configuration for ALAM-16 as reference

Step20:Installation of safe operation board and fence

1.Connect fence and fix bolts

2.Fix safe operation board and top logo

Tool set
M10 bolts and nut----------16 wrench



The drawing is configuration for ALAM-16 as reference

Step21:Installation for rain shelter (Optional)

Truck crane or other lifting equipment for the rain shelter installation(Optional)(Notice:All workers at site should fasten safety belt and wear safety helmet)

Tool set
M16 bolts and nut----------24 wrench



The drawing is configuration for ALAM-16 as reference

Step21:Commissioning

1.Chain and wheels lubrication

2.Paint repair

3. Pouring of foundation bolt clearance (the 2nd time)

4.Fasten the foundation bolt and nut.

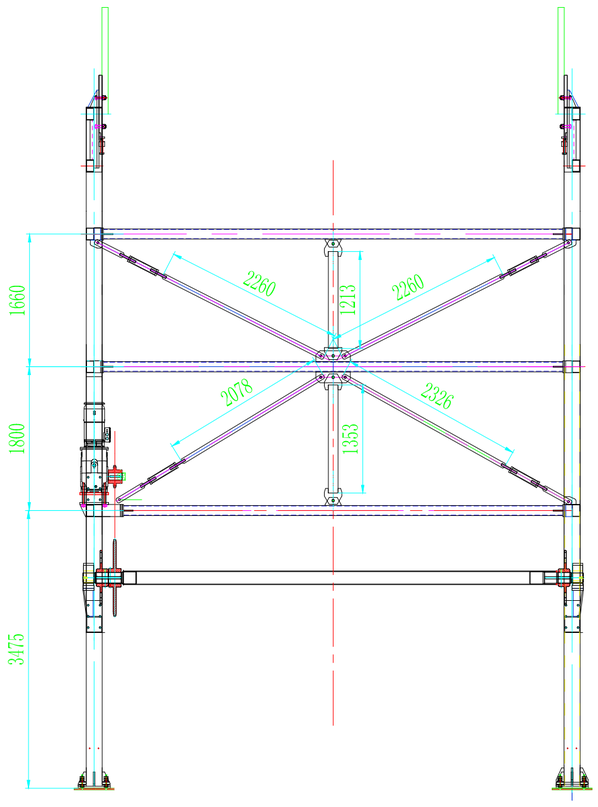
5.Final operation testing



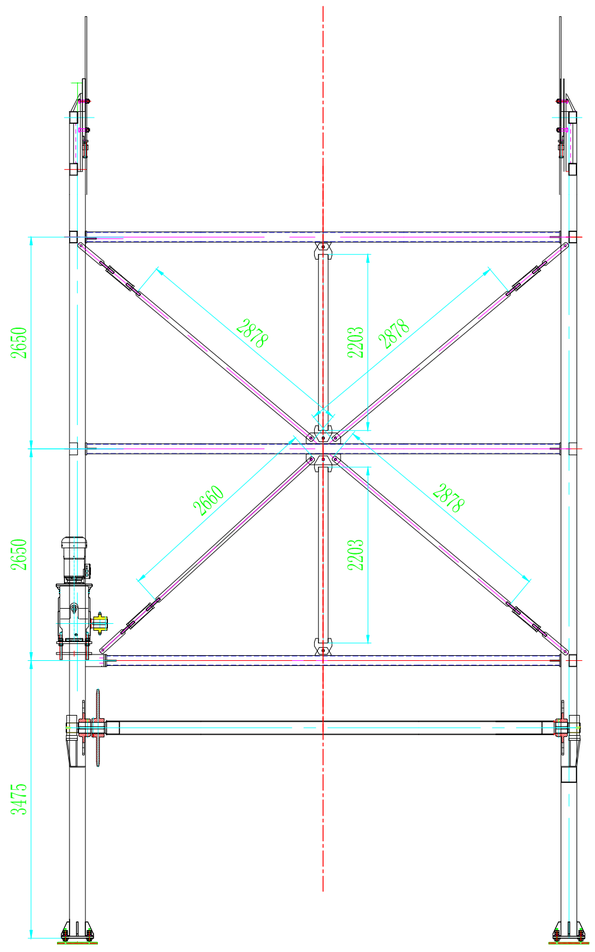
The drawing is configuration for ALAM-16 as reference

6.The appended drawings for space beam and size of bracing bar

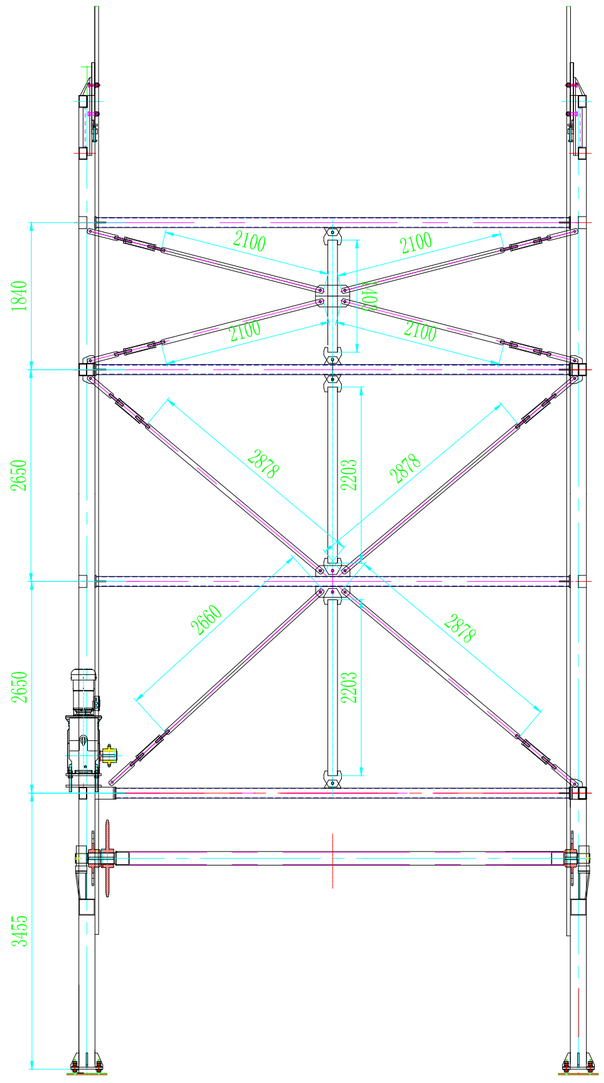
Drawing 1: Sedan type space beam and adjustable bracing bar dimension.



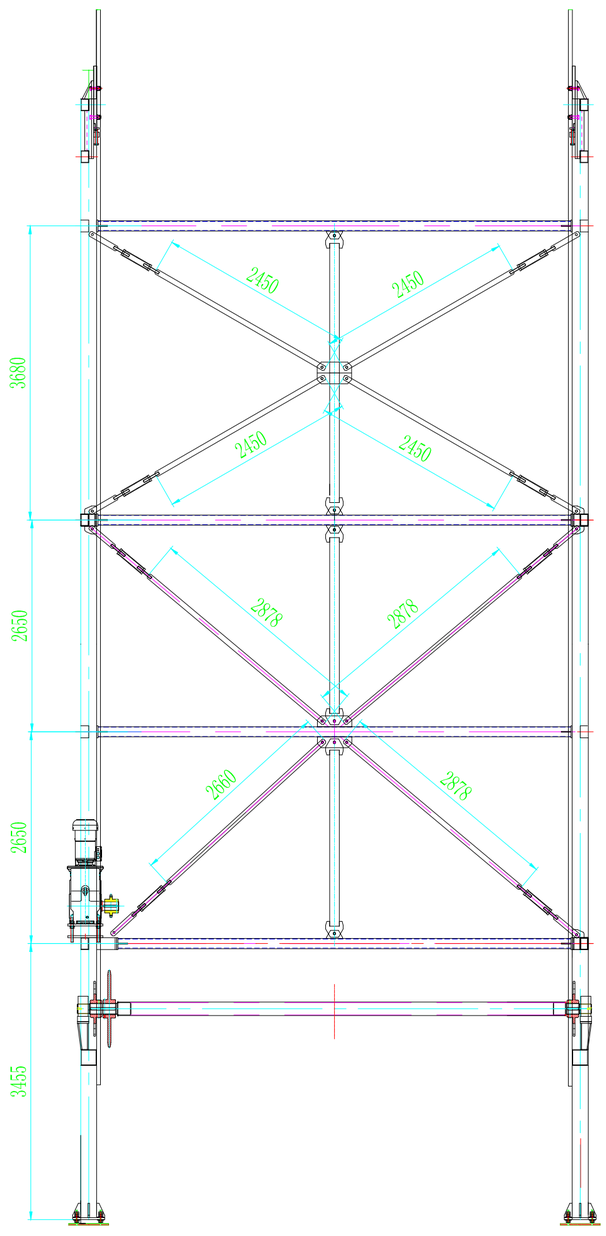
ALAM-8



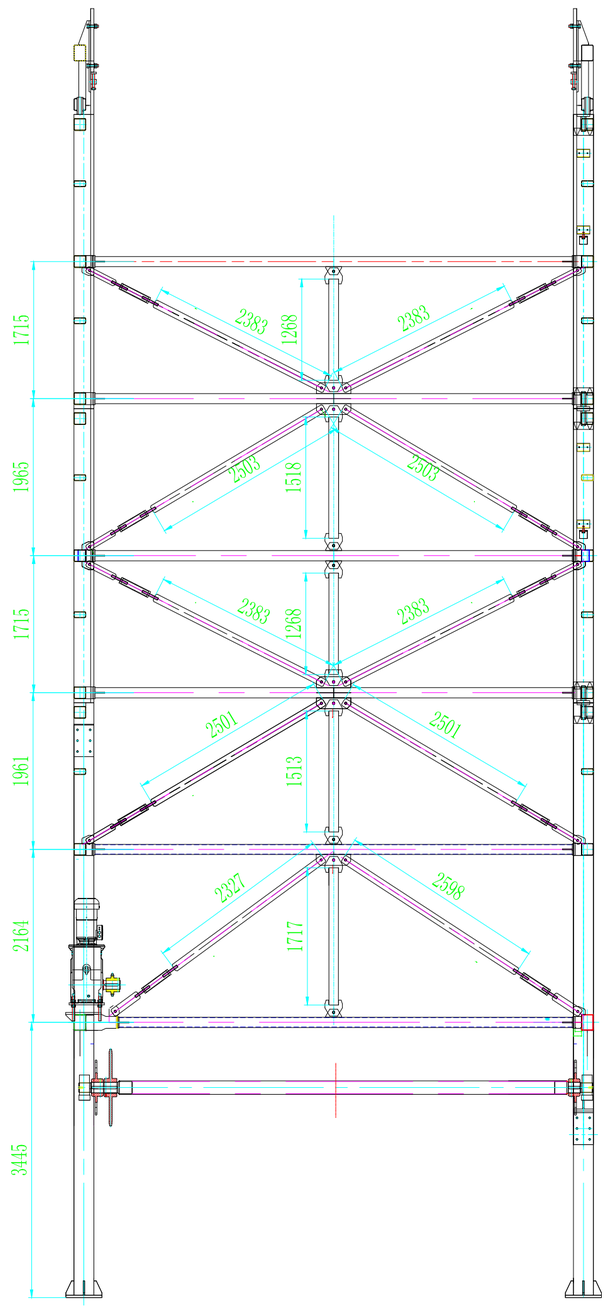
ALAM-19



ALAM-12

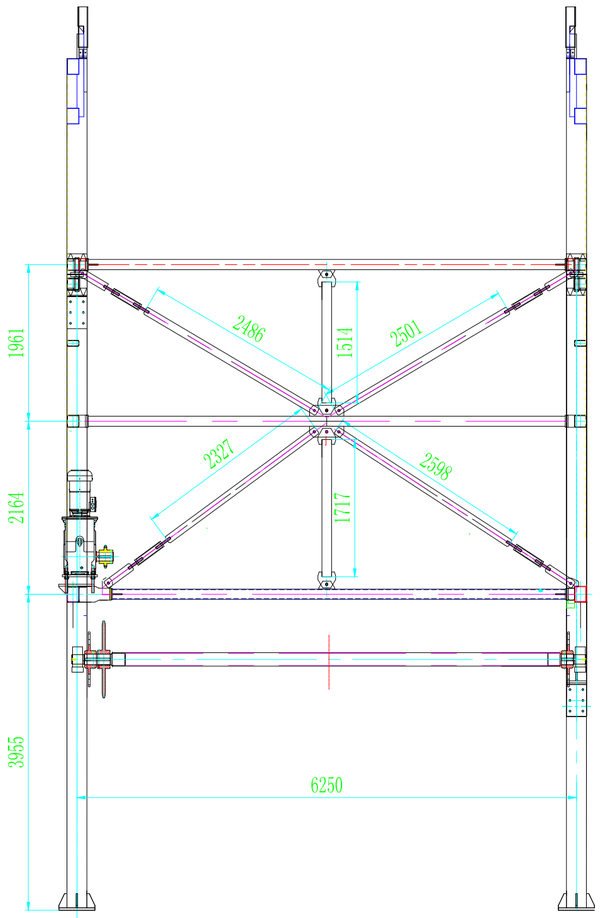


ALAM-14

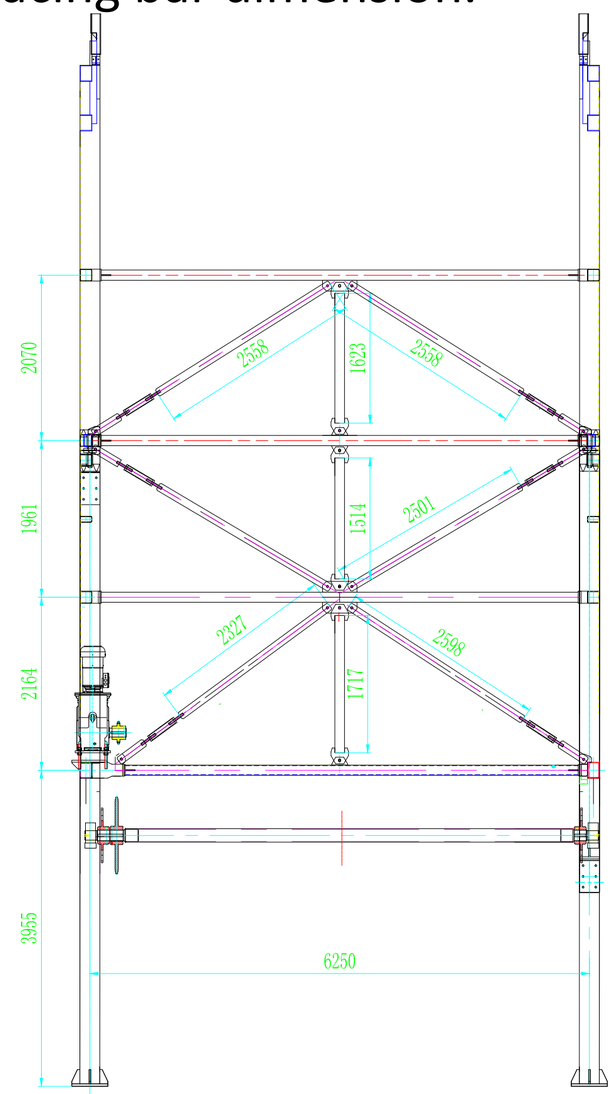


ALAM-16

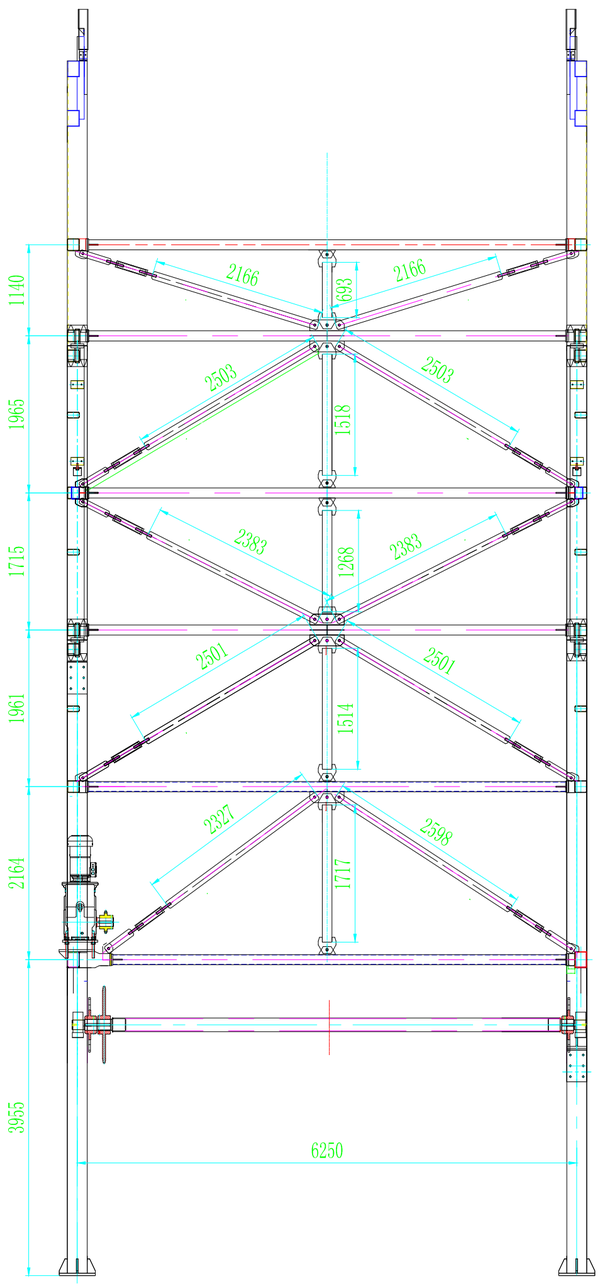
Drawing 2: SUV type space beam and adjustable bracing bar dimension.



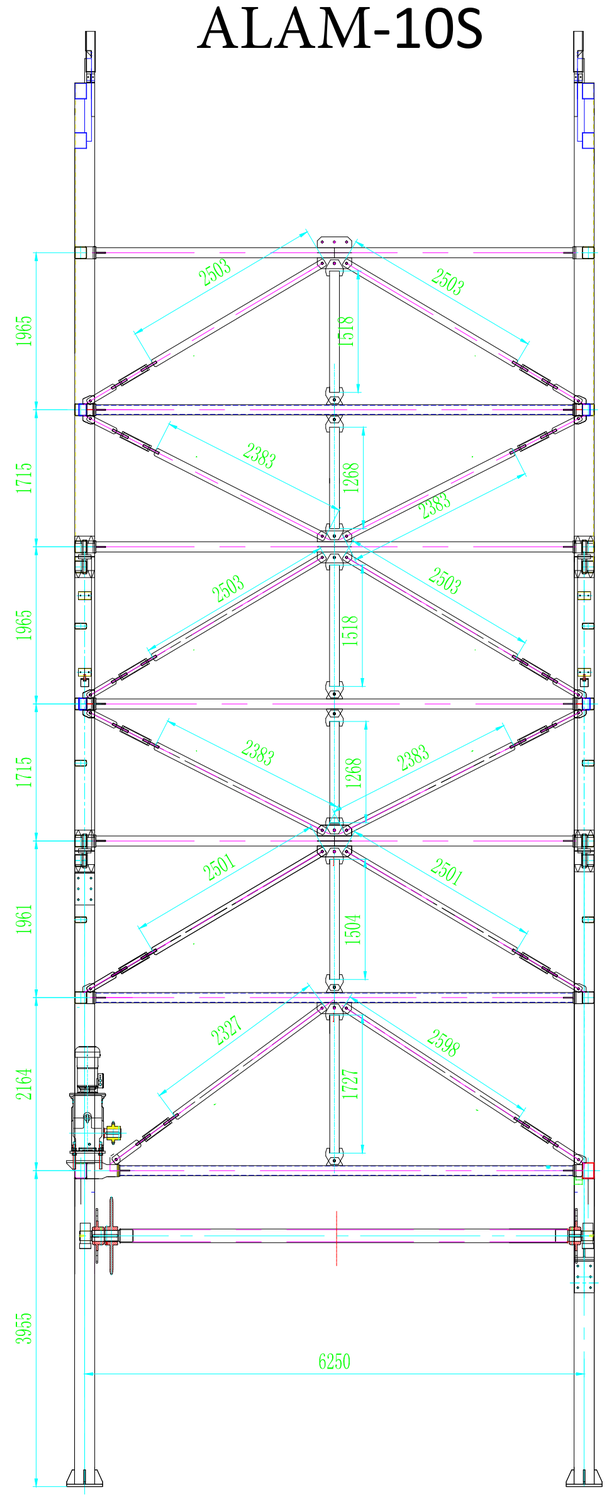
ALAM-8S



ALAM-10S



ALAM-12S



ALAM-14S

7.Commissioning and inspection

No.	Detection parts	Test criteria	Result	Note
1	Appearance	No paint or stain		
2	Column bottom	Cement solidification without contraction		
3	Keep wheel of pallet vertical-align	tolerance±3mm		
4	Keep wheel of pallet horizontal-align	tolerance±3mm		
5	Adjusting triangle chain plate	Triangular chain plate parallel to assembly frame		
6	Sensors and photoelectric detection	Sensitive and effective		
7	Space of pallet and beam below	Not less than 15mm		
8	Lubrication of gear, chain and bearing	Grease lubrication		
9	Drive chain tightness	Prevent of too loose or too tight		
10	Control box interface	Fastening		
11	Safety indicator installation	Fastening		
12	Wire connection	Correct		
13	Anti swing rail	Steady and fluent		

Must have no-load test after installation more than 2hours, featuring stable start,rotating,braking and accurate stagnation without abnormal noise. Then have an imitate load test more than 2hours. Start parking operation after all test completed successfully.

Tighten the two ends of chain when it loosens without car(adjust the two ends of the anti-swing guide at the meantime).Lubricate the bolt head to decrease the resistance.

Should have a detailed inspection for the whole equipment after installation.Make sure no structure damage,firm connection and correct wiring. And have an insulation resistance and ground resistance test.

1.Technical performance of parking equipment in normal operation;

2.All safety , protection settings and devices;

3.Brake performance;

4.Fixed condition of all parts;

5.Reliability and accuracy of the indicating device;

6.Power systems,controllers etc.

8.Lubrication

Lubricate parts	Lubricants
Rail	Conventional grease
Main chain	General grease
Drive chain	Conventional grease
Reducer	Special lubricating oil for reducer
Bearing	Grease
Drive chain gear	Grease

9.Annexed table

Mechanical cubic car parking equipment inspection record sheet

No.:

Company name: _____ Project name: _____

Equipment No.: _____ Installation location: _____

Inspection items:(If meet the requirements, please tick in the box)

1.All signs installed in place; ☐

2.Equipment operation without blocking; ☐

3.Equipement operation without abnormal noise; ☐

4.Equipment running smoothly; ☐

5.Load running smoothly; ☐

6.Load operation without abnormal noise; ☐

7.Flexible and effective motor brake ; ☐

8.Complete protective cover of motor and mechanical rotating part and control switch in good condition; ☐

9.Motor grounding is good, insulation inspection is qualified and have the inspection certificate; ☐

10.All overall size and verticality of the garage meet the design requirements; ☐

11.Emergency stop button is effective; ☐

12.Photoelectric sensors are effective ; ☐

Problems and solutions:

Note:the users must inspect and fill in the inspection record sheet according to the items after installation.

This form is in duplicate. One is for the user, the other is submitted to the inspector.

Inspector:_____ Inspect date: _____