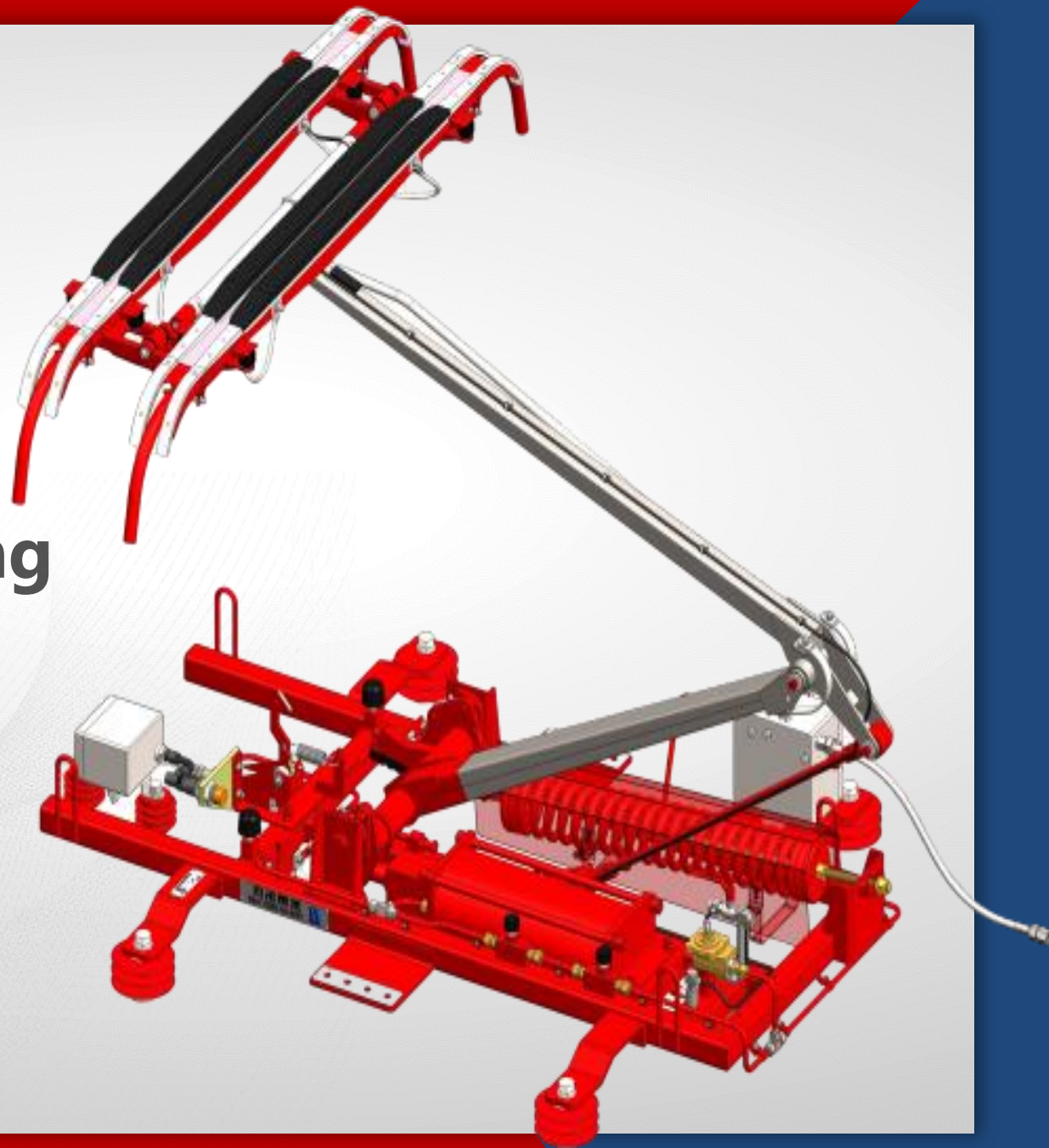


Pantograph

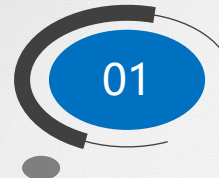
Collector shoe

Carbon contact strip

Chengdu Yonggui Toyo Rolling Stock Equipment Co.,Ltd



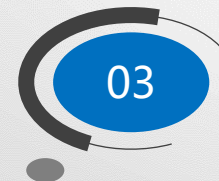
Contents



Company Profile



Application performance



Technical Highlights



Products and services

PART ONE

Company Profile

Company Profile



| | |
|---------------------------|---|
| Company Name | Chengdu Yonggui Toyo Rolling Stock Equipment co.,Ltd |
| Establishment | 23-Aug-17 |
| Registered capital | 30 million RMB |
| Investment ratio | Zhejiang Yonggui Electric Co., Ltd. 51% , TOYO DENKI SEIZO K.K. 49% |
| Address | No. 369, Chuangfei Road, Shibantan Town, Xindu District, Chengdu,China |
| Business scope | R&D, production and maintenance of complete sets of electrical equipment such as pantographs, electrical connectors and traction for rail vehicles |



Headquarter Introduction



Zhejiang Yonggui Electric Equipment Co.,Ltd. (www.yonggui.com)

- **Yonggui Electric** : Headquartered in Tiantai, Zhejiang, listed on the Shenzhen Stock Exchange in 2012, stock code 300351
- **Qualification honor**: National high-tech enterprise, obtained more than 40 national invention patents, with a total of more than 300 patents
- **Seven types of rail transit products**: Pantograph、 Gangway、 Connector、 Door system、 Battery power system、 Oil damper、 Axle counter system
- **Four major industry sectors**: Rail transit、 New energy、 Communications, Military equipment





Headquarter Introduction

TOYO DENKI SEIZO K.K. (www.toyodenki.co.jp/cn/)



- **TOYO DENKI:** Established in 1918 and listed on the Tokyo Stock Exchange in 1949, headquartered in Tokyo, Japan, and has four business divisions. The pantograph manufacturing base is in the Yokohama plant.
- **Rail transit products**

1.Current collector (Pantograph) (YongGuiDongYang)

2.Auxiliary power device (SIV), inverter (VVVF)

3.Traction motor

4.Gear box

5.Controller,Passenger display system

.....



High&New tech enterprises



Chengdu rail transit leading talent workroom

2020年度
双百强特刊

成都永贵东洋轨道交通装备有限公司



王建军同志，男，48岁，中共党员，硕士研究生，高级工程师，现任成都永贵东洋轨道交通装备有限公司总经理。

1995年从电子科技大学毕业后被分配到国有军工企业从事电连接器产品研发及试验工作，先后在国家级刊物《机电元件》和《中国设备工程》上发表多篇论文。2005年起担任浙江永贵电器股份有限公司和四川永贵科技有限公司副总经理。

2017年策划成立中日合资公司-成都永贵东洋轨道交通装备有限公司，主要从事轨道交通车辆受电弓的研发、生产、维保业务。先后参与了成都地铁5、6、8、11、都江堰M-TR、台州S1及160公里新

一代全自动市域A型列车等项目受电弓的研发、生产交付，同时为成都地铁1、4号线架大修项目提供维保服务。自成都地铁5、6号线开通运营以来，公司产品运行效果良好，得到业主的认可，为成都市轨道交通事业的发展做出了贡献。为了增加对公司知识产权的保护，先后申请受电弓专利16项，被评为2019年度成都市“双创明星”。

王建军同志高瞻远瞩、审时度势，确立了企业更高的发展战略。面对市场新的需求和更高的要求，不断思索、不断求新、不断开拓，力争将成都永贵东洋打造成为四川省乃至全国轨道交通行业重要骨干企业。

双百强特刊 79

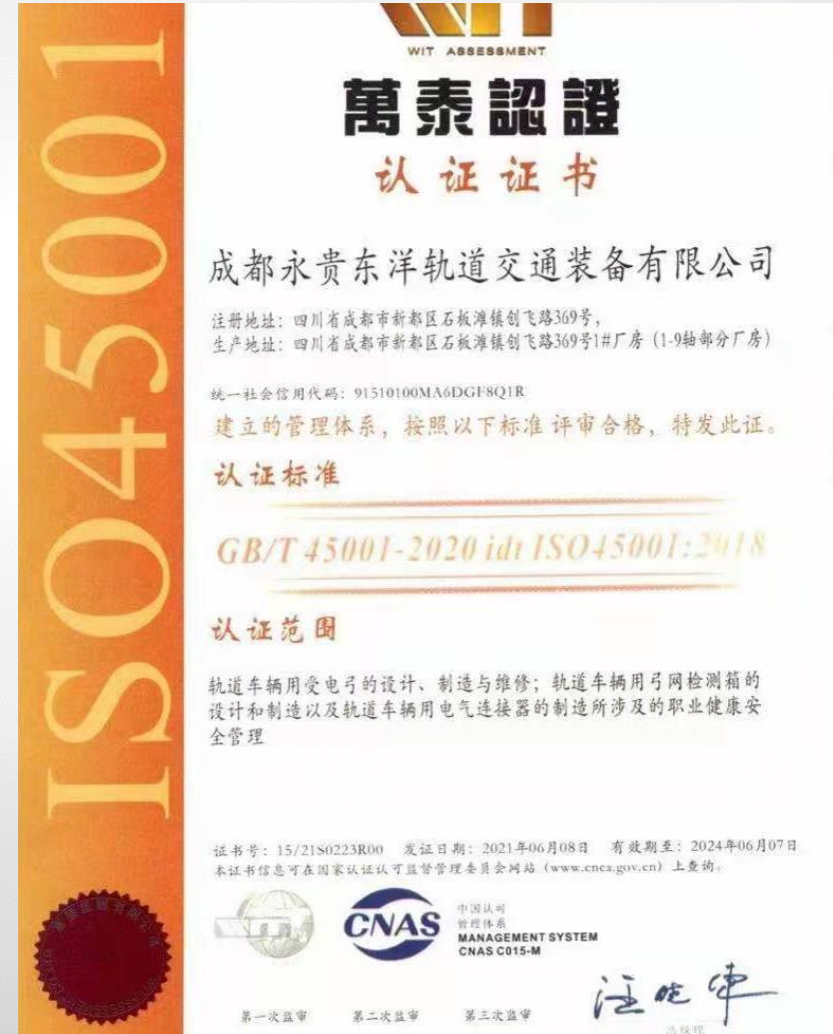
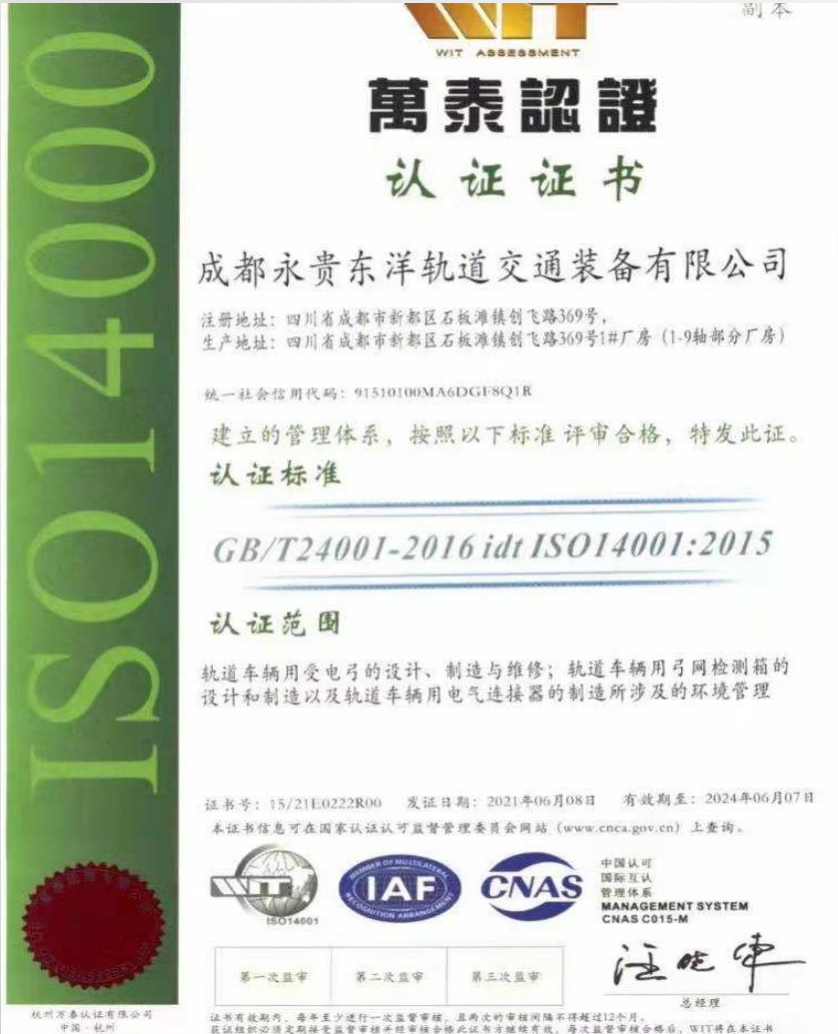
成都永贵东洋轨道交通装备有限公司

王建军 总经理

2020成都市工业和信息化行业

领军企业家

成都市工业经济联合会
二〇二一年七月



Supplier qualification - CRRC Changchun、Sifang、 CRRC Tangshan、Dalian、BCP……



CRRC Changchun



CRRC Qingdao Sifang



科技成果评价证书

CERTIFICATE OF S&T ACHIEVEMENTS EVALUATION

评价结论：

整体达到国内领先水平，建议进一步推广应用

证书编号：交铁科评（评价）字[2020]第 025 号

成果名称：一种单臂式弹簧受电弓

完成单位：成都永贵东洋轨道交通装备有限公司

基准日期：2020 年 04 月 18 日

批准日期：2020 年 07 月 17 日

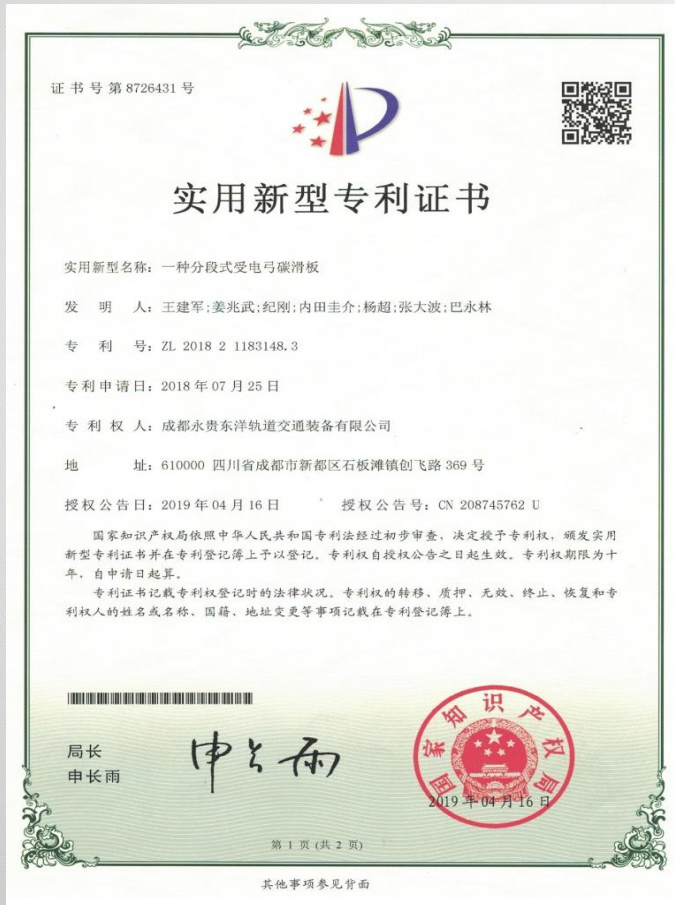
成都永贵东洋轨道交通装备有限公司：

受贵单位委托，我们对贵单位科技成果“一种单臂式弹簧受电弓”的技术水平、应用推广前景、社会与经济效益等，以 2020 年 04 月 18 日作为基准日进行评价，并形成科学技术成果评价报告。

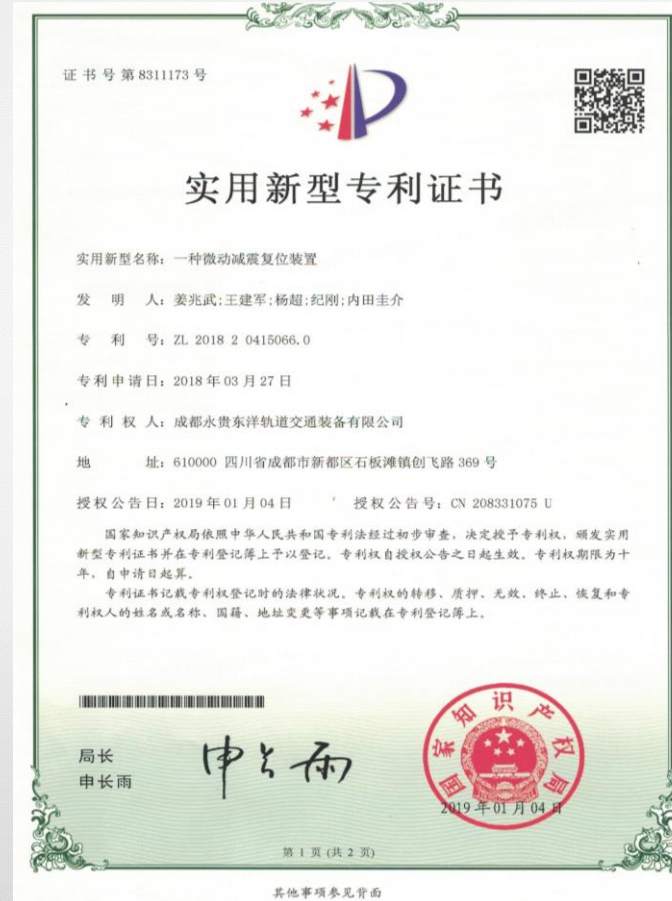
交铁科技评价中心（成都）有限公司
（西南交通大学科技评价中心）



The company has obtained 28 patents



Segmented carbon strip



Micro-vibration bellows spring



Raising/lowering detection device



Buffer type pantograph



New pantograph



New pantograph head

Manufacturing capacity



Existing workstations: 5

Reserved workstations: 5

Capacity per worker:

1 set/person/3 days

Manufacturing capacity:

1200sets/year

Site picture



Assembly station



Pantograph test machine



Overview



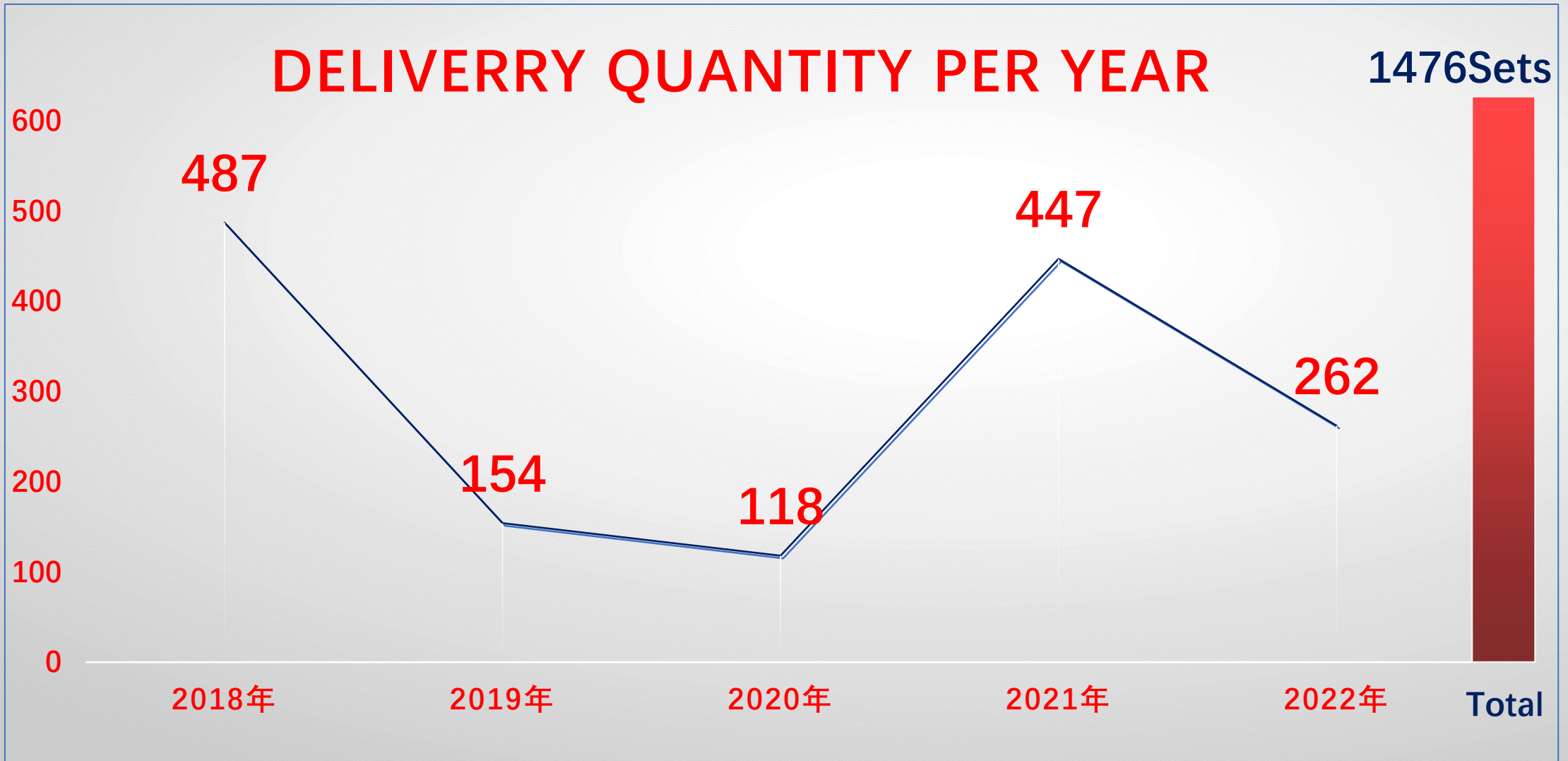
PART TWO

Application performance

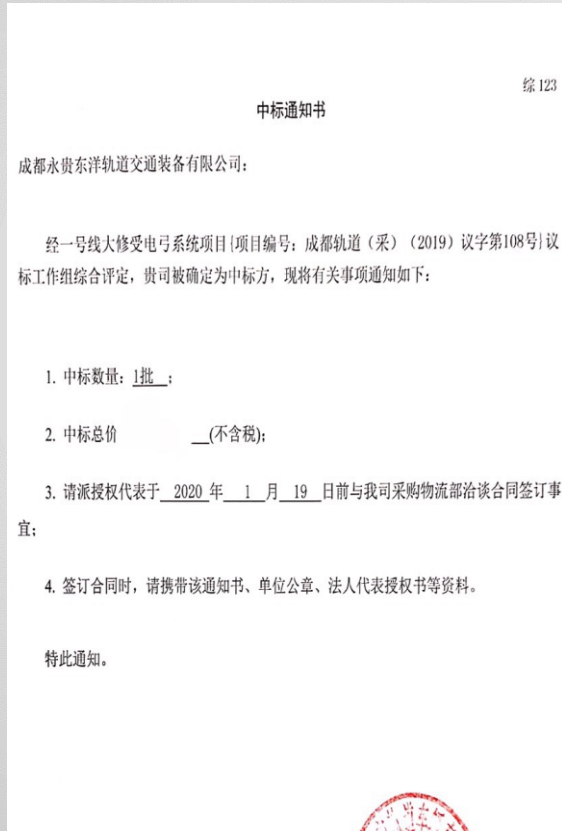
Key projects of Year 2023

1. Tianjin L8 (19trains, 38sets)start delivery on Aug
2. Chongqing L4 (36trains, 144sets)19 trsins delivery finished
3. Tianjin L9 replacement (38trains, 76sets) ...29 trsins delivery finished
4. Wenzhou S2 (37trains, 74sets)24 trsins delivery finished
5. Chengdu L27 (29trains, 58sets)2 trsins delivery finished
6. Chengdu L30 (36trains, 72sets)7 trsins delivery finished
7. Chengdu Ziyang Line (11trains, 22sets)3 trsins delivery finished

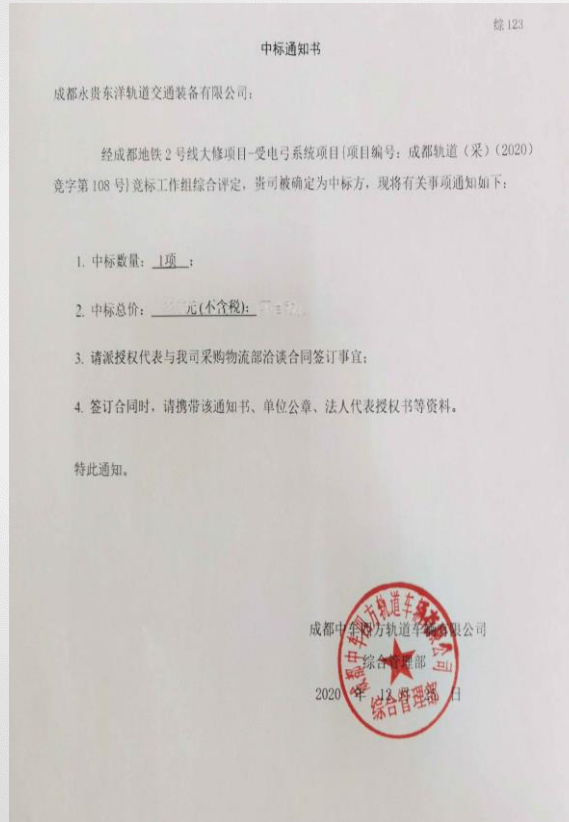
Delivery data in China



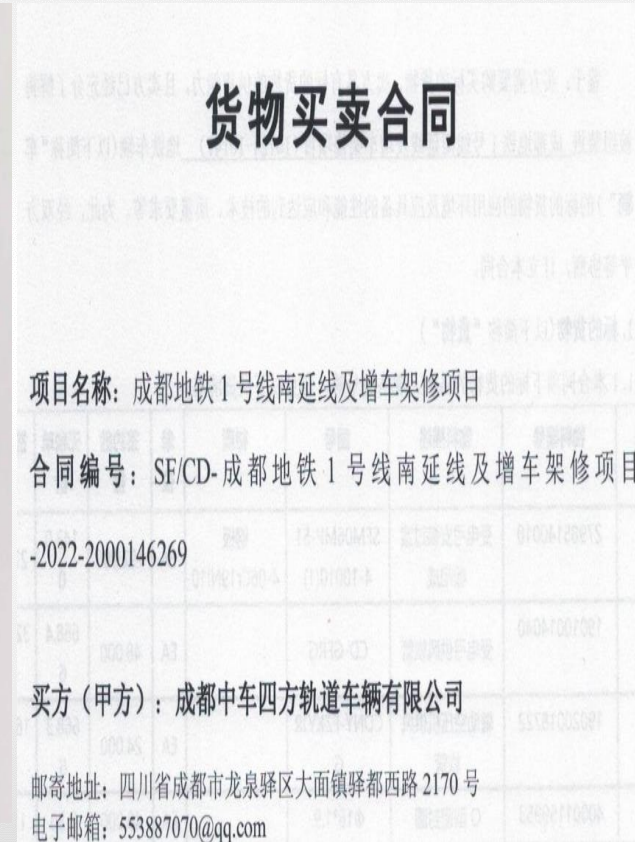
Overhaul Projects



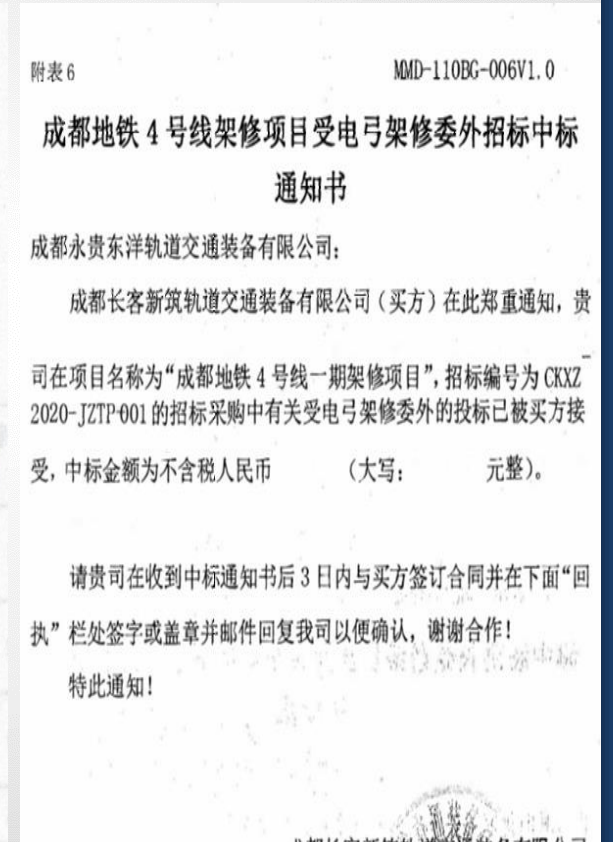
Chengdu L1



Chengdu L2



Chengdu L1 south
extension



Chengdu L4

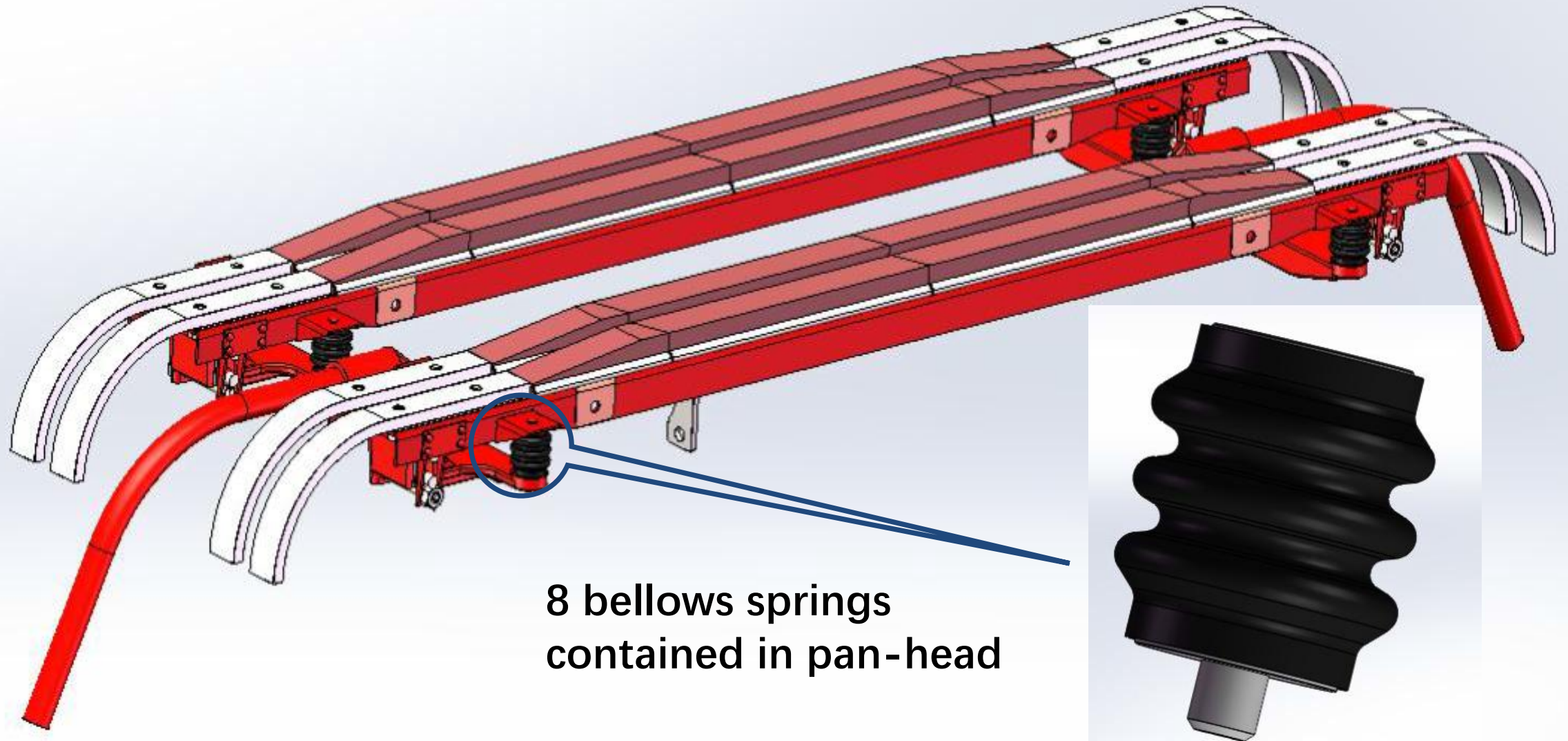
PART THREE

Technical Highlights

The characteristics of Yonggui's pantograph

- ① Pantograph and contact line system matches well, unique bellows spring secondary buffer design
- ② Segmented contact strip design, makes maintenance simple, convenient transportation
- ③ Raising by mechanical spring, reliable and stable
- ④ The mechanical abrasion is small, which is conducive to the extension of the life of the contact line and strip. $F=80\pm 10\text{N}$

1.Unique pan-head design—bellows spring



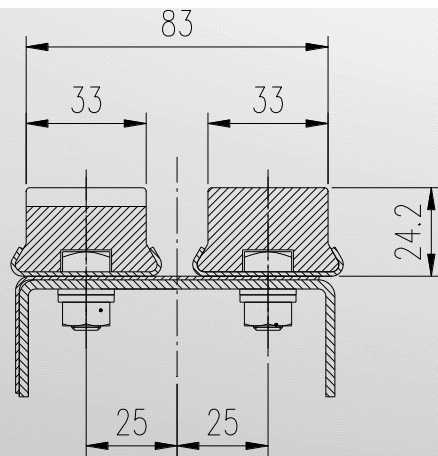
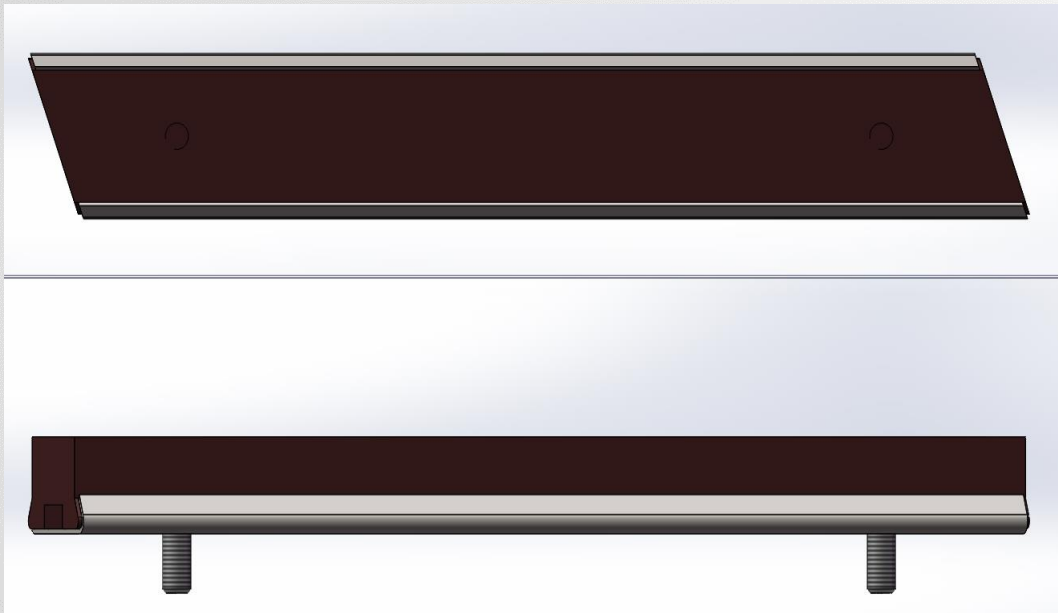
8 bellows springs
contained in pan-head

Abrasion statistics of carbon strip on Chengdu metro (until May 2023)

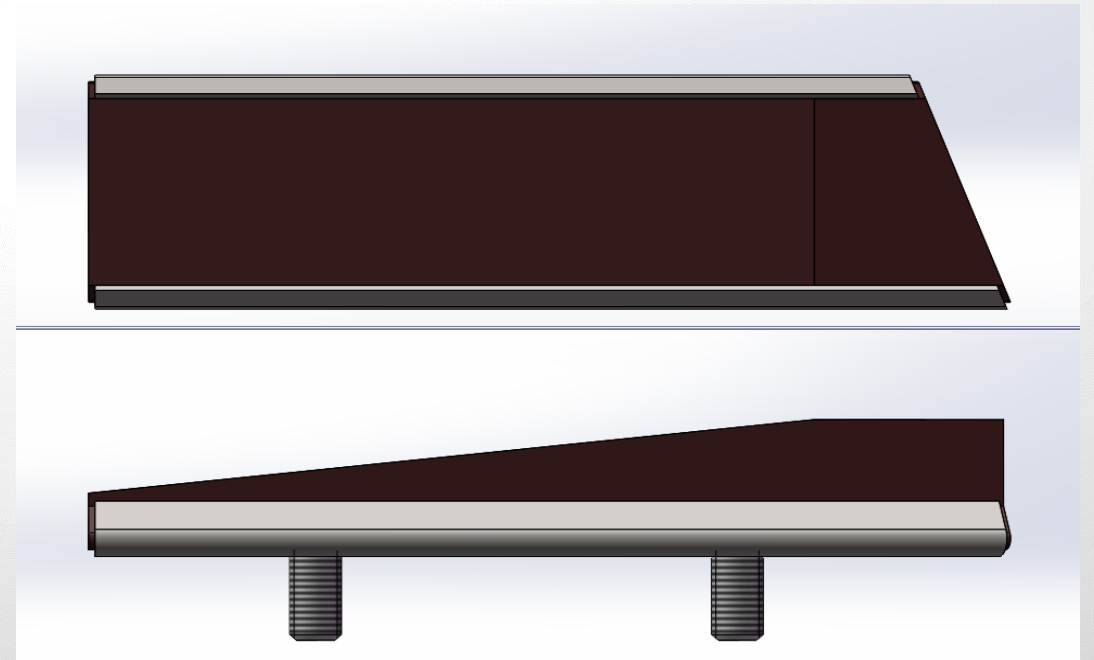
Summary of parameters of pantograph carbon strips on Chengdu metro

| | Metro Line | line1 | line 2 | line3 | line4 | line5 | line7 | line10 |
|--|--|--------------|--------------|--------------|--------------|----------------------------------|-------------|-------------|
| Carb on stri p tech nica l para mete rs | Carbon Strip model | MY7A2-PS8062 | MY7A2-PS8062 | SK1852 | SK1852 | YTPT7203.01.02 YTPT7203.01.03 | 59309 | 59309 |
| | Carbon strip specifications (including pan head) | 1548*60*37 | 1548*60*37 | 1550*60*36.8 | 1550*60*36.8 | 1330*33*24.2 | 1700*65*245 | 1700*65*245 |
| | weight(pan angle) | | | ≈5kg | ≈5kg | ≈8kg | ≈6.4kg | ≈6.4kg |
| | abradable thickness | 17mm | 17mm | 17mm | 17mm | 16mm | 21mm | 21mm |
| | Effective use size of contact strip (length of carbon strip) | 800*60*22 | 800*60*22 | 910*60*36.8 | 910*60*36.8 | 800*33*24.2 | 1050*60*26 | 1050*60*26 |
| | Maximum static current (rigid contact line) | 500A | 500A | 460A | 460A | 600A | 300A | 300A |
| | Applicable vehicle speed | 120km/h | 120km/h | <120km/h | <120km/h | 120km/h | NA | NA |
| | abrasion value/10000km | <2mm | <2mm | <1.3mm | <1.3mm | <0.45mm | <2mm | <2mm |

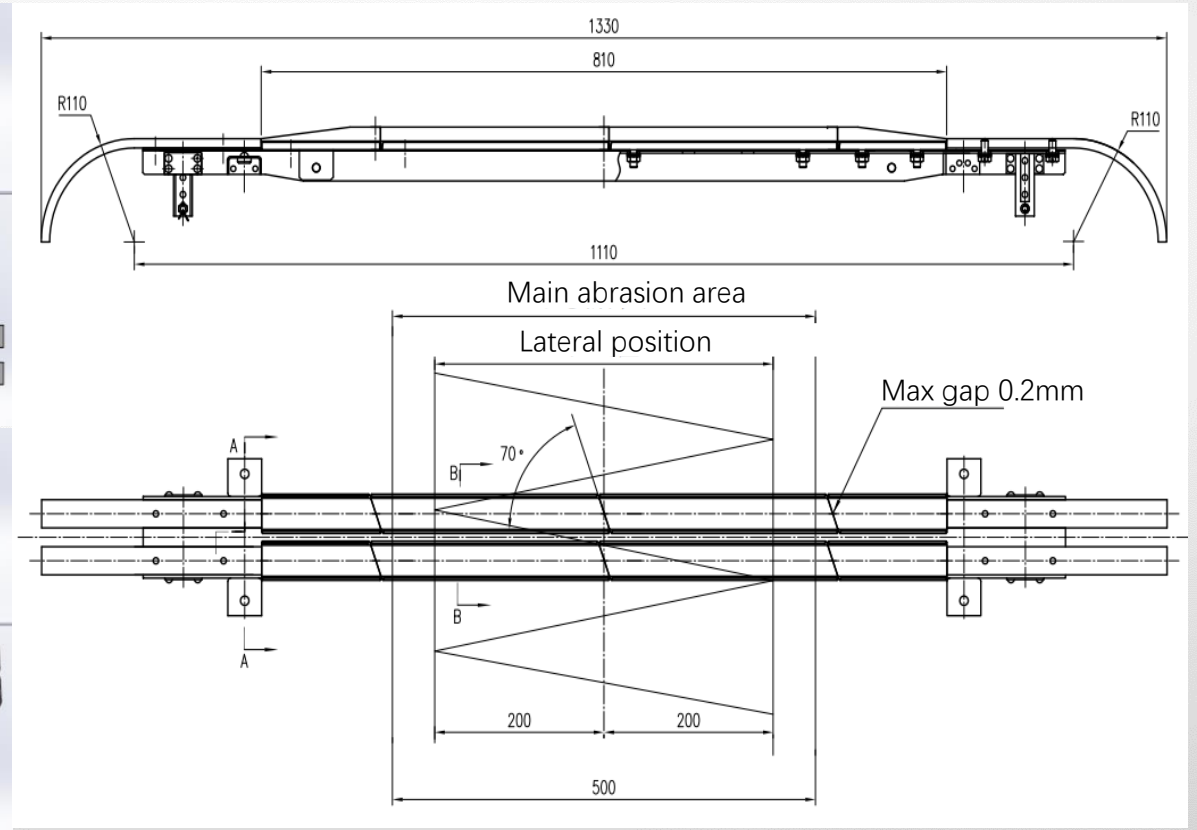
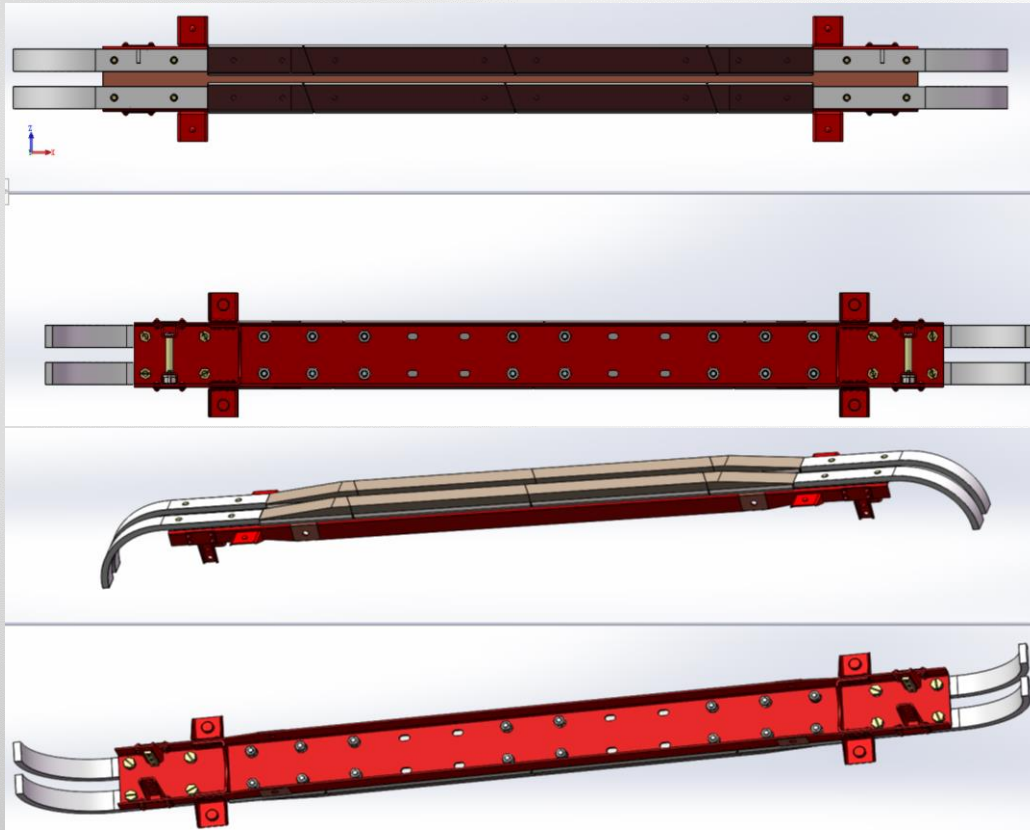
2. Segmented contact strip design



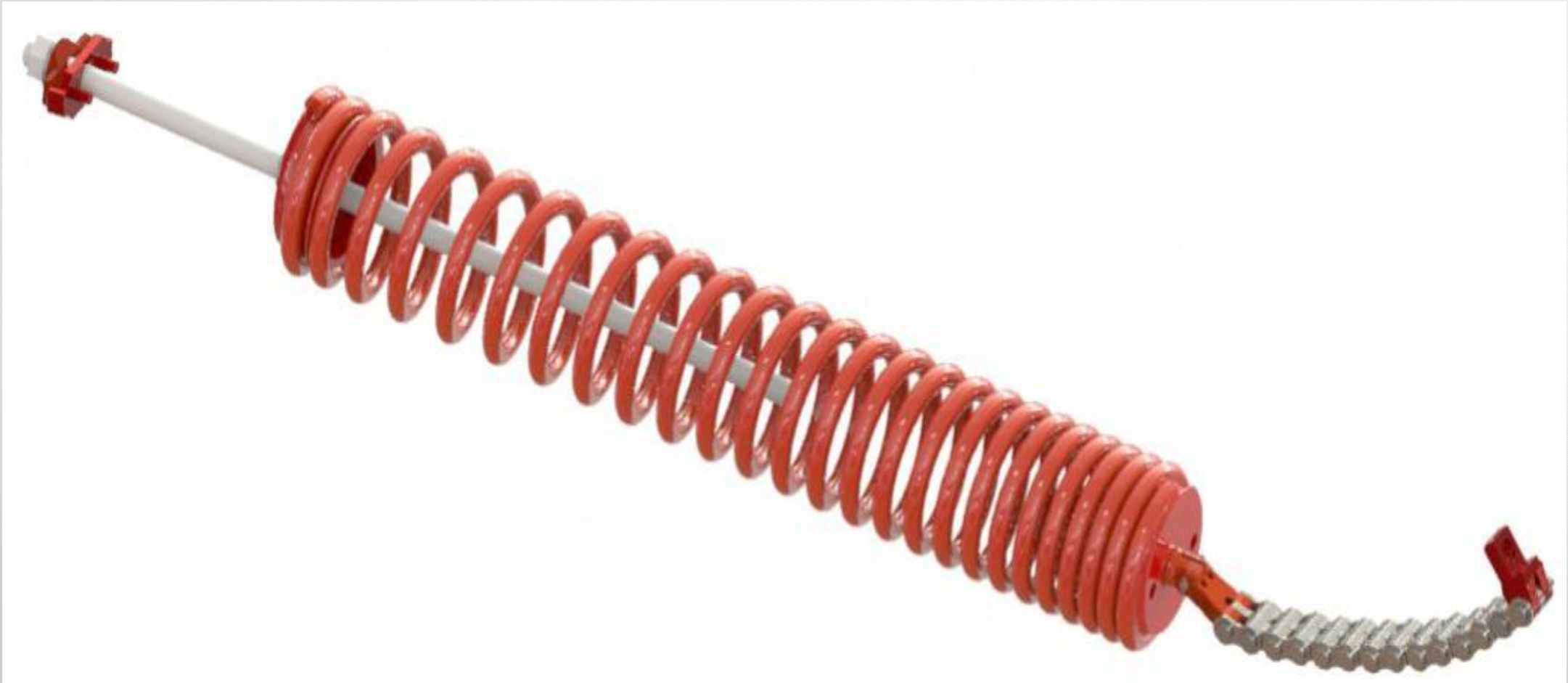
A-A



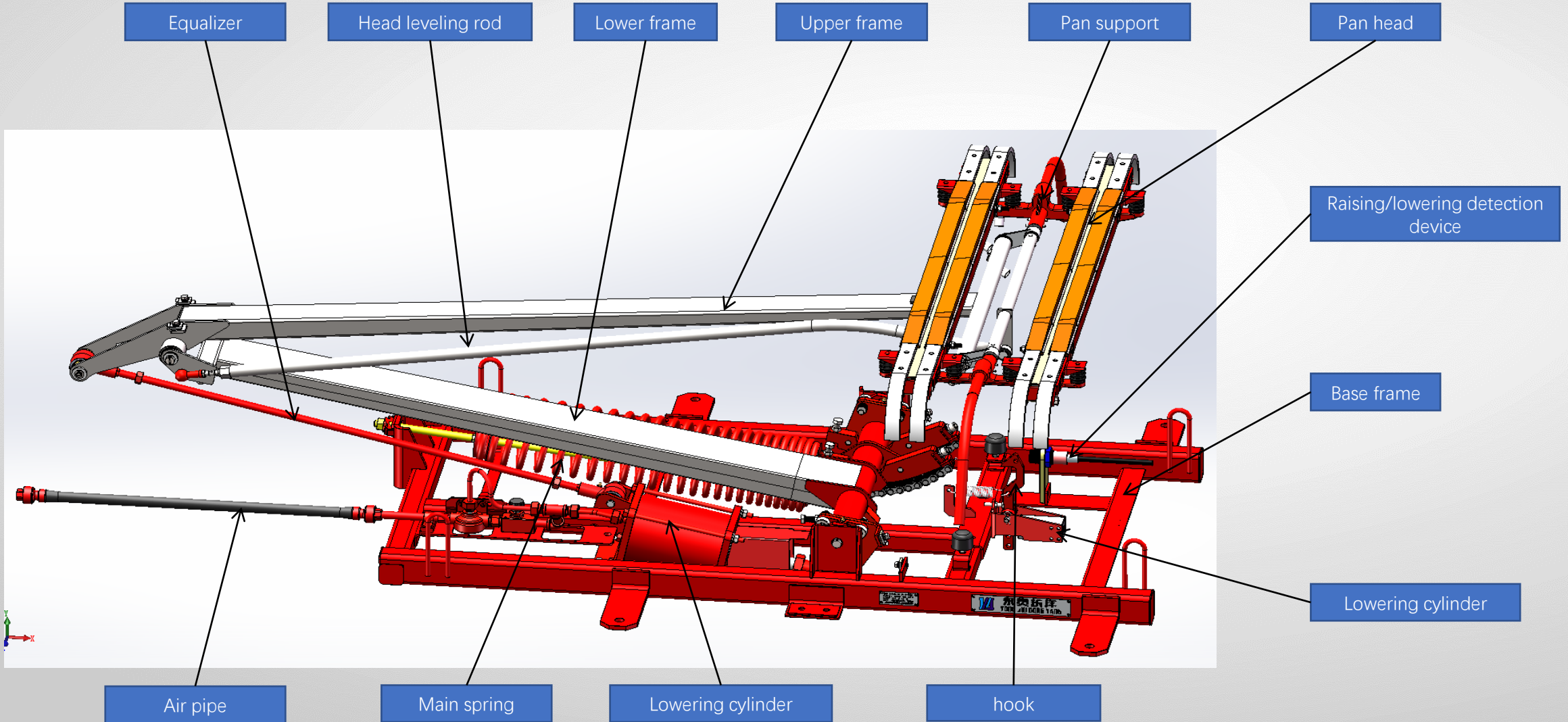
Design basis of segmented contact strip



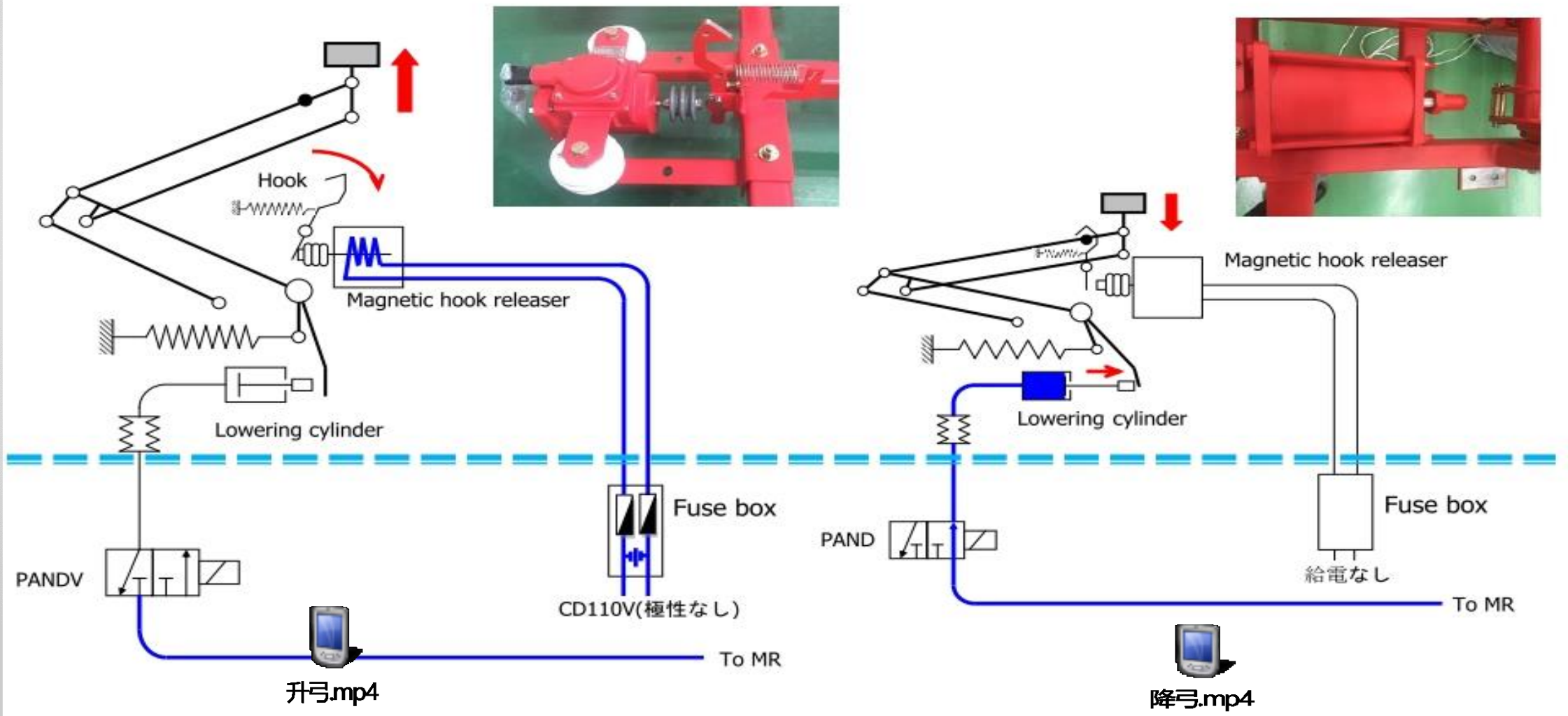
3. Imported main spring provide power source of pan-raising



Structure of Pantograph



The principle of pantograph raising/lowering



PART FOUR

Products and services

Specification of Pantograph -PT7203 Series



PT7203 type: (Metro and urban rail)

Contact line voltage: DC 1500 V

Pantograph name: single arm pantograph

Max. operating speed: 120 km/h

Current collecting performance: Max 2400A

Lowering/raising: raising:spring/lowering:air

Raising method: Electromagnetic hook

release/ air hook release

Operating air pressure: 450 - 980 kPa

Static contact force: 80 ± 10 N

Pantograph height: Max working 2235 mm

Contact strip: Metal-impregnated carbon strip

Contact strip fixing method: bolt fastening

mass: ≤ 170 kg (without insulators)

Working environment temperature: $-20 - 50^{\circ}$

(Storage and assembly temperature can be -40°)

Specification of Pantograph -YT7204 Series



YT7204 (LRV)

Contact line voltage: DC 600V or DC 750V

Pantograph name: single arm pantograph

Max. operating speed: 120 km/h

**Current collecting performance: Max
1200A,RMS 800A**

Lowering/raising: raising : spring/lowering:
Electric

Raising method: Electric

Operating voltage: 24V (20-28V) /DC

Static contact force: 49 - 70 N

Pantograph height: Max working 2000 mm

Contact strip: Copper sintered alloy, metal-
impregnated carbon strip, pure carbon strip

Contact strip fixing method: bolt fastening

mass: 150 - 170 kg (without insulators)

Working environment temperature: -20 – 50°

Specification of Pantograph YT7100 Series



YT7100 type (metro/ Intercity line)

Contact line voltage: DC 1500V and/or AC 25kV

Pantograph name: single arm pantograph

Max. operating speed : 160 km/h

**Current collecting performance: Max1200A /RMS
800 A**

Lowering/raising: raising:spring/lowering:air

Raising method: Electromagnetic hook
release/ air hook release

Operating air pressure: 490 - 880 kPa

Static contact force: 49 - 70 N

Pantograph height: Max working 1700 mm

Contact strip : Copper sintered alloy, metal-
impregnated carbon strip, pure carbon strip

Contact strip fixing method: bolt fastening

mass: 100 - 140 kg (without insulators)

Working environment temperature: -20 – 50°



Specification of Pantograph –PS207 Series



PS207 (high speed train)

Contact line voltage: AC 25k V

Pantograph name: low noise single arm pantograph

Max. operating speed: 350 km/h

Current collecting performance: Max800A/RMS600A

Lowering/raising: raising:spring/lowering:air

Raising method: air hook release

Operating air pressure: 780 - 880 kPa

Static contact force: 54 N

Pantograph height: Max working1145 (1195) mm

Contact strip: Iron sintered metal

Contact strip fixing method: bolt fastening

mass: about 185 kg

Working environment temperature:-20 - 40 °C

Applied to Japan E2 series Shinkansen

Service Pledge

3 hours response, 24 hours domestic arrival

Commitment to implement full service before, during and after sale





永贵东洋

YONG GUI DONG YANG

Thank you!