

POWER GRID STRINGING MAINTENANCE PLATFORM

CRRC's all-round, multi-function and expandable contact line maintenance platforms enable comprehensive overhaul, bridge and tunnel detection and rescue operations.

MAIN FEATURES

- ▶ Equipped with a double power unit, our stringing maintenance platform has two operation modes including high-speed and low speed operation, with stable starting and fast acceleration. The maximum speed is up to 160 km/h;
- ▶ A range of operating equipment is installed to complete maintenance operations of various contact lines;
- ▶ A complete safety protection device ensures the safety of operating personnel;
- ▶ A rigid body supporting system guarantees that the vehicle can be operated normally in wind speeds of 12.5m/s;
- ▶ Living facilities including dining tables, restrooms, lounges, conference rooms, etc. provide a better living environment for workers;
- ▶ The high altitude work bucket extended can reach to the height required for the maintenance and repair work of rail equipment;
- ▶ With powerful expandability of the product platform, various equipment for working, official, EMU, detection used vehicles can be installed according to the requirement of users.

WORKING WITH YOU TO
CONNECT THE WORLD



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TRACK HEALTH MANAGEMENT SOLUTION

The perfect solution for track health detection and maintenance

OVERVIEW

The CRRC track health detection and maintenance solution is mainly designed for the detection and maintenance operation of railway infrastructure (OCS, rail and tunnel) and related equipment, including key OCS parts and components, defects on rail surfaces, and cleaning of interior tunnel wall equipment. It is a cutting-edge, safe, reliable, economic and environmentally friendly track health management product.

A RESCUE PLATFORM

Our railway crane is mainly used to rescue railway locomotives and rolling stock to erect bridges and building units, handle important cargo, install large equipment, and to lay railway tracks and facilitate their maintenance.

MAIN FEATURES

- ▶ **LARGE TORQUE OF CRANE**
With a maximum lifting torque of up to 1760t·m, our crane has the largest torque in the world compared to similar products, it can be used to rescue heavy duty trucks and to improve overall rescue performance. Rescue operations can be carried out tunnels with the application of an arm end hook.
- ▶ **FLEXIBLE OPERATION MODE**
With its double rotation feature, our crane can be operated without affecting traffic on adjacent lines. The curve leveling system can perform self-running with certain load in curves with superelevation of the external rail. Asymmetric support operations can be performed in field, bridge and the freight yard with restricted conditions. Different span is applied for each supporting leg to perform operations.
- ▶ **DRIVER'S OPERATION MANUAL**
The crane features an integrated manual to facilitate driver operation, as well as to optimize procedures across the safety control system. The latter has an optimized user friendly interface and of the are which are all suitable for rescue demand.
- ▶ **ACCLIMATIZATION**
The crane can be operated in low temperatures, and is reliable in other severe weather conditions.
- ▶ **ADVANCED SAFETY CONTROL TECHNOLOGY**
The real-time parameters of each mechanism acquired by each sensor and CAN bus communication are able to assist the driver to ensure the safety of the crane operation after going through the logic and data analysis of control procedures. In the process of the driver's operation, The function of navigation can be operated for prompt according to real-time status to improve working efficiency.
- ▶ **STEEL STRUCTURE**
The telescopic lifting arm is made of super high strength steel, and features an elliptical section lifting arm. Other structures are made of high strength steel, and benefit from high strength, high stiffness and light weight.

COMPONENT INTRODUCTION OR TEST DATA

▶ ELECTRO-HYDRAULIC CONTROL TECHNOLOGY

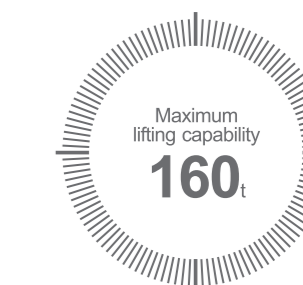
With advanced and reliable electro-hydraulic control technology standard diesel engine, hydraulic pump and execution units are able to perform coordinately to improve work efficiency and reduce power loss.



KEY TECHNICAL PARAMETERS

1700T·M NEW 160T TELESCOPIC LIFTING ARM RAILWAY CRANE

Maximum lifting capability	160t
Maximum lifting torque	1,760t·m
Lifting Speed with full load	4m/min
Lifting Speed with 0 load	14m/min
Slewing speed	1r/min
Self-running speed	20km/h
Amplitude variation time (with lifting arm fully contracted)	80s
Time for lifting arm fully extended	80s
Working range	6.5m~25m
Maximum lifting height	21.5m
Slewing radius of turntable tail	7m
Gauge	1,435mm
Axle load	22.9t
Return speed	120km/h
Radius of minimum curve passed	145m
Curb weight	194t
Lifting capacity × range (± 30°)	160t×11m
Lifting capacity × range (± 360°)	160t×8m



COMMERCIAL VALUE AND MARKET APPLICATION

At present, there are about 60 railway cranes need to be updated and the market prospect is good in China. The international market has a strong interest in this vehicle.

COMPONENT INTRODUCTION OR TEST DATA

▶ MULTI-FUNCTIONAL EQUIPMENT

The equipment is fitted with a lifting hoist, rotating work platform (with basket), wire rope winch and OHL detection device, all of which facilitate maintenance of the catenary, emergency maintenance above the roof of vehicles, repair or replacement of components of the OHL suspension, supporting and positioning parts and. Detection of the repaired catenary geometry parameters. The basket can also be used for inspection and maintenance of lamps and other high-altitude equipment on both sides of the railway.

▶ SAFETY CONTROL TECHNOLOGY

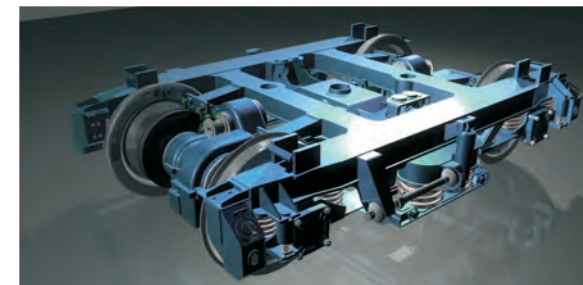
Security control mainly consists of a rigid support device between car body and bogie, wind speed measurement and control, operation equipment and safety protection of vehicle running safety control and emergency condition, etc. When the vehicle is running at high speed, vehicle running stability and vehicle comfort can be ensured: When the vehicle is moving for working, reliable stability for vehicles with equipment extension outside can be ensured.

▶ DUAL-MODE RUNNING SYSTEM OF 160KM/H HIGH-SPEED RUNNING AND 10 KM/H LOW-SPEED WORKING

Our dual-mode running system consists of a hydromechanical transmission and a hydrostatic transmission. 160 km/h speed is achieved through high-speed axle gear boxes driven by hydraulic transmission with their power from a diesel engine. And 10 km/h working is achieved by hydraulic motor with its oil supply from a hydraulic pump, which is driven by transfer case with its power from diesel engine.

▶ BRAKE TECHNOLOGY

A variety of braking devices are applied. Firstly, due to the high speed of the vehicles, plate type brakes act as the main brakes. Secondly, as the vehicle has traction ability, braking of the whole trains drawn should be considered besides the vehicle braking itself. As a result, hydromechanical braking is used to achieve a constant running speed on long sharp slope with stability and no shock. Finally, as the vehicle speed in working mode is low, smooth braking is needed. Together, these three types of brakes allows us to achieve integrated and efficient control of the vehicles.



KEY TECHNICAL PARAMETERS

BR711C FAST MULTI FUNCTION INTEGRATED OPERATION VEHICLE

Items	Indicators
Maximum altitude	≤2,500 m
Ambient temperature	-25~+45°C
Relative humidity	≤90%
Demarcation	GB146.1-1A/B
Min. curve negotiation radius	145 m
Maximum slope passed	33‰
Maximum superelevation of external rail	180mm

Operation conditions	Can be operated in heavy rain, at night, in sand and dust, and other severe weather conditions
Maximum Self propelling speed	160km/h
Maximum testing speed	176km/h
Gauge	1,435mm
Axle load	<21t
External dimension	24,340X2,875X4,650 mm
Coupler height	880±10 mm
Distance between bogie centers	17,000 mm
Wheel diameter	920mm
Bogie wheel base	2,600mm
Emergency braking distance	1,400m
Starting Traction force	124kN
Continuous traction force	87 kN
Continuous speed	31 km/h
Aloft working bucket	+18m /-10m/load 400kg
Lifting and rotating operation platform	+6.8m/load 300kg
Wire drawing device	+8m/3,000N

COMMERCIAL VALUE AND MARKET APPLICATION

BR711C multi-function vehicle is suitable for the contact line maintenance and repair operation of high-speed railways and electrified railways. To date, we have received an order of 66 sets in total from China Railway Corporation, respectively allocated to 13 bureaus and company groups including the Beijing Bureau, Shanghai Bureau, Chengdu Bureau, Qinghai and Tibet Company.



LINE MAINTENANCE PLATFORM

Our line maintenance platform is designed for inspection and maintenance of rails and overhead lines, including rail grinding and daily inspection and maintenance of OHL.

MAIN FEATURES

INSPECTION AND MAINTENANCE OF RAILS

▶ REDUCE HARM TO WORKERS AND IMPROVE WORKING EFFICIENCY

Using a catenary electricity supply allows us to reduce harm to workers' health caused by internal combustion power supply rail grinding cars in such enclosed environments such as tunnels full of CO₂, SO₂ and other poisonous and harmful waste gas. It also allows us to solve other problems such as engine overheating, subsequent engine shutdown and low efficiency caused by poor ventilation.

▶ SUPPORT MULTIPLE CARS RECONNECTION

The vehicle has the multiple-connection function. Two set of dual power supply 48-head grinding cars can form a 96-head grinding car by multiple-connection.

INSPECTION AND MAINTENANCE OF OHL

▶ MATURE AND RELIABLE DRIVE SYSTEM

Fuel injection system of diesel machine uses the latest second generation BOSCH electronically controlled high pressure common rail technology to meet China national III emission standard. The gear box uses electron self-energy intelligent control to allow manual and automatic gear shifting. Automatic gear shifting and electronic fault detection are used to significantly reduce labor intensity and improve the accuracy of fault analysis.

▶ MODULAR DESIGN FOR COMPONENTS

Main components are modular, which allows the interchangeability of parts in order to improve the utility and maintainability of products.

▶ SAVE ENERGY, REDUCE EXHAUST AND NOISE AND PROTECT THE ENVIRONMENT

Catenary electricity supply sharply lowers fuel cost, reduces emissions of harmful gases such as CO₂, SO₂. Meanwhile, the whole vehicle, designed in accordance with the standards of electric locomotives, has a comfortable and clean internal environment, can greatly reduce noise pollution brought by traditional internal combustion engines and put an end to exhaust pollution.

▶ LOWER THE MAINTENANCE COST OF THE FULL LIFECYCLE

The catenary electricity supply can significantly reduce fuel cost. In addition, using mature accessories of electric locomotives with good universality and interchangeability can reduce maintenance cost.

▶ SAFE AND STABLE HYDRAULIC SYSTEM

When we design the hydraulic system, field work environment are full considered.

The hydraulic system is reliable use, which is convenient operation and maintenance.



COMPONENT INTRODUCTION OR TEST DATA

INSPECTION AND MAINTENANCE OF RAILS

▶ ADVANCED TECHNOLOGY OF SEAMLESS POWER SUPPLY CONVERSION

Dual power supplies ensure that grinding cars can not only work on electric lines, but also work in the absence of electricity. The seamless conversion technology ensures no interruption of grinding when the grinding car runs in transition between electric lines and lines without electricity.

INSPECTION AND MAINTENANCE OF OHL

▶ POWER TRANSMISSION SYSTEM

Applied with hydraulic-mechanical transmission mode, the transmission system is mainly composed of engine, transmission, transmission shaft, axle gear box and air compressor. The engine and the transmission box are directly connected and placed outside the driver's cab in the rear. The axle gear boxes are driven by the cardan shafts with its power from the transmission box. Two axle gear boxes are installed on two axles to drive the wheels rotation to realize the whole power transmission. The transmission chain is short, the structure is compact and the indoor noise is low.

▶ Bogie

Bogie structure: frame assembly, primary suspension device, body supporting device, traction device, axle gear box suspension device, foundation braking device, derailment limit device, vehicle lifting device. Derailment block device is designed beside the bearing box to prevent too large derailment displacement. Bearing box and frame are designed for integral lifting of the bogie. Installation opening is designed in the bearing box to install temperature detecting device, ensuring correct installation and reliable detection data.

▶ ADVANCED TRACTION TRANSMISSION SYSTEM

The main parts of our self-developed traction transmission system adopt mature products from electric locomotives and EMU. A Three-phase AC asynchronous traction motor can not only meet the requirements of high speed running of the vehicle, but also meet the requirements of low constant speed working with high torque output. Optimization design has been done for grinding running and high speed running characteristics of the dual power 48-head rail grinder, which can meet the highest speed of 100 km/h and grinding speed of 2 to 16 km/h of good stability and precision.

▶ BRAKING SYSTEM

The braking system consists of three parts: basic brake, hand brake and pneumatic brake, to ensure the operation safety in long ramp with light and easy operation and easy maintenance. Foundation brake adopts unilateral tread brake shoes. Front and back wheel-sets adopts an independent brake unit respectively, of which one unit is connected to hand brake and used for shoe gap adjusting and parking braking. Pneumatic brake adopts JZ-7 type brake with no need to configure auxiliary air reservoir. And brake cylinder leakage can be compensated automatically.



COMMERCIAL VALUE AND MARKET APPLICATION

At present, 88 sets of TY5 hydraulic mechanical transmission operation vehicle serves in each China Railway Bureau constituting 30% of the market.

KEY TECHNICAL PARAMETERS

HYBRID POWER STEEL RAIL GRINDING VEHICLE WITH 48 GRINDING HEADS

Track gage	1,435mm
Height from the coupler center line to the rail surface	880±10mm
Wheel base	2,600mm
Wheel diameter	φ915mm
Axle load	23t
Maximum running speed	Self-running: 100km/h, coupled: 120km/h
Height from the floor surface to the rail surface	1,710±10mm
Radius of minimum curve passed	Self-running: 100m; coupled: 145m; grinding operation: 180m
Maximum slope	33‰
External dimension of vehicle	63,000mm (coupler center) × 3,055mm × 4,700mm (pantograph state)
Transmission	AC-DC-AC axle: operation vehicle: 2-2; traction vehicle: B0-B0
Operation speed	2~16km/h
Operation speed accuracy	±0.5km/h
Deflection angle of grinding motor	-70°~ +25° (negative for the inside of track and positive for the outside)
Power supply	Diesel generating set + contact line
Rated operating voltage at line side	25kV
Service power	Diesel generating set: 2×1,119kw; power supply for contact line: 2,400kVA
Maximum traction force for start	142kN
Continuous tractive Force	142kN
Minimum calculation speed	25km/h
Vehicle dynamic performance	Meet the requirements of GB/T17426-1998

TY5 HYDRAULIC-MECHANICAL TRANSMISSION OPERATION VEHICLE

Gauge	1,435mm
Distance	7,400 mm
Wheel base	2,400mm
Wheel arrangement	1A-A1
Wheel diameter	840mm rolled steel wheel, LM tread
Kerb weight	38t (without line tightening column /40t (with line tightening column)
Axle load	9.5t (without line tightening column /10t (stringing vehicle)
Engine power	247kW(336Ps)
Maximum Torque / rotating speed of engine	1,300Nm/1,100-1,500rpm
Transmission	Hydraulic mechanical transmission
Braking mode	Air brake and parking hand brake
Maximum self-running speed	100km/h
Height from coupler to the rail surface	880±10mm
External dimension	14,385mm×3,100mm×4,750mm



TUNNEL LINE MAINTENANCE PLATFORM

Subway tunnels are cleaned through a combination of high pressure water washing, brushing, vacuum recycling, and sewage suction with diaphragm pump.

MAIN FEATURES

▶ HIGHLY INTEGRATED CLEANING METHOD

When performing cleaning work, tunnel cleaning vehicle is able to highly integrate high-pressure water spraying, brushing, vacuum recycling into one to effectively clean tunnel and recycle dirt.

▶ SPECIAL FLAT-CAR

A new type of underframe structure with optimized design is applied. Underframe applies variable cross section structure with all side beam disconnected to meet the requirement of cleaning vehicle.



▶ VACUUM SYSTEM

Negative pressure is created due to great capacity of volume and high speed air flow occurring in the outlet pipe of the vacuum. The rolling brush facilitates sewage suction. This mode is characterized by efficient sewage suction, covering a greater area.

▶ CONTROL SYSTEM

Control system applies PLC and man-machine interface (touch screen) control, signals from various sensors and inductive switches are acquired by PLC module to transmit to the touch screen after data of each transducer is acquired through Modbus and TCP/IP data bus. Operator can perform relevant operation through touch screen.

TCV04 TUNNEL CLEANING VEHICLE

Track Gauge	1,435 mm
Floor height	1,200 mm
Wheel diameter	840mm
Wheel base	2,200mm
Bogie center distance	12,600mm
Whole-vehicle external dimension	18.93×2.46×3.65m
Traveling Speed	80km/h
Operation speed	3-5km/h
Pressure of high pressure water	150bar
Pressure of low pressure water	80bar
Water loading capacity	≥20t
Wind speed at air inlet	≥37m/s
Emission standard	European IIIa
Designed speed	90km/h
Minimum radius of curvature	110m
Axle load	≤141t
Coupler device	No.13 coupler and buffer

COMMERCIAL VALUE AND MARKET APPLICATION

Our tunnel cleaning vehicle is successfully operating on the Shanghai Metro. Not only does it meet customer demand for clean operation and greatly improve cleaning efficiency, it also reduces the cost of cleaning and is an outstanding example of the development of rail cleaning equipment. We foresee a significant commercial value and a market share for our product.