High Speed Railway Bridge Construction Equipment

In China, Tiange Xian has supplied more than 300 sets of bridge construction equipment for the high-speed railway construction such as Beijing-Shanghai line, Harbin-Dalian line, Wuhan-Guangzhou line, Zhengzhou-Xi'an line, Shijiazhuang-Taiyuan line, Beijing-Tianjin line, Hefei-Wuhan line, Guangzhou-Shenzhen-Hong Kong line, Hefei-Beijing line, Beijing-Shijiazhuang line, Shijiazhuang-Wuhan line, Chengdu-Daqing line, Nanchang-Xiamen line, Nanchang-Guangzhou line, Shanghai-Hangzhou line, Hangzhou-Changsha line, Ningbo-Hangzhou line, Hefei-Bengbu line, Nanchang-Guangzhou line, Haikou-Xiuzhou line, Changzhou-Shanghai line, Hengyang-Beijing line, Daliang-Xi'an line, Nanjing-Anting line, Hefei-Fuzhou line and Guangxi-Guangzhou line. And the equipments have completed about 50,000 pieces of girders till March of 2011.

1. Erecting simple supporting concrete box beam.
2. Simple supported self-launching to stabilized longitudinal movement and high safety performance.
3. The winch is installed at the rear of L.G. in order to reduce total height and to guarantee flexibility when passing bridges and tunnels with height limits.
4. Concrete box beam erecting separately and concrete box beam transporting separately allow high production efficiency.
5. Special designed cabin and wireless remote control for easy operation.
6. Width adjustment and height adjustment, the equipment can be moved through double line tunnel.
7. The L.G. can be carried by a tyre trolley for long distance bridge to bridge transfer.
8. High-positioned under-bridge satisfies the requirement of first and second span erection.
9. L.G. is also suitable for short distance concrete box beam erection for entrance and exit of tunnels.

Launching Girder is mainly used for the bridge construction of double line full span concrete pre-cast beam for 200-350km/h railway passenger line. It can be combined with a Tyre Trolley for concrete box beam erection. L.G. can be used for normal concrete box beam erection as well as first span and last span erection, curve construction, different span construction and short distance self-launching without additional equipment. L.G. can be easily disassembly for transfer. It can be transferred by a Tyre Trolley either in full assembly or partly disassembly to next bridge even through a double line railway tunnel.
Special carrier is suitable for railway bridge construction in mountainous area. Without disassembling, special carrier can directly erect concrete box beam on the top of the piers at the entrance or exit of tunnels. The special carriers from Tolian are widely used in Nanning-Qinzhou Line, Nanning-Liuzhou Line, Lanzhou-Urumchi Line and Hangzhou-Changsha Line.
High Speed Railway Bridge Construction Equipment

**Tyre Trolley**

Technical Characteristics of Tyre Trolley:
1. Driving is from a closed loop hydraulic system and steering system is based on load monitoring.
2. Electrical control with CAN-BUS technology, the coordination and reliability between movements is assured.
3. Load monitoring system, steering cooperative control system, slip and over speed control system.
4. Video monitoring and automatic driving offset monitoring system.
5. Diagnostic system shows problem area for easy repair.
6. Two pipeline hydraulic safety system for the wheel bogies to ensure safe operation.
7. Main purchased parts are all from first class suppliers all over the world.

- **Tyre Trolley 450t**

- **Tyre Trolley 900t**
Rubber-Tyred Gantry Crane

Creative New Design:
1. Dual beam, dual gantry. Tyre trolley can drive in from one side and the different length of tyre trolley is adapted.
2. Meet the lifting requirement of various concrete box beams with different length and weight.
3. Bogies can turnover 90° to feed beam to tyre trolley according to different condition of beam yard.

Structure:
1. Meet the requirement of four-point hoisting three-point balancing.
2. Level tolerance ±2mm, vertical tolerance ±10mm.
3. Driver cabin with PLC screen to visualize operating conditions and display system fault area.
4. Alarm display: visual and audible alarms as well as emergency stop system.
5. Synchronizing control.
   Two ends synchronizing movement control (motor speed sensor).
   Main beam slewing sensor control
   Main beam and side support laser sensor control
6. Unique concrete box beam over speed lowering emergency stop, independent power supply and hydraulic control.

Dual Beam Gantry Straddle Carrier for Jinghu Project

Single Beam Dual Gantry Straddle Carrier for Shijiazhuang--Wuhan Line

Single Beam Single Gantry Straddle Carrier for Shijiazhuang--Wuhan Line
Gantry Crane

This kind of crane can lift beams with a span of 86m (4m64ft) and two cranes can cooperate to increase the payload from 45,000 to 90,000 tons.

MGZ-150t Gantry Crane

Two cranes working together for 900t concrete box beam
Suspension span by span launching girder is widely used for viaduct, light rail, huge river bridge, huge sea bridge and railway bridge.

**Advantages of suspending span by span Launching Girder:**

1. Made in mass production, the quality of segments is stable and controllable.
2. Segment production is simultaneous with foundation preparation to decrease construction period and improve efficiency.
3. The construction is mainly on the pier with limited interfering to land traffic.
4. Construction load can be allocated evenly.
5. No need for heavy lifting equipment, heavy concrete mixer and heavy tyre trolley.
6. Can be reused for another project.
7. Precast site and jobsite can be organized separately to reduce pollution.
Movable Scaffolding System

MSS introduction:
MSS is a mobile concrete workshop moving on top of the bridge. It permits the pre-cast parts used for top structure to be casted in situ and it reduces the cost dramatically.

- MZS2200t/62.5m Overhead Cast-in-Situ MSS for Zhujian Bridge
- MZ1500t/50m MSS for Nanchang Bridge
- 900t/32m Express Railway MSS
- Two Sets of 1300t/50m MSS for Zhanjiang Bridge
- MZ1400t/45m MSS for Bengbu Bridge