

Mantis 30011 Rerailer



2008

General Specifications



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1. Typical Operating Parameters

- 1.1 Operating temperatures will typically be between 20°F (7°C) to 110°F (43°C).
- 1.2 Relative humidity ranges between 20% and 100%.
- 1.3 Typical climates consist of hot, dry summers and cool winters.
- 1.4 Crane will be used to re-rail freight cars and locomotives in yard areas and main lines.
- 1.5 This crane will be on call 24 hours per day and is critical to the continuation of railroad operations.

2. General

- 2.1 Crane can maintain an average speed of 65 MPH (105 KPH) over interstate and secondary highways.
- 2.2 Maximum speed when using hi-rail equipment is 25 MPH (40 KPH) forward and 12 MPH (19 KPH) reverse.
- 2.3 Equipped with a detachable, steerable tag axle.
- 2.4 Maximum overall dimensions are 45' (13.7 m) in length, 8'-6" (2.6 m) in width and 13'-6" (4.1 m) in height.
- 2.5 Crane is equipped with a 45,000 lb (2,411 kg) capacity deck winch. Winch is mounted at the front of the crane deck and includes all pulleys and sheaves necessary to route the winch cable out the rear of the crane.
- 2.6 The deck winch has both remote ground and crane cab controls.
- 2.7 Complete spare tire assemblies for both the front and rear axles of the carrier are included.
- 2.8 Aluminum fuel tanks with total capacity of 100 gallons (378.5 l).
- 2.9 Both the crane and carrier cabs are equipped with fire extinguishers.
- 2.10 Tow hooks are placed on both the front and rear of the crane.
- 2.11 A lightweight, removable, rail car towing device, compatible to existing A.A.R. couplers (USA), is at the rear of the crane. Can be adapted to meet European standards.

3. Vehicle Weights & Clearances

- 3.1 The total gross weight of the crane is 87,500 lb (39,690 kg).
- 3.2 Charts indicating the overall weight of the crane and the load distribution are included.

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4. Crane Carrier

- 4.1 Carrier is specifically designed for railroad crane service. The frame is fabricated from high tensile steel and is of special box frame construction.
- 4.2 The distance between the inside front and inside rear axles is 16' (4.88 m), excluding the air lift tag axle.
- 4.3 The distance between the front tandem axles is 5' (1524 mm).
- 4.4 The distance between the rear tandem axles is 4'-6" (1372 mm).
- 4.5 Front axles are dual "I" Beam type, with a minimum rated capacity for 40,000 lb (18,144 kg).
- 4.6 Rear Axles are tandem automotive type, with a minimum rated capacity of 46,000 lb (20,865 kg).
- 4.7 Brakes are drum type and installed on both the front and rear axles on all 10 wheels or wheelsets.
- 4.8 A 12 CFM (34 cm³) capacity belt driven air compressor is included for carrier braking. Lines and accessories for supplying train line air ARE NOT included.
- 4.9 Air brake systems comply with all existing American and European Safety Standards.
- 4.10 Spring loaded chamber parking brakes are provided on both rear axles.
- 4.11 Suspension is heavy-duty leaf type for front and rear walking beams.
- 4.12 Front axles are equipped with heavy-duty hydraulic shock absorbers.
- 4.13 Full fenders for both front and rear tires are provided. Fenders are constructed of aluminum tread plate for safety and weight reductions.

5. Engine & Drive Train

- 5.1 Engine is CAT C13, rated 380 horsepower @ 2,100 RPM and complies with all American and European regulations regarding emissions and is equipped with a turbo charger.
- 5.2 Engine is equipped with a heavy duty radiator to provide engine, transmission and hydraulic system cooling.
- 5.3 The engine is equipped with governor capable of limiting the speed of the crane to 65 MPH (105 KPH).
- 5.4 Engine is equipped with a "Jake Brake" to compliment braking effort during high workload and physical demands.
- 5.5 The engine is equipped with a fast idle kit capable of maintaining 1,000 RPM for extended periods of time.
- 5.6 Highly visible lights and audible warnings are installed in both the crane and carrier cabs. The warnings indicate failure of critical systems and

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include high temperature, low oil pressure, engine over speed and alternator charge failure.

- 5.7 Engine is equipped with an electronic programmable control package to allow the versatility required to meet special running and/or load conditions.
- 5.8 Transmission is automatic 5 speed, Allison with torque converter.
- 5.9 Drive shafts are heavy duty with Spicer needle bearing universal joints.
- 5.10 Crane is equipped with a power take off system capable of engagement from either the crane or carrier cabs.
- 5.11 All wheel rims are aluminum 22.5" (571.50 mm), hub piloted, for weight reduction
- 5.12 Tires are supplied as required to meet local transit requirements and have a minimum of an 18 ply rating in front and 14 ply in the rear.
- 5.13 All tires are conventional highway tread.
- 5.14 A vertical exhaust system is installed on the right of the chassis, near the boom cradle. Exhaust is routed in a manner to prevent damage to any crane components by overheating. Heat, exhaust gas, and noise emissions meet all international standards. Any locally specific standards must be provided by purchaser prior to order.
- 5.15 All four front wheels are steerable. A worm and roller power steering system (Sheppard 492 or equivalent) is used.
- 5.16 The power steering pump is belt driven off the rear of the engine.
- 5.17 Rear axles are two-speed with air actuated change-over. High ratio will provide a minimum highway speed 65 MPH (105 KPH). Low ratio will provide pulling capacity to move the crane over exposed rails.

6. Carrier Cab

- 6.1 Carrier cab is of heavy duty construction and be designed to comfortably accommodate one (1) operator and one (1) passenger.
- 6.2 It is equipped with a heavy duty air conditioning system and with an engine driven air conditioning compressor.
- 6.3 Soundproofing and insulation comply with existing OSHA and European noise suppression requirements and provide adequate insulation from cold.
- 6.4 The cab is full tilting to provide simplistic engine and component servicing. The tilting mechanism is hydraulic, and includes all necessary cylinders, components and a hand operated pump for raising and lowering the cab.

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- 6.5 Seats for both the operator and passenger are fully adjustable and equipped with an air cushioning mechanism. Both seats are equipped with seat belts.
- 6.6 Dual standard and convex West Coast style rear view mirrors are installed. Mirrors are 12 volt heated to provide frost and ice free viewing surfaces. Both mirrors are electrically remote controlled.
- 6.7 Heavy-duty heater and defroster are installed. Heating vents are included for both overhead and floor heating.
- 6.8 All windows of the cab are constructed of safety glass.
- 6.9 Full instrumentation and gauges are installed to include:
 - A. Fuel Gauge
 - B. Water Temperature Indicator
 - C. Alternator Charging Indicator
 - D. Oil Pressure Indicator
 - E. Engine Hour Meter
 - F. Air Brake Pressure Indicator
 - G. Low Air Brake Pressure Warning Device
 - H. Engine Tachometer
 - I. Transmission Temperature Gauge
- 6.10 A two-speed windshield wiper system is installed. Windshield wipers will have an “intermittent” feature.
- 6.11 Windshield washers are installed complete with pump.
- 6.12 Dual chrome air horns are installed with controls convenient to the operator.
- 6.13 An AM/FM Weather radio with Compact Disc player is included. Radio is mounted in a console and includes two speakers and antenna.

7. Crane

- 7.1 Crane is rated at not less than 300,000 lb. (136,077 kg) capacity over the rear and sides at a radius of 11’ (3.35 m).
- 7.2 Crane is capable of achieving 360° of rotation.
- 7.3 The boom is two-section telescopic. Retracted length of the boom is 26’ (7.9 m). Extended length of the boom is 40’ (12.2 m).
- 7.4 Lifting capacity of the boom at extended length of 40’ (12.2 m) 100,000 lb (45,359 kg) at a 14’ (4.3 m) radius.
- 7.5 All aspects of boom operation are hydraulically actuated and controlled. Controls are of a “Joystick” type.
- 7.6 An anti-two block mechanism is installed to prevent damage to the boom head and/or components.
- 7.7 Visible boom length and boom angle indicators are included.

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- 7.8 The crane is equipped with emergency free fall load release mechanism.
- 7.9 Hoisting cable 1” (25 mm) diameter with 10 parts sufficient to lift the certified capacity. Cable is approved for lifting and of a strand type and size to allow cable flexibility during sub-freezing temperatures.
- 7.10 A boom cradle is installed directly behind the carrier cab.
- 7.11 Wear strips are placed on the upper portion of the boom to prevent wear to the boom and cable where it moves across the boom.
- 7.12 The lifting hook is duplex style.
- 7.13 The slewing ring of the crane is a triple roller bearing type, with a minimum rated capacity of 4,125,000 lb (1,871,069 kg).
- 7.14 The crane has a two-speed line hoisting with minimum line speed of 1-20 feet per minute.
- 7.15 All crane drives, including lifting, boom elevation, and swing are capable of being independently operated yet still enable simultaneous operation at full power rating.
- 7.16 A 150 ton (136 MT) capacity hook block is included.
- 7.17 The crane is equipped with an electronic load moment indicator system. This system is programmed to protect the crane against over-load conditions at any boom angle, boom length or load weight. The system includes all sensors and the computer. An over-ride switch for the system is included.

8. Crane Cab

- 8.1 Crane cab is equipped with windows on all sides, rear and roof. Glass is of the safety type.
- 8.2 Cab is insulated for winter operation and is equipped with an electric heater and defroster system.
- 8.3 All necessary crane controls are clearly marked and easily accessible to the operator.
- 8.4 The crane access door is placed on the exterior side of the cab. Door includes lower window panel for better visibility of ground crews.
- 8.5 Crane instrument panel includes:
 - A. Tachometer
 - B. Fuel Gauge
 - C. Engine stop and fast idle controls
 - D. Emergency stop button
 - E. All necessary warning lights and alarms
 - F. Electric windshield wiper

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- 8.6 A load chart, clearly depicting the load limitations of the crane with outriggers extended and retracted, is posted in the cab and is readily visible to the operator.

9. Electrical System

- 9.1 The starting system is 12 volts. Starter is heavy duty.
- 9.2 Four 12 volt heavy-duty batteries are included. All vehicle accessories and lights are 12 volt.
- 9.3 All vehicle lighting and reflectors comply with current USA Regulations.
- 9.4 Additional, operator controlled halogen headlights with dim and bright capabilities are mounted on the rear of the crane for reverse movement while on hi-rails.
- 9.5 Alternator has a minimum of 145 ampere capacity.
- 9.6 Crane is equipped with front and rear railroad marker lights for rail operation. The marker lights are controlled from the carrier operator's panel.
- 9.7 Boom, hi-rail, and crane are equipped with sufficient auxiliary area lighting to provide safe illumination for night re-railing operations.
- 9.8 Orange "strobe" type beacons are installed on the roof of the carrier and crane cabs.
- 9.9 A diesel powered 110 volt auxiliary generator having a minimum rated working capacity of 5,000 watts, is installed on the crane chassis. Generator provides power for the crane cab heater.
- 9.10 Generator will be Onan, Honda, or equivalent brand. A durable aluminum weather proof cover is provided for the generator.
- 9.11 A duplex 110 volt weatherproof outlet is installed in the vicinity of the generator for the operation of power tools and auxiliary lighting.
- 9.12 An audible back-up alarm is included. The alarm actuates any time the transmission is placed in reverse gear.
- 9.13 The alarm must be a continuous actuation type.

NOTE: Electrical systems can be converted to European Standards when preferences are determined

10. Hydraulics

- 10.1 Hydraulic system has 1 variable displacement pump mounted to the engine or transmission driven power take-off and is equipped with a load sensing feature.

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- 10.2 A hydraulic oil reservoir constructed of aluminum and capable of holding a minimum of 100 gallons (378.5 l) of hydraulic fluid is installed.
- 10.3 All necessary controls to operate crane, outriggers and hi-rails are included. All controls are easily accessible to operators.
- 10.4 An in-tank cartridge type filtration system with a 6 micron full flow filter is included.
- 10.5 Hydraulic systems are protected with relief valves.
- 10.6 Thermostatically controlled hydraulic cooling systems are included.
- 10.7 Crane is equipped with an auxiliary, emergency hydraulic system capable of restoring the crane boom to the neutral position for movement in case of main hydraulic system failure. System may be electrically or auxiliary generator motor driven.

11. Outriggers

- 11.1 The crane is equipped with 4 hydraulically actuated outriggers on the sides and 1 fixed outrigger at rear
- 11.2 Outrigger pad cylinders are equipped with quick disconnect couplings.
- 11.3 Controls for the outriggers are placed on both sides of the crane at ground level. Controls are also included in the crane cab.
- 11.4 Outrigger beams retract within the width of the crane carrier.
- 11.5 Outrigger pads are constructed of lightweight materials such as aluminum or nylon to allow easy lifting and placement. Five (5) pads are included with the crane.
- 11.6 Racks are provided on the crane to allow for transport of all 5 outrigger pads.
- 11.7 Front outriggers are mounted on a swivel mechanism. The outriggers are parallel to the frame during transport. The outriggers are extendable and capable of placement at any angle within 90° of the crane.
- 11.8 On-ground outrigger controls have “two-hand” operation to prevent the possibility of having the operator’s hand pinched by outrigger retraction.

12. Hi-Rail Equipment

- 12.1 Crane is equipped with hi-rail equipment on both the front and rear. The front set of hi-rails is equipped with tandem type wheels. Single wheels are included on the rear
- 12.2 Hi-rail is capable of being retracted and locked in the up position.

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- 12.3 The rear tires must remain in contact with the rail to provide the locomotive forces when the equipment is placed on the hi-rail system.
- 12.4 The front hi-rail system is equipped with air actuated brakes. The brakes are controlled from the carrier cab.
- 12.5 The hi-rail equipment has a standard rail gauge of 4'-8.5". Metric gauge is available.
- 12.6 Controls for lowering and raising hi-rail are placed adjacent to each unit.
- 12.7 Hi-rail system is capable of retaining the crane on the rail during all operating conditions including travel over curved trackage.

13. Counterweight System.

- 13.1 Crane is equipped with a removable counterweight system.
- 13.2 Counterweight is capable of being quickly attached and detached from the crane.
- 13.3 The counterweight weighs 25,000 lb (11,340 kg).
- 13.4 All components for installing and securing the counterweight are included.
- 13.5 Load charts are provided that indicate the differential in lifting capacity with the counterweight attached.
- 13.6 The load moment indicator system is programmed to recognize load lifting limitations with the counterweight removed or attached.

14. Training

- 14.1 Mantis provides one week on-site training. The training includes:
 - A. Operational safety and potential safety hazard awareness
 - B. Equipment familiarization and operation.
 - C. Preventative and reactive maintenance processes.
- 14.2 Mantis provides copies of a video describing the complete operation of the crane.

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