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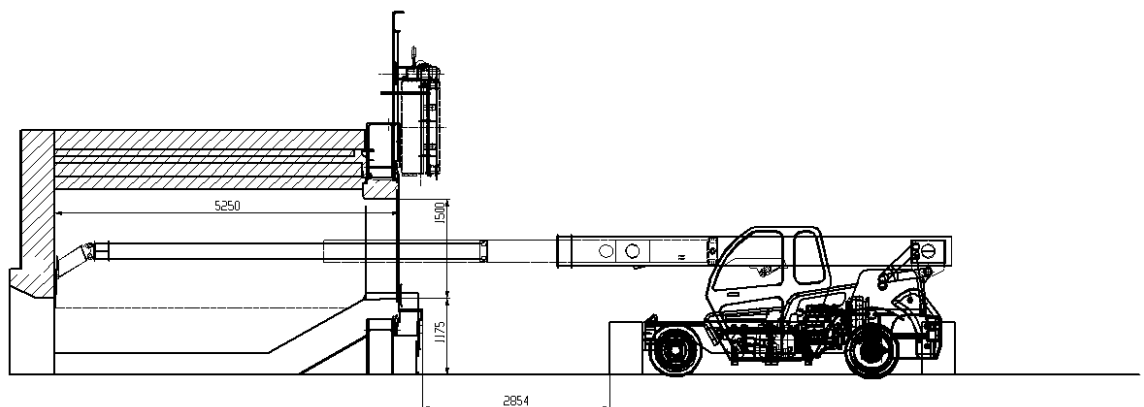
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Slag Removing Truck



1. Introduction of Slag Removing truck

It is also known as Furnace Tending Vehicle, widely use in Aluminum Refinery factory, to remove molten slag from the smelter (furnace). It has telescopic boom allow the rake head reaching bottom of the smelter to remove the molten slag.



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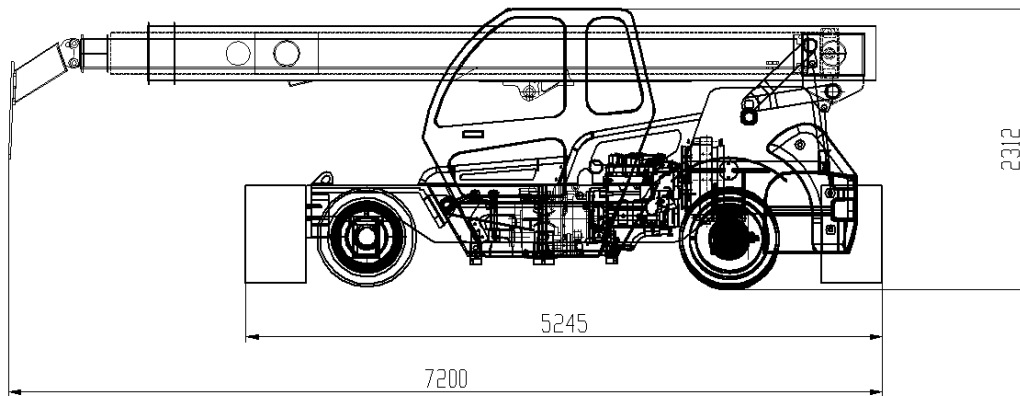
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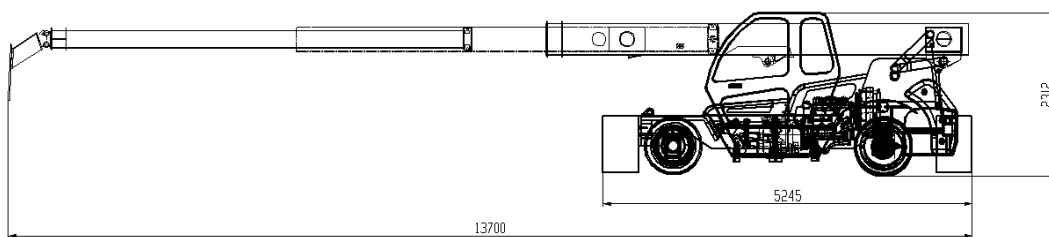
It also being use to remove over heated material in Steel Metallurgy, for hot metal treatment, continuous casting, converter, Electric Furnace working area. It can contain all type of the slag which produced in the above area.

2, Overall Dimension

Telescopic boom withdrawn position, Overall Length: 7200mm, Height: 2312mm



Telescopic boom extended position: Overall length 13700mm, height 2312mm

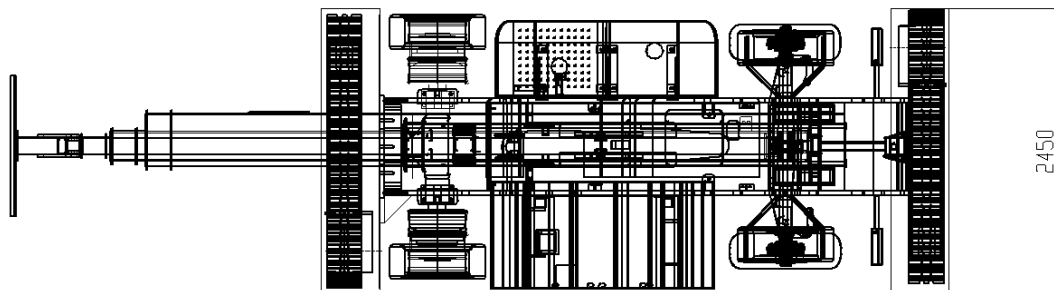


Overall width: 2450mm

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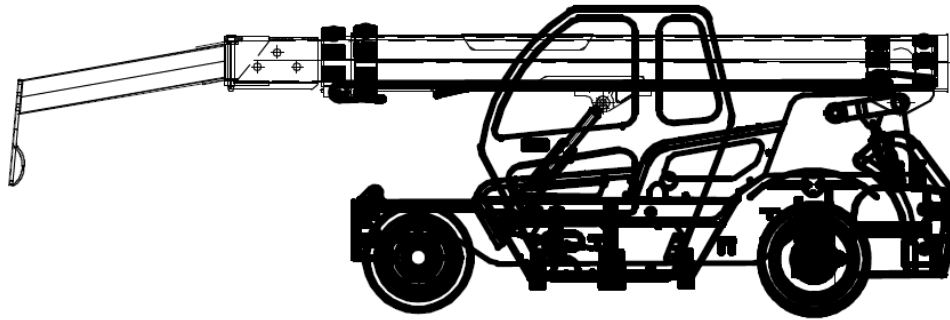
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变幅油缸、复合动作油缸布置方案

Amplitude cylinder, composite move cylinder layout solution

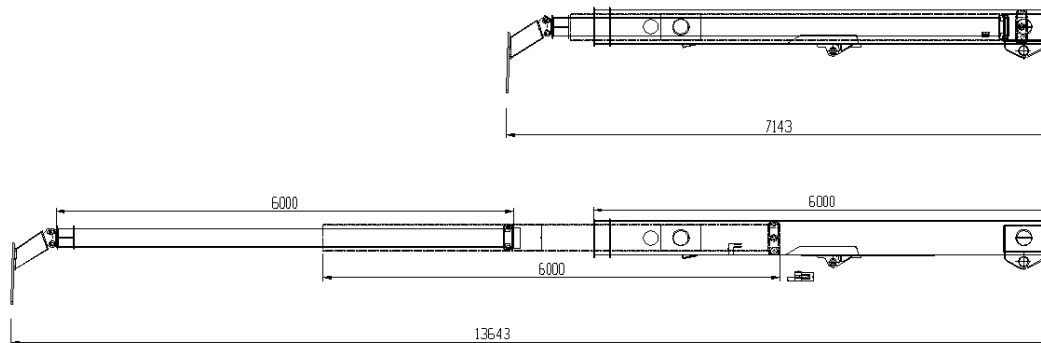


变幅油缸连接在车架与伸缩臂前支点，复合升降机构与伸缩臂后支点连接。

Amplitude cylinder connect on the front supporting point of chassis and telescopic boom, composite move connects with rear supporting point of telescopic boom

一、 伸缩臂详细方案

Telescopic boom detailed solution



参数: Parameter

收缩状态: Withdrawn , overall length, 7143mm

伸出状态: Extended, Overall length, 13643mm

伸缩行程: Stretch out and draw back distance, 6500 mm

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描述: Description

臂间布置滚轮导向和润滑。滚轮内部使用免润滑石墨轴套，方便维护。

There is roller guide and lubricant between each section of boom, the roller is with lubricant-free graphite shaft sleeve, easy to maintain

扒渣臂、第三节伸缩臂和第二节伸缩臂均使用耐高温不锈钢 0CR25NI20 材质制造，保证高温工况下的机械性能。

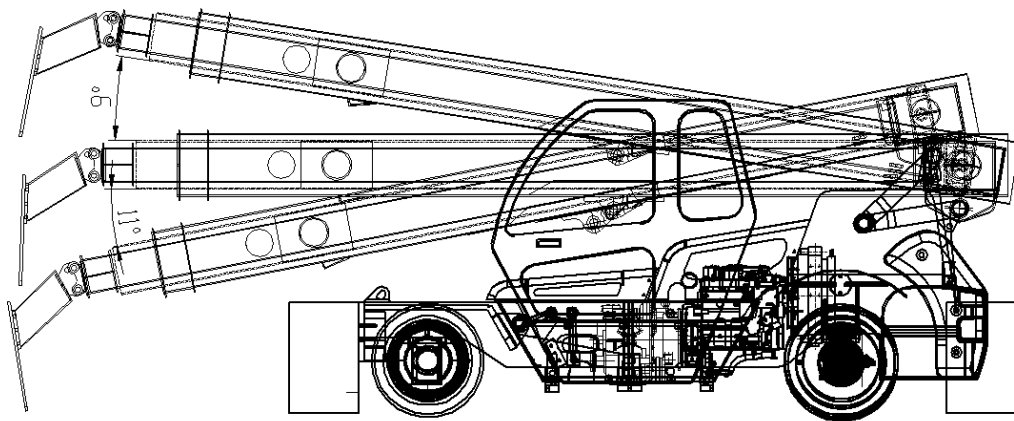
The slagging arm, the 2nd and 3rd section of boom use the high temperature resistant stainless steel 0CR25NI20 material, guarantee the mechanic performance in high temperature working environment

第一节臂内部布置链条链轮传动机构，以液压马达和减速机驱动第二节臂进行伸缩运动，第二节臂通过链条机构带动第三节臂进行伸缩运动。

There is chain sprocket transmission mechanism inside the first section boom, the stretching and withdrawing movement of 2nd boom is driven by hydraulic motor and reducer, Then the 2nd boom drive the 3rd boom to stretch or withdraw by Chain mechanism

伸缩臂变幅角度示意: $-11^{\circ} \sim 9^{\circ}$

Telescopic boom Amplitude angle draft: $-11^{\circ} \sim 9^{\circ}$



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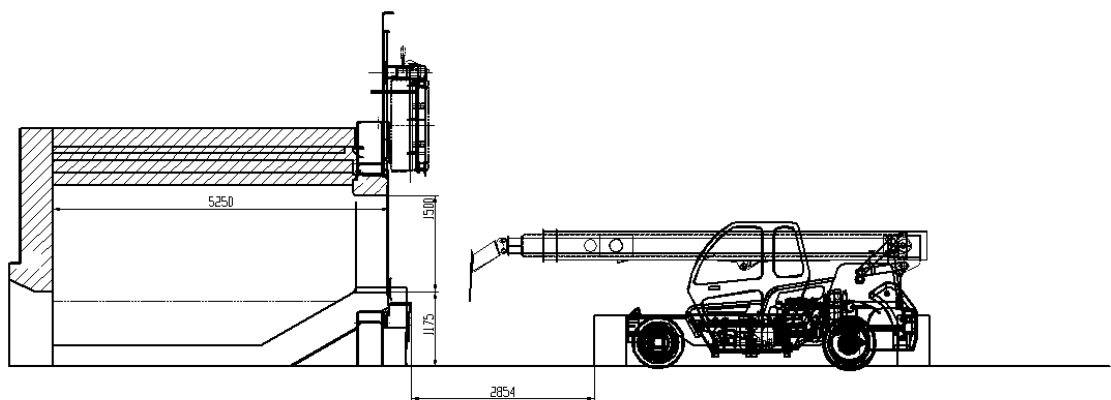
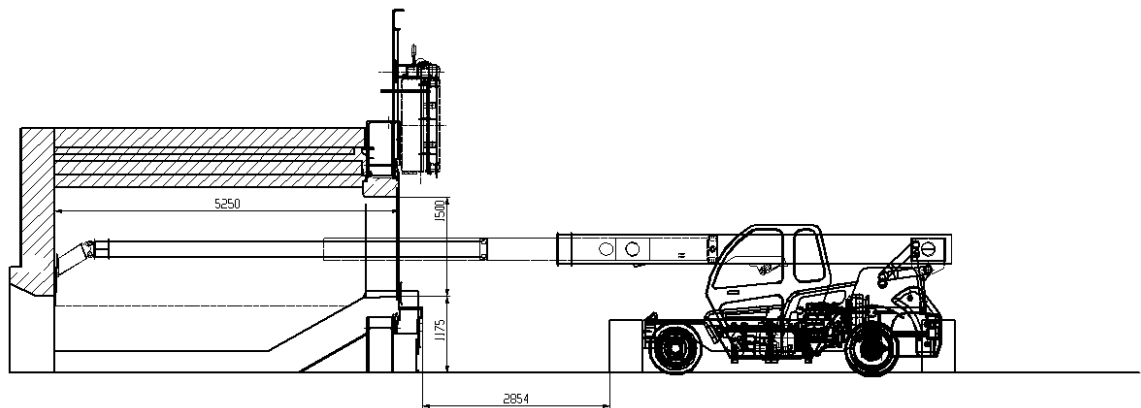
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二、 工况示意图:

Working demonstrating:

浮渣清理工况 (skimming)

Scum removing working environment



平伸最长状态: 离炉门距离 2854mm

Max horizontal reach status: 2854mm distance to the furnace door

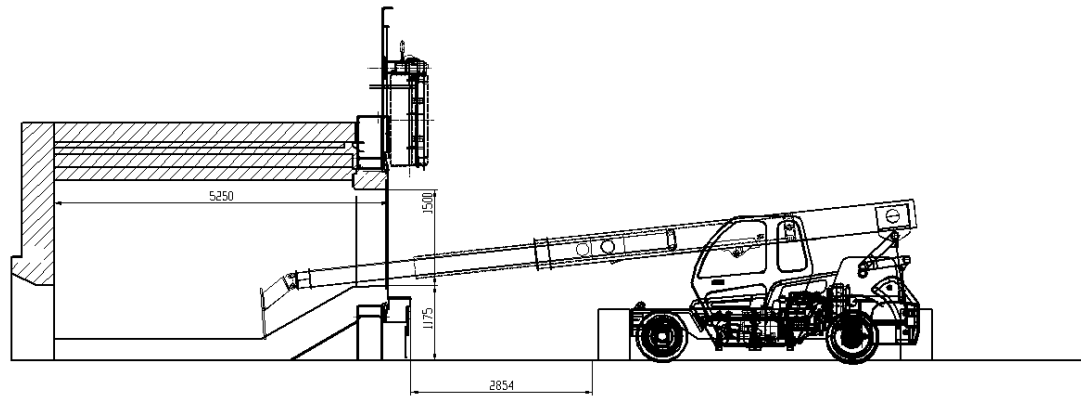
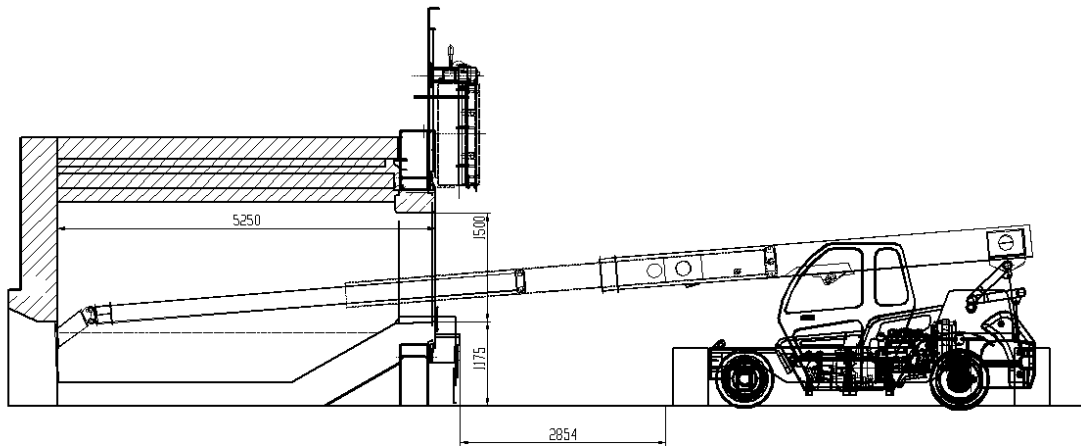
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清炉工况 (slagging)

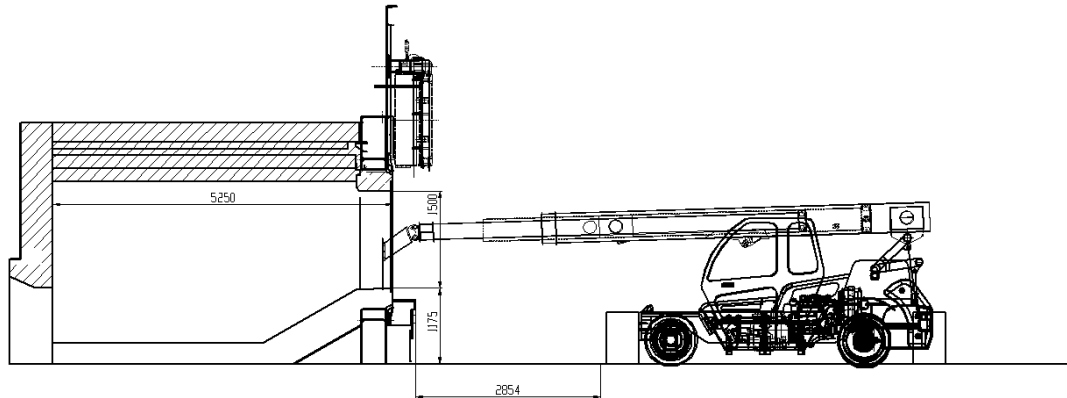
Slagging working environment



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清炉作业时，炉膛页面以下区域无死角，同时扒渣板侧面可以用于侧面炉壁的清
理。

When slagging, there is not die corner under hearth page zone, at the same time the
side of the slagging plate can clear the side corner of the furnace

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设备技术规格表

Equipment technical data table

- 1、供货范围：扒渣搅拌清炉车 1 台，扒渣清炉头 1 件，一年内易损件（见备品备件清单）、专用工具 1 套。

Equipment list: Furnace-tending vehicle 1 unit, slagging plate 1pc, wearing parts within 1 year(see spare parts list), special tools 1 set

- 2、技术规格：

Technical data

项目名称 Item Name	技术规格 Technical data
1. 基本要求 Basic requirement	1.1 该装置采用当代机械制造、电气、液压等先进成熟的技术进行设计、制造，设备的各种配套应选择知名公司生产的标准件及通用件。具有高可靠性，能够连续稳定工作。 1.1 The device is designed and manufacture with the matured technology of modern machinery manufacturing, electrical and hydraulic par. The spare parts are standard and compatible parts from renowned brand. It can continue to work for a long time with high reliability. 1.2 设备的设计必须符合相应产品的设计标准及相应的国际标准，并适用中国现行标准和使用环境，要求设计合理、质量可靠、性能先进、造型美观，便于维护检修、操作方便灵活。 1.2 The design of the equipment is complied with corresponding product design standard and international standard, and it is suitable to the current standard and working environment in china. It is with Reasonable design, reliable quality, advanced performance, beautiful appearance, easy to maintain, easy to operate 1.3 设备钢板及型钢、设备选用配套设备及部件系国内、外著名品牌产品。设计和选材必须符合国家相关标准和规范。

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	1.3 The steel plate and profile steel, equipment adopt domestic and abroad renowned brand. The design and material is complied with relevant national standard and regulation 1.4 环境保护：合同设备的厂界噪声值、污染物的排放量应符合相应标准，并不超过中华人民共和国环境保护的有关规定标准。 1.4 Environment protection: The noise standard, pollution emission of the equipment on the contract is complied with relevant standard and can not exceed the relevant regulation of environment in China P.R. 1.5 安全防护：合同设备及其相关电源和控制均应配有可靠的安全装置及必要的安全保护措施，符合中华人民共和国的有关法律法规要求。 1.5 Safety protection: The equipment in the contract and relevant power and control should be equipped with relevant safety protection device and necessary safety protection measure. It should comply with relevant law and regulation of China P.R. 1.6 职业健康：合同设备的噪声值、粉尘浓度符合中华人民共和国职业健康的有关规定标准。 1.6 Profession health: The noise and dust density should be complied with relevant profession health of China P.R. 1.7 本装置所有零部件和各种仪表的计量单位应全部采用国际公制单位（SI）。 1.7 All of the spare parts and measurement unit of all kinds of meters adopt international metric unit
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3.设备工作条件 Working Enviroment	3.1 炉门口温度: $\leq 750^{\circ}\text{C}$ Temperature of furnace door 3.2 炉内温度: 铝液温度 $700\sim 750^{\circ}\text{C}$, 炉膛温度: $750\sim 850^{\circ}\text{C}$ Temperature of internal Furnace 3.3 污秽等级: III级。Pollution Grade III 3.4 使用地点车有害物质环境: 空气中含有粉尘、炭粒粉尘、氟化氢气体、沥青烟等有害物质。Vehicle Use site hazardous substances environment: The air contains dust, charcoal dust, hydrogen fluoride gas, asphalt smoke and other harmful substances. 3.5 运行方式: 全年 365 天, 每天 24 小时间断运行。间断多久? Operation Time: 365 days, 24 hours non stop continuously running 3.6 操作及控制方式: 驾驶舱内操控杆控制 Operating & Control manner: Joystick control in Cabin 3.7 具有清炉功能, 可以快速清理炉底和炉壁上的铝渣。清炉头、伸缩臂 材质: 采用耐热抗腐蚀材料制作, 并寿命保证 1 年以上, 伸缩臂应具有足够的热强度, 伸缩、进出自如。 With the function of cleaning furnace, it can quickly clean the aluminum slag on the bottom and the wall of the furnace. Material of head and telescopic arm: made of heat-resistant and anti-corrosion materials and has warranty life of over 1 year. The telescopic arm should have enough thermal strength to extend-withdraw and move in and out freely 3.8 具有扒渣及合金搅拌等功能: 可以快速对炉内铝液表面结渣进行清理。 It has functions of slag stripping and alloy stirring: It can quickly remove slag on the surface of liquid aluminum in the furnace.
4.设备主要技术参数	4.1 扒渣/清炉工作行程: 工作行程: 6500mm Boom working stroke range for slag removing : 6500mm 4.2 扒渣臂结构形式: 单臂

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	Slag arm structure: Single arm
4.3 扒渣/清炉臂垂直提升行程:	400 mm
Vertical lifting stroke of slag/removing arm	
4.4 扒渣/清炉头伸缩速度:	0-1000 mm/S (操作手柄控制调速)
Moving head extend/withdraw speed. 0-1000 mm/S(Speed controlled by Joystick control in cabin)	
4.5 最小离地间隙:	180 mm The minimum ground clearance
4.6 最大爬坡度:	10 ° Maximum gradient
4.7 最大下推力:	10KN Maximum lower thrust
4.8 最大水平推/拉力:	10KN
Maximum horizontal push/pull.	
4.9 最大行驶速度:	20KM/h
Max travelling speed	
4.10 前后轮胎:	(实心) Front /Rear tires (solid)
4.11 发动机:	1104D -44TA Perkins
Engine	
4.12 满载爬坡度:	大于 10 °
Gradient at full load: over 10 degree	
4.13 整机自重:	12000Kg
Weight of whole machine:	
4.14 整机长度	8.2m.
Overall Length	
4.15 动力形式:	柴油发动机
Engine : Diesel engine	
4.16 操作形式:	坐式自动挡
Operating: Seated, automatic gear	

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	4.17 行走驱动方式: 前驱后转向 Driving form: front wheel drive, rear wheel steering 4.18 制动方式: Brake mode: 气推油盘式制动 Pneumatic disc brake
5.设备组成	5.1 扒渣车结构主要由车体、提升构架、伸缩架体三部分组成。车体完成行走及转弯动作；提升部分完成耙杆的平行升降和下俯动作；伸缩机构完成耙头的伸出和拉回动作。 The structure of slagging truck is mainly composed of three parts: truck body, lifting structure and telescopic structure. The truck body carry out up-down movement and bend down movement of the rake rod; The telescopic mechanism carry out the stretching and pulling back of the rake head.
6. 伸缩臂功能	功能描述: Functional description 6.1 伸缩臂具有伸缩运动从而完成扒渣、搅拌和清炉动作。包括炉底及侧壁的清理。The telescopic arm has retractable motion to complete slag removing stirring and furnace cleaning. Including bottom and cleaning the side walls. 6.2 采用链条滚轮式单臂伸缩机构；以液压马达作为动力，通过链条链接拉动扒渣臂；液压马达带动链条同时滚轮进入工作状态，根据扒渣臂的工作行程需要，在链条运动时采用石墨润滑剂进行润滑，石墨润滑剂最高在1300度的高温下保证润滑效果。润滑系统可以满足高温作业条件的需要。 Adopted Chain roller type single - arm expansion mechanism: With the hydraulic motor as the power, through the chain link to pull the slag arm, The hydraulic motor drives the chain and the roller enters the working state at the same time; According to the working stroke of the slagging arm, graphite lubricant is used to lubricate the chain movement. The graphite lubricant can guarantee the lubrication effect at a maximum temperature of 1300 degrees. The lubricating system can meet the requirement of high temperature working conditions. 6.3 臂体是采用耐高温的不锈钢材质。The arm is made of high temperature resistant stainless steel.

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	6.4 发动机不工作情况下，配置应急扒渣臂收回系统。 When the engine is not working, it is equipped with an emergency recovery system of slag arm. 6.4 技术数据: <u>technical data</u> 驱动方式 Type of drive : 液压马达 Hydraulic Motor 液压马达 Brand of Hydraulic Motor: Danfoss 传动方式 Transmission Model 链条传动 chain transmission; 减速机 Speed Reduction Gear: Danfoss 制动器 Brake: 钳盘式制动 Caliper disc brake 伸缩速度: extend/withdraw speed 0~ 100mm/s 可调 Ajustable 伸缩行程: extend/withdraw stroke range 6500mm 前后推拉: front and rear driving force : 10KN 下推力: downward thrust 10KN 提升速度: Hoisting speed 大于 100mm/s, over 100m/s
7.伸缩臂结构	7.1 材料 Material: 第三节主臂及扒渣头耐热不锈钢 0CR25NI20 Stage3 of main arm and slag scraping head made of heat resistant stainless steel 7.2 伸缩导向: Telescopic guide 滚轮导向 Roller guide 7.3 润滑: lubrication 石墨 graphite 7.4 链条结构: The chain structure 链条内置传动不外露、链条维护更换方便、快捷。The inner chain is not exposed to ensure, and the maintenance and replacement of the chain is convenient and fast.
8 扒渣车平移机构	8. 1 扒渣车平移功能有一套独立的液压系统，前后各设有一组一键的升降的履带液压驱动装置，在需要平移功能时一键起升将整个车体托起，再操作一键运行液压驱动系统来实现精确的平移，满足扒渣和清炉的最佳工作

	位置。驾驶室内完成操作，操作方便。 Slagging truck horizontal moving function rely on a set of independent hydraulic system, at the front and rear each equipped with a device set of crawler hydraulic driving to controlling hoisting and falling, in one touch key device. When horizontal moving required, touch the key to lifting the whole truck body, then touch another key to operation of hydraulic drive system to realize the accurate horizontal moving, meet the best working position. The whole operation all in the cabin. 8.2 车体起升下降速度: 100mm/s (可调) Hoisting and downing speed adjustable 8.3 车体平移速度: Horizontal speed adjustable 200mm/s (可调) 8.4 车体最大离地高度: 50-60mm Ground vertical gap: 50-60 mm 8.5 平移轮传动机构: Horizontal moving wheel drive mechanism 液压马达履带传动 Hydraulic motor driving
9. 拔渣头 Slag removing head	9.1 功能描述: 通过快速定位机构与扒渣臂前端固定, 直接与铝液和铝渣接触完成扒渣、清炉和搅拌。材料: 耐热不锈钢。 Function description: through the quick positioning mechanism and the front end of the slag picker arm fixed, directly contact with aluminum liquid and aluminum slag to complete the slag picker, furnace cleaning and stirring. Material: heat resistant stainless steel.
10. 发动机 Engine	10.1 功能描述: supply power 提供扒渣车的所有动力 10.2 生产厂家: manufacturer Perkins 帕金斯发动机 10.3 性能参数: Data 发动机型号: Model 1104D -44TA Perkins 额定功率 Power capacity: kw/rpm: 74/2200 油箱容积: Fuel tank capacity 230L
11. 驱动桥 Drive axle	11.1 主传动型式: 螺旋伞齿轮一级减速 Main drive type: Helical bevel gear

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	first reduction 11.2 轮边减速型式: 一级行星减速 Wheel side reduction: First stage planetary reduction
12.转向系统 steering system	12.1 转向器类型: 全液压转向系统 Steering type: Full hydraulic steering system
13.驾驶室	13.1 操作室内设置空调, 保证操作工有良好的操作环境, 使扒渣视线处于最佳角度。 The operating room is equipped with air conditioning to ensure the operator has a good operating environment, so that the slag picking visual is at the best angle. 13.2 扒渣操作系统为多功能操作杆, 一名操作员即可以完成所有扒渣操作, 驾驶座附带减震装置。 The slag removal operating system rely on a multi-function operating joystick. One operator can complete all the slag removal operations, and the driver seat is equipped with damping device. 13.3 驾驶室挡风玻璃采用钢化玻璃。 The windshield of the cab is made of tempered glass
14. 可视影像雷达 Visual imaging radar	14.1 配置 2 个摄像头: 倒车 1 个, 伸缩臂外侧 1 个, 画面自动切换, 配置 3 点测距雷达。 Equipped with 2 cameras: 1 astern, 1 outside the telescopic arm, automatic picture switching, equipped with 3 point range radar.
15.电控系统 Electronic control system	15.1 系统完整、安全可靠; Complete system, safe and reliable; 15.2 电气设备保护设施齐备; Complete electrical equipment protection facilities; 15.3 设备旁的电气接线盒封闭严密; The electrical junction box next to the equipment is tightly closed 15.4 减速机选用意大利 RR 品牌; The speed reducer is Italian RR brand

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	15.5 具备系统自检、报警功能; It has the function of system self-check and alarm
16. 液压系统 Hydraulic System	功能描述: 为扒渣车液压执行元件提供控制及动力 Function description: provide control and power for the hydraulic actuator of slag truck. 液压压力: The hydraulic pressure 16MPa 油箱容积: <u>fuel tank capacity</u> 230L 液压油型号 Hydraulic oil type 抗磨液压油 Anti-wear hydraulic oil 46# 油冷却装置: 风冷 Oil cooling device: air cooling 控制方式 control model: 先导液压控制 Lead hydraulic control 控制阀 Control valve: Danfoss 优先阀 Priority valve:: Danfoss 多路阀 Multi-way valve: Danfoss 转向器 Steering gear Danfoss
17. 执行管理体系 Adopted Executive management system	环境管理体系认证 Environmental Management System Certification (GB/T 24001-2004/iso:14001 2007) 职业健康安全管理体系认证 Occupational health and safety management system certification (GB/T 20081-2011 OH SAS 18001: 2007IDR) 质量管理体系认证 Quality management system certification (GB/T (GB/T 19001-2008/iso 9001:2008)

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