



# 自上料搅拌车 产品手册

SELF-LOADING CONCRETE MIXER PRODUCT MANUAL

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## 1. 用户须知

### User Instructions

- 用户在购机之时，要领取说明书，本机合格证、保修卡；

Upon purchasing the machine, the user shall collect the instruction manual, product certificate and warranty card of the equipment.

- 驾驶员在操作本机前，必须详细阅读使用说明书，应按说明书中的要求进行操作、调试和保养。

Before operating the machine, the driver shall read the operation manual thoroughly and perform operation, commissioning and maintenance in accordance with the specified requirements.

- 本机的液压系统不准随意调整压力；

The pressure of the hydraulic system of this machine shall not be adjusted arbitrarily.

- 保修期从购机之日起 12 个月。无产品合格证、保修卡、电器件、易损件，以及因使用不当、人为损坏造成的故障不在保修范围之内。轮胎在保修期内出现起包现象给予三包，其它情况不在保修范围之内。因缺黄油造成的损失不予三包。

The warranty period is 12 months from the date of purchase. Faults without a valid product certificate or warranty card, damage to electrical components and wearing parts, as well as failures caused by improper use or artificial damage are not covered by the warranty. Tire bulging occurring within the warranty period is covered by the three guarantee service; other tire problems are excluded from warranty coverage. Losses caused by insufficient grease lubrication shall not be covered by the three guarantee service.

- 本机出现机械故障时，用户应马上把本机型号，出厂编号，购买日期按保修卡的电话通知经销商。

In case of any mechanical failure, the user shall immediately contact the dealer via the phone number on the warranty card, and provide the machine model, factory serial number and purchase date.

## 2. 安全注意事项

### Safety Precautions

- 严禁超载！超载将导致不可预见的安全事故。

Overloading is strictly prohibited! Overloading may cause unforeseen safety accidents.

- 驾驶员及有关人员在使用搅拌车之前，必须仔细地阅读使用维护说明书或操作维护保养手册，按规定的

事项去做。否则会带来严重后果和不必要的损失。

Before using the mixer truck, the driver and relevant personnel must carefully read the Operation & Maintenance Manual and comply with all regulations. Failure to do so will result in serious consequences and unnecessary losses.

- 驾驶员穿戴应符合安全要求，并穿戴必要的防护设施。

The driver shall wear work attire complying with safety standards and necessary protective equipment.

- 在作业区域范围较小或危险区域，必须在其范围内或危险点设置警告标志。

Warning signs must be installed in confined working areas or at hazardous locations.

- 绝对禁止驾驶员酒后或过度疲劳驾驶作业。

It is absolutely forbidden for the driver to operate the vehicle after drinking alcohol or when suffering from excessive fatigue.

- 进入搅拌罐或进行检查之前，必须在驾驶方向盘上贴警示标签并断开电池电源。

Before entering the mixing drum or conducting inspections, attach a warning label to the steering wheel and disconnect the battery power supply.

- 要在搅拌车停稳之后，通过蹬梯扶手上下搅拌车，切勿在搅拌车作业或行走时跳上跳下。

Board and alight the truck only when it is completely stationary and only use positions with ladders and handrails. Never jump on or off the truck while it is in operation or moving.

- 维修搅拌车需要举臂时，必须固定举起的动臂，维修未完成，动臂绝对不能落下。

When lifting the boom for maintenance work, securely lock the raised boom. The boom must not be lowered before maintenance is fully completed.

- 在搅拌车行驶前，收起延伸料槽并用挂钩固定牢靠。卸料槽固定在行驶位置并锁紧手柄。

Before driving, retract the extended chute and fasten it firmly with hooks. Secure the discharge chute in the traveling position and lock the handle tightly.

- 行驶时应时刻牢记搅拌车重心高且装满混凝土的搅拌罐旋转时向右偏心。车辆向左转弯时应比向右转时更当心，在运输混凝土时严禁搅拌罐转速超过 10 转 / 分钟。

Always bear in mind that the mixer truck has a high center of gravity, and the fully loaded rotating mixing drum has a rightward eccentricity. Exercise greater caution when turning left than turning right. The rotating speed of the mixing drum shall never exceed 10 revolutions per minute during concrete transportation.

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- 严禁靠近旋转的搅拌罐运动部件，严禁手接触旋转的滚轮及传动轴。

Keep away from all rotating moving parts of the mixing drum. Never touch the rotating rollers and drive shafts with hands.

### 3. 设备概述、主要结构及特征

## Equipment Overview, Main Structure and Features

众合鲁东自上料搅拌车，是建筑行业中的一种高效多功能的混凝土生产设备，集混凝土原料装载、搅拌和运输功能于一体，实现了从上料、加水、搅拌、卸料以及运输等混凝土生产全过程自动化，具有操作简单、快捷、生产效率高优点。可以根据用户需求加装冷暖空调、高精度电子秤、黄油机、高压洗车、双向驾驶、液压料槽、直流加油泵等。

Zhonghe Ludong self-loading concrete mixer is a highly efficient and multi-functional concrete production equipment in the construction industry. It integrates the functions of concrete raw material loading, mixing and transportation, realizing full-process automation of concrete production including feeding, water addition, mixing, discharging and transportation. It features simple operation, high speed and high production efficiency. Optional configurations such as heating and cooling air conditioner, high-precision electronic scale, grease dispenser, high-pressure washing system, dual-direction driving, hydraulic chute and DC fuel pump can be installed according to user requirements.

本车主要由底盘、发动机、液力变矩器、前后四驱桥、上料装置、进料斗、卸料斗、加长卸料斗、机架、搅拌罐、搅拌专用行星减速机、液压系统、电控系统、自动上水系统等组成，其特征如下：

The vehicle mainly consists of chassis, engine, hydraulic torque converter, front and rear 4WD axles, loading device, feed hopper, discharge hopper, extended discharge hopper, frame, mixing drum, special planetary gear reducer for mixing, hydraulic system, electric control system and automatic water supply system. Its features are as follows:

- 行走系统由发动机通过液力变矩器、前后传动轴到前后驱动桥。采用液压转向四驱形式，大大减小转弯半径，适于工地上工作，特别是狭小空间施工。采用液力变矩器减少对发动机的冲击、延长了发动机的寿命。行走采用无级变速电控阀，操控更灵活。

The traveling system transmits power from the engine to the front and rear drive axles through the hydraulic torque converter and front/rear drive shafts. It adopts 4WD with hydraulic steering, which greatly reduces the turning radius and makes it suitable for construction sites, especially operations in

confined spaces. The hydraulic torque converter reduces impact on the engine and prolongs its service life. The traveling system is equipped with an electronically controlled stepless speed control valve for more flexible operation.

- 液压系统 5-6 方采用恒功率变量柱塞泵，1.2 - 4 方采用齿轮泵，减少发动机的功率损耗。

For the hydraulic system, constant-power variable displacement piston pumps are used for 5-6 m<sup>3</sup> models, and gear pumps for 1.2-4 m<sup>3</sup> models, reducing engine power loss.

- 搅拌罐的旋转由液压马达通过专用行星减速机带动，行星减速机的输出轴可以实现一定角度的摆动，以满足恶劣路况下搅拌罐的跳动。搅拌车的搅拌罐加有控速阀，能够精确控制搅拌罐搅拌转速。

The rotation of the mixing drum is driven by a hydraulic motor via a dedicated planetary gear reducer. The output shaft of the planetary gear reducer can swing at a certain angle to accommodate the bouncing of the mixing drum under rough road conditions. A speed control valve is installed on the mixing drum to accurately control its mixing speed.

- 干料上料，按照设计好的配比由铲臂、动臂油缸、铲斗铲料后，电子称重，自动上料。进料斗倾斜安装，确保进料流畅。用于出料的卸料槽可以旋转并通过锁紧机构固定在适当的位置。用于加长卸料槽长度的延伸料槽可折叠并放置于其固定位置，并用挂钩固定在卸料槽上。

For dry material loading, materials are scooped by the shovel arm, boom cylinder and bucket according to the designed mix ratio, then automatically loaded after electronic weighing. The feed hopper is installed at an inclined angle to ensure smooth material feeding. The discharge chute for material output can be rotated and locked in a proper position via a locking mechanism. The extended chute for lengthening the discharge chute can be folded and placed in its fixed position, then secured to the discharge chute with hooks.

- 进水系统带有定量自吸泵，由定量控制器设定实现自动定量进水。

The water supply system is equipped with a metering self-priming pump, which realizes automatic quantitative water supply as set by the metering controller.

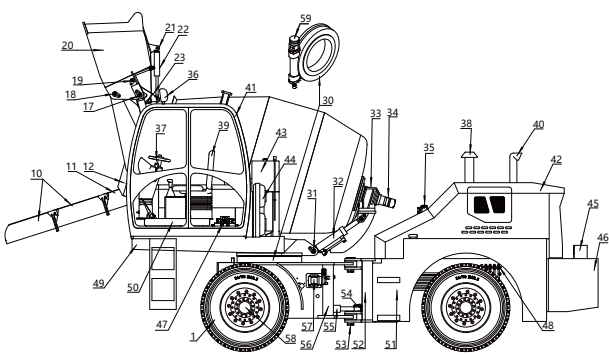
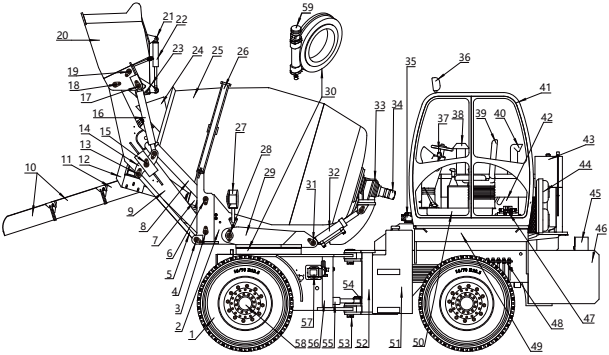
- 搅拌罐通过三点固定和支撑在底架上，前端与固定在底架上的齿轮箱输出法兰联接，该法兰可以改变倾斜角度。搅拌罐通过焊装的轨道支撑在固有锥型轴承的 2 个滚轮上。进料、搅拌和出料由压制成型的叶片系统来完成。搅拌罐正向旋转为进料、混凝土搅拌，反向旋转，在螺旋叶片的推动下，混凝土由出料口出料。

The mixing drum is fixed and supported on the chassis frame at three points. Its front end is

connected to the output flange of the gearbox mounted on the chassis frame, and the flange can adjust its inclination angle. The mixing drum is supported by two rollers with tapered bearings inside via welded tracks. Feeding, mixing and discharging

are completed by a press-formed blade system. Forward rotation of the mixing drum enables material feeding and concrete mixing; reverse rotation allows concrete to be discharged from the outlet under the push of the spiral blades.

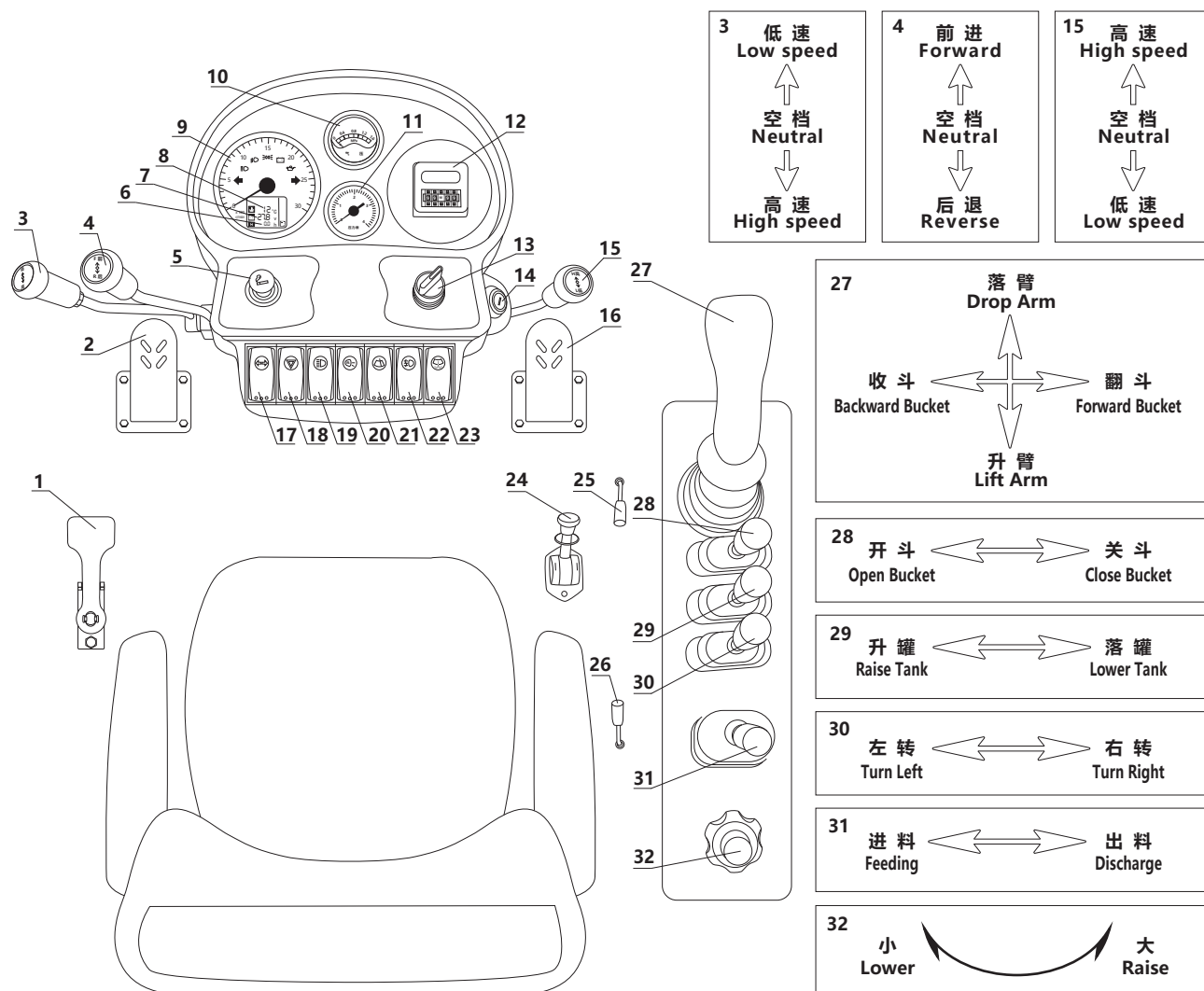
3.1 主要部件  
Main Components



| 序号 | 中文名称       | 英文名称                                          |
|----|------------|-----------------------------------------------|
| 1  | 轮胎         | Tire                                          |
| 2  | 前上架        | Front Upper Frame                             |
| 3  | 升降臂销轴      | Lifting Arm Pin                               |
| 4  | 拉杆销轴       | Pull Rod Pin                                  |
| 5  | 拉杆         | Pull Rod                                      |
| 6  | 升降臂油缸销轴    | Lifting Arm Cylinder Pin                      |
| 7  | 承重滚轮       | Load-bearing Roller                           |
| 8  | 升降臂升降油缸    | Lifting Arm Hoist Cylinder                    |
| 9  | 升降臂        | Lifting Arm                                   |
| 10 | 加长出料槽      | Extended Discharge Chute                      |
| 11 | 出料槽        | Discharge Chute                               |
| 12 | 上料斗支架      | Feeding Hopper Bracket                        |
| 13 | 摇臂销轴       | Rocking Arm Pin                               |
| 14 | 摇臂         | Rocking Arm                                   |
| 15 | 摇臂固定销轴     | Rocking Arm Fixing Pin                        |
| 16 | 翻斗油缸       | Tipper Cylinder                               |
| 17 | 翻斗油缸销轴     | Tipper Cylinder Pin                           |
| 18 | 升降臂连接上料斗销轴 | Lifting Arm to Feeding Hopper Connecting Pin  |
| 19 | 闸门销轴       | Gate Pin                                      |
| 20 | 上料斗        | Feeding Hopper                                |
| 21 | 闸门油缸销轴     | Gate Cylinder Pin                             |
| 22 | 闸门油缸       | Gate Cylinder                                 |
| 23 | 闸门         | Gate                                          |
| 24 | 进料斗        | Feed Hopper                                   |
| 25 | 搅拌罐        | Mixing Drum                                   |
| 26 | 捆带         | Binding Strap                                 |
| 27 | 前大灯        | Headlight                                     |
| 28 | 转盘连接前上架销轴  | Turntable to Front Upper Frame Connecting Pin |
| 29 | 转盘         | Turntable                                     |
| 30 | 回转支撑       | Slewing Bearing                               |

| 序号 | 中文名称      | 英文名称                                                  |
|----|-----------|-------------------------------------------------------|
| 31 | 举罐油缸销轴    | Tank Lifting Cylinder Pin                             |
| 32 | 举罐油缸      | Tank Lifting Cylinder                                 |
| 33 | 搅拌罐减速机    | Mixing Drum Reducer                                   |
| 34 | 转罐马达      | Tank Rotating Motor                                   |
| 35 | 外吸水装置     | External Water Suction Device                         |
| 36 | 棚顶灯       | Canopy Light                                          |
| 37 | 方向机       | Steering Gear                                         |
| 38 | 空气滤清器     | Air Filter                                            |
| 39 | 座椅        | Seat                                                  |
| 40 | 排气管       | Exhaust Pipe                                          |
| 41 | 驾驶室       | Cab                                                   |
| 42 | 机罩        | Hood                                                  |
| 43 | 液压油电子散热器  | Hydraulic Oil Electronic Radiator                     |
| 44 | 空调散热器     | Air Conditioner Radiator                              |
| 45 | 刹车转向倒车组合灯 | Combination Light for Braking, Steering and Reversing |
| 46 | 水箱        | Water Tank                                            |
| 47 | 电磁阀       | Solenoid Valve                                        |
| 48 | 镀锌高压油管    | Galvanized High-pressure Oil Pipe                     |
| 49 | 驾驶室支架     | Cab Bracket                                           |
| 50 | 前后驾驶室转盘   | Front and Rear Cab Turntable                          |
| 51 | 液压油箱      | Hydraulic Oil Tank                                    |
| 52 | 后架子       | Rear Frame                                            |
| 53 | 前后架连接销轴   | Front and Rear Frame Connecting Pin                   |
| 54 | 转向油缸销轴    | Steering Cylinder Pin                                 |
| 55 | 转向油缸      | Steering Cylinder                                     |
| 56 | 前下架       | Front Lower Frame                                     |
| 57 | 高压洗车泵     | High-pressure Car Washing Pump                        |
| 58 | 轮边桥       | Wheel-side Axle                                       |
| 59 | 回转马达      | Slewing Motor                                         |
|    |           |                                                       |

## 3.2 操作面板及功能 Operation Panel and Functions



| 序号 | 中文名称    | 英文名称                            |
|----|---------|---------------------------------|
| 1  | 座椅旋转定位销 | Seat rotation locking pin       |
| 2  | 刹车      | Brake (brake pedal)             |
| 3  | 高低速转换档  | High/low speed switch           |
| 4  | 行驶转换档   | Travel mode switch              |
| 5  | 点烟器     | Cigarette lighter               |
| 6  | 工作时间    | Operating hour meter            |
| 7  | 电压      | Voltage                         |
| 8  | 水温      | Water temperature               |
| 9  | 发动机转速表  | Engine tachometer               |
| 10 | 气压表     | Air pressure gauge              |
| 11 | 变矩器压力表  | Torque converter pressure gauge |
| 12 | 加水计时器   | Water filling timer             |
| 13 | 加水开关    | Water filling switch            |
| 14 | 钥匙孔     | Ignition key hole               |
| 15 | 高低速转换档  | High/low speed switch           |
| 16 | 油门      | Throttle (accelerator pedal)    |

| 序号 | 中文名称        | 英文名称                                            |
|----|-------------|-------------------------------------------------|
| 17 | 转向灯         | Turn signal lights                              |
| 18 | 应急灯         | Emergency lights                                |
| 19 | 前大灯         | Headlights                                      |
| 20 | 后大灯         | Rear lights / Reverse lights                    |
| 21 | 雨刷          | Windshield wipers                               |
| 22 | 驾驶室顶灯       | Cab dome light                                  |
| 23 | 备用          | Spare                                           |
| 24 | 手刹          | Hand brake / Parking brake                      |
| 25 | 液压卸料槽开关     | Hydraulic discharge hopper switch               |
| 26 | 双向驾驶换向阀     | Dual-drive reversing valve                      |
| 27 | 动臂、铲斗控制手柄   | Boom and bucket control lever                   |
| 28 | 铲斗仓门控制手柄    | Bucket gate control lever                       |
| 29 | 搅拌罐升降控制手柄   | Mixing tank lift control lever                  |
| 30 | 搅拌罐左右旋转控制手柄 | Mixing tank rotation control lever (left/right) |
| 31 | 进出料控制手柄     | Loading/unloading control lever                 |
| 32 | 手动油门控制手柄    | Manual throttle control lever                   |

## 4. 操作流程及规范

### Operation Procedures and Specifications

在操作之前，操作者必须仔细阅读手册，尤其是安全细节和所有的提醒、警告，并要熟练掌握操作手柄的各种功能。

Prior to operation, the operator must carefully read the manual, especially safety details and all reminders and warnings, and become proficient in the various functions of the control levers.

#### 4.1 上车前

##### Before Boarding the Vehicle

**注意：**新车第一次工作前一定要将液压系统销轴及铰接处加注润滑脂。

**Note:** Before a new vehicle is operated for the first time, all pins and hinged joints of the hydraulic system must be lubricated with grease.

- 检查轮胎螺母、发动机、变速箱各紧固螺栓及销轴是否松动；检查各锁定是否锁紧；检查轮胎外观及气压（低压胎 4 个气压，高压胎 8-10 个气压）。

Check for looseness of tire nuts, fastening bolts and pins of the engine and gearbox; check whether all locking points are securely locked; inspect tire appearance and air pressure (4 bar for low-pressure tires, 8-10 bar for high-pressure tires).

- 检查整车有无漏油、漏水、漏气现象。

Check the entire vehicle for oil leakage, water leakage or air leakage.

- 检查发动机机油（油量一定要介于机油尺的最高刻度与最低刻度之间）、冷却水（注意：发动机工作中或工作后不要打开水箱，避免发生危险）。

Check engine oil level (must be between the maximum and minimum marks on the dipstick) and cooling water (Note: Do not open the water tank while the engine is running or immediately after operation to avoid hazards).

- 检查前、后液压油箱油量（注意：液压油散热器开关上的 0，表示自动，当液压油油温达到 60℃，散热器风扇会自动开启工作状态；1 表示手动，当液压油散热器开关处于手动状态下，散热器风扇处于持续工作状态中）；正常使用，开关处于 0 位置。

Check oil levels in the front and rear hydraulic oil tanks (Note: On the hydraulic oil radiator switch, 0 stands for automatic mode: the radiator fan will start automatically when hydraulic oil temperature reaches 60℃; 1 stands for manual mode: the radiator fan runs continuously). For normal operation, set the switch to position 0.

- 检查变矩器液力传动油（发动机点火后，油位在

玻璃管 1/2 处）。

Check hydraulic transmission oil of the torque converter (after engine start, oil level should be at 1/2 of the sight glass tube).

- 检查柴油箱油量以及车载水箱水量。

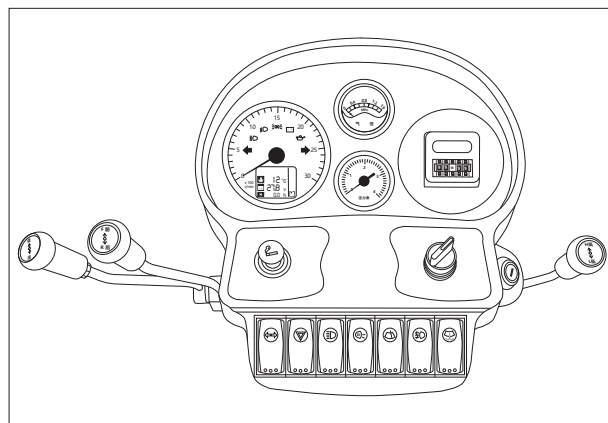
Check fuel level in the diesel tank and water level in the on-board water tank.

#### 4.2 上车后

##### After Boarding the Vehicle

发动机点火前，打开电源总开关，然后检查方向盘左边挡杆是否在空挡位置；

Before starting the engine, turn on the main power switch, then check whether the levers on the left side of the steering wheel are in neutral.

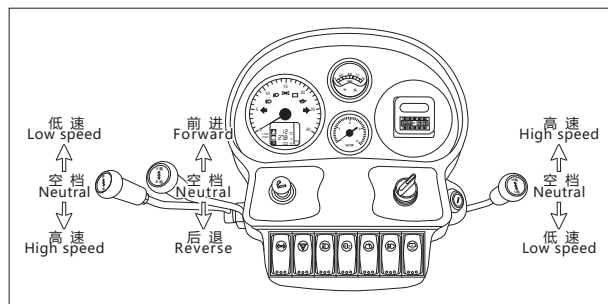


发动机点火后，检查气压（必须达到 0.4Mpa 以上，否则车辆无法行走），变矩器压力表（正常值 1.2Mpa），发动机转数、机油压力、水温、电池电压。

After starting the engine, check air pressure (must be above 0.4 MPa, otherwise the vehicle cannot move), torque converter pressure gauge (normal value 1.2 MPa), engine speed, oil pressure, water temperature and battery voltage.

#### 4.3 车辆起步

##### Vehicle Starting



方向盘右边挡杆为高、低速转换挡，分为高速挡、空挡、低速挡，搅拌车行走时用高速挡（空车行驶），工作时用低速挡。

The lever on the right side of the steering wheel

is for high/low speed shifting, with positions for high speed, neutral and low speed. Use high speed for mixer travel (empty vehicle) and low speed for operation.

**注意：**高、低速转换挡在挂挡的时候，必须要保证方向盘左边的两个挡杆处于“空挡”状态下。

**Note:** When shifting between high and low speeds, ensure both levers on the left side of the steering wheel are in neutral.

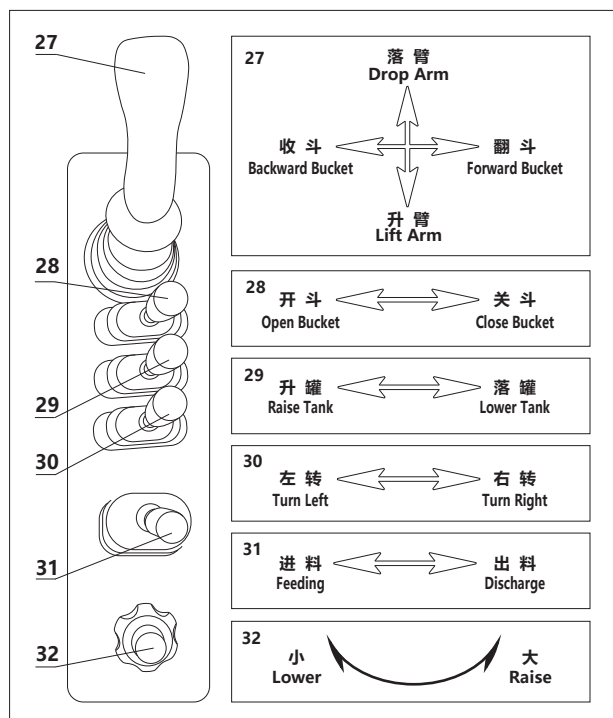
搅拌车行走时，踩下刹车，方向盘右边推高挡，然后方向盘左边推低速挡、挂前进挡起步，松手刹、脚刹，踩油门，再换高速挡。

To move the mixer, depress the brake, shift to high speed on the right lever, then select low speed and forward gear on the left levers to start; release the parking and foot brakes, depress the accelerator, then shift to high speed.

## 4.4 工作状态 Operating Condition

**注意：**环境气温低于 0℃时，搅拌车启动，必须先怠速预热 10-15 分钟（严寒 15-20 分钟），直至液压油温度上升后才可以正常工作。

**Note:** When ambient temperature is below 0℃, after starting the mixer, idle for preheating for 10-15 minutes (15-20 minutes in severe cold) until hydraulic oil temperature rises before normal operation.



自上料搅拌车上料顺序依次是：水、水泥、沙子、石子；（水泵流量 90 L/min，混凝土具体配料比例请根据施工要求自行配置）。

Loading sequence of the self-loading concrete mixer: water, cement, sand, aggregate (water pump

flow rate 90 L/min; configure specific concrete mix ratio according to construction requirements).

• 工作前，应先检查搅拌罐内是否有水，如有应排除干净；

Before operation, check for water inside the mixing drum and drain it completely if present.

• 启动发动机，方向盘左边两个挡杆在“空挡”位置的前提下，将方向盘右边高低速转换挡挡杆拨到“低速”位置（重载行驶）；

Start the engine, and with both left levers in neutral, shift the high/low speed lever on the right to low speed (for heavy-duty travel).

• 发动机怠速情况下，确认“进、出料”挡杆是否在“进料”位置，“落、升罐”挡杆是否在“落罐”位置；

With the engine idling, confirm that the feed/discharge lever is at feed position and the drum lower/raise lever is at drum lower position.

• 将方向盘左边的挡杆分别推至“低速”、“前进”，松刹车、踩油门的同时，向前推动手柄（落臂），装满料后，向后拉手柄（升臂），上料斗举升到位后，将“开、关斗”挡杆拨至“开斗”位置，打开上料斗仓门，即可实现上料过程，上料结束后将“开、关斗”挡杆拨至“关斗”位置，及时关闭上料斗仓门。

Move the left levers to low speed and forward respectively; release brakes and depress the accelerator while pushing the control lever forward (lower the arm). After loading, pull the lever backward (raise the arm). Once the loading hopper is fully raised, set the hopper open/close lever to open to start loading. Upon completion, return the lever to close and shut the hopper gate promptly.

## 4.5 加水泥 Cement Feeding

将水泥倒入料斗，然后装入搅拌罐。

Pour cement into the hopper and then feed it into the mixing drum.

**注意：**上升时不要收起铲斗，应平行上升不易撒水泥，进水泥时闸门开二分之一即可。

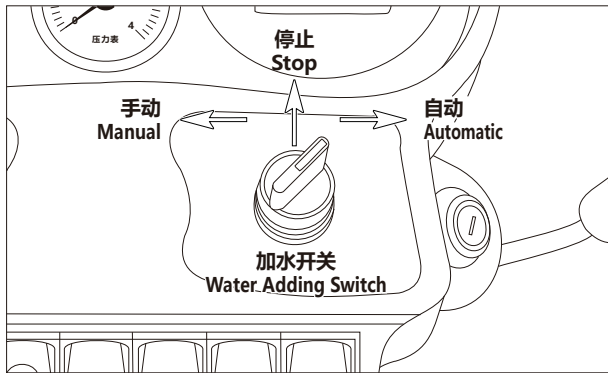
**Note:** Do not retract the bucket during lifting; lift horizontally to avoid cement spillage. Open the gate halfway when feeding cement.

## 4.6 罐体加水 Water Adding to Mixing Drum

自上料搅拌车的车载加水可分为自动加水和手动加水两种状态，如果您选择使用自动加水功能，请先设置加水时间，设置完成后，将开关旋转到自动位置即可。

On-board water addition to the mixing drum has automatic and manual modes. If using automatic mode, set the water addition time first, then turn the

switch to automatic.



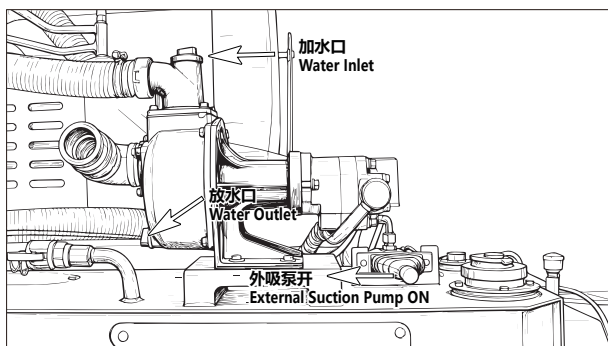
手动加水状态下, 无需设置时间, 只要开关是打开的, 系统则持续保持加水状态, 直到关闭为止。

In manual mode, no time setting is required; the system will keep adding water continuously as long as the switch is on until turned off.

自上料搅拌车外部加水, 需要接入 220V 或 380V 电源连接水泵和控制器, 定好时间即可遥控加水。

For external water supply, connect the water pump and controller to 220V or 380V power supply, set the time, and remote-controlled water addition is available.

#### 4.7 车载水箱加水 Water Adding to On-board Water Tank



首先将水泵加入水, 注意进水管灌满水直接接入水泵快接卡口, 启动车利用液压马达带动水泵向水箱吸水, 水箱排气孔向外喷水时证明已加满水箱。

First prime the water pump; ensure the inlet hose is fully filled with water and connected directly to the pump quick coupling. Start the vehicle to drive the pump via hydraulic motor to fill the tank. Water spraying from the tank vent indicates the tank is full.

**注意:** 车载水箱加水完毕后, 一定要及时关闭外吸泵开关, 否则会影响自上料搅拌车工作状态。

**Note:** After filling the on-board water tank, turn off the external suction pump switch promptly; otherwise it may affect normal operation of the mixer.

#### 4.8 卸料过程 Discharging Process

自上料搅拌车卸料时, “进、出料” 挡杆从 “进料” 位置时一定要拨到 “空挡” 位置稍作停留, 才可以拨至 “出料” 位置, 然后将 “落、升罐” 挡杆拨到 “升罐” 位置, 升高搅拌罐即可实现出料过程;

When discharging, move the feed/discharge lever from feed to neutral and hold briefly before shifting to discharge. Then set the drum lower/raise lever to drum raise and lift the mixing drum to start discharging.

出料结束后, 及时将 “进、出料” 挡杆拨至 “进料” 位置, 并落下搅拌罐。

After discharging, return the feed/discharge lever to feed and lower the mixing drum promptly.

#### 4.9 清洗过程 Cleaning Process

为了使自上料搅拌车保持良好工作状态, 延长其使用寿命。

To maintain good performance and extend the service life of the self-loading concrete mixer.

建议每天工作结束后, 对搅拌罐、出料口、出料槽以及整车外表及时清洗, 特别是与混凝土有直接接触部分, 以防止残余混凝土凝固结块。

It is recommended to clean the mixing drum, discharge outlet, discharge chute and the entire exterior after daily operation, especially parts in direct contact with concrete, to prevent residual concrete from hardening and caking.

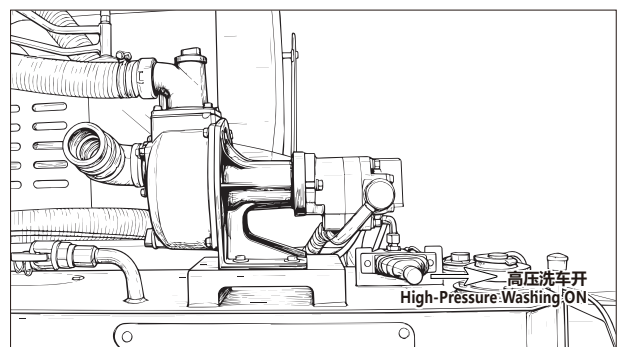
#### 操作流程 Operation Steps

- 将搅拌罐内注水, 然后将罐体充分旋转, 洗掉罐内残余的混凝土;

Fill the mixing drum with water, then rotate the drum thoroughly to wash away residual concrete.

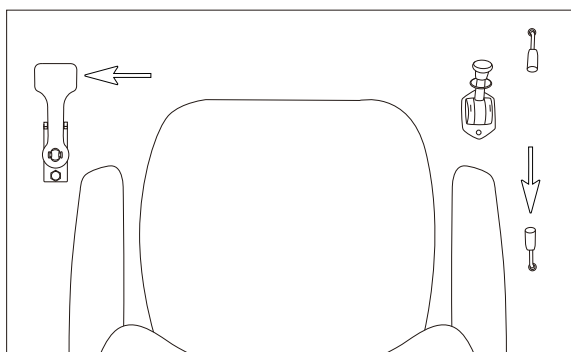
- 将水枪连接高压洗车泵, 然后打开开关即可。

Connect the water gun to the high-pressure washing pump and turn on the switch.



#### 4.10 双向驾驶功能 Bidirectional Driving Function

## 后置驾驶室版 Rear Cab Version



- 将座椅向前移到最前端，左脚踩下定位销，向左用力旋转即可。

Slide the seat fully forward, depress the locating pin with your left foot and rotate it firmly to the left.

- 将驾驶座位左下方换向阀拨到另一端，使方向盘旋转方向和车的行驶方向一致，避免产生操作危险。

Move the directional control valve at the lower left of the driver's seat to the other end, so that the steering wheel rotation direction is consistent with the vehicle travel direction to avoid operational hazards.

## 前置驾驶室版 Front Cab Version

拨动“右转”挡杆，搅拌罐及驾驶室向右 180° 旋转到位；

Move the right-turn lever to rotate the mixing drum and cab 180° to the right into position.

打开换向阀，即可实现双向驾驶功能。

Open the directional control valve to activate the Bidirectional Driving function.

复位时，拨动“左转”挡杆，搅拌罐及驾驶室向左旋转 180 度，并及时关闭换向阀。

For reset, move the left-turn lever to rotate the mixing drum and cab 180 ° to the left, then close the directional control valve promptly.

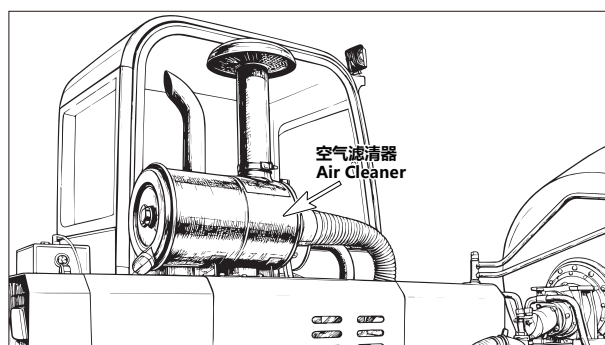
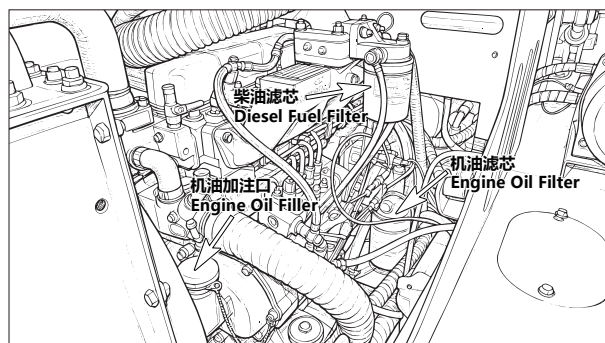
## 5. 设备保养规范 Equipment Maintenance Specifications

### 5.1 首次保养： Initial Maintenance

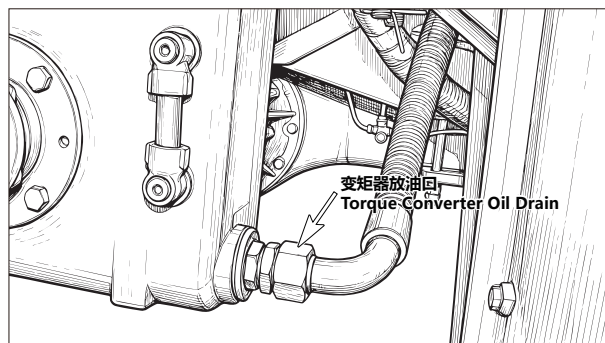
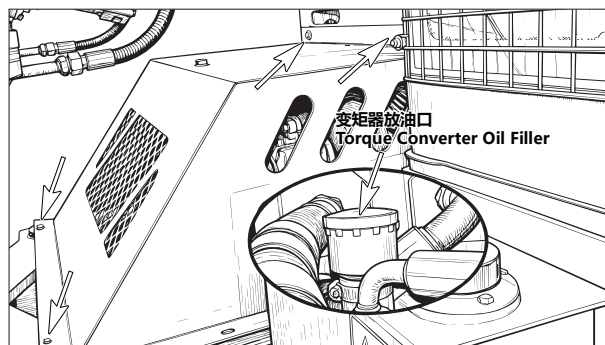
发动机工作 300 小时，需要及时更换发动机机油 (15W-40 号柴油机油 5-8kg)、机油滤芯、柴油滤芯、空气滤芯 (注意：自上料搅拌车空气滤芯至少保持每周清理一次)，以后 1000 小时更换一次即可。

After 300 hours of engine operation, replace the

engine oil (5–8 kg of 15W-40 diesel engine oil), oil filter, diesel filter and air filter in a timely manner (Note: The air filter of the self-loading concrete mixer shall be cleaned at least once a week). Replacement shall be performed every 1,000 hours thereafter.



### 5.2 变矩器保养： Torque Converter Maintenance



变矩器的放油口及过滤网在变矩器左下角，用扳手拧开螺丝，将油排放干净后，再清洗过滤网。清洗干净后，打开盖板，从变速箱上方加入 8 号液力传动油 (约

20-25kg), 油量为发动机启动后, 玻璃管的二分之一处。

The oil drain port and filter screen of the torque converter are located at its lower-left corner. Unscrew the bolts with a wrench, drain the oil completely, then clean the filter screen. After cleaning, remove the cover and add No. 8 hydraulic transmission oil (approx. 20–25 kg) from the top of the gearbox. The oil level shall be at half the height of the sight glass tube after engine startup.

### 5.3 制动系统保养 Brake System Maintenance

自上料搅拌车采用气液复合制动系统, 应定期检查刹车油, 保持刹车油油量不低于油杯标注下限。(前刹车油杯位于前桥上方, 打开固定盖板螺丝即可看到, 后刹车油杯位于驾驶座位左下角);

The self-loading concrete mixer adopts an air-hydraulic composite brake system. Check the brake fluid regularly and keep its level not lower than the lower mark on the fluid reservoir. (The front brake fluid reservoir is located above the front axle, visible after removing the cover fixing bolts; the rear brake fluid reservoir is at the lower-left corner of the driver's seat.)

在更换刹车油以及储油壶干底后添加新刹车油时, 需要将制动管路及泵中空气放净。其方法如下:

When replacing brake fluid or adding new fluid after the reservoir runs dry, bleed air completely from the brake lines and pumps as follows:

- 将制动踏板连续地踏下数次, 松开放气阀, 放出管内空气, 旋紧气阀, 松开制动踏板。如此重复数次, 直到油路内空气排完为止。

Depress the brake pedal several times continuously, loosen the bleeder valve to release air in the lines, retighten the valve, then release the pedal. Repeat this procedure until all air in the hydraulic circuit is expelled.

- 放气过程中要随着贮油壶油面降低而不断添加刹车油, 不能让储油壶干底, 全部放气完毕后, 应把刹车油加足。制动踏板的自由行程由制动总泵推杆来调整。

During bleeding, add brake fluid continuously as the fluid level in the reservoir drops to prevent it from running dry. Refill the brake fluid fully after all air is bled. The free play of the brake pedal is adjusted by the pushrod of the master cylinder.

制动踏板全行程 160mm, 自由行程为 8-10mm, 当发现制动踏板太低时应检查:

Total travel of the brake pedal is 160 mm, with free play of 8–10 mm. If the pedal feels too low, inspect the following:

- 管路是否漏油;  
Leakage in the hydraulic lines;

- 刹车片与刹车鼓的间隙是否过大;  
Excessive clearance between brake shoes and brake drums;

- 管路中是否有空气;  
Air trapped in the hydraulic lines.

每工作 200 小时, 应检查制动蹄片的磨损。当蹄片磨损到使踏板行程过大时, 必须调整蹄片和鼓之间的间隙, 其过程如下:

Inspect brake shoe wear every 200 operating hours. If shoe wear causes excessive pedal travel, adjust the clearance between shoes and drums as follows:

- 顶起需调整的车轮;  
Jack up the wheel to be adjusted;
- 在制动底板的背面找到偏心轮螺栓, 转动偏心轮螺栓, 直到蹄片与鼓接触, 然后放松偏心轮螺栓, 直到车轮自由转动并且蹄片与鼓不再磨擦时为止。

Locate the eccentric bolt on the back of the brake backing plate. Turn the bolt until the shoes contact the drum, then back it off until the wheel rotates freely without rubbing between shoes and drum.

### 5.4 液压系统保养 Hydraulic System Maintenance

液压系统是由齿轮泵、多路换向阀、优先阀、举升臂油缸、翻斗油缸、转向油缸、工作油箱及管路等组成。液压油从齿轮泵经优先阀、多路换向阀, 通过操纵相应的滑阀把油液输送到各油缸。工作装置不工作时, 油液经多路换向阀的中间油道回流液压油箱。

The hydraulic system consists of a gear pump, multiple directional control valves, priority valve, lifting arm cylinder, dump cylinder, steering cylinder, hydraulic tank and pipelines. Hydraulic oil flows from the gear pump through the priority valve and multiple directional control valves, and is delivered to each cylinder by operating the corresponding spools. When the working equipment is not in operation, the oil returns to the hydraulic tank through the central oil passage of the multiple directional control valves.

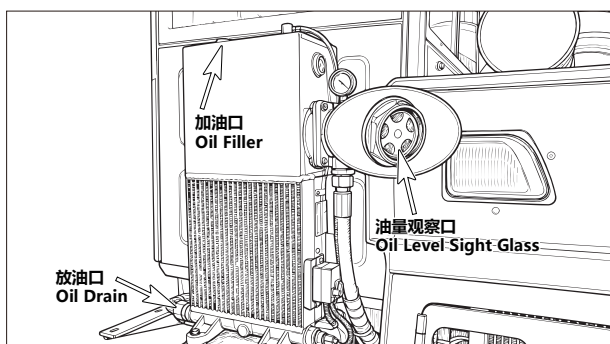
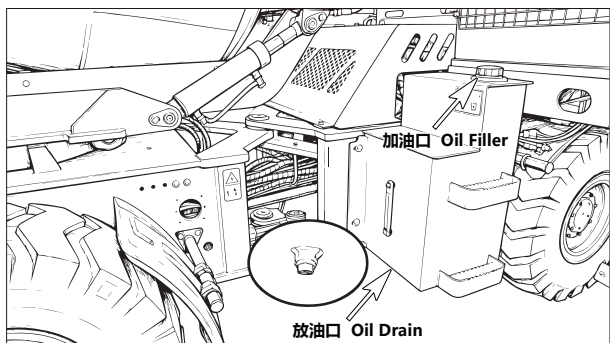
首次使用 300 小时, 排放干净液压油箱中原有脏液压油, 并用新油冲洗一遍, 再将新液压油 (L-HM46 号抗磨液压油) 加满液压油箱;

After the first 300 operating hours, drain all contaminated hydraulic oil from the tank, flush the system with new oil, then refill the tank with new L-HM46 anti-wear hydraulic oil.

再次使用 1000 小时或一年一次。前液压油箱的放油口在油箱底部, 后液压油箱的油量加至红点处。

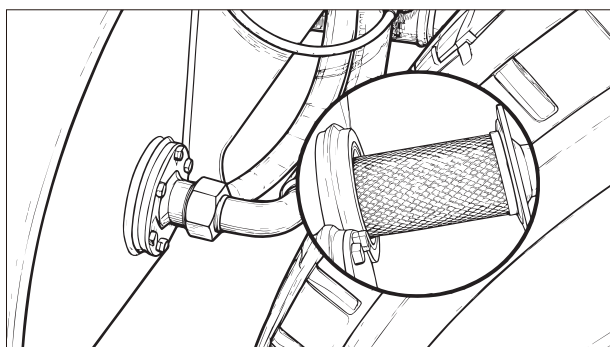
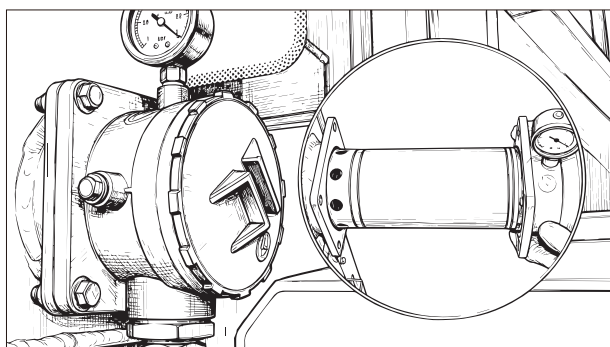
Subsequent replacement shall be performed every 1,000 operating hours or once a year, whichever comes first. The front hydraulic tank has a

drain port at the bottom; fill the rear hydraulic tank up to the red mark.



**注意：**当油温低时不宜加太满。

**Note:** Do not overfill the tank when the oil temperature is low.

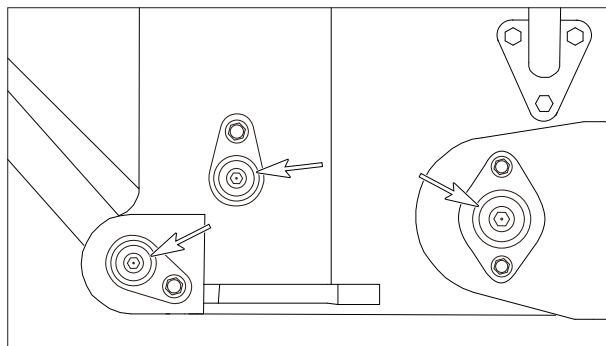


每次更换液压油时，请及时清洗过滤网。

Clean the filter screen promptly each time hydraulic oil is replaced.

## 5.5 销轴及轴套保养

### Pin and Bushing Maintenance



新车第一次工作前一定要将液压系统销轴及铰接处加注润滑脂。每天工作之前及时检查液压系统销轴及铰接处润滑脂。

Grease all pins and articulated joints of the hydraulic system before operating a new vehicle for the first time. Check grease at these locations before daily operation.

## 5.6 驱动桥保养

### Drive Axle Maintenance

主、被动齿轮已按接触区标准进行选配，可长期使用，只有在更换损坏零件或因零件磨损更换时，可进行调整。

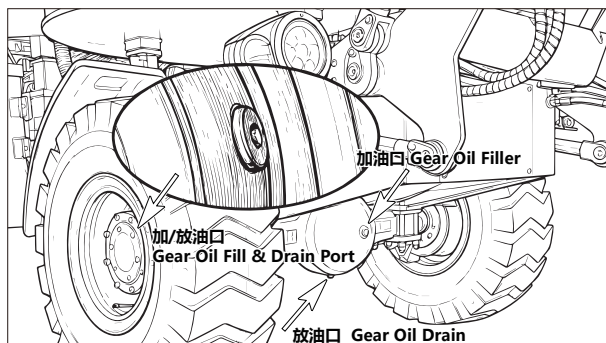
The drive and driven gears have been matched per contact pattern standards for long-term use. Adjustment is only required when replacing damaged or worn components.

● 主动齿轮的轴承间隙：由主动齿轮上的轴承内圈背后的垫座来调整，调整后应该没有间隙而又能自由转动；

Drive gear bearing clearance: Adjusted by shims behind the bearing inner race on the drive gear. After adjustment, there shall be no clearance but free rotation shall be allowed.

● 主、被动齿轮的齿侧间隙：在主动齿轮的法兰盘半径 45mm 的周围上测时，其位移（弧长）应在 0.2-0.4mm 之间；

Backlash between drive and driven gears: Measured at a radius of 45 mm on the drive gear flange, the displacement (arc length) shall be between 0.2 mm and 0.4 mm.



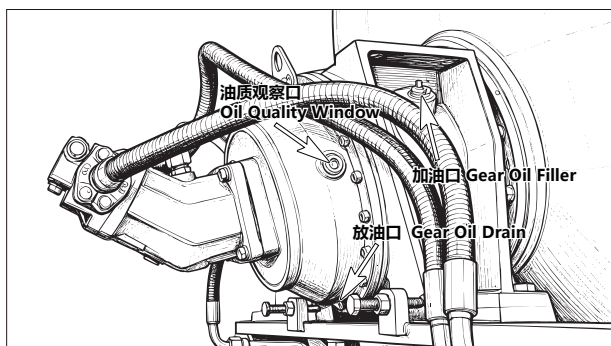
● 每工作 1000 小时更换一次齿轮油。驱动桥的中间加 4kg 齿轮油，两边各加 2kg 齿轮油。

Replace gear oil every 1,000 operating hours. Add 4 kg of gear oil to the center housing of the drive axle and 2 kg to each side housing.

## 5.7 减速机保养 Reducer Maintenance

冬季环境气温低于 0℃时，冷启动需怠速预热 5-10 分钟（严寒 15-20 分钟），避免液压油低温粘稠导致系统损伤。

When ambient temperature is below 0℃ in winter, idle the engine for 5-10 minutes for preheating (15-20 minutes in severe cold) before cold startup to avoid system damage caused by viscous hydraulic oil at low temperatures.



● 首次工作 300 小时更换一次齿轮油，并用扭矩扳手紧固法兰螺栓（扭矩 295N.m）及底座螺栓（扭矩 580N.m）；

Replace gear oil after the first 300 operating hours, and tighten flange bolts (torque: 295 N · m) and base bolts (torque: 580 N · m) with a torque wrench.

● 再次工作 1000 小时或满一年时（以先到者为准），进行第二次更换齿轮油。

Perform the second gear oil replacement after another 1,000 operating hours or one year, whichever comes first.

● 换油时，应确保系统管路封闭，仅需排空减速机壳体内旧油，并打开泵、马达壳体泄油口放油。随后，将新油品倒入油箱，注意排空系统中的空气。

During oil change, ensure all system lines are closed. Drain only the old oil from the reducer housing and open the drain ports on pump and motor housings. Then pour new oil into the tank and bleed air from the system.

● 严禁混用不同品牌的油品。

Mixing oil products of different brands is strictly prohibited.

## 5.8 关键部件紧固检查：

## Fastening Inspection of Key Components

- 变矩器固定螺栓  
Torque converter mounting bolts
- 传动轴连接螺栓  
Drive shaft connecting bolts
- 减速机与罐体连接螺栓  
Reducer-to-drum connecting bolts
- 水箱底座固定螺栓  
Water tank base mounting bolts
- 泵固定螺栓  
Pump mounting bolts
- 罐体与车架固定螺栓  
Drum-to-frame mounting bolts

本搅拌车在出厂前各部位均已调整至最佳状态，客户在使用新车时无需调整。待工作一段时间后一些部位可作适当的调整，具体调整方法如下：

All parts of this mixer have been adjusted to optimal conditions before delivery; no adjustment is needed for a new vehicle. Proper adjustments may be made after a period of operation, with specific methods as follows:

## 5.9 离合器调整 Clutch Adjustment

- 离合器踏板自由行程的调整  
Adjustment of Clutch Pedal Free Play

为了确保离合器在传递动力时不打滑，离合器分离轴承和分离杆之间应保持一定的间隙。就离合器踏板而言，自由行程距离应为 25-30mm。在操作过程中，由于摩擦片的磨损，分离杆与分离轴承之间的间隙会逐渐减小甚至消失。因此，必须定期检查和调整踏板的自由行程。

To ensure no slippage during power transmission, a certain clearance must be maintained between the clutch release bearing and release forks. The free play of the clutch pedal shall be 25-30 mm. During operation, this clearance gradually decreases or disappears due to friction disc wear. Therefore, pedal free play must be inspected and adjusted regularly.

自由行程的调整是通过改变离合器杆的长度，延长离合器杆，行程减小，缩短离合器杆，行程增大来实现的。

Free play is adjusted by changing the length of the clutch rod: lengthening the rod reduces free play, while shortening it increases free play.

- 离合器分离杆位置的调整  
Adjustment of Clutch Release Fork Position

离合器两个分离杆的端面应在同一平面上，且彼此之间的差异不应超过 0.15mm。通过转动调整螺栓进行调整。

The end faces of the two clutch release forks shall lie on the same plane, with a deviation not exceeding 0.15 mm. Adjustment is made by turning the adjusting bolts.

#### ● 搅拌车电器设备

#### Electrical Equipment of the Mixer Truck

自动上料搅拌车电器系统采用直流电压 24 伏，负极接地制

The electrical system of the self-loading concrete mixer uses a 24 V DC supply with negative earthing.

## 6. 电器设备规范 Electrical Equipment Specifications

### 6.1 蓄电池使用规范

#### Battery Operation Specifications

蓄电池功用上是发动机起动时，供电给起动电动机。当发动机正常工作时，若发电机的电压低于蓄电池的电压时，则供电给用电设备；若发电机的电压高于蓄电池的电压时，则发电机向蓄电池充电，以储存一部分电能。

The battery supplies power to the starter motor for engine starting. During normal engine operation, it powers electrical equipment if the generator voltage is lower than battery voltage; when generator voltage is higher, the generator charges the battery to store electrical energy.

在使用中应注意：

Precautions during use:

● 经常保持充电状态，如长期不用，每月最少应充电一次。

Keep the battery in a charged state. If unused for a long time, recharge it at least once a month.

● 经常检查电解液液面高度，液面应高出极板 10-15 毫米，不足时可添加蒸馏水。如确因电解液漏洒损失时，则应加比重为 1.28 的电解液。

Check electrolyte level frequently; the level shall be 10-15 mm above the plates. Add distilled water if low. If electrolyte is lost due to leakage, add electrolyte with a specific gravity of 1.28.

● 应经常检查蓄电池通气孔是否堵塞，如若堵塞，应及时清除外部泥土和脏物，擦净溢出的电解液，并在电极上涂以薄层锂基润滑脂以防腐蚀。

Inspect the battery vents for clogging regularly. If blocked, remove external dirt and debris promptly, wipe off spilled electrolyte, and apply a thin layer of

lithium-based grease on terminals to prevent corrosion.

● 不得频繁使用起动机。

Do not operate the starter motor frequently.

● 蓄电池应紧固，以免受震动而损坏。

Secure the battery firmly to avoid damage from vibration.

## 6.2 发电机与调节器

### Generator and Regulator

#### 6.2.1 硅整流发电机

##### Silicon Rectifier Generator

发电机上标有 "+"、"F" 两个接线柱和一个 "-" 接地钉。它们应与继电器调节器上标有相同文字的接线柱连接。发电机两端用螺栓固定在发电机支架上；另有一个电机撑脚，用来调整三角皮带张紧度。

The generator is equipped with two terminals marked "+" and "F" and one negative earthing post marked "-". These shall be connected to correspondingly marked terminals on the relay regulator. The generator is bolted to the bracket at both ends; an adjustable support leg is provided to adjust V-belt tension.

#### 6.2.2 继电器调节器

##### Relay Regulator

继电器调节器是由截流器、调压器、限流器三个装置组成。继电器调节器上标有 "+"、"F" 二个接线柱和一个 "-" 接地螺钉，"+"、"F" 接线柱应与发电机上相应的接线柱相连。

The relay regulator consists of a current cutout, voltage regulator and current limiter. It has two terminals marked "+" and "F" and one negative earthing screw. Terminals "+" and "F" shall be connected to corresponding terminals on the generator.

蓄电池的 "+" 接线柱与电流表 "-" 极相连，电流表的 "+" 极接线柱与电锁的一挡相连。

The positive terminal of the battery connects to the negative terminal of the ammeter, and the positive terminal of the ammeter connects to one position of the ignition switch.

发现调节器工作不正常或使用 1000 小时后，需要有熟练的电工进行调整。

If the regulator malfunctions or after 1,000 operating hours, adjustment must be performed by a skilled electrician.

## 7. 作业补充注意事项

### Supplementary Operating

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## Notes

- 进、出料状态切换时，从进料到出料过程需在发动机怠速下操作，必须在“空挡”位置稍作停留，然后方可拨至下一个操作位置，避免对减速机造成损害。

When switching between feeding and discharging, the operation shall be performed at engine idle speed. Pause briefly at the neutral position before shifting to the next position to avoid damage to the reducer.

- 出料前，在发动机怠速的情况下，检查“进、出料”挡杆是否在“出料”的位置。油门控制手柄可适当上抬，提高发动机转速，使搅拌罐转速增加。行驶过程出料时不可使用油门。

Before discharging, check that the feed/discharge lever is in the discharge position at idle speed. The throttle lever may be raised slightly to increase engine and drum speed. Do not use the manual throttle while discharging during travel.

- 混凝土在未添加缓凝剂的情况下，通常会在 1 小时左右进入初凝状态，这时再进行混凝土浇注施工将影响混凝土的工程质量。因此搅拌车运送混凝土的输送半径一般控制在 1 小时以内。从出料到卸料完毕的最长时间为 90 分钟。

Without retarder, concrete normally begins initial setting in approximately one hour, which will impair construction quality if placed afterward. Therefore, the concrete delivery radius of the mixer is generally limited to within one hour. The maximum duration from batching to complete discharge is 90 minutes.

- 搅拌车行驶时，“进、出料”挡杆应处于“进料”状态。

The feed/discharge lever shall be in the feed position when the mixer is traveling.

- 工作完毕后，应及时对搅拌罐内部进行冲洗。如不及时冲洗，会造成搅拌罐内混凝土的粘结，使装载量减少，以及进料不畅，请务必注意！

Flush the inside of the mixing drum promptly after operation. Failure to do so will cause concrete buildup, reducing loading capacity and obstructing material feeding. Strict attention is required!

- 在冬季车辆停用时，请将水箱、管路和水枪中的余水全部排净，以免冻坏供水系统零部件，造成不必要的损失。

When the vehicle is parked in winter, drain all residual water from the water tank, pipelines and water gun to prevent freezing damage to water supply components and unnecessary losses.

### ● 一般作业时的重要注意事项

#### Important General Operating Notes

在进行出料作业，需要离开驾驶室时，必须完全锁定制动器，然后再进行作业。

When leaving the cab for discharging operations, fully apply the brakes before starting work.

使用加长卸料槽时，请切勿将手伸到卸料槽和加长卸料槽的连接部分；卸料结束后，必须及时拆除加长卸料槽。

When using an extended discharge chute, never place hands near the joint between the main chute and extension. Remove the extension chute promptly after discharging.

在搅拌罐运转时，请不要接近上料斗和搅拌罐出料口。

Do not approach the loading hopper or drum discharge opening while the mixing drum is rotating.

进行加油、加润滑油等作业时，为防止发生卷入搅拌罐驱动部件（托轮、驱动轴）及其它运转部件的危险，必须将发动机熄火，钥匙拔出后，一定由操作者携带，以免发生人身危险事故。

During refueling and lubrication, shut off the engine and remove the key (kept by the operator) to prevent entanglement hazards with rotating drum drive components (support rollers, drive shafts) and other moving parts.

## 8. 长期不用时应采用的措施 Measures for Long-Term Storage

自上料搅拌车如果长期不用，应存放于通风、防潮的车库内，不宜露天存放。同时还应将冷却液和燃油放尽，切断电源。

If the self-loading concrete mixer is to be out of service for a long time, store it in a ventilated, moisture-proof garage; outdoor storage is not recommended. Drain all coolant and fuel and disconnect the power supply.

如属短期在露天存放，应用帆布加以遮盖，特别是料斗，出料口。避免雨天，雨水进入搅拌罐内会造成大量积水，以及轮胎停车时负荷量的增大。

For short-term outdoor storage, cover the vehicle with canvas, especially the hopper and discharge opening, to prevent rainwater accumulation inside the drum and increased tire loading during parking.

由于搅拌罐、进料斗、卸料槽等部件都是易损件，长期与砂石接触，停用后钢板表面会锈蚀，还需进行油漆类表面喷涂。

Since the mixing drum, feed hopper, discharge chute and other components are wearing parts that contact aggregates for long periods, their steel surfaces will corrode during storage; surface painting

is required.

## 9. 常见故障及处理方法

### Common Faults and Troubleshooting Methods

#### 9.1 搅拌罐不旋转

##### Mixing Drum Fails to Rotate

**9.1.1 检查液压油油位和油品质，液压油不足时，补足液压油直至油位计中位。液压油很脏时，更换液压油。**

Check hydraulic oil level and quality, If hydraulic oil is insufficient, top up to the middle level of the oil level gauge. If hydraulic oil is contaminated, replace it.

**9.1.2 检查进油球阀是否被关闭，如关闭，开启球阀并用限位螺栓限位**

Check whether the oil inlet ball valve is closed; if closed, open it and secure with a limit bolt.

**9.1.3 检查滤清器是否已堵塞，若是则更换滤芯**

Check whether the filter is clogged; if so, replace the filter element.

**9.1.4 将泵控制手柄向前或向后推动一段距离后，查看泵控制阀上控制柄是否相应的变更了角度。**

Push the pump control lever forward or backward for a certain distance, then check whether the control handle on the pump control valve rotates accordingly.

**如有相应变更角度，则转入 9.1.5 步骤**

**If the angle changes accordingly, proceed to Step 9.1.5.**

**未变更角度则检查如下步骤**

**If no angle change occurs, inspect as follows:**

- 检查泵控制软轴是否与控制手柄有效连接

Check whether the pump control flexible shaft is properly connected to the control lever.

- 检查泵控制软轴是否固定牢固在软轴座上

Check whether the pump control flexible shaft is securely fastened to the flexible shaft bracket.

- 检查软轴座是否固定牢固在底架上，刚度是否足够

Check whether the flexible shaft bracket is firmly fixed to the chassis and has sufficient rigidity.

- 检查控制手柄变动角度，软轴是否伸缩。如不伸缩则软轴已断，更换软轴。

Check whether the flexible shaft extends or retracts when the control lever angle changes. If no movement occurs, the flexible shaft is broken and

must be replaced.

- 检查软轴是否与控制器连接牢靠及软轴后端是否固定牢靠

Check whether the flexible shaft is securely connected to the controller and its rear end is firmly fixed.

- 检查控制器是否已损坏，损坏则更换控制器

Check whether the controller is damaged; if damaged, replace the controller.

**注意：**驾驶室内控制器与后控制器并联，如后控制器因配件损坏问题失效，则可用驾驶室控制器暂时代用，直至损坏配件更换。如果后控制器或驾驶室控制器皆因配件的损坏而失效，在当有混凝土在搅拌罐中时，司机可用液压泵上的控制阀的控制柄来强制卸料，注意使用此控制柄只能慢慢的改变角度，且角度不宜过大，（大角度改变时，罐的转速将有可能很快，不安全）

**Note:** The cab controller and rear controller are connected in parallel. If the rear controller fails due to damaged parts, the cab controller may be used temporarily until the damaged parts are replaced. If both controllers fail, when concrete remains in the drum, the operator may use the control handle on the hydraulic pump control valve to force discharge. Note that this handle shall only adjust the angle slowly and not excessively, as a large angle change may cause excessively fast and unsafe drum rotation.

**9.1.5 检查泵控制阀用手小角度拨动控制阀控制柄，查看罐体是否旋转，如旋转，则转入 9.1.6 步骤，如不旋转，则检查如下步骤**

Check the pump control valve: manually toggle the control handle at a small angle and check whether the drum rotates. If it rotates, proceed to Step 9.1.6; if not, inspect as follows:

- 检查控制柄与阀旋转轴是否连接牢固和一并旋转

Check whether the control handle is firmly connected to the valve shaft and rotates together.

- 从泵上拆下控制阀总成时，检查控制阀的连杆机构是否与伺服机构的连杆联接，如未联接，则联接起来，如连杆损坏，则更换连杆

When removing the control valve assembly from the pump, check whether its linkage is connected to the servo mechanism linkage. If not, reconnect; if the linkage is damaged, replace it.

- 查看控制阀上的 3 个控制油孔是否干净，如有堵塞，需用气枪冲洗干净。同时也应检查泵体上进入伺服机构的控制油孔是否堵塞。

Check whether the three control oil ports on the control valve are clean; if clogged, flush with an air gun. Also check whether the control oil ports leading to the servo mechanism on the pump body are clogged.

● 拨动控制柄，查看阀芯是否运动正常。如拨动控制柄，阀芯不运动，则阀芯断裂，更换控制器总成。

Toggle the control handle and check whether the valve core moves normally. If no movement occurs, the valve core is broken; replace the control valve assembly.

#### 9.1.6 检查泵补油压力

Check pump charge pressure

补油压力正常 (18bar)，则检查高压安全阀，如高压不足，则更换高压安全阀。

If charge pressure is normal (18 bar), check the high-pressure safety valve; if high pressure is insufficient, replace the high-pressure safety valve.

补油压力为 0，则泵输入轴或花键损坏，更换泵输入轴。

If charge pressure is 0, the pump input shaft or spline is damaged; replace the pump input shaft.

补油压力不正常 - 检查滤清器

If charge pressure is abnormal, check the filter.

搅拌罐只能向一个方向旋转

Mixing Drum Rotates in One Direction Only

#### 9.1.7 检查控制器和控制软轴

Check the controller and control flexible shaft

将控制手柄向不旋转的方向推到最大行程。查看控制阀上控制柄是否相应变动控制角度。

Push the control lever to full travel in the non-rotating direction and check whether the control handle on the control valve changes angle accordingly.

相应角度变化，但罐体不旋转，则转入 9.2.2 步骤

If angle changes but the drum does not rotate, proceed to Step 9.2.2.

● 测量下当前软轴行程尺寸，然后将控制手柄推到中停位置，再次记下当前软轴的行程尺寸。将控制软轴与控制阀控制柄相连接的万向球头脱离，然后将控制手柄向旋转方向推动到最大行程处，记录下当前行程尺寸。以中停位置为基准 0 行程，并确认最大不转方向和最大旋转方向，软轴的行程是否伸（缩）向相反行程方向。

Measure the current flexible shaft travel, push the lever to neutral and record again. Disconnect the universal ball joint between the flexible shaft and control valve handle, push the lever to full travel in the rotating direction and record. Using neutral as 0 travel, verify whether the flexible shaft extends/retracts in opposite directions between maximum non-rotating and rotating positions.

● 如以中停为基准 0 行程，软轴有相反行程方向，则该软轴已损坏，更换软轴。如以中停为基准 0 行程，软轴无相反行程方向，则拆开控制器，查看控制器是否

损坏，如无损坏，因控制器行程出现单向，则需要重新调整控制器行程，直至以中停为参照，向不同方向推动时，软轴伸缩双向行程尺寸相近，调整好后再次联接万向球头

If the flexible shaft moves in opposite directions from neutral, it is damaged and must be replaced. If no opposite movement occurs, open the controller and inspect for damage. If undamaged but with one-sided travel, readjust the controller travel until bidirectional extension/retraction distances are similar from neutral, then reconnect the universal ball joint.

#### 9.1.8 检查控制阀内外联接（脱离控制软轴与控制柄相联的万向球头）

Check internal and external connections of the control valve (disconnect the universal ball joint between flexible shaft and control handle)

##### a. 检查控制阀输入轴是否磨损而导致单边失效

Check whether the control valve input shaft is worn causing one-sided failure.

##### b. 控制阀总成拆卸下，检查内部连杆机构是否损坏

Remove the control valve assembly and check whether the internal linkage is damaged.

c. 检查控制阀上控制油孔是否有因液压油脏而堵塞，如油脏堵塞控制油孔需用压力气枪清洗干净。

Check whether control oil ports on the valve are clogged by contaminated oil; if so, clean with a pressure air gun.

d. 检查泵主体壳上到伺服机构的控制油孔是否因脏油而堵塞，如被堵塞，用压力气枪清洗干净。

Check whether control oil ports from the pump housing to the servo mechanism are clogged by contaminated oil; if so, clean with a pressure air gun.

检查补油单向阀，确认是否被堵塞或损坏，如堵塞需拆下在干净的液压油中清洗，如损坏则更换。

Check the charge check valve for clogging or damage. If clogged, remove and clean in clean hydraulic oil; if damaged, replace.

#### 9.1.9 检查不旋转方向相对应安全阀及平衡梭阀。

Check the safety valve and balance shuttle valve corresponding to the non-rotating direction.

测试不旋转方向相应的高压压力，如无高压则拆下相应的安全阀检查是否被堵塞或损坏，如被堵塞，则清洗，如损坏则更换。

Test high pressure in the non-rotating direction. If no high pressure exists, remove the corresponding safety valve and inspect for clogging or damage; clean if clogged, replace if damaged.

检查梭阀，查看相应方向弹簧是否损坏，而导致单

边直接泄压，更换弹簧或增加垫块。

Check the shuttle valve for damaged springs causing one-sided direct pressure relief; replace springs or add shims.

## 9.2 系统反应迟缓 Slow System Response

9.2.1 检查取力器转速（可由电发动机转速折算）至少 500-600 r/min

Check PTO speed (convertible from engine speed) – minimum 500–600 r/min.

9.2.2 检查液压油油位及油品质

Check hydraulic oil level and quality

液压油不足，补充液压油直至油位计中位

If insufficient, top up to the middle level of the oil level gauge.

液压油很脏，更换液压油

If contaminated, replace hydraulic oil.

**注意：**9.2.3、9.2.4 两步骤只能是受过初步液压系统专业维修训练的技工方能进行。

**Note:** Steps 2.3 and 2.4 shall only be performed by technicians with basic hydraulic system maintenance training.

9.2.3 检查滤清器

Check the filter

如滤清器真空表指针指向或超过 - 2.5psi (1.27cm of Hg) 则更换滤芯。

If the filter vacuum gauge pointer reaches or exceeds -2.5 psi (1.27 cm Hg), replace the filter element.

9.2.4 检查液压泵补油压力

Check hydraulic pump charge pressure.

9.2.5 检查马达的回油背压阀

Check the motor return oil back-pressure valve.

9.2.6 检查泵控制阀内外联接件

Check internal and external connectors of the pump control valve.

## 9.3 系统油温过高 Excessively High System Oil Temperature

9.3.1 检查液压油油位及油品质

Check hydraulic oil level and quality

液压油不足时，补足液压油直至油位计中位液压油很脏，则更换液压油。

If hydraulic oil is insufficient, top up to the middle

level of the oil level gauge. If contaminated, replace hydraulic oil.

9.3.2 检查进油球阀是否被关闭

Check whether the oil inlet ball valve is closed.

如被关闭，开启球阀并用限位螺栓限位。

If closed, open it and secure with a limit bolt.

9.3.3 检查滤清器是否堵塞

Check whether the filter is clogged.

查看真空表，如表针指向或超过 - 2.5psi (1.27cm of Hg) 则更换滤芯。

Check the vacuum gauge; if the pointer reaches or exceeds -2.5 psi (1.27 cm Hg), replace the filter element.

9.3.4 查看散热风扇是否旋转

Check whether the cooling fan rotates.

不旋转进入 9.3.5 步骤，如旋转则检查 9.3.6 步骤

If not rotating, proceed to Step 9.3.5; if rotating, proceed to Step 9.3.6.

9.3.5 检查散热器温控开关及电路

Check the radiator thermostatic switch and circuit.

开启手动开关，查看风扇是否旋转。

Turn on the manual switch and check whether the fan rotates.

A: 不旋转，则检查：

A: If not rotating, inspect:

a. 保险丝是否被熔断，熔断则更换保险丝 (15A).

Check whether the fuse is blown; if so, replace the 15A fuse.

b. 检查线路是否接触不良，线路是否被扯断（接触不良，则重新连接，线路扯断则接通）

Check for poor connections or broken wires; reconnect or repair as needed.

c. 检查开关是否损坏，损坏则更换开关

Check whether the switch is damaged; if so, replace it.

B. 旋转，则关闭手动开关检查

If rotating, turn off the manual switch and inspect:

a. 连接温控开关的线路是否接触不良或线路被扯断（接触不良，则重新连接，线路扯断则接通）

Check for poor connections or broken wires to the thermostatic switch; reconnect or repair as needed.

b. 将温控开关触头置于 60°C 以上的热水中，查看散热器风扇是否旋转，如不旋转，更换温控开关。

Immerse the thermostatic switch contact in hot water above 60°C and check fan operation; if no rotation, replace the thermostatic switch.

c. 检查开关是否损坏，损坏则更换开关

Check whether the switch is damaged; if so, replace it.

**注意：**因手动开关和温控开关并联控制风扇，如温控开关损坏，可用手动开关暂时控制风扇直至更换温控开关

**Note:** The manual switch and thermostatic switch control the fan in parallel. If the thermostatic switch is damaged, the manual switch may be used temporarily until replacement.

#### 9.3.6 检查补油压力和马达的壳体压力

Check charge pressure and motor housing pressure.

用压力表测试该项压力，标准压力为 18bar，如果压力过低更换补油泵或马达壳体背压阀。

Measure with a pressure gauge; standard pressure is 18 bar. If pressure is too low, replace the charge pump or motor housing back-pressure valve.

### 9.4 搅拌罐不能转动

#### Mixing Drum Fails to Rotate

- 油泵控制阀损坏

Damaged oil pump control valve.

- 检查高压溢流阀是否受堵。

Check whether the high-pressure relief valve is clogged.

- 电磁阀是否卡死。

Check whether the solenoid valve is stuck.

### 9.5 搅拌罐提速不起来

#### Mixing Drum Fails to Accelerate

- 液压油品质下降，液压油脏，吸油不足请清洗或更换液压油箱吸油滤清器。

Deteriorated or contaminated hydraulic oil and insufficient oil suction: clean or replace the hydraulic tank suction filter.

- 液压系统漏油，检测或更换密封垫或涂密封胶。

Hydraulic system leakage: inspect and replace gaskets or apply sealant.

- 油门拉线太松，或者操纵机构卡死，请检修。

Loose throttle cable or stuck control mechanism: overhaul.

- 柴油机输出功率不足。

Insufficient diesel engine output power.

- 动力输出泵或液压马达受损。

Damaged power take-off pump or hydraulic motor.

### 9.6 油泵异响

#### Abnormal Noise from Oil Pump

- 检查液压油位。从油箱或减速机上的油位计，检查是否缺油。

Check hydraulic oil level via the oil level gauge on the tank or reducer for insufficient oil.

- 检查油液是否变脏，查看负压表指针，如果压力表读数大于 0.3Mpa，请立即更换液压油及滤芯。

Check for contaminated oil using the vacuum gauge; if reading exceeds 0.3 MPa, replace hydraulic oil and filter element immediately.

- 检查系统内是否有空气。用手握住高压油管检测是否有间断的颤抖。有颤抖现象须进行放气处理。

Check for air in the system by feeling for intermittent vibration on high-pressure hoses; bleed air if vibration exists.

- 检查液压油的品质。拧开放油螺堵检查油品，是否油品变质或乳化。

Check hydraulic oil quality by removing the drain plug for deterioration or emulsification.

- 检查筒体内是否有剩料结块，进行清理处理。

Check for solidified concrete residue inside the drum and clean as needed.

- 检查油泵补油阀是否堵塞，进行清理。

Check whether the pump charge valve is clogged and clean it.

- 油泵吸空，吸油滤清器堵塞，清洗或更换油滤清器。

Pump cavitation and clogged suction filter: clean or replace the oil filter.

- 油泵里面有铁屑等杂质，清洗或检修。

Impurities such as iron chips inside the pump: clean or overhaul.

### 9.7 减速机异响

#### Abnormal Noise from Reducer

- 检查减速机油位。从减速机上的油位计。检查是否缺油。

Check reducer oil level via its oil level gauge for insufficient oil.

- 检查减速机油液是否变质，如果变质进行更换。

Check whether reducer oil is deteriorated;

replace if necessary.

- 检查减速机连接法兰处是否缺少黄油，如缺油加注黄油。

Check for insufficient grease at the reducer connecting flange; add grease if low.

- 检查减速机轴承是否损坏，发出异响为间断响声。  
Check for damaged reducer bearings indicated by intermittent noise.

- 检查连接法兰与筒体间螺栓是否松动。  
Check for loose bolts between the connecting flange and drum.

- 磨损严重，检修。  
Excessive wear: overhaul.

## 9.8 油路系统漏油 Oil Leakage in Hydraulic System

- 检查管路密封圈是否破损。  
Check for damaged pipeline seals.
- 螺纹连接部位漏油，检查是否松动，须进行紧固。  
Oil leakage at threaded connections: check for looseness and tighten.

- 油泵偏心轴处漏油，检查是否限位螺栓松动。  
Oil leakage at the pump eccentric shaft: check for loose limit bolts.

- 控制阀漏油，检查固定螺栓是否松动。  
Oil leakage at control valve: check for loose mounting bolts.

- 油泵油封漏油，进行更换。更换步骤如下：  
Oil leakage from pump oil seal: replace the oil seal using the following steps:

- a. 拧出油泵连接法兰紧固螺栓，取出垫圈。  
Remove the pump connecting flange bolts and washers.

- b. 用三爪拉马取出连接法兰。  
Remove the connecting flange using a three-jaw puller.

- c. 取出卡簧。  
Remove the circlip.

- d. 取出油泵油封安置处。  
Remove the old pump oil seal.

- e. 清洗油泵油封安置处。  
Clean the oil seal seat.

- f. 将新的油封内外圈用机油或油脂润滑后，装入。  
Lubricate the inner and outer surfaces of the

new oil seal with engine oil or grease, then install.

- g. 装入卡簧。  
Install the circlip.

- h. 转动油泵输出轴，进行磨合。  
Rotate the pump output shaft for break-in.

## 9.9 传动轴异响 Abnormal Noise from Drive Shaft

- 检查传动轴两端法兰连接螺栓是否松动，须进行紧固。

Check for loose flange bolts at both ends of the drive shaft and tighten.

- 检查花键、万向节轴是否缺油脂润滑。  
Check for insufficient grease lubrication on splines and universal joints.

- 检查十字轴承是否损坏，更换或检修。  
Check for damaged cross bearings; replace or overhaul.

- 检查花键连接部分是否磨损严重。  
Check for excessive wear at spline connections.

## 9.10 散热器风扇电机不转 Radiator Fan Motor Fails to Rotate

- 测量油温，是否高于 65°C。  
Measure oil temperature to check whether it exceeds 65°C.

- 检查散热电路线路连接是否良好。  
Check for good connections in the cooling circuit wiring.

- 检查散热电路保险是否完好。  
Check whether the cooling circuit fuse is intact.

- 检查散热电路继电器是否完好。  
Check whether the cooling circuit relay is intact.

- 检查温控开关是否完好（检查温控开关两端电阻，温控开关为常开式）。  
Check whether the thermostatic switch is intact (normally open type; measure resistance across terminals).

## 9.11 进料斗漏料 Material Leakage from Feed Hopper

进料斗的橡胶圈磨损，用 1cm 厚，大小合适的橡胶板更换。

Worn rubber ring of the feed hopper: replace

with a suitably sized rubber plate of 1 cm thickness.

## 9.12 托轮异响、抱死 Abnormal Noise and Seizure of Support Rollers

- 与轨道摩擦，托轮表面涂适量润滑油脂，但不能过量，防止打滑。

Friction with the track: apply an appropriate amount of grease to the roller surface, avoiding excess to prevent slippage.

## 9.13 整机颤抖 Whole Machine Vibration

- 检查搅拌罐内是否有混凝土结块，需清除。

Check for solidified concrete inside the mixing drum and remove it.

- 清除搅拌罐内混凝土结块时，需注意对称清除，避免造成搅拌罐质量偏心。

When removing solidified concrete, ensure symmetrical cleaning to avoid mass eccentricity of the mixing drum.

## 10. 紧急处理预案 Emergency Response Plan

当搅拌车在运输混凝土时，如果出现发动机或液压泵或马达或齿轮箱损坏导致搅拌罐无法旋转，为了避免混凝土凝固在罐体内，请用如下紧急处理预案：

If the mixing drum fails to rotate during concrete transportation due to damage to the engine, hydraulic pump, motor or gearbox, the following emergency response plan shall be implemented to prevent concrete from solidifying inside the drum:

### 10.1 发动机损坏 Engine Damage

因发动机损坏，搅拌车将失去动力源，故罐体无法旋转，请采用如下紧急处理预案：

If the engine is damaged, the mixer will lose its power source and the drum will not rotate. Please adopt the following emergency response plan:

**预案 A:** 从维修孔处将混凝土排出

**Plan A:** Discharge concrete through the service openings

将罐体后锥体上的 2 个维修孔盖的螺栓拆除，并将维修孔盖打开。

Remove the bolts from the two service opening covers on the rear cone of the drum and open the covers.

将液压泵与马达相连的两根高压管旋松或拆除；

Loosen or remove the two high-pressure hoses connecting the hydraulic pump and the motor;

将混凝土从维修孔处排出。因维修孔在罐体的下端，故混凝土从入孔流出的速度将很快，在打开维修孔前，尽量使维修孔朝向车侧面。

Discharge the concrete through the service openings. Since the service openings are located at the lower part of the drum, concrete will flow out rapidly. Before opening the service openings, orient them toward the side of the vehicle as much as possible.

**注意:** 在旋松或拆除高压管时，因系统中有高压阻力，在旋松管件时有可能会有高压油喷出，请特别注意安全并防止烫伤。另罐体由于惯性作用，有可能自动旋转，救援人员必须注意安全。在旋松或拆除高压油管前，在滚轮与轨道之间放入木楔，阻碍罐体旋转。

**Note:** When loosening or removing high-pressure hoses, high-pressure oil may spray out due to system pressure, so extreme caution must be taken to avoid scalding. In addition, the drum may rotate automatically due to inertia; rescuers must pay close attention to safety. Before loosening or removing high-pressure hoses, insert wooden wedges between the support rollers and tracks to prevent drum rotation.

**预案 B:** 紧急救援

**Plan B:** Emergency Rescue

准备好一套救援软管 (2 根高压软管, 1 根低压软管), 并准备 18L 液压油。

Prepare one set of rescue hoses (2 high-pressure hoses and 1 low-pressure hose) and 18 liters of hydraulic oil.

**故障车的操作**

**Operations on the Faulty Vehicle**

a、将故障车熄火，并用手刹制动。（如在坡度处，应用木楔限位后轮）

a. Shut off the engine of the faulty vehicle and apply the parking brake. (If on a slope, chock the rear wheels with wooden wedges.)

b、将高压管和低压管从马达接口处卸下。注意用容器将泄出的油盛起来，避免污染车辆。

b. Disconnect the high-pressure and low-pressure hoses from the motor ports. Collect spilled oil in a container to avoid contaminating the vehicle.

c、将 3 根救援管分别接到相应的接口位置，必须紧固各接口。

c. Connect the three rescue hoses to their corresponding ports respectively, and ensure all connections are securely fastened.

d、将卸料槽放低并固定，在卸料槽尾端准备好盛放混凝土的料斗或容器。

d. Lower the discharge chute and secure it in place, then prepare a concrete hopper or container at the end of the discharge chute.

#### 救援车的操作（未装载车辆）

#### Operations on the Rescue Vehicle (Unloaded)

a、将同型号液压系统的搅拌车驾驶到事故现场，将救援车与故障车并排放置，平行间距约 1-2 米，车头与车头对齐。

a. Drive a mixer with the same type of hydraulic system to the scene, park it parallel to the faulty vehicle with a spacing of approximately 1-2 meters, and align the front ends.

b、将发动机熄灭，并用手刹制动。（如在坡度处，应用于木楔限位后轮）。

b. Shut off the engine and apply the parking brake. (If on a slope, chock the rear wheels with wooden wedges.)

c、将高压管和低压管从马达接口处卸下。（注意用容器将泄出的液压油收集起来，避免污染车辆）。

c. Disconnect the high-pressure and low-pressure hoses from the motor ports. (Collect spilled hydraulic oil in a container to avoid contaminating the vehicle.)

d、将 3 根救援管参照故障车的联接位置安装到救援车液压泵相应的接口位置，必须紧固各接口。

d. Install the three rescue hoses to the corresponding ports of the hydraulic pump on the rescue vehicle by referencing the connections on the faulty vehicle, and tighten all connections securely.

e、启动救援车的发动机，使发动机怠速运转数分钟后，在救援车液压油箱中补足液压油。

e. Start the engine of the rescue vehicle, let it idle for several minutes, then top up the hydraulic oil in the rescue vehicle's hydraulic tank.

f、操作救援车的控制系统，将故障车内混凝土排出。

f. Operate the control system of the rescue vehicle to discharge concrete from the faulty vehicle.

g、救援完毕后，使两车恢复原状。

g. After rescue is completed, restore both vehicles to their original conditions.

**注意：**救援软管需另外订购。2 根高压软管总成，1 根低压软管总成，皆长约 4.5 米。

**Note:** Rescue hoses must be ordered separately. Two high-pressure hose assemblies and one low-pressure hose assembly, each approximately 4.5 meters in length.

## 10.2 液压泵损坏

### Hydraulic Pump Damage

**预案 A：**更换同型号的液压泵，使搅拌车恢复正常运转，将混凝土运到工地，再卸出。

**Plan A:** Replace the hydraulic pump with one of the same model to restore normal operation, transport the concrete to the construction site, then discharge.

**预案 B：**从维修孔将混凝土排出，见发动机损坏预案 A。

**Plan B:** Discharge concrete through the service openings, refer to Plan A for Engine Damage.

**预案 C：**紧急救援，见发动机损坏预案 B。

**Plan C:** Emergency rescue, refer to Plan B for Engine Damage.

## 10.3 马达损坏

### Motor Damage

**预案 A：**更换同型号马达，使搅拌车恢复正常运行，将混凝土运到工地再卸出。

**Plan A:** Replace the motor with one of the same model to restore normal operation, transport the concrete to the construction site, then discharge.

**预案 B：**从维修孔将混凝土排出，见发动机损坏预案 A。

**Plan B:** Discharge concrete through the service openings, refer to Plan A for Engine Damage.

## 10.4 齿轮箱的损坏

### Gearbox Damage

**预案 A：**向罐体投入大量的缓凝剂和水或葡萄糖溶液，缓解混凝土凝固，运到工地再处理。

**Plan A:** Add a large amount of concrete retarder, water or glucose solution into the drum to delay concrete solidification, transport to the construction site for further treatment.

**预案 B：**从维修孔将混凝土排出，见发动机损坏预案 A。

**Plan B:** Discharge concrete through the service openings, refer to Plan A for Engine Damage.

| 名 称<br>Name    | 故障现象<br>Fault Phenomenon         | 原因分析<br>Cause Analysis                                     | 排除方法<br>Troubleshooting Method           |
|----------------|----------------------------------|------------------------------------------------------------|------------------------------------------|
| 发动机<br>Engine  |                                  | 请参看柴油机说明书<br>Refer to the diesel engine manual             |                                          |
| 离合器<br>Clutch  | 离合器打滑<br>Clutch slipping         | 踏板自由行程太小<br>Excessively small pedal free travel            | 重新调整<br>Readjust the release levers      |
|                |                                  | 压力弹簧变弱<br>Weak pressure spring                             | 更换压力弹簧;<br>Replace the pressure spring   |
|                |                                  | 摩擦盘表面有油<br>Oil on the friction disc surface                | 清洁<br>Clean the surface                  |
|                |                                  | 摩擦片磨损<br>Worn friction plates                              | 更换摩擦片<br>Replace the friction plates     |
|                | 离合抖动<br>Clutch jitter            | 花键磨损过大<br>Excessively worn splines                         | 更换离合器花键<br>Replace the clutch splines    |
|                |                                  | 紧固螺栓松动<br>Loose fastening bolts                            | 紧固螺栓<br>Tighten the fastening bolts      |
|                |                                  | 摩擦表面有油<br>Oil on the friction surface                      | 清洁<br>Clean the surface                  |
|                |                                  | 分离杆调整不均匀<br>Uneven adjustment of release levers            | 重新调整<br>Readjust the release levers      |
|                | 离合器不分离<br>Clutch not disengaging | 踏板自由行程太大<br>Excessively large pedal free travel            | 重新调整<br>Readjust the release levers      |
|                |                                  | 分离杆调整不当<br>Improper adjustment of release levers           | 重新调整<br>Readjust the release levers      |
| 变速箱<br>Gearbox | 异响<br>Abnormal noise             | 齿轮磨损严重,齿隙过大<br>Severely worn gears with excessive backlash | 更换齿轮<br>Replace the gears                |
|                |                                  | 轴承磨损<br>Worn bearings                                      | 更换轴承<br>Replace the bearings             |
|                |                                  | 紧固螺栓松动<br>Loose fastening bolts                            | 紧固螺栓<br>Tighten the fastening bolts      |
|                |                                  | 缺少润滑<br>Lack of lubrication                                | 加注润滑油<br>Add lubricating oil             |
|                |                                  | 齿轮和轴花键过度磨损<br>Excessively worn gears and shaft splines     | 更换齿轮和花键<br>Replace the gears and splines |
|                | 齿轮抖动<br>Gear jitter              | 定位弹簧损坏<br>Damaged positioning spring                       | 更换弹簧<br>Replace the spring               |

| 名 称<br>Name             | 故障现象<br>Fault Phenomenon                                                          | 原因分析<br>Cause Analysis                                                 | 排除方法<br>Troubleshooting Method                            |
|-------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------|
| 变速箱<br>Gearbox          | 齿轮抖动<br>Gear Jitter                                                               | 叉轴定位槽磨损<br>Worn positioning grooves of shift fork shaft                | 更换叉轴<br>Replace the shift fork shaft                      |
|                         |                                                                                   | 内外花键磨损<br>Worn internal and external splines                           | 更换花键<br>Replace the splines                               |
|                         | 变 速 箱 卡 滞<br>Gearbox Jamming                                                      | 齿轮受冲击<br>Gear impact damage                                            | 修理或更换齿轮<br>Repair or replace the gears                    |
| 驱动桥<br>Drive Axle       | 行驶时 有 响 声<br>Abnormal noise during driving                                        | 主减速齿轮啮合点不好<br>Poor meshing of main reduction gears                     | 调整或更改锥齿轮<br>Adjust or replace the bevel gears             |
|                         |                                                                                   | 轴 承 磨 损 逾 限 或 松 动<br>Bearing wear beyond limit or loosening            | 更换轴承或调整<br>Replace or adjust the bearings                 |
|                         |                                                                                   | 齿 轮 磨 损 逾 限<br>Gear wear beyond limit                                  | 更换齿轮<br>Replace the gears                                 |
|                         | 制 动 时 异 响<br>Abnormal noise during braking                                        | 制 动 底 板 弯 曲<br>Bent brake backplate                                    | 修复或更换<br>Repair or replace                                |
|                         |                                                                                   | 制 动 摩 擦 衬 片 铆 钉 松 动<br>Loose rivets of brake friction linings          | 修 理<br>Repair                                             |
|                         |                                                                                   | 制 动 鼓 损 坏<br>Damaged brake drum                                        | 修复或更换<br>Repair or replace                                |
|                         | 制动时车辆跑偏<br>Vehicle deviation during braking                                       | 制动蹄片表面有油<br>Oil on the surface of brake shoes                          | 清洗 Clean                                                  |
|                         |                                                                                   | 间隙调整不当<br>Improper gap adjustment                                      | 重新调整<br>Readjust the release levers                       |
|                         |                                                                                   | 轮胎气压不合标准<br>Tire pressure not up to standard                           | 使气压一致<br>Unify the tire pressure                          |
|                         | 制动失灵<br>Brake failure                                                             | 制动鼓与制动蹄片间隙调整不当<br>Improper gap adjustment between brake drum and shoes | 重新调整<br>Readjust the release levers                       |
|                         |                                                                                   | 有油污 Oil contamination                                                  | 清洗 Clean                                                  |
|                         |                                                                                   | 制动摩擦衬片磨损超限<br>Brake friction linings worn beyond limit                 | 更换 Replace                                                |
| 转向系统<br>Steering System | 方向盘慢转轻、快转沉<br>Steering wheel is light at rotation and heavy at slow fast rotation | 供油不足<br>Insufficient oil supply                                        | 调整分流阀、优先阀<br>Adjust the diverter valve and priority valve |
|                         | 转向无力<br>Weak steering force                                                       | 工作压力油压力低<br>Low hydraulic oil working pressure                         | 调整优先阀溢流阀<br>Adjust the priority valve and relief valve    |
|                         | 转动方向盘油缸不动<br>Steering cylinder does not move when turning the steering wheel      | 系统中有空气或油量不足<br>Air in the system or insufficient oil quantity          | 排除空气或补充油<br>Bleed air from the system or replenish oil    |

| 名 称<br>Name                           | 故障现象<br>Fault Phenomenon                                                                              | 原因分析<br>Cause Analysis                                                                                                                    | 排除方法<br>Troubleshooting Method                                                                            |
|---------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 液压和制动系统<br>Hydraulic and Brake System | 举升臂提升力不足<br>或<br>转斗力不足<br>Insufficient lifting force of lift arm or Insufficient bucket tilting force | 安全阀调整不当系统压力低<br>Improper adjustment of safety valve, low system pressure                                                                  | 按规定值调整系统工作压力<br>Adjust the system working pressure to the specified value                                 |
|                                       |                                                                                                       | 吸油管及滤油器堵塞<br>Clogged oil suction pipe and oil filter                                                                                      | 清洗并更换液压油;<br>Clean and replace the hydraulic oil                                                          |
|                                       |                                                                                                       | 油泵、油缸、管路内漏<br>Internal leakage of oil pump, oil cylinder and pipeline                                                                     | 更换油泵并按自然沉降量检查系统密封性<br>Replace the oil pump and check the system tightness according to natural settlement |
|                                       |                                                                                                       | 多路阀过度磨损、阀杆与阀体配合间隙超过规定 Excessive wear of multi-way valve, the fit clearance between valve stem and valve body exceeds the specification    | 更换多路阀<br>Replace the multi-way valve                                                                      |
|                                       | 系统工作性能降低或不稳定<br>Reduced or unstable system working performance                                        | 工作油变质<br>Deterioration of working oil                                                                                                     | 更换工作油<br>Replace the working oil                                                                          |
|                                       |                                                                                                       | 异物堵塞管路<br>Pipeline clogged by foreign matters                                                                                             | 清洗油路系统和油箱<br>Clean the oil circuit system and oil tank                                                    |
|                                       |                                                                                                       | 滤油器堵塞或损坏<br>Clogged or damaged oil filter                                                                                                 | 清洗或更换;<br>Clean or replace                                                                                |
|                                       |                                                                                                       | 系统内有空气<br>Air in the system                                                                                                               | 检查进油系统有无漏气<br>Check the oil intake system for air leakage                                                 |
|                                       | 举升臂举升后自行下沉<br>Lift arm sinks automatically after lifting                                              | 举升臂油缸内漏 Internal leakage of lift arm oil cylinder                                                                                         | 拆修油缸、更换密封圈 Overhaul the oil cylinder and replace the sealing ring                                         |
|                                       |                                                                                                       | 多路阀阀杆间隙过大<br>Excessive clearance of multi-way valve stem                                                                                  | 拆修或更换<br>Overhaul or replace                                                                              |
|                                       | 油温过高<br>Excessively high oil temperature                                                              | 重负荷工作时间过长<br>Prolonged heavy load operation                                                                                               | 停机休息或减少负荷<br>Stop the machine for cooling or reduce the load                                              |
|                                       |                                                                                                       | 油量不足<br>Insufficient oil quantity                                                                                                         | 加油到规定油位<br>Refuel to the specified oil level                                                              |
|                                       | 方向盘回位后继续转向<br>Insufficient braking force                                                              | 转向器内回位弹簧片损坏<br>Damaged return spring plate in the steering gear                                                                           | 拆修更换弹簧片<br>Overhaul and replace the spring plate                                                          |
|                                       |                                                                                                       | 配油套和配油轴之间卡死或配油套与 阀体 Seizure between oil distribution sleeve and oil distribution shaft, or between oil distribution sleeve and valve body | 拆开转向器修复<br>Disassemble and repair the steering gear                                                       |
|                                       | 制动力不足<br>Insufficient braking force                                                                   | 制动分泵漏油<br>Oil leakage of brake wheel cylinder                                                                                             | 更换分泵油封<br>Replace the oil seal of wheel cylinder                                                          |
|                                       |                                                                                                       | 制动液压管路中有空气<br>Air in the brake hydraulic pipeline                                                                                         | 排除空气<br>Bleed the air from the system                                                                     |
|                                       |                                                                                                       | 制动总泵皮碗损坏<br>Damaged cup of brake master cylinder                                                                                          | 更换皮碗<br>Replace the cup                                                                                   |
|                                       |                                                                                                       | 制动总泵油液不足 Insufficient oil in brake master cylinder                                                                                        | 加油<br>Refuel                                                                                              |

| 名 称<br>Name                           | 故障现象<br>Fault Phenomenon                                                                            | 原因分析<br>Cause Analysis                                             | 排除方法<br>Troubleshooting Method                                                                          |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 液压和制动系统<br>Hydraulic and Brake System | 制动力不足<br>Insufficient braking force                                                                 | 推杆行程调节不当<br>Improper adjustment of push rod stroke                 | 调正行程<br>Adjust the stroke                                                                               |
|                                       |                                                                                                     | 制动摩擦片磨损到极限<br>Brake friction linings worn to the limit             | 更换新制动摩擦片<br>Replace with new brake friction linings                                                     |
| 电气系统<br>Electrical System             | 发动机正常而蓄电池不充电 或<br>充电率低<br>Engine works normally but battery does not charge or charging rate is low | 蓄电池极板硫化<br>Sulfation of battery plates                             | 脱硫处理或更换极板;<br>Desulfurize or replace the plates                                                         |
|                                       |                                                                                                     | 发电机皮带过松或损坏<br>Generator belt is too loose or damaged               | 重新调整或更换<br>Readjust or replace                                                                          |
|                                       |                                                                                                     | 接线不牢,接触不良<br>Loose wiring and poor contact                         | 检查并重接<br>Check and reconnect                                                                            |
|                                       |                                                                                                     | 调节器调节不当或有损坏<br>Improper adjustment or damage of regulator          | 重新调整或修理;<br>Readjust or repair                                                                          |
|                                       | 蓄电池容量不足<br>Insufficient battery capacity                                                            | 电解液比重或液面过低<br>Too low electrolyte specific gravity or liquid level | 重新调整比重或添加电解液;<br>Readjust the specific gravity or add electrolyte                                       |
|                                       |                                                                                                     | 极板间短路<br>Short circuit between plates                              | 消除沉淀物,更换电解液;<br>Remove sediment and replace electrolyte                                                 |
|                                       |                                                                                                     | 极板硫化<br>Plate sulfation                                            | 脱硫处理或更换极板<br>Desulfurize or replace the plates                                                          |
|                                       |                                                                                                     | 导线接触不良<br>Poor wire contact                                        | 检查并消除<br>Check and eliminate                                                                            |
|                                       |                                                                                                     | 极板活性物质脱落<br>Falling off of plate active material                   | 更换极板<br>Replace the plates                                                                              |
|                                       | 发电机不发电<br>Generator fails to generate electricity                                                   | 剩磁消失<br>Loss of residual magnetism                                 | 按发电机原来极性,用蓄电池<br>Charge magnetism by connecting battery according to the original polarity of generator |
|                                       |                                                                                                     | 磁场线圈回路断<br>Open circuit of magnetic field coil                     | 接于磁场线圈两端并接通 Connect both ends of the magnetic field coil and turn on the circuit                        |
|                                       |                                                                                                     | 电刷卡住不灵活<br>Brushes are stuck and inflexible                        | 修正电刷尺寸,调整弹簧压力;<br>Correct the brush size and adjust the spring pressure                                 |
|                                       |                                                                                                     | 电枢匝间短路<br>Armature interturn short circuit                         | 检查并修复;<br>Check and repair                                                                              |

**本手册仅供参考，具体细节以实际产品型号为准！**  
**This manual is for reference only. Specific details shall be subject to the actual product model!**

**青岛众合鲁东机械有限公司**  
**Qingdao Zhonghe Ludong Machinery Co., Ltd**

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