

混凝土泵车的使用 Operation And Use Explain

4.1 行驶状态的操纵 Transporting Operation

4.2 作业状态的操纵 Working Operation

4.3 混凝土泵送的操纵 Operation of concrete pumping

4.4 正确使用说明 Correct operation instruction

4.1 行驶状态的操纵 Transporting Operation

泵车行驶状态是指布料臂折叠收回，并在布料臂支架上安放到位；支腿全部收回并锁定；料斗及车体清洗干净；变速箱已转换到行驶状态；整车可以正常行驶或正在行驶的状态。

Driving state of the truck-mounted concrete pump means that the boom folds to take back, and put on the boom support; the striggers are taken back and locked;hopper and bodyworks are cleaned;The gear-box has already been convertd to driving state;The whole car is in the state of normal driving or positive professional driving.

4.1.1 驾车行驶前的检查 Inspection before transport

- (1) 料斗及车体应清洗干净。

The hopper and the vehicle body should be cleaned.

- (2) 布料臂在支撑托架上应放置到位（如“在位”指示灯亮）。

The placing boom should be retracted and placed on the collar until indicator “boom” is on.

- (3) 支腿应收放到位，支腿定位锁应锁定。

The outrigger should be fully retracted and securely locked.

- (4) 泵车电控柜、遥控器及各操纵台上的按钮及手柄应放在非工作位置。

Buttons and levers on the control panel, remote controller should be placed in the non-working position.

- (5) 将发动机转速调至怠速状态。

Engine should be at idle.

4.1.2 从作业状态到行驶状态的操作

Transferring from work condition to transport condition

- (1) 踏下离合器，将变速杆放到空档位置；

Push down the clutch pedal, put the gear-shift lever to neutral position.

(2) 将驾驶室内面板上的“行驶/作业”转换开关转换到行驶侧，行驶指示灯亮。此时，泵车即进入了可行驶状态。

Switch the select switch “Chassis/PTO” to “Chassis” position, indicator “transporting”

should be lit and “working” unlit. Now, the machine is in transport condition.

提示：如 ISUZU 底盘泵车，行驶前还需将收音机上方的 PTO 按钮按上来。如果有任何的操作不同，我们将在操作现场向操作人员解释。

Note: For truck mounted concrete pumps with ISUZU chassis, the button “PTO” above radio should be released before transport. If there are any operational differences, we will explain it to the operators in operation training.

4.2 作业状态的操纵 Working Operation

泵车作业状态是指泵车在平整、坚实的工作场地停放就位；分动箱已转换至“作业”位置；按规定打好支腿；整机调平；泵车轮胎离地（50mm）；清洗系统水箱加满水；可以操纵布料臂进行工作或正在进行工作的状态。

Working condition means that the vehicle is placed on even, compact ground; transfer case is shifted to “PTO” position; the outriggers are set up according to regulations; the machine is levelled; ground clearance is 50 mm; the cleaning system water tank is full. In these conditions, the placing boom can be operated.

4.2.1 从行驶状态到作业状态的操作

Operation of transferring from transport to work

(1) 踏下离合器，将变速杆放到空档位置，拉上手刹；

Push down clutch pedal, put the gear-shift lever to neutral position, and engage parking brake.

(2) 将驾驶室内面板上的“行驶/作业”转换开关转换到作业侧，作业指示灯亮。再按该面板上的电源开关，“电源”灯亮，泵车主电控柜得电，进入可操作状态；

Turn the selected switch “Chassis/PTO” to ‘ PTO ’ position, then trigger the selected switch “Confirm” till the indicator “PTO” is on and “Chassis” is off.

(3) 按下电源开关，指示灯亮；

Press button “Power”, the indicator “Power” is on.

(4) 踏下离合器，将变速杆放到直接档位置；

Push down clutch pedal, put the gear-shift lever to direct drive transmission.

(5)将发动机转速提速至最大设定值:

Accelerate engine to the set Max. speed.

提示 Note:

如 ISUZU 底盘泵车, 必须在进入作业前, 底盘熄火按下 PTO。如 VOLVO 底盘泵车, 必须在提速前将方向盘左下侧操纵杆上“RESUME”推至“ON”位置。

对于不同的底盘, 其中变速杆直接档位置:

VOLVO FM12 6×4 放到 8 档;

VOLVO FM12 8×4 放到 6 档 (高速档);

VOLVO FM400 6×4 8×4 放到 8 档;

ISUZU CXZ51Q 欧II 6×4 底盘放到 5 档; ISUZU CXH50T 欧 II 8×4 底盘放到 6 档

ISUZU CYZ51Q 欧 III 6×4 底盘放到 5 档; ISUZU CYH51Y 欧 III 8×4 底盘放到 6 档;

BENZ ACTROS 6×4 及 8×4 放到 7 档 (高速档);

HINO 底盘放到 5 档。

如果有设计和生产改变或者其它的操作变化, 请与我们的服务中心联系。

Machines with ISUZU chassis, before operation, the button “PTO” should be pressed and the chassis engine should be shut off. Machines with VOLVO chassis, before accelerating the engine speed, put the “RESUME” on control lever at the lower left of steering wheel to “on” position.

For different chassis, the direct drive transmission of gear-shift lever should be in following position:

VOLVO FM12 6×4: 8th gear;

VOLVO FM12 8×4: 6th gear;

VOLVO FM400 6×4 8×4 8th gear;

ISUZU CXZ51Q EuroII 6×4chassis: 5th gear; ISUZU CXH50T EuroII 8×4chassis: 6th gear;

ISUZU CYZ51Q EuroIII 6×4chassis: 5th gear; ISUZU CYH51Y EuroIII 8×4chassis: 6th gear;

BENZ ACTROS 6×4 and 8×4: 7th gear; HINO: 5th gear.

If there are design and manufacture changes and any other operational variations, please contact our service center.

特别提示: 当环境温度低于零度时, 转换至作业状态发动机应怠速运转 15~20 分钟, 同时点动油缸, 使液压系统预热,

防止恒压泵突然高速冷启动，造成吸油能力不足，损坏油泵。之后再提速至设定值。

Special Note:

When the environmental temperature is below 0°C, Idle the engine for 15~20 minutes before changing to working condition. Simultaneously, trigger the cylinder intermittently to preheat the hydraulic system first, to prevent the constant pressure pump from starting at high speed when cold, which results in insufficient oil suction and damage to the pump. After idle running for 15—20 minutes, accelerate the engine speed to the set rpm.

4.2.2 作业前安全检查 Safety Inspection before operation

泵车在进入作业状态前和进入作业状态但未开始作业前，司机应对其进行下列检查。

Before work or preparing to work, the driver should check the following points and make sure that:

- (1) 确认泵车将要停放的工作场地地面平整、坚实，满足承载要求。

The machine is placed on even, compact ground, which satisfies the loading requirements.

- (2) 确认工作场地是否足够大，保证支腿及臂架必要的伸展空间。

The working area is sufficient for extending the outriggers and telescopic boom.

- (3) 查看周边是否远离高压电线、易燃易爆等危险物品。

The surrounding area is free from dangerous objects such as electric cables, explosive & combustible materials, etc.

- (4) 确认臂架、支腿控制及泵送控制的开关或手柄均在非工作位置。

注意：紧急停止按钮应旋起松开，否则泵车无法启动。

The switches & levers used to control boom, outrigger and pump are in non-working position.

Note: Emergency button should be released, otherwise, the machine can not be started.

- (5) 确认发动机转速、水温、机油压力等仪表指示正常。

The meters for engine speed, water temperature, engine oil pressure, etc, are in normal working range.

- (6) 确认泵送系统各压力表(控制压力、蓄能器压力)以及吸油、回油的真空表压力指示正常。

The pressure gauges (control pressure, accumulator pressure) of pumping system and suction & returning line are in normal working range.

- (7) 各臂架关节部位应注满润滑油。

Joint of each boom section should be greased.

- (8) 各混凝土输送管中是否磨损严重，确认其厚度满足泵送要求。

There is not any serious wear in the concrete pipe and the thickness satisfies conveying requirements.

- (9) 确认整机其它部件均满足使用性能要求。

Other parts of the vehicle satisfy performance requirements.

4.2.3 泵车上装操作 Operation of outriggers and boom

完成上述步骤，在确认泵车整机满足作业要求后，即可依序进行泵车支腿、泵车臂架的伸展操作。

After finishing the procedures mentioned above, and confirming that the machine satisfied the operation requirements, extend the outriggers and boom as follows:

4.2.3.1 伸展支腿操作 Extending outriggers

- (1) 打开所有支腿的机械锁；

Open the mechanical locks of all outriggers.

- (2) 将电控柜控制面板上的“面控/遥遥”转换开关旋至手动档；

Put the selected switch “Panel / Remote” on the control panel to “Panel” position.

- (3) 确认支腿工作区没人后，按手柄处标示，操作泵车左右侧支腿手柄。

Make sure that nobody except the operator is in the working area of the machine, then control the outrigger levers on both sides of the machine according to the indication on the lever.

- (4) 依次将前后支腿张开，直至摆动到最大极限位置；

Extend the front and rear outriggers successively, until they swing to Max. limit position.

- (5) 根据地面条件，垫好合适垫块，降落两前支腿，至前轮胎离地，再降落两后支腿，至后轮胎离地；(离地间隙约 50mm)

Using the proper pad according to ground conditions, lower two front outriggers until the front wheels leave the ground, then lower the two rear outriggers until the rear wheels leave the ground (The ground clearance-should be about 50 mm) .

- (6) 调节前后支腿顶升高度，将整机调整为水平(最大允许倾角为 3°)；

Adjust the height of front & rear outriggers, so that the whole machine is level. (Max. inclination must be less than 3°) .

- (7) 最后务必确认各支腿控制手柄已回到中间位置。当泵送施工结束时，支腿收放的操作步骤是在确认臂架已正确落

在臂架支撑上后，按伸展支腿的反向顺序操作；且支腿在即将伸展或收放到位时，应减小操作手柄的动作幅度，使支腿轻缓就位，避免冲击。

Finally, confirm that all the outrigger control levers are returned to the neutral position. When pumping is finished, before retracting outriggers, please ensure that the boom is placed on the boom collar properly, then retract outriggers in reverse sequence of the extending procedures. Carefully operate the lever before the outriggers are fully retracted or fully extended to avoid impaction.

警告：务必确认支腿已全部展开到位，并水平支撑在坚实的地面上，否则整机作业时可能失稳倾翻，造成设备损坏及人员伤亡等严重事故。

Warning: Check that the outriggers are fully extended. Check the ground below the outriggers is solid, or else the machine may lose balance and turn over, which will result in serious damage to the machine and people.

4.2.3.2 伸展臂架操作 Operation of the boom

(1) 将电控柜控制面板上的“手/遥”转换开关旋至遥控档。

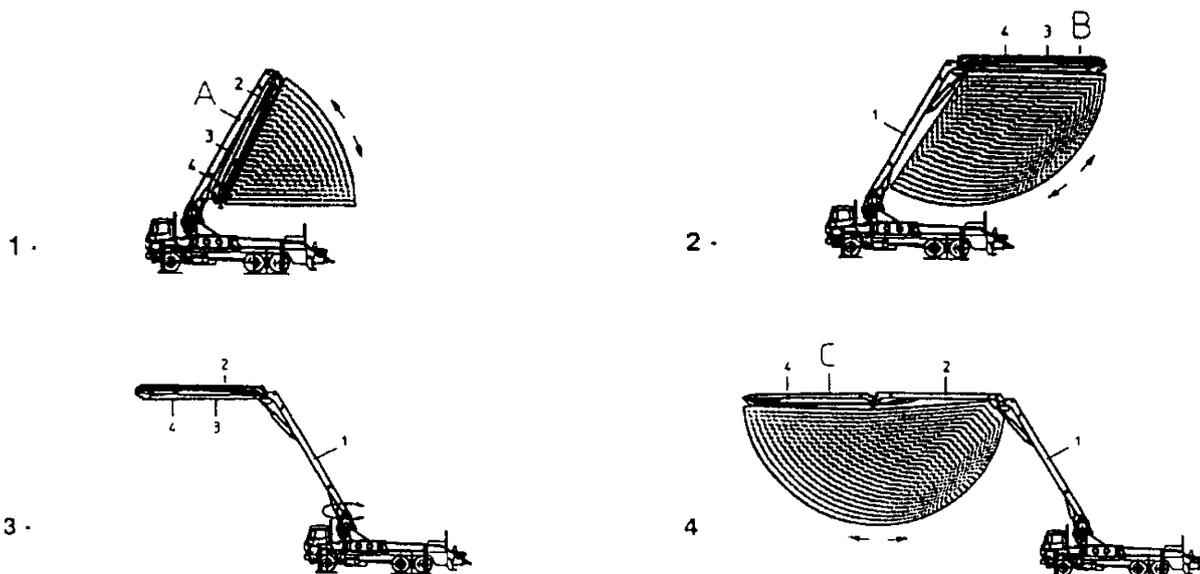
Rotate the “Panel/Remote” switch on the control panel to “Remote” position.

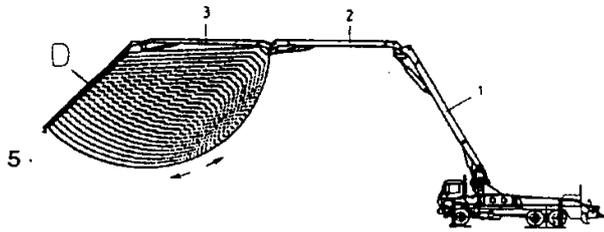
(2) 鸣响警笛（在臂架运动过程中，也要间断性鸣响警笛。）；

Use horn to give warning. (horn should be used intermittently during boom moving.)

(3) 通过遥控器带标示的手柄，依次操作张开臂架。不同型号泵车，根据各臂架折叠方式不同，其展臂动作顺序略有差异。臂架基本形式包括“R”形及“Z”形。具体展开过程如下图示：

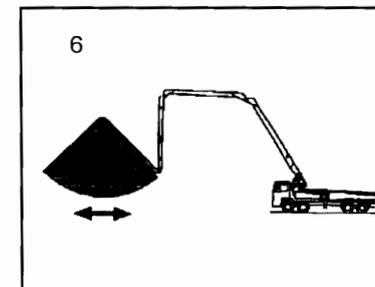
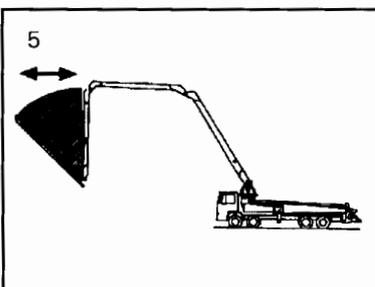
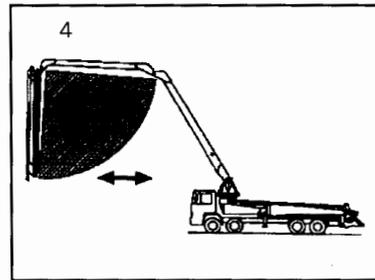
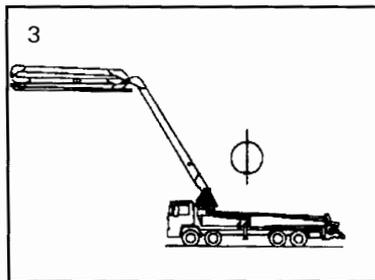
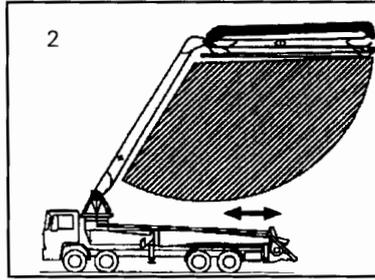
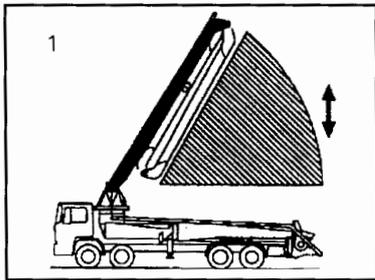
Open boom successively according to the indication on remoter. For differe machines, boom opening sequences may vary according to different folding types. Basic folding types are “R” type and “Z” type. Extending procedures are as follows.





(a) .“R”型臂架展臂

“R” type boom extension



4.2.3.3 臂架检查 Checks on boom

因臂架动作属高空危险作业，所以在操作臂架时，应格外细心，确保作业安全。在张好支腿，动作臂架前，还应做好臂架的以下检查：

When operating boom, be careful to ensure safety for the surrounding working area. Following items should be checked before extending outrigger and operating boom:

- (1) 检查臂架各紧固件、管卡、输送管是否都正常及安全可靠；

Check all clamps of boom, pipe clips and pumping pipe are secure.

- (2) 检查并清理臂架上的遗留工具及杂物等；

Clear away tools from booms.

- (3) 确保臂架作业区内没有任何人或物；

Ensure that there is no-one and no objects in the boom moving area.

- (4) 检查并注意泵车臂架范围内是否有障碍物可能对臂架操作产生影响等。

Ensure that there are no obstacles in boom working area, which maybe influence boom operation.

4.2.3.4 臂架伸展前的排气操作 purging hydraulic system

臂架液压油缸及管道等元件中，如果有空气，在动作臂架时就可能出现快速下落的危险，导致设备及人员损伤。在以下情况时，必须进行臂架伸展前的排气操作：

If there is air in hydraulic cylinder and hydraulic pipe, the boom will be lowered rapidly during operation and may cause damage to machine and persons. In the following situations, air should be purged before pumping concrete.

- (1) 泵车首次进行臂架操作的；

operating the booms for the first time.

- (2) 操作机手首次进行臂架操作的；

The operator operates the booms for the first time

- (3) 对臂架、油缸或臂架上的液压件进行过拆卸的；

The boom, the cylinder or the hydraulic parts of boom have been dismantled.

(4) 泵车放置时间超过一个月以上未进行过臂架操作的；

The boom operating hasn't been done for one month.

(5) 对泵车及臂架情况不明的等。

进行排气操作的具体步骤是：

The working capability of the machine has not been clarified. The procedures of purging air are as follows:

A、 将大臂，即第一臂缓慢展开约 15° 左右，再依次收紧二、三、四(五)臂并憋缸；每节臂收紧憋缸时间不得少于 60 秒；

Slowly open the 1st boom approx 15° , then successively fold the 2nd, 3rd, 4th (5th) boom firmly. Folding time of each boom from the 2nd to the 4th(5th) should not be less than 60 seconds.

B、 操作一臂在 $0^{\circ}\sim 30^{\circ}$ 之间来回动作三、四次；

Open and fold the 1st boom between 0° and 30° , repeat for two or three times.

C、 再次收二、三、四(五)臂并憋缸约 60 秒；

Fold the 2nd, 3rd, 4th (5th) boom again for 60 seconds.

D、 将一臂展至 60° 左右，操作二臂在 $0^{\circ}\sim 30^{\circ}$ 之间来回动作三、四次并憋缸；

Open the 1st boom section approximate 60° , then open and fold the 2nd boom between 0° and 30° , repeat for two or three times.

E、 旋转臂架约 90° ，使臂架不要停留在泵车上方，并将一臂收回到约 30° 左右；

Slew the boom about 90° until away from the upper side of the machine body, fold the 1st boom to approx 30° .

F、 将二臂展至 30° 左右，操作三臂在 $0^{\circ}\sim 15^{\circ}$ 之间来回动作三、四次并憋缸；

Open the 2nd boom approx 30° , then open and fold the 3rd boom between 0° and 15° , repeat for three or four times.

G、 将一臂展至 60° 左右，操作二臂在 120° 左右，收紧三、四(五)臂

Open the 1st boom approx 60° , the 2nd boom approx 120° , fold the 3rd, 4th (5th) boom section.

H、 依前法依次排除三、四(五)臂油缸内空气，并展开；

Purge the air in the cylinder of the 3rd, 4th (5th) boom successively according to above mentioned procedures, then open the boom.

I、在确定臂架油缸内空气被基本排除后，可依次将每节臂伸收到位二、三次，以全部排除油缸内的残余空气。

After ensuring that the air in the boom cylinders has nearby been purged, open/fold each boom section twice or three times successively to purge the remaining air in the cylinder.

针对不同泵车型号，臂架因折叠方式的不同，操作步骤会略有所差异。但总的原则相同，即从第一臂，到最后一节臂，依次小幅度来回动作臂架并憋缸，再渐次增大臂节伸展幅度并憋缸，以彻底排除油缸内的残余空气。

Operation procedures can vary due to different folding types, but the general principle is the same, i.e, open and fold each boom section from the 1st boom within a small angle, then gradually increase the angle and fold each boom to attain a thorough purge.

折叠收回臂架时，按伸展臂架的反向顺序操作。

When folding the booms, the operation procedure is in reverse order of that of opening boom sections.

警告：臂架控制手柄为比例控制，应轻推轻拉；如急推急拉，会加剧臂架抖动，影响正常使用。

臂架回转时不要碰到驾驶室，臂架伸缩时不要碰到周边物体。

Warning: Boom control lever is proportionally controlled, so it should be pushed or pulled slightly, otherwise the operation can not be performed normally due to strong oscillation.

When slewing the booms, be careful the chassis cab is not touched by the booms. When opening or folding the booms, act carefully not to touch the surrounding objects.

4.2.3.5 面控档臂架操作 Manual operation of boom

一般只有当无线或有线遥控器不起作用时，才采用臂架分配多路阀的控制手柄来操作臂架。

Only when the remote or radio control system fails to work normally, can the control lever of the valve block be used to control the movements of booms.

4.2.3.5.1 将电控柜控制面板上的“面控/遥控”转换开关旋至面控档；

Rotate the select switch “Panel/Remote” on the control panel to “Panel” position.

4.2.3.5.2 按照手柄处的标示，操纵手柄来控制臂架动作。

Actuate the lever to operate boom motions according to the indication on the lever.

4.3 混凝土泵送的操纵 Operation of concrete pumping

混凝土泵送的操作控制可通过固定安装在料斗附近的电控柜面板控制和远距离无线（或有线）控制。电控柜面板上有面控/遥控转换开关，当需要在电控柜盘面操作时，选择开关拧至面控档。若采用遥控器操作时，则需先将选择开关拧至遥控档。

The concrete pumping can be controlled either on the control panel next to the hopper or remote wireless (wire) control. There is a “Panel /Remote” select switch on the control panel. If you choose manual control, switch to “Panel” position on control panel ; if you choose remote control, switch to “Remote” position on control panel .

4.3.1 泵送前的检查 Inspection before pumping

(1) 检查液压油是否充分、正常，且润滑油箱应加满润滑油脂；

Make sure that the hydraulic oil tank and lubrication grease tank are full.

(2) 泵送水箱加满清水或乳化剂，同时注意有无砂浆流入水箱，以判定混凝土活塞密封是否良好；

Pump water tank should be filled with water or emulsifier, and inspect that the concrete piston seal is normal by observing if there is mortar in water tank.

(3) 检查眼睛板、切割环间隙是否正常（间隙不得超过 2mm）；

The clearance between anti-wearing plate and cutting ring is less than 2mm.

(4) 检查泵送操作的各开关手柄都应处于中位(非工作位)；急停开关旋起松开，关闭卸荷开关；

Place all the pumping control switches and levers in neutral position; release the emergency switch and shut off discharge switch.

(5) 启动泵送，尚未泵料时，应检查各功能动作及压力仪表指示是否正常。

Start pumping, before pumping concrete, check all functions and pressure gauges are normal.

4.3.2 泵送作业操作 Pumping Operation

(1) 操作机手应与端部软管作业人员联系沟通；

Operator of pumping should always be in contact with operator of end rubber hose.

(2) 开始泵送混凝土料前，先泵送少量水及砂浆，润滑管道

Before pumping concrete, to lubricate the delivery pipe, a small quantity of grout and water should be pumped first.

(3) 搅拌机构的手动换向阀(靠近料斗后侧处)，切换至搅拌马达正转，待料斗中注入充分混凝土料后，启动遥控器或电控柜面板上的“泵送”按钮，开始自动泵送作业；用户根据环境温度的高低启动冷却风扇，如环境温度过高，泵送开始时，启动电控面板上“冷却泵手动/关闭/自动选择开关”钮)。

Actuate the lever of hand-operated direction valve to rotate the mixer, start pumping button after the hopper is filled with concrete; when the oil temperature in hydraulic oil tank is above 40°C, start cooling fan;

(4) 如泵送时需动作臂架，应采用慢挡位操作臂架；

During pumping, should boom operation be necessary move booms slowly.

(5) 布料结束时，按下泵送停止按钮，泵送动作停止；

Press stop button to stop pumping when the concrete placing is finished.

(6) 停机后，将搅拌手动换向阀切换至中位，搅拌停止；打开搅拌手动换向阀旁边的卸荷阀，释放蓄能器及液压管道内压力。

Place the lever of hand-operated direction valve to neutral position to stop the mixing; actuate the off-loading valve.

4.3.3 泵送管路及泵车清洗 Cleaning the concrete pipes and machine

每次泵送施工完成后，都必须将输送管路及泵车整机清洗干净。

After finishing concrete pumping, the concrete pipes and whole machine should be cleaned.

4.3.3.1 输送管路清洗 Cleaning concrete pipes

泵送结束后，反泵点动排出混凝土缸内混凝土料，打开料斗门，放出料斗内余料，用水冲洗料斗。卸下料斗出料口弯管，用水清洗干净，然后装上弯管。根据施工现场具体情况，可以采用以下方式对输送管道进行清洗：

After pumping, reverse pumping intermittently to empty the concrete out of hopper; open the door of the hopper to discharge the remnant concrete and clean hopper with pressurized water. Dismantle the bent pipe on hopper outlet port, and clean it with water, then reassemble it.

There are three ways to clean the concrete pipes as follows:

A、料斗内注水，锥管内装入海绵球，采用自动泵送来清洗；

Fill the hopper with water, insert sponge balls in the taper-type pipe, cleaning pipes by auto pumping.

B、将海绵球从末端胶管塞入，用反泵操作，将海绵球吸入锥管处进行清洗；

Insert sponge balls into the rubber hose end, by reverse pumping, the sponge balls will be pulled to the taper-type pipe to clean.

C、采用高压水泵进行清洗等。

Use high-pressure water pump.

4.3.3.2 泵车整机清洗 Cleaning the machine

泵车上装有高压清洗装置，由清洗水箱、水泵、马达、安全阀、过滤器、水枪及水管等组成。当需要进行清洗工作时，通过安装于靠近料斗后侧处的手动换向阀（冷却/清洗）切换至清洗状态，水泵马达开始工作，即可使用水枪清洗泵车走台、臂架、驾驶室等。

The high pressure cleaning device is fitted on the machine, which includes cleaning water tank, water pump, motor, safety valve, filter, water gun and water pipe, etc. When cleaning, change the hand-operated direction valve (cooling or cleaning) fitted at the end of the deck of machine to cleaning position, then the water pump motor begins to work, i.e., you can use water gun to clean the deck, boom, driver's cab, etc.

4.4 正确使用说明 Correct operation instruction

4.4.1 分动箱的使用 transfer case PTO

(1) 分动箱运行前必须确认其中已按规定加入润滑齿轮油。润滑齿轮油的牌号及加入量在铭牌上已有规定。推荐牌号为 CLP220(DIN51517)或壳牌 220 两种矿物油。或使用化学合成油 PGLP220(DIN51502) 或壳牌 WB 220, 或美孚 SHC220。

Before working, check that the transfer case is filled with lubricating gear oil. Refer to the indication on the nameplate for brand and level volume of lubricating oil. The recommended brand is CLP220 (DIN 51517) or Shell omala oil 220, chemical combination oil PGLP 220 (DIN 51502) or Shell Tivela oil WB220, or Mobilegear SHC220 are also available.

警告：不同牌号和类型的润滑油不能混合使用！当油的品种更换时必须完全清除原箱体中的油，并进行清洗。

Warning: The lubricating oil of different brands and types cannot be mixed together. The original oil should be drained out and the tank be fully cleaned before the new lubricant is used.

(2) 润滑齿轮油的注入量按铭牌规定为 8.5L，但以不超出与传动轴法兰等高的溢流螺塞为准，在初次加油运行后由于

油被零件吸附后使油平面降低，故应再增加一定量的油以使油平面达到要求高度。并注意拧紧螺塞以防油的流失。建议使用专用的齿轮油加注器注油。

The filled volume of lubricating gear oil is 8.5L according to regulation on the nameplate, but the oil should not exceed the height of threaded plug of the relief valve, which is as high as the driving shaft flange. The first time the gear oil is filled, please refill gear oil to stated height due to supplement the oil assimilate by parts in the transfer case. Screw down the threaded plug to avoid losing oil. Special injector for filling gear oil is recommended.

(3) 在工作 200 小时后应进行第一次换油，其后的每次换油按 2000 工作小时的间隙（或 12 个月的间隔）进行一次。但在夏季周围温度偏高，齿轮油持续高温，挥发较快，应考虑换油或补油。如安装法兰上出现油溢出时，表明油封已坏应更换。

After first 200 hours, replace gear oil completely. Then replace every 2000 working hours (or every 12 months). In summer high temperatures, the gear oil level could drop, so replacement or refill of oil is needed. If there is any overflowing of oil from the installation flange, the seal is damaged and should be exchanged.

(4) 应注意检查齿轮油的温度，对于矿物油，油温不得超过 95°C，对于化学合成油，油温不得超出 120°C。使用时注意取力箱周围散热环境，保持分动箱壳体表面的清洁，以防热量积蓄而使油温过高。

Inspect the temperature of the gear oil. As for the mineral oil, the temperature should not exceed 95°C, not exceeding 120°C for synthetic oil. Pay attention to the exterior temperature of the P.T.O, keep the surface of transfer case clean to prevent accumulation of heat.

(5) 分动箱气动换档的气动回路必须保持工作气压，并且工作气压不得超出 6 bar，取力齿轮箱只能在如下状态进行换档：离合器断开，发动机至变速箱输出端的动力传递被切断，汽车变速箱处于空档。

The working pressure of pneumatic system of transfer case should be maintained at no less than 6bar. Only after disengaging the clutch and placing the transfer case in neutral, can the gear case be shifted.

(6) 分动箱内轴承中的黄油，每隔 1000 小时加注一次，加注 1/3 轴承空间。

The grease in transfer case bearing should be topped up every 1000 hours, the total volume is 1/3 of bearing space.

警告 Warning:

分动箱严禁无油运行!

The transfer case should never be used if it has no oil.

分动箱不允许在运转情况下换挡!

It is forbidden to change the gear while running.

分动箱工作过程中出现任何异常都应切断动力进行检查!

The power should be cut off, should any abnormality occur during operation.

分动箱工作过程中表面温度可灼伤皮肤, 切勿触摸!

Do not touch the surface of transfer case for it may burn the skin.

4.4.2 泵送机构的使用 Pumping mechanism

(1) 泵送工作时, 泵送机构的水箱必须装满冷水, 它既可对混凝土活塞起冷却作用, 又可对混凝土缸起清洗作用; 当水温超过 50°C 需更换; 当泵车工作完毕, 必须放尽水箱及混凝土缸筒内的积水。

The water tank should be full of cold water before pumping, which not only helps to cool the concrete piston but cleans the concrete cylinder as well. Exchange the water when the water temperature is more than 50°C. After working, the water in the water tank and concrete cylinder should be drained off completely.

(2) 每次开机泵送时, 混凝土缸润滑点, 如自动注油, 应检查注油点是否有油进入; 如人工手动注油, 则必须将混凝土活塞分别退到注油位置充分注油。

Before pumping, check there is grease in the centralized lubrication points on the pumping cylinder. For the points not covered by the centralized system, inject grease by means of a hand pump.

(3) 泵送流量大小可以根据工作的需要来调节。

Pumping flow can be adjusted accordingly as necessary.

(4) 通过电控柜控制面板上的“面控/遥控”转换开关的转换, 可使用手控面板控制, 或无线(有线)遥控器控制泵送启停操作。

Switch the selector switch “Panel/Remote” on control panel to control pumping start/stop

either on the panel or by remote control.

(5) 如泵送过程中停顿约 10~15 分钟, 应间歇地多次正泵和反泵, 使混凝土料前后移动, 保持良好流动性。

If pausing for 10~15 minutes during pumping, continue pumping or reverse pumping intermittently to maintain good

fluidity of concrete.

(6) 如泵送中长时间停顿时，应将管道内混凝土料吸回到料斗，充分搅拌后再泵送。

After a longer downtime, the concrete in the pipes should be pulled back to hopper and fully mixed in the hopper before pumping again.

(7) 一旦堵管，不要坚持泵送，因立即进行多次反泵操作。

Stop pumping if blockage occurs, and immediately reverse pumping repeatedly.

4.4.3 臂架总成的使用 Operation Of The Boom

(1) 泵车在泵送施工时，臂架都会有一定幅度的摇晃，其摇晃的幅度大小取决于混凝土泵的泵送频率以及臂架的伸展作业姿态等。

The boom may oscillate during pumping, the amplitude of oscillation is determined by the pumping frequency and boom open position, etc.

(2) 末节输送管摇摆的原因，是由于末节输送管内混凝土料的加速，从而引起末节胶管定量的运动，属正常现象。

It is normal that the last section of concrete pipe swings due to the acceleration of concrete in the last section.

(3) 如果臂架与末端胶管的晃动过大，可能影响结构件稳定性，减少易损部件的工作寿命，危及操作者安全等。

If the boom and the rubber hose swing strongly, it may affect the structures stability and decrease the lifetime of wear parts and endanger the safety of operator.

为减小臂架的摇晃，可采取如下措施：

In order to decrease the swinging amplitude, the following methods may be adopted:

a) 降低泵送性能即低速泵送；

Pumping at low speed.

b) 增加混凝土料的流动性，使混凝土料易被吸入混凝土缸；

Increase concrete fluidity.

c) 检查泵的泵送频率与臂架固有频率应不同，来防止共振引起的臂架振幅加大；

Pumping frequency should be different from that of the boom to prevent the occurrence of resonance.

d) 检查在泵送油缸中是否有空气，以防止由于吸空造成胶管损坏；

Keep the air out of pumping cylinder to prevent the damage to hose.

e) 最后一节臂架要尽量在水平位置工作。

The last boom should remain horizontal as much as possible while working.

(4) 通过遥控器上的快、慢档转换，以及手柄推拉的幅度调节臂架动作速度；

Adjust boom movement speed either by lever or quick / slow selector switch on the remote control.

(5) 臂架运动要平缓，以防止惯性冲击对泵车的稳定性和整体结构严重影响；

The boom should be moved slowly and carefully to avoid reducing stability of the whole structure due to inertia impaction.

(6) 臂架在操控移动中，操作员必须本人或他人协助，观察到臂架的所有的动作。

The operator should personally or with the help of others observe all the motions during boom operation.

4.4.4 关于清洗时弯管端盖的使用 Operation of the cover on bend

当泵车采用反泵清洗时，为便于清洗球从料斗出口弯管中取出，泵车随机配的弯管处的 150 型端盖，应将端盖上带把手侧朝外，带止位杆的一侧朝内安装。

在正常泵送作业时，则应将此端盖上带把手侧朝内，带止位杆的一侧朝外装配（或更换此盖）。

There is one $\Phi 150$ cover delivered with the machine as spare part. The cover is used on the bend near hopper. When clean the conveying pipe with the method of reversing pumping, you should fix it with the handle side up, and stop pole side down.

And when the machine is switched to concrete pumping condition, then you should reverse the cover and fix it with the handle side down.

4.4.5 功能按钮的使用 Operation of function button

泵车上，各控制按钮的使用，在说明书的相关章节中都有详细的说明。在操作泵车或对某功能键有疑问时，请务必对照说明书，仔细查阅其相应控制按钮的具体功能与使用说明；从而确保泵车使用安全可靠。

你所使用泵车的个别操作可能与该说明书有所差异，如有疑问，请及时咨询我公司服务站人员。

The details of all the control buttons are explained in the chapter of hydraulic system and electric system. Please read this part carefully to ensure safe and reliable operation of the machine.

If you have any questions about these function buttons, don't hesitate to ask for our service persons.